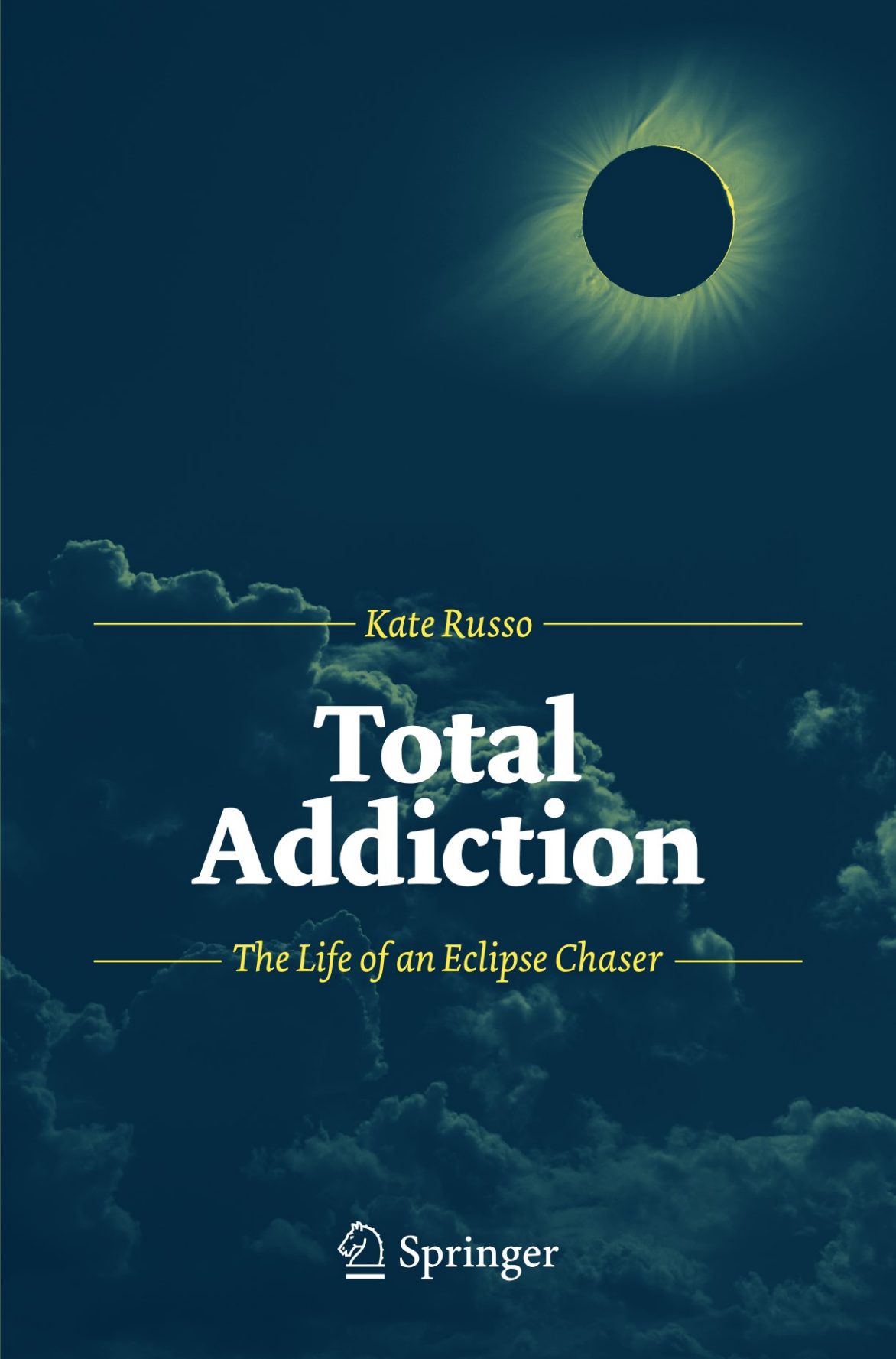

Kate Russo

Total Addiction

The Life of an Eclipse Chaser

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Synopsis

This book is about people who are passionate about the total eclipse of the Sun, one of the most amazing spectacles in nature. Experiencing a total eclipse is a life-changing event for many people, and is described by some as an unforgettable event to experience at least once in your life. However, there are many people who believe that once in a lifetime is not enough. These people—eclipse chasers—travel every 18 months or so to very specific locations around the world in order to experience a total solar eclipse. What motivates eclipse chasers to do this?

It is difficult to describe the eclipse experience to those who have not witnessed the event. Images do not convey the magical experience of totality, the most thrilling part of the total eclipse. Currently, we struggle to understand the experience of totality, and the motivations of the eclipse chaser. As a result, eclipse chasers are considered to be a mysterious but odd group of individuals due to their unusual passion.

This book gives an insight into the world of the eclipse chaser by first describing the experience of totality, and then exploring their lives and motivations. Those who chase eclipses will find this book useful in helping them to understand their experiences. Those not lucky enough to have seen a total solar eclipse will obtain a glimpse into the intriguing world of the eclipse chaser, and perhaps by the end of it, will want to experience totality for themselves.

Preface

It is Christmas Eve, 2009. There is steam rising from the hot bubbling outdoor Jacuzzi, swirling as it meets the cold air. Snow is falling heavily, disappearing immediately where it falls onto the bubbling water, and plastering the tops of our heads and our shoulders. I am in the hot tub opposite Geordie, my partner of 16 years. There is a layer of white all around where snow has fallen for several days, blanketing the ground and trees, and muffling the sounds of nature. The temperature is about 3 °C, although we are blissfully steaming in the hot tub. All that is missing is a glass of bubbly.

We look at each other and smile, raise imaginary glasses and silently clink them together, imagining how the falling snow would melt in our drinks. We make a point of marking this moment—that we are in this magical setting where cold meets hot, with snow falling on us. We reflect on our lives—the choices we have made, the experiences we have had that year, and many years previously. We consider the following year—future adventures, unknown freedom. We rejoice at our relationship—16 years of joy, fun, friendship and sharing. Lastly, and with seriousness, we praise our good health which allows us to fully experience our lives with few restrictions. We smile as the snow continues to fall around us, feeling so happy together and incredibly lucky.

It is funny how moments like these seem to take on a huge significance, and are remembered in such detail when they later become recognised as turning points in our lives. That time certainly turned out to be a turning point for us. Just 2 weeks later I am sitting on a vinyl chair in a hospital, wearing a plastic apron, gloves and a mask on my face. I am watching over Geordie as he lies asleep in his bed in a single isolation room. The speed at which his body was succumbing to a life-threatening infection is frightening. I watch with relief as he breathes slowly in and out, sweating profusely and seemingly temporarily free from the pain that has consumed him for the previous 2 weeks. My thoughts return to that hot tub moment where we commented on our good health. Did we jinx our health by saying those things? How could our life circumstances have changed so rapidly? Earlier that day we had spoken to the hospital consultant, who had sensitively tried to prepare us for the reality of Geordie not being able to fight off the severe

pneumonia he had developed, with fluid building up around his heart and lungs and many other complications. It was so sudden and unexpected, and so far outside my life experience that it was as though I was an observer in a re-enactment of my own life. But it was real. I was there. This was happening. The only thing that would help Geordie now was time for his body to win the fight against the infection.

After a month in hospital Geordie was finally able to return home, frail and in pain, but at least out of danger. There were further set-backs and several more emergency hospital admissions, but he continued gradually to make progress. After 6 months he was able to make a slow return to work. After 1 year he was much improved, working full time, although still easily fatigued. Now, after 2 years, life has almost returned to how it was before. We again savour those moments where we feel happy together and incredibly lucky. But we are older, wiser and more aware of the fragility of life. I knew this already, working as a psychologist in a hospital with children with life-limiting conditions. But it is only when these things happen to you that you are sharply reminded of the fragility of life. You then learn to appreciate things in a way that you have not done previously.

During Geordie's recovery I was repeatedly drawn to photographs of our many travel adventures, related to our years of eclipse chasing. I began to realise how important these eclipse adventures had been, and how experiencing each and every total eclipse had helped me appreciate life. I was already aware that my eclipse chasing was a first-rate antidote for the emotionally demanding work I was engaged in, working in a hospital with children with life-limited conditions. There is an emotional cost to this work—you can become desensitised to emotions as a way of protecting yourself from any distress you experience. Eclipse chasing during this time had become a way of ensuring that I reconnected with my emotions, with my life, with the world.

Each eclipse was a celebration of life, and a reminder that life is precious and wonderful. And ultimately life ends. We have one chance at it, and we ought not waste any moment as there will be a time where those moments no longer exist. Geordie's illness made me really appreciate how a total solar eclipse is a reminder of our lives. A total eclipse lasts only a few minutes, but we are mesmerised, awestruck, and aware of every second. It is also precious and wonderful. And then it is over. A total eclipse is a perfect metaphor for life.

Having developed a deeper understanding of what eclipses mean for me, I wanted to understand more about the experience. Why is totality so powerful? How does it affect people? Do other eclipse chasers think about eclipses in the same way I do?

In my academic research I have expertise in doing phenomenological research, which aims to understand how people make sense of their experiences. My research programme has focused upon health and illness. I wanted to use this phenomenological approach to understand more about the experience of totality. I had fantasised for years about researching how people experience total eclipses

and now seemed like the perfect time. I was very much encouraged by those around me – my colleagues, friends and other eclipse chasers.

This is the story of the genesis of this book. The important message of the book is this—life is precious. Spend your time with those you love, doing what you love to do. And make sure you experience a total eclipse, at least once in your life.

January 2012 Kate Russo

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Part I
Eclipse Chasing Context and Background

Fred Espenak, (Mr Eclipse), Scientist Emeritas, NASA/Goddard Space Flight Centre

Glorious Totality!

There are precious few events in life that leave such an indelible impression that the simple act of recollection can quicken the pulse and increase respiration as vivid memories flood one's mind. The total eclipse of the Sun is just such an event.

The simple act of standing within the shadow of the Moon affords the rare and unprecedented opportunity to gaze directly at the halo of million-degree plasma surrounding our star. Twisted, tortured, and constrained by the Sun's enormous magnetic fields, the solar corona is revealed to the naked eye only during the brief seconds when the Moon completely blocks the brilliant disk of the Sun.

The corona's gossamer crown of pearly light displays an ethereal beauty that transcends both science and nature. It hypnotizes the viewer into an altered state where time seems to stands still. Nevertheless the diamond ring of third contact, signaling the end of totality, appears much too quickly. Hungry eyes search in vain for one last glimpse of the corona hidden by the rapidly expanding glare.

Totality is over. The memory of this fleeting event will be replayed many times in the years to come. But for some people it will not be enough. They will travel to the far corners of the globe at the appointed time and place to witness the grand spectacle again. And again. And again. They are the eclipse chasers.

Chapter 1
A Personal Introduction to Eclipse Chasing

1 Confessions of an Eclipse Chaser

My name is Kate. And I am an eclipse chaser.

My eclipse interest was, I believe, shaped during my childhood by my father's curiosity about the night sky and by witnessing a partial eclipse when I was about 7 years old. I also recall reading Enid Blyton's book *The Secret Mountain* when I was eleven, which featured a total solar eclipse in the storyline. I had always been drawn to the image of a total eclipse, and thought it was mysterious and worth seeing one day. But it was not until my late twenties that I stood under the shadow of the Moon for the very first time. Since that eclipse on the coast of France in 1999 I have been an eclipse chaser. I have now seen seven total solar eclipses. My eclipse chasing adventures have taken me to places around the world that I may not have visited otherwise. My future travel is now determined by where the shadow of the Moon falls upon the Earth, and I know that I will be an eclipse chaser for as long as I am able.

Whenever I tell people I am an eclipse chaser there is usually a response of surprise, mixed with curiosity and bemusement. Surprise, because most people are aware of eclipses but may never have thought of anyone 'chasing eclipses'. Curiosity, because I do not fit the typical profile of what they would expect an eclipse chaser to be—a new age reveller, or a bearded man fiddling with a telescope. Bemusement, because people do not understand why I would want to travel around the world to see something that lasts only for a few minutes. Occasionally I get a look that suggests the person thinks I have lost my marbles. However, revealing myself as an eclipse chaser is a social lubricant that always gets interesting conversation going. Telling people that I am a Clinical Psychologist, in contrast, is a definite conversation stopper in many social situations.

Being an eclipse chaser is a part of my identity that I am proud of and extremely passionate about. When I talk about eclipses I come alive with a childlike excitement. I call these my 'nerdy moments' as I can get a little carried away by the excitement as I talk about the alignment of the Sun, Moon, and Earth. I gush

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excitedly about the wonder of totality, how everyone should experience it, and how it makes you feel very much alive. My excitement just seeps out of every pore, my body language becomes more animated and my eyes sparkle. When asked "*Why do you do it? Why do you chase eclipses?*" it has been difficult to give a definitive response. It is such a simple question, yet I find it difficult to fully explain why I chase eclipses and I end up reducing it to a statement: "*It's just who I am*." There is no clear way of describing the sheer magic of totality and the passion I feel in a way that people who have not seen an eclipse can relate to.

I am not surprised to learn that most eclipse chasers report feeling this way. To others, we may appear to have lost touch with reality, or seem to be explaining a drug-induced psychedelic experience. One can clearly explain the scientific aspects of what happens during an eclipse (see Chap. 5), but that is only a small part of the experience. It does not describe the passion associated with totality—giving eclipse chasers their reason for doing what they do. So at times we are perceived to be nutty, a little irrational, even on the edge of society. But in order to understand the eclipse chaser, one must first understand the experience of a total eclipse of the Sun.

Sharing the Excitement of my First Total Eclipse

I would rate my own passion for eclipse chasing as being at 99 %. I easily re-live the excitement of my eclipse experiences, and I enjoy talking about eclipses to anyone who will listen. I have had the idea for this book for many years and certainly my passion for eclipses has not wavered since my first eclipse in 1999. In preparation for this book and in order to help me communicate where this passion was first fired up, my friend and fellow eclipse chaser Terry Moseley (see Chap. 8) interviewed me about my first total solar eclipse and how my passion for eclipse chasing has in some ways taken over my life.

My first total eclipse was a very powerful experience. I was aware that a total eclipse was an unusual event, and I have always been drawn to experiencing things that are new, intense, and out of the ordinary. I always knew that it was only a matter of time in my life until I saw a total eclipse. In 1999 Geordie and I had to leave the UK for visa purposes and this coincided with the total eclipse over Europe. We were able to make simple arrangements which allowed us to see the total eclipse from Fecamp, along the northern coast of France:

> I had no expectations. I didn't know anything scientific about eclipses really. We got there to find a massive crowd of people. We found a spot down at the beachfront. We really just followed the crowds. I was so excited when I saw the first bite of the Sun. Then I remember feeling a little bored watching the partial phases. We had a bottle of red wine and some little pastries, so we were sitting down behind a wall protected from the wind, drinking and eating, and would stand up every once in a while and have a look through our eclipse glasses as the partial eclipse progressed. But then there was a point where things changed rapidly. The wind picked up, then eeriness. Do you know that feeling when the

> crowd suddenly changes? There was a shift—something very tangible that we noticed. We figured that we needed to stand up and take notice. It was happening. It was just… that ominous feeling. I felt it in my chest. I remember feeling that something big was going to happen. I didn't know what to expect—it was just unfolding. It was ominous. And it was very hard to pinpoint what that was.

The sensations were incredibly physical, and that really took me by surprise:

> It was such a physical feeling in my chest and that's a very hard thing to explain. A shuddering, a shaking. It didn't feel like pure adrenaline. I don't think I was overtly scared. But it was a thrill—it was very exciting. It's a body sensation-connection. I didn't know what I was supposed to look for during the eclipse but it didn't matter. I just remember thinking—"it's all around, it's happening. The peak is about to come". You could feel it. All around us there was techno music thumping—that seemed to add to the whole thing. Not that your heart was going at the same speed, but the sound was the connecting thing and it was… I'm feeling it now in my chest. It's like thump, thump, thump. I wasn't really aware of the music beforehand or what was going on. But certainly, just before totality that part of it really resonated with me and I was just thinking this is, you know, all coming together. But the shuddering—I am feeling it now. It's very powerful. It connected me.

Here, again I am struck by the physical sensations that I describe. I recognise that I didn't know what to expect. For me it was the sounds that really made the connection between what was happening and what I was feeling. What is also striking is the ease with which I am able to re-experience these emotions—this event happened 13 years ago and although I do not recall much of the visual detail of the eclipse itself, I am re-living my reactions to the experience as if it were happening. As I recounted these physical reactions during the interview with Terry, I started to shake. My face became flushed, and I was actually finding it difficult to connect with language—I was finding it hard to communicate. I am referring repeatedly to a 'connection'. Although it was hard to verbalise during the interview, the connection was perhaps one of connecting on a purer level with my body and emotions. It was about being there in that moment and experiencing nature coming alive and rushing towards me as totality occurred:

> Then "Oh my God, it's here!!" It was just thrilling. I remember hearing the crowd. It was almost like the crowd's response became one, and this united crowd response lifted up. I was just so blown away. I have no recollection of what I was saying or thinking. I just remember being so captivated, even though I can't even remember what I saw. In fact that sounds very strange, but I can't remember the detail of what I saw in the sky. All I remember is that overwhelming sense of sheer thrill. Euphoria. Just intensity. And that feeling of connection. We didn't have binoculars—we didn't have anything apart from eclipse glasses. It didn't matter. It was just about the connection. I wouldn't say it was a connection with cosmic energy or anything like that. I didn't have any religious thoughts. It was just a connection with the environment. I felt insignificant, but extremely lucky and very strong. I felt connected with the crowd until the moment of totality and then I was so focused on what was happening within me that everything else melted away except me and the Universe. I think that is why I don't remember details of the actual eclipse because I was taking it all in on a very physical level.

The peak of that eclipse lasted for two minutes and seven seconds, but to me it seemed a lifetime. I recall being completely stunned at what had just happened once totality was over:

> It was so exhilarating. After it finished, I was like "Wow, what was that?" I wasn't disappointed it was over. It was utter thrill that I had that opportunity to be there—to experience it. That's when I became emotionally overwhelmed—the choked up feeling. The intensity swept through me. I was thinking "Oh my God, what *was* that?"

Immediately afterwards I knew I wanted to repeat that experience. I felt so strongly that I had to experience this again and as soon as I could. It had such a profound effect on me. It was as if I was seeing things in a different way and my view of my life and the world had just expanded. I knew it had changed my life, and that the eclipse experience was now going to be a part of my life. It was not going to be a once-in-a-lifetime thing for me. It was at that moment that I became an eclipse chaser. I didn't want to miss a moment.

Many places where the total eclipse could be seen in 1999 had poor forecasts for clear skies, with those forecasts proving correct. Most of the UK and much of France was clouded out, so we were incredibly lucky to see the eclipse at our location. It wasn't until years later that I googled the place we were and saw photographs showing the sky almost covered in cloud. I had no awareness of that at the time, and I had no concern for there being any possibility of missing the eclipse because of the weather. As far as I was aware, you go to the place, you see the eclipse, and you go home. I now know more.

That first experience was obviously a very powerful and physical experience for me. Subsequent eclipses have been similar, although not as intensely profound as that first time. I can never have that complete naivety again, of not being aware of what is going to happen, although each eclipse is unique and the experience always seems new. Once I saw my first, I wanted to learn more about eclipses, and I have found that the more I know, the more I feel I want to control things such as the weather and location. Anxiety creeps in because I understand that the eclipse will occur but there are no guarantees that I will see it. I have been very lucky—my first six total eclipses were clear. It wasn't until 2009 that I was faced with cloud cover denying me the totality experience—that was hugely disappointing.

Obviously, whilst preparing for and writing this book I have spent most of my time and energy thinking, writing, reading, interviewing—living and breathing eclipses. It has been immensely enjoyable. There are a few things that I think sustain my interest in eclipse chasing. My love of travel and seeing new things appear to be central to my motivation for eclipse chasing. After my first eclipse in France I researched where the next one would be. When I saw that it crossed over Africa and Madagascar, I just knew that I was going to Madagascar for that eclipse. It was simple. It's a great excuse to explore places that I have always been curious about. I enjoy combining my love of the natural world with my eclipse travel in order to have a great experience. I love getting off the beaten track, and eclipse chasing allows me to do this.

I also prefer to experience a total eclipse from a height. I love being able to see everything. I enjoy doing a 360 degree turn and seeing the colours on the horizon all around me. I see it. I feel it. I'm in the middle of this world. It does seem like entering into a different world. It is just magical and special. I just buzz. I have a photograph of myself after the total eclipse in Turkey in 2006 which is one of my

Fig. 1.1 The author in awe, taken moments after totality in Turkey in 2006. The buzz and excitement is clear to see. © Geordie McRobert

favourite pictures (see Fig. 1.1—the author in awe). I look at that photograph now and I can still capture that feeling—I just look alive.

2 The Total Solar Eclipse: A Brief Introduction

A total eclipse of the Sun has to be one of the most dramatic and awe-inspiring events of the natural world. There are many other events that take our breath away—the aurorae on a blistering cold evening, a meteor shower shooting across the sky, the explosive eruption of a volcano, or a powerful thunderstorm with lightning. But a total eclipse, or totality as it is known, allows you to experience the three-dimensional nature of the Universe—events occurring in the cosmos are able to be experienced directly on Earth. The darkness that you experience during totality is the shadow of the Moon as it passes in front of and completely covers the Sun, blocking out all light. The Sun, the Moon, and Earth are all in perfect alignment.

Totality: In a Nutshell

During totality, you are standing on a planet, observing another heavenly body cross paths with a third. The scale is unimaginable, yet here it is happening right on top of you and around you. It is real. You can literally *feel* the ominous shadow

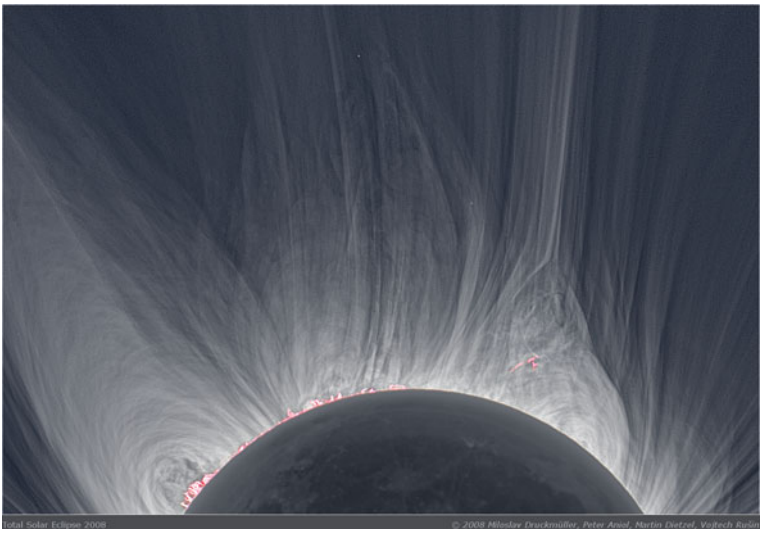

Fig. 1.2 The corona. This stunning composite image shows the enhanced detail of the corona of the total eclipse taken from Bor Udzuur, Mongolia in 2008. The image shows the details about the Eastern limb of the Sun. Prominences can also be clearly seen © 2008 Miloslav Druckmüller, Martin Dietzel, Peter Aniol, Vojtech Rušin

before it arrives. The temperature drops. The wind picks up speed. The sunlight slowly dims, bathing the surroundings in an eerie twilight that produces colours with shades rarely seen in the natural world. Then it is time. Moments before totality a wall of darkness comes rushing towards you at speeds of up to 5,000 miles per hour—this is the shadow of the Moon. You feel alive. You feel in awe. You feel fear. Nothing can prepare you for the absolute beauty of an eclipse and then the 'click' in place as the Moon completely blocks out the light of the Sun, allowing those directly underneath to look up with the naked eye and see the corona—the outer atmosphere of the Sun—in all its majesty (see Fig. 1.2—the corona). After what seems like a brief moment of eternity, the Moon continues on its journey and the shadow races away, marking the return of the light. The whole event is eerie, unnatural even, and stunningly beautiful. Most people are familiar with the image of the Sun in total eclipse—the black disc with the delicate blue-white of the corona streaming out from behind. However, pictures do not, and cannot convey the beauty, the eeriness, and the feel of totality. Nothing you read, see, or hear can prepare you for the spine-tingling, goosebump-inducing experience of the two most familiar heavenly bodies dramatically crossing paths, turning day momentarily into night. The eerie twilight that confuses birds and other animals and, at times, humans, is like no other experience you have ever had. It is impossible to be a passive observer. You do not simply see a total eclipse. You experience it. You are immersed in it. You are completely overwhelmed by it. Many people say that the experience of totality changes their lives.

Being in the Right Place, at the Right Time

A total solar eclipse is a rare event, occurring somewhere in the world on average every 18 months and often only visible in places that are rarely inhabited. The shadow of the Moon moves rapidly across the surface of the Earth along a narrow pathway, known as the *path of totality*. When the path of totality passes over land, it allows those along that path an opportunity to experience a total eclipse. In 1999, the year in which I saw my very first total eclipse, the path of totality swept across Europe and Asia, giving millions of people an opportunity to experience the total eclipse. Sometimes the path of totality makes very limited landfall or only occurs over remote areas. This happened for the total eclipse of 2004, which was only visible in Antarctica and witnessed by fewer than 1,000 people. The shadow of the next total eclipse in November 2012 will only make landfall over Northern Australia, near to the place I was born.

At any specific location, there is an average wait of 375 years for a total solar eclipse to occur again in the same location. For example, the next total solar eclipse can be seen from Cairns in North Queensland, Australia. The last total eclipse that could be seen from this location was in 710 AD, and the next total eclipse to be seen from Cairns will be in 2237. That is a wait of 225 years for that particular location—several lifetimes. For London, England, the last total eclipse that was visible was in 1715, and the next will be in 2151.[1] The rare occurrence of a total eclipse in any given location makes the experience a once-in-a-lifetime event for most people. However, there is good news—you do not have to wait a lifetime for a total eclipse to come to you—you can travel anywhere along the path of totality for the next total eclipse and intercept the shadow instead. This is exactly what eclipse chasers do.

Eclipse Chasers: Who are We?

It is hard to estimate how many eclipse chasers there are in the world. Eclipse chasers are made up of every type of person—young and old, male and female, from all backgrounds and interests. These people will do all they can to travel to the path of totality, even if that means expeditions to the remotest places on Earth. In my 13 years of being an eclipse chaser, I have seen seven total eclipses and two annular eclipses on five different continents.[2] I have not yet seen an eclipse in

[1] The path of totality for the 1999 total eclipse passed south of London, so London was able to see only a partial eclipse, not a total eclipse. The total eclipse was only visible where the path of totality crossed through Cornwall. This causes confusion to many people. Essentially, you can only witness a total eclipse if you get yourself within the path of totality.

[2] See Chap. 5 for more information on the different types of eclipses.

North America, although 21 August 2017 is already pencilled in my diary to see the first total eclipse making landfall on the US mainland since 1979. The excitement is already building up. My other missing continent is Antarctica. Antarctica, as remote as it is, did not stop about 1,000 intrepid eclipse chasers in 2004 (with more time and money than I had) from travelling by ship and plane to see a total eclipse of the midnight Sun. There are never any guarantees—many who travelled did not actually see that eclipse due to cloud. Eclipse chasers are just madly passionate about totality and will do all they can to try to experience the magic.

If you have never experienced a total eclipse, it may be difficult to understand why eclipse chasers would be motivated to travel to see a total eclipse. But once you have experienced totality, it seems like the most natural thing in the world to do. The desire to repeat the experience is strong. For me, travelling to see a total eclipse is no longer a choice—it is a given, my default setting. The dates of the next eclipses are already in my mind, and I have vague plans for what I will be doing for each total eclipse occurring in the next 5 years. They have simply become an important part of my life, my identity, and my future. It is like having an alternative celestial calendar that runs in parallel to my everyday life.

Why We Should Research Eclipse Chasers and the Experience of Totality?

As an eclipse chaser, one of the main challenges is how to convey to others what it is like to experience totality. It is something that has to be experienced to be understood. I recently met with Sir Patrick Moore, the great British writer, broadcaster, and amateur astronomer, in order to share our passion for eclipse chasing. As a man who has devoted his life to inspiring others about astronomy, he admitted that even he has difficulty explaining the eclipse experience:

> I had read descriptions of totality, I had seen pictures of it. So I knew more or less what to expect. But what I did not realise was how awe-inspiring it is. You can't really describe it.

I am fascinated by just how difficult it is to describe the experience of totality. My job as a psychologist is to help people make sense of their experiences, to identify and connect with their emotions, and to communicate to others about things that are important. Eclipse experiences are a challenge to communicate, and therefore worthy of further exploration if more people are to share this event. You can listen to the words and read descriptions, but it is beyond understanding until you experience it.

We are unable to easily describe the experience of totality because it is such an unusual event. It goes beyond anything we have ever experienced. Given the rarity of the event and the fact that most people might be lucky only ever to witness it once in their lives, most are never able to make sense of that experience in a coherent fashion—it remains an isolated event that defies explanation. First-time

eclipse viewers are left speechless. They experience totality and are reduced to muttering "wow". And so begins an intense desire to repeat the experience, perhaps in an attempt to understand what happened. This is why eclipse chasers are unique—we have chosen to experience this amazing event repeatedly. If we want to understand more about totality, it makes sense to talk to eclipse chasers about their experiences. After all, eclipse chasers have been repeatedly trying to make sense of what they have experienced.

3 What This Book is About

Although this book is about eclipses and uses rigorous qualitative research to explore people's experiences, it is neither an academic nor a science book. I have aimed to make it readable to anyone who has an interest in eclipses, whether it be chasers themselves, family members, friends, colleagues, or anyone who would one day like to experience totality.

The first part of the book focuses on the total solar eclipse itself and the context of eclipse chasing. Dava Sobel, awarding winning author and renowned science writer, provides a narrative account of her travel by sea off Mexico to experience her first total eclipse, which lasted seven minutes. This trip resulted in Dava, like many first time eclipse viewers, becoming an eclipse chaser. Dava's story provides a realistic introduction to what happens for those who have never before experienced a total eclipse.

Part Two provides a more detailed exploration of the experience of totality using information from a survey of eclipse chasers. This part includes information about the physical and emotional reactions that people have experienced during totality, and explores reasons why it produces such an intense response.

Part Three focuses on detailed interviews with nine eclipse chasers to help provide some insight into what it is like to be an eclipse chaser. This part also aims to understand how people make sense of the eclipse experience and what it means to them. These interviewees include chasers who have a scientific background and others with no formal academic training. Many have discovered a significant personal meaning in their eclipse experiences, and there are some who have developed a way of earning a living from their passion. There are chasers from Canada, the USA, and the UK, with the number of total solar eclipses experienced for each person ranging from 1 to 24.

Part Four gives a general overview of the commonalities in experience reported by those interviewed, providing some answers to two key questions: Why is the totality experience so powerful? What motivates eclipse chasers? Other questions that relate to the human experience of totality will also be explored.

In Part Five, the final part of the book, I provide a light-hearted description of some of the challenges faced by eclipse chasers, tips for those who have never experienced a total eclipse, as well as an overview of the total solar eclipses from 2012–2020.

This research into the experience of totality has been a true labour of love for me—a combining of my career as a psychologist with my expertise in phenomenological research and my passion for chasing eclipses. I hope you enjoy reading this as much as I have enjoyed researching and writing. I also hope that this book inspires you to join me some day, somewhere, along the path of totality in the shadow of the Moon.

Chapter 2
Understanding the Passion of the Eclipse Chaser

1 History of Eclipse Chasing

For hundreds of years people have been travelling to undertake scientific observations and experiments during celestial events such as eclipses. Scientific expeditions were funded in order to undertake important research during total solar eclipses, which often took years of planning, preparation and travel. The results of these observations and experiments were proudly reported upon return in national papers and journals. Each eclipse was an opportunity for science to progress, and focus was placed upon the scientific elements of totality. *Scientific American* was one such journal that reported eclipse expedition findings and reports dating back to the late 1800s make reference to 'esteemed individuals' who would travel alongside scientific expeditions to the path of totality. They tell of crowds of local people who would suddenly find themselves in a privileged position based purely upon where they lived. However, apart from the scientists and esteemed individuals, very few ordinary people would have been able to travel repeatedly to see a total eclipse.

That changed as travel became more accessible in the 1950s and 60s, allowing more people to travel independently to see a total eclipse. Modern day eclipse-chasing tours began in 1972 when the *Voyage to Darkness* cruise sailed 900 miles from New York to intercept the path of totality. This paved the way for other specialist tours to facilitate people to experience a total eclipse.

What a different world we live in today. Not only is travel much more affordable and accessible, but it is also simple to obtain information about the location of each eclipse, complete with weather predictions and suggestions on what else to see and do whilst in the area. It has never been easier to be an eclipse chaser. Furthermore, there are hundreds of specialist travel companies who now arrange eclipse chasing tours, and demand for these continues to grow. Increasingly, people are pursuing interests and events that are out of the ordinary, and there appears to be a growing interest in seeing a total eclipse. No longer is eclipse chasing for scientists and esteemed individuals. Today, anyone can become an eclipse chaser.

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2 Eclipse Chasing as a Passion

An eclipse chaser can be defined as: *an individual who has made a life choice to give in to their insatiable desire to re-experience the thrill and excitement of totality*. The one thing that seems to initiate such an intense and passionate drive is experiencing totality for the first time. This seems to ignite the fire. Dr Glenn Schneider, professional astronomer, scientist, and passionate eclipse chaser, explains:

> Seeing a total solar eclipse once gets under your skin and into your body and into your spirit.

But not everyone who sees a total solar eclipse then goes on to become an eclipse chaser. For example, millions of people are estimated to have seen the total eclipse in 1999, when the path of totality passed through many high density population regions of Europe and Asia. Similarly, the 2009 eclipse passed through high density population regions of Asia. Yet not all of these people have become eclipse chasers. Granted, most observers will be restricted by poverty, time, or their ability and freedom to travel. For many, seeing an eclipse was a great experience but one that does not need to be repeated. However, a number of these will find the fire ignited in them and subsequently go on to chase eclipses. These are the eclipse chasers who have developed a passion.

The word 'passion' comes from the Greek word 'pathos' meaning '*to suffer*', and expresses an intense desire or compulsion, or unusual enthusiasm for an object, event, person, or thing. Eclipse chasers, as we shall see, can be extremely passionate about experiencing a total solar eclipse. This passion is not unique to eclipse chasers—everyone knows someone who is passionate about something. There are many stories of individuals who decide to embark upon their own personal mission to do something extreme—such as walk across the country or cycle their way around the world. This passion is different to having a general interest or liking something—it is all-consuming, focused, and sustained over many decades. People can be hugely driven to do the things that have personal meaning for them, and it is hoped this book will help us understand more about what drives this passion for eclipse chasing.

Eclipse chasers from all around the world come together along the path of totality. This sense of common purpose is hugely reinforcing and reaffirming—you are with others who 'get it', who know and love the experience, and feel the pull. There is a strong sense of belonging. To have a passion is exciting—and to share this with others once every 18 months or so is immensely satisfying.

3 The Eclipse Chasing Community

Within the eclipse chasing community or subculture, there is already an established vocabulary that is used when referring to eclipses. Much of this vocabulary is science-related. Eclipse chasers talk about the corona, prominences,

Baily's Beads, the umbra, the Diamond Ring, lunar limb profiles, and shadow bands (refer to Chap. 5 for explanations). After observing an eclipse, these words will probably become part of your own vocabulary.

There are also amusing phrases, such as referring to those who have never seen an eclipse as an 'eclipse virgin', and referring to the time after totality as the 'cigarette moment'—clearly hinting at the parallels between experiencing totality and having an orgasm. Other words and phrases are used that attempt to explain the strong motivations of the eclipse chaser. Consider these comments from two different eclipse chasers in a recent eclipse chasing survey:

> I saw my first eclipse in Zambia in all its splendour - that day I was definitely hooked and I became an eclipse chaser.

> The first one was close to my country, Bulgaria - it was a good opportunity so I viewed one and then became addicted.

In these two quotes, the words 'hooked' and 'addicted' are used to describe how strong the pull was for these eclipse chasers after their first eclipse. Similarly, some eclipse chasers use language suggesting they think of chasing as an obsession—consider this quote, again from the same survey:

> I'm going to go to every eclipse for the rest of my life. I have to do this - I just have to do this.

Eclipse chasers also use a number of metaphors to describe the eclipse experience. One such metaphor is that the first eclipse experience is like a doorway. This is used by the wonderfully expressive Diane Ackerman, bestselling author of many books including *A Natural History of the Senses* and *The Zookeeper's Wife*, in a poem that can be read at the end of this book. In this poem she writes: "*A door opens to the ghost towns of our past*", describing how the eclipse seems to connect us to our more primitive ancestors. Another commonly used metaphor is that of celestial mechanics—referring to the regularity and predictability of eclipses and other astronomical events as time-keepers on a grand scale. The language and metaphors are interesting, but do not explain to eclipse virgins the awe, the fascination, the fear, the beauty, the life-enhancing nature of totality, or the passion we feel for eclipse chasing.

4 Eclipse Chasers as Travellers

To be an eclipse chaser one must also be a traveller. The majority of eclipse chasers are passionate about travel and have an independent spirit with a tolerance for flexibility. The very few eclipse chasers that do not like to travel comment that they endure the travel for the reward of totality. If one is investigating the motivations of eclipse chasers, it is useful to understand a little about why people are passionate about travelling.

Travel as Part of Human Nature

The urge or desire to travel seems to be an innate part of being human. From an evolutionary perspective, travel may have been an essential requirement for survival, driven by the search for food and variability in partners. Hunter-gatherers would have had to explore new environments whenever resources in an area became depleted over time. There is now evidence that seeking novelty as a means of survival is encoded in our DNA, since in some circumstances it may have been those who took risks to explore who would have survived. In modern times, some people are required to move due to natural disasters, food shortages, political instability, and climate change. Others are forced to travel for economic reasons, to find work to support a family. Many people travel for leisure and describe a strong desire to travel. Human beings seem to be naturally curious about the world and are willing to explore. Our curiosity also extends beyond our world and into space. One of the most significant achievements of space exploration has been to allow us to look at Earth from a different perspective, showing us clearly the fragility of the atmosphere, the beauty of our planet, and the commonalities across all cultures. As noted by Norman Cousins, American peace activist:

> What is most significant about the lunar voyage was not that men set foot on the Moon but that they set eye on the Earth.

In the same way, travelling to other countries allows us the opportunity to achieve an outsider's perspective of our own culture and beliefs—a different perspective on our own lives. Travel broadens the mind and satisfies the soul. Therefore the desire to travel can be seen as a desire to understand and challenge ourselves.

What Motivates People to Travel?

Despite the massive appeal of travel and the multi-billion dollar industry that is involved, there is little research on the psychology of why people are motivated to travel. Several simple theoretical models have been used to understand why people travel or migrate to different areas. The first is the Push/Pull theory as outlined by Everett Lee in 1966, and used to understand migration. In this theory, there is some internal motivation that pushes an individual to want to travel—the push. Then there is a pull that occurs from a particular country, location, or event which determines where they go and what they do. According to the theory, both push and pull factors are required for people to experience a desire to travel. Most research shows that we are pushed to explore by our psychological needs for security, belonging, and self-actualisation. It might be useful for us to consider using this broad framework to explore the things that are unique about the eclipse experience itself, things that make us want to experience it again and again (the

pull of totality). Then we can look at the factors that drive our motivation over many years, factors that keep us chasing eclipses (the push).

Researchers have also attempted to categorise travellers into types according to what they do when they travel, length of stay, cost, educational interest, learning a new skill, building on existing social connections, exploring cultures, seeing natural events, and attending social events. This categorisation may describe the *purpose* of a particular trip, but does not allow for the multiple reasons why people travel, or the meanings associated with travel.

Other researchers have relied upon the simple categorical distinction between *tourists*, who travel for short breaks and often do not immerse themselves in the local culture, and *travellers*, who are motivated to gain more understanding of the culture and people in different places.

The sociologist McCannell in his book *The Tourist: A New Theory of the Leisure Class*, suggests that people travel because they are searching for an authentic experience of the real world, in order to compensate for an increasing sense of alienation and isolation in their own lives. That is, we seek out travel experiences because we feel isolated within our own lives. Whilst this may say something important about modern Western culture, it does not resonate with the motivations of many travellers, nor eclipse chasers. Most travellers and eclipse chasers would argue that instead of fulfilling a deficit, their passion actually adds something positive.

It is, therefore, difficult to categorise and understand why people are motivated to travel. The desire for travel is a dynamic process, and one that we can only understand by investigating personal meanings for travel. Julia Harrison, a Canadian professor of sociology, explored this in her book *Being a Tourist*. Personal means for travel included finding intimacy and connection, expressing a personal aesthetic, exploring the meaning of home, and making sense of a globalised world. Ultimately we still have a lot to learn and understand about our motivation for travel.

5 How Eclipse Chasers are Perceived By Others

The media love reporting news of a total eclipse. Prior to an eclipse, a lot of focus is placed upon how the local community is preparing to deal with the increase in visitors for the occasion. Sometimes an eclipse chaser will be interviewed in an attempt to communicate what totality is like. Those who are portrayed in the media tend to be the more extreme chasers, with a background in science and possible connection with NASA or some other scientific organisation or university. Often the eclipse chaser is quoted trying to communicate the magic of totality. Sometimes the context is lost, or the message is a little unclear, or communicated in a way that makes the eclipse chaser sound a little odd. However, there are also some great examples of news articles which capture the excitement and thrill of a total eclipse, and how powerful and significant it is for everyone. Some articles even

manage to capture the moment where the journalist then becomes an eclipse chaser themselves after experiencing totality.

Views of an Eclipse Virgin

Those who have never experienced a total solar eclipse are often bemused by eclipse chasers. Although my family, friends and colleagues do appear to be genuinely interested in eclipses, they do not understand how powerful the experience is and why it means so much to me.

To explore the views of an eclipse virgin, I engaged my older sister Vicki in a discussion. We obviously share the same background, growing up on a farm in North Queensland, Australia. Vicki recalls our father sharing his excitement about a partial eclipse in 1976, and viewing this partial. I have no real recollection of this eclipse as I was about 3. My first memory of an eclipse is another partial eclipse that Vicki also recalls, occurring a few years later in 1981, where we were both instructed at school on how to observe safely. We both recall viewing this partial eclipse.

What I find intriguing is this—given the similarities of background, curiosity of our father, and viewing a partial eclipses, why is it that I have become so passionate about eclipses and she has not? I saw my first total eclipse in 1999 and from then on made the decision that I just had to do this for the rest of my life. Had she had the opportunity to see a total eclipse would she too have become an eclipse chaser? Perhaps it is not just opportunity at play. She shares an interest in travel and other cultures and has travelled in the past, although she has settled in the area local to where we grew up. I have made different choices to travel extensively and have lived away from Australia for the past 15 years. I am perhaps more impulsive than she, and feel more comfortable taking risks. There are many other differences, along with opportunity, personality, different drives and motivations, and personal circumstances which all combine perhaps to explain why I am an eclipse chaser and she is not. But I believe the biggest difference is that I have experienced totality and she has not had this opportunity.

When I asked Vicki about her views of eclipse chasers, she explained that eclipse chasers are no different to others who are passionate about their hobbies. She is more interested in the places they go to and what they discover about local cultures rather than hearing about the eclipse. Of the eclipse experience itself, she comments:

> Yep, it goes dark, what more is there to tell?

She believes that it is the whole adventure and not just the eclipse itself that may be the motivation for eclipse chasers. She adds:

> I think seeing any eclipse is something special but I don't think about how the eclipse experience personally affects eclipse chasers.

She acknowledges that there can be, just like any other event, personal variations in the level of interest in totality. She is aware that watching an eclipse on TV does not convey any true sense of the eclipse experience, and can understand that some people can be pulled towards certain activities, but she personally does not see how totality could pull her in. When asked about the passion eclipse chasers have she was quite amused:

> I see no major 'thrill' as such to seeing an eclipse. I can see the thrill in jumping out of a plane, but it's a little weird to be THAT thrilled about going to see an eclipse.

Vicki's comment here is representative of many who have not seen totality. Most people understand the excitement and what may be involved when jumping out of a plane, but it is difficult to imagine the 'thrill' of totality. Eclipse chasers are expressing great excitement at something which in no way appears to be exciting. It would therefore make sense that those who seem excited by totality would come across as 'weird'.

Vicki did not express a strong desire to see a total eclipse; however, she would probably travel to see one if it was somewhere she wanted to go and time and money weren't an issue. Luckily for her, location, time, and money are all on her side to enable her to be in the path of totality for the November 2012 total eclipse—it's almost in her backyard. We will be sharing that experience together, and although she is looking forward to seeing what all the fuss is about, she is more gratified by the fact that her daughter will be able to experience a total eclipse at a young age. I am interested as to whether her first experience of totality will light the same fire in her as it did me.

6 Understanding the Pull of Totality

A total eclipse can have a tremendous personal impact—and once experienced some then go on to become eclipse chasers. There is something amazing about the totality experience that is different to experiencing other things that also inspire awe. For example, the Grand Canyon is an amazing place—I can still recall my first sight of it. My jaw did literally drop and I was dumbfounded with the immensity, the scale, and the beauty of the experience. But would I repeatedly visit the Grand Canyon? Do I feel 'hooked' on repeating that experience? Would I get the same experience if I were to visit there year after year? Do people express a 'passion' for repeatedly seeing the Grand Canyon?

Despite the profound impact that a total eclipse can have on a person, there are still difficulties in communicating the experience to those who have not seen a total eclipse. What are missing are clear, coherent accounts of what it is like to experience totality, that is, the phenomenology of the eclipse experience, which is then analysed to give a brief overview of the lived experiences of a total eclipse. This book will hopefully allow those outside of this amazing experience a richer, more detailed insight into the mysterious world of the eclipse chaser.

Chapter 3
Researching Eclipse Chasers: Surveys and Interviews

There are several books about total solar eclipses, and most focus on the science and technical aspects of such events. Many comment briefly on the experience of totality, and even focus a chapter or two on this. Notable amongst books is *Totality: Eclipses of the Sun* by eclipse chasers Mark Littmann, Fred Espenak, and the late Ken Willcox. In this book, anecdotal accounts are used to highlight the wonder of the eclipse experience to good effect, helping to communicate just how majestic and awe-inspiring the total eclipse is.

Despite these accounts in books and on websites, many who have not experienced totality remain unaware of the personal impact that a total eclipse can have. My sister, an eclipse virgin, cannot understand why anyone would get a thrill from seeing a total eclipse. This view is common amongst the general population. However, even those who have a lifelong interest in astronomy have found it difficult to learn about this aspect of totality. For example, Terry—my eclipse-chasing friend, amateur astronomer, and media liaison for the Irish Astronomical Association explained why he did not see his first total eclipse until 1999, despite a lifelong interest in astronomy:

> I thought a total eclipse would be nice to see, but it was not worth going out of my way to see. Nobody really at that time had managed to convey to me just the sheer thrill and the emotional effect of seeing an eclipse as a human experience, as opposed to a scientific observation. And that's what makes the difference.

The experiential aspect of totality cannot be captured in abstract science and therefore requires an investigation of personal experience. What is needed are detailed descriptions of totality that capture the essence of totality and formulate a cohesive way of describing the totality experience. We also know very little about eclipse chasers generally as a group. Who are they? What do their collective experiences tell us about eclipse chasing?

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1 The Eclipse Chaser Survey

In June 2011, as a first step to gathering information about eclipse chasers, I created an online survey in order to obtain a snapshot of views and experiences of eclipse chasers from around the world. The survey explored eclipse experiences, using a simple rating scale to respond to questions ranging from personality to beliefs about eclipse chasing. The survey had open-ended questions regarding the impact of eclipses and how people made sense of their experiences. Eclipse chasers were free to leave their contact details to be considered for further interviews.

The main challenge lay in contacting eclipse chasers—they come from all walks of life, but do not necessarily make themselves easily accessible as a group—with one notable exception. Most serious eclipse chasers are members of the Solar Eclipse Mailing List (SEML), a Yahoo listserve group with a membership of more than 500 eclipse chasers. This listserve is a key resource for information on solar eclipses. Posts are made daily by users who are predominantly those from within the scientific community. However, others with a strong passion for eclipse chasing can also become members and frequently post comments. I have been a member of the SEML for several years, and although I am not a regular poster, I find the daily discussions both interesting and informative. In August 2011, I posted a message about my eclipse chasing survey on the SEML and was delighted by the interest and number of responses I received. The link to the eclipse chasing survey was also placed on a popular eclipse chasing website (www.eclipsechasers.com hosted by Bill Kramer), so that other eclipse chasers who were not SEML members could access the survey.

At the close of the survey in November 2011, 80 eclipse chasers had participated—approximately 60 from the SEML and the remainder through word of mouth. This is a small number, and represents a response rate of approximately 12 % of the eclipse chasers from the SEML. Since it is rather low, I make no claims about this survey being representative of those on the SEML, or indeed of all eclipse chasers. I was not aiming to conduct a robust survey whose results could be generalised, but aimed to gain a brief snapshot of eclipse chasers. An important aim of the survey was to identify eclipse chasers who would be suitable to interview for this book.

This next section is for those who enjoy reading statistics—providing an overview of the results of the survey.

Overview of those who Completed the Survey

Of the 80 survey responses returned, 67 were completed in full, allowing a summary of their responses to be reported here. Responders were from a range of countries, with the majority (39 %) from the USA, 20 % from the UK, 11 % from Canada, 5 % each from Greece and Ireland, and 3 % each from Italy, New Zealand, Romania, and Spain. A small number (1.5 % each) were from Sweden, Russia, the Netherlands, Germany, France, and Argentina.

The average age of all respondents was 46 years. 13 % of respondents were under 34 years of age; 18 % were between 35 and 44; 24 % between 45 and 54; 35 % between 55 and 64, and 10 % between 65 and 74 years. No respondent was over 75 years old. Most of the respondents were male (92 %).

The majority of respondents had achieved high academic qualifications—39 % had a bachelor's degree and 46 % had a postgraduate degree. For the remainder, 6 % had graduated from college or high school, 6 % had completed some college training, and 3 % had an associate degree. People reported working in a variety of employment. The highest percentage of respondents were in science and research (12 %) and in education (12 %). 9 % of respondents reported working in media, print, and publishing, and 7 % in business and professional services. Those working in engineering and architecture; health and medical; and those not working at all each accounted for 6 % of respondents. 5 % of respondents reported working in each of the following areas: finance and banking, computers, consulting, and government and military. The areas of construction, legal, and non-profit each accounted for 3 % of respondents, whereas biotechnology and manufacturing both recorded 2 % of respondents. 9 % of all respondents reported 'other'. This highlights the appeal of eclipse chasing—and confirms that it is certainly not limited solely to academics or those working in the sciences.

The number of total eclipses seen ranged from 0 to 29, with an average number of seven total eclipses seen by respondents. To put this in perspective, it would take approximately ten years to see seven total eclipses. This conveys the commitment these respondents have toward their passion. It was interesting to note that 95 % of the respondents had seen 14 eclipses or fewer—anything above this was an unusual amount, given their infrequency.[1]

The number of annular eclipses seen by this group ranged from zero to eight (see Chap. 5 for descriptions of the different types of eclipses). It was interesting to note that a moderate proportion of the respondents had never seen an annular eclipse (30 %). Of those who had seen an annular eclipse, 90 % had seen fewer than three. This difference between total and annular eclipses demonstrates that it is the total solar eclipse that is the central focus for eclipse chasers.

As expected, eclipse chasers expressed different levels of motivation to see the different types of eclipses. 64 % of eclipse chasers surveyed said they would definitely travel to see a total eclipse regardless of location, whereas only 3 % would travel anywhere for an annular eclipse, 2 % for a partial, and 3 % for a lunar eclipse. No eclipse chaser answering the survey reported that they would definitely not travel for a total eclipse, whereas 5 % said they would definitely not travel for an annular, 43 % that they would not travel for a partial, and 29 % that they would not travel for a lunar eclipse. Overall, 93 % of eclipse chasers said they would travel to a total eclipse if the trip was not too difficult.

[1] Many of these respondents would have seen the annular eclipse on May 20 2012 which could be seen from China, Japan, Taiwan and the US.

The respondents outlined their plans for future eclipses, with 73 % planning on attending the eclipse in North Queensland in 2012, and 90 % planning on seeing the 2017 total eclipse across North America. Ease of access appeared important to many, as eclipses in more challenging locations saw lower numbers of eclipse chasers planning to attend. For example, the hybrid eclipse (that is, a mix of total and annular eclipse along the same pathway) across central Africa in 2013 saw 39 % planning to attend, but 25 % of respondents had already decided not to go. This may be due to a variety of factors, including cost, political instability, or even the fact that it is a hybrid eclipse. In contrast, the 2015 total eclipse over Svalbard and the Arctic had 55 % planning to attend, and the 2016 total eclipse over Indonesia had 54 % planning to attend.

In terms of passion for eclipse chasing, over two-thirds of the eclipse chasers surveyed reported that their passion was 80 % or above, with 8 % reporting that their passion for eclipse chasing was well off the scale—over 100 %! Those reporting off-the-scale passion were all male. The lowest reported passion for eclipse chasing was 20 %.

Getting to Totality—Extreme Lengths

87 % of eclipse chasers reported that they had gone to extreme lengths to see a total eclipse. Many recognised that their travels would not be 'extreme' when compared to other eclipse chasers who tended to go to similar locations. However, the eclipse chasers appeared to have covered all continents and every part of the globe in their quest to stand in the shadow of the Moon. This highlights the randomness of the path of totality and the lengths some eclipse chasers have taken to see totality. Some recounted the variety of journeys required in order to get to the path of totality, which involved journeys across deserts, climbing up mountains and volcanoes, walking through bushland, camping on arctic tundra, taking a flight to intercept the path of totality, sailing to remote places, and even climbing Antarctica's highest peak.

A range of transport options were used in order to get to the path of totality, including the more usual planes, cruise ships, cars, trains, and buses. However, people also described chartering transport specifically for eclipse travel, including private Learjets and other small planes, catamarans, and small boats, whilst other desperate chasers even resorted to borrowing cars to get to the path of totality. Other less common forms of transport were also used, including camels, elephants, icebreakers, helicopters, dug-out canoes, and quad bikes (ATVs), not to mention hiking great distances. (see Fig. 3.1—getting to the path of totality).

The main barrier that stopped eclipse chasers from travelling to see an eclipse was cost (62 %), followed by location of the eclipse (36 %), being unable to get time off work (25 %), and poor weather prospects (13 %).

Fig. 3.1 Getting to the path of totality. A soldier waits for the total eclipse in the Libyan desert in 2006. © John McKune

Motivations, Beliefs, and Identity as an Eclipse Chaser

Altogether 92 % of respondents enjoyed meeting other eclipse chasers, and 73 % reported becoming good friends with other eclipse chasers. 85 % felt they belonged to the eclipse chasing community. There were mixed opinions about whether they thought their eclipse chasing was an addiction. Some people identified with this very strongly (25 %), whereas others (17 %) strongly disagreed with labelling their chasing as an addiction. Overall, however, the vast majority of eclipse chasers surveyed reported agreement that their chasing was an addiction (59 %). There was more consistency in responses to whether others felt they were obsessed with eclipse chasing—here, 67 % agreed that others felt they were obsessed with eclipses, whereas 19 % disagreed, and 14 % remained neutral. 67 % felt that being an eclipse chaser was part of their identity. 57 % felt they were risk-takers in life.

68 % of respondents reported that experiencing a total eclipse had changed their outlook on life. 66 % of eclipse chasers surveyed reported that they prioritised their eclipse chasing over other events in their lives. 60 % of individuals reported that they planned their lives around their eclipse chasing activities, but 19 % strongly disagreed with this. 20 % of respondents had identified a way to generate an income from their eclipse chasing activities.

With regards to spending money on eclipse-related activities, there was an interesting divide in responses. 14 % of respondents felt strongly that they had spent more than planned on their eclipse chasing, whereas 20 % strongly disagreed with this. While it is true that some do get into debt as a result of chasing (some individuals made comments in the survey to this effect), 61 % of individuals said this was not their experience.

There was overwhelming agreement on several questions in the survey—93 % of respondents expressed a love for travel. The same 93 % of eclipse chasers were motivated to see as many total eclipses as possible, with 98 % of eclipse chasers believing that everyone should see a total solar eclipse at least once in their lives.

Another interesting thing was the number of other activities these eclipse chasers described themselves as being passionate about. Some of these activities included travel, the sciences, sports, fitness, current affairs, the arts, photography, nature, family and friends, other natural events (aurorae, storm chasing, wildlife), transport, computers, history, meditation, and Abba (you know who you are). Many made comments about their love for their other hobbies and interests and why it was important to be passionate about a range of things in life. All expressed a passion for their lives, except for one individual who reported that *"those who have passions in life are on the nutty fringe"*. Overall, eclipse chasers have a passion for life generally, and eclipse chasing is their strongest, but certainly not their only passion.

Preferences for Viewing Eclipses

There were mixed findings with regards to how people liked to view their eclipses. 17 % had a strong preference for being in a crowd during totality, but a similar percentage strongly disagreed (12 %), preferring to see totality away from crowds. The vast majority of people were neutral in response to this question. Overall, 49 % showed some positive preference to being in a crowd, whereas 24 % showed a negative preference to crowds. 37 % of respondents reported that they have a routine or ritual that they follow during the eclipse, such as breaking open the local tipple at first contact, when the Moon first meets the Sun.

A similar split was seen with regards to independent travel versus travelling with a tour company. 60 % preferred to travel independently to eclipses where possible, whereas only 23 % of respondents preferred to travel with a tour company.

86 % of those surveyed reported that they become emotional during totality, and a very small percent (3 %) disagreed. 74 % of eclipse chasers reported that they would feel upset if they were unable to see the next eclipse.

55 % of respondents in the survey felt it was important to photograph during totality, whereas 17 % felt strongly that it was not.

The Technical Term for an Eclipse Chaser

The survey also asked what words people commonly used to describe themselves. The term '*eclipse chaser*' was used most frequently, as many felt the term was clear and easy to understand. Several respondents, however, commented that '*eclipse interceptors'* is a more accurate term to describe what we do. That is, we do not chase the shadow of the Moon around the world; instead we put ourselves in the pathway and wait for the shadow to come to us. Other suggestions include eclipse aficionados, ecliptomaniacs, umbraphiles, lunatics, Grub-Hunter Outdoorsy explorers of the unknown, intelligent people, passionate people, people of high taste, solar astronomers, eclipse ambushers, adventuresome, mad, the first astronomical tourists, and 'total(ity) nuts'.

If there is a scientific term to describe those who repeatedly put themselves within the path of totality, this word is '*umbraphile*'. The word was apparently first published in 1976 by Dr Glenn Schneider, an avid American eclipse chaser and considered by many to be the most passionate—even a little 'out there', having seen 29 total eclipses and four annular eclipses, spanning 40 years of chasing. The word is used to describe people with a great or intense interest in eclipses. The word has interesting etymological roots—*umbra* is the Latin word for shadow, and is commonly used to describe the shadow of the Moon, and *phile* is a Greek suffix used to define attraction or obsession with something. Many words have Greek or Latin roots, prefixes and suffixes, although it is not common to blend both in the same word. Within the eclipse chasing community, there has been discussion about the unusual roots of the word, and some have even argued that it should not be used. Glenn himself describes how this word came about:

> The mixing Greek and Latin roots on my part was intentional, so as to implicitly convey that umbraphiles as eclipse chasers, just like eclipses themselves, pay no attention to national or cultural barriers.

It seems that most eclipse chasers have accepted the term umbraphile, and it is now widely used within the eclipse chasing community. However, some feel it should be reserved for the more extremely passionate amongst the community—people exactly like Glenn Schneider.

Survey Summary

As described earlier, this survey is not likely to be representative of all eclipse chasers, nor representative of those in the SEML community. What this survey has shown is that there is variety amongst some eclipse chasers regarding the way they see themselves and their preferences for experiencing totality. Eclipse chasers who replied appear to be passionate about their lives generally and show a strong love for travel. The feedback also shows that eclipse chasers have interesting experiences and adventures, a love of nature, and a willingness to help others understand their passion.

Throughout the book, and especially in Chap. 6 on the experience of totality, I will draw upon the results of the survey when it seems relevant and helpful to do so, using anonymous quotes where appropriate. The survey data is interesting and provides a summary of eclipse chasers' general experiences. A key aim of this book, however, is to obtain a more detailed understanding of the experiences of eclipse chasers using interviews. We will now look at how this was done.

2 Eclipse Chaser Interviews: A Phenomenological Approach

A survey such as the one just outlined can tell us about eclipse chasing in general, although it communicates little about the experience of totality for an individual, or what it means for that individual. What we need to do is what Husserl, a European philosopher suggests—*"to go back to the things themselves"*—to fully explore the experience of totality. This is known as *'phenomenological research'*—that is, it aims to capture the essence of an experience for an individual. This type of research is undertaken by interpreting an individual's account of their experience of a 'thing' (in this case, totality). As an eclipse chaser myself, I could effectively analyse my own experiences in order to describe what it is like to experience totality and be an eclipse chaser. However, writing an entire book about my own experiences would be somewhat self-indulgent. As an eclipse chaser *and* phenomenological researcher, I am in a unique position to understand and interpret the accounts of others who chase eclipses, as I am able to interpret from *within* that experience. I have therefore focused on a small number of eclipse chasers who describe their experiences of totality *and* of being an eclipse chaser.

This book embraces the phenomenological approach originated by Edmund Husserl, a European philosopher and mathematician, and his student Martin Heidegger, a German philosopher. Phenomenology means "*to study that which appears*", and is based upon an approach traditionally used by philosophers seeking to understand how things present themselves in and through experience. Importance is placed upon the lived experience of events, the 'making sense' of an experience, rather than accepting the 'truth' of objective scientific explanations. Phenomenological research is undertaken by exploring rich and detailed first-person accounts which are then interpreted by a researcher.

Analysing individual cases to uncover complexity has been used extensively in many traditions, including science, medicine, and psychology. A prime example is RD Laing, a Scottish psychiatrist, who wrote extensively in the 1960s about the experiences of those with mental illness. He highlighted the importance of obtaining descriptions of the lived experience of psychosis rather than simply accepting biological explanations. His work challenged the predominant medical view of mental illness at the time, and led to a new movement of more humane treatment and understanding of those with schizophrenia. Similarly, the work of Oliver Sacks in the 1970s and 80s brought alive unusual complexities involved in rare neurological conditions in the brilliant *The Man who Mistook his Wife for a Hat*, and other

writings. His work has allowed others to understand the lived experience of those with rare conditions and has made neuropsychology more accessible.

I have used a similar approach in exploring the lived experiences of a small number of eclipse chasers in order to obtain a more detailed understanding of what it is like to be an eclipse chaser. By analysing these accounts in more depth I will attempt to identify the core experiences of what it is like to experience totality, and what motivates eclipse chasers.

So, it is now time to start exploring the 'thing' a bit more closely—the total solar eclipse.

Part II
The Total Solar Eclipse

Professor Jay Pasachoff, Field Memorial Professor of Astronomy at Williams College, USA

It has been interesting and fun observing the 56 solar eclipses (29 total) I've seen so far, each one with its own story. Sometimes people suggest that I do it for the travel, but in my defense I point out that the first eclipse I saw was in a plane over the Boston area, where I was a freshman at Harvard, and that it was the spectacular view of the corona and of the eclipse phenomena that brought on my interest. There is still so much to learn from studying the corona at eclipses, now also in conjunction with space observations, and I am proud to be a part of the scientific effort.

Chapter 4
Totality: An Introduction and Narrative

1 Twilight Time

To an 'eclipse virgin', the intensity of passion that eclipse chasers experience can be difficult to understand. The personal experience of totality is also difficult to relate to. One way to describe it is to refer to something everyone can experience each day—twilight. Twilight, or 'two lights', occurs when the Sun is below the horizon but remaining light is scattered from the upper atmosphere to the lower atmosphere. This occurs twice a day, before sunrise and after sunset, with the ambient light radiating from the part of the sky near to the location of the Sun. The resulting ambient light over one horizon gives off interesting hues of colour and has long been used by poets, artists, and painters for inspiration, as well as photographers who wish to create atmospheric images. During the deeper twilight (astronomical twilight), stars and planets can be seen. There is much beauty in sunrises and sunsets and the accompanying twilight, and many people are moved when they experience a beautiful twilight moment.

Totality as a Twilight Explosion

The total eclipse experience is a little like twilight but there are several differences. During totality, the Sun is not below the horizon—it remains in the sky but is completely obstructed by the Moon. The corona—the glowing outer atmosphere of the Sun—can be seen around the eclipsed Sun. When you look at the horizon during totality there appears to be twilight 360 degrees around you. This is the ambient light that scatters from areas outside of the path of totality—where light from the Sun is still shining. If the path is is wide, for example at 160 miles, then there will be a deep darkness and the horizon will have just a faint glow of beautiful colours all around. If the path is much narrower, say 80 miles, then it will not be as dark, and there will be more 'twilight' and colours all around. This is

K. Russo, *Total Addiction*, DOI: 10.1007/978-3-642-30481-1_4,

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Fig. 4.1 The shadow of the Moon moving across the sky, from west to east during the total solar eclipse in China/Mongolia in 2008. © John McKune

what makes the event so immersive—you are aware of the path of the shadow, and indeed you can see the cone of the shadow moving across the sky under the Sun (see Fig. 4.1—the shadow of the Moon). This 360 degree twilight is beautiful, and the colours that appear are often reported to be shades that are rich and dramatic. This is why eclipse chasers enjoy finding locations where they can see the horizon all around during totality.

The twilight analogy goes some way to describe the general atmosphere of totality, and is one that people can relate to, since everyone can experience twilight. However, it is only a part of the experience. Near to the equator twilight occurs for approximately 20 minutes, and longer twilight occurs further away from the equator. In contrast, the most dramatic part of a total eclipse—totality—occurs for anywhere between a few seconds to seven and a half minutes. Totality is quick and the environment changes rapidly with much more noticeable results. As a result, the eclipse experience is far more dramatic than normal twilight.

The early parts of a total eclipse are intellectually fascinating, but it is when you can start to experience the other changes that it gets eerily immersive in a way that twilight does not. As the Sun continues to be covered during the partial phases, there is a gradual and perceptible drop in temperature. These rapid surface air temperature changes can also affect local weather conditions during totality, influencing wind speed. This is where our senses become even more heightened—we perceive these changes, and interpret that something is coming and it feels… sinister. It is similar to the feeling before a large storm when there is a sudden drop in atmospheric pressure that results in perceptible changes. Your senses are definitely aware of the ominous nature of the event that is about to unfold.

Despite being increasingly obstructed by the Moon, the light from the Sun is still strong until the Sun is about 95 % covered by the Moon. Only then do the changes in light become truly noticeable. In the final few moments, perhaps the

Fig. 4.2 The ominous shadow. Daniel Lynch and friend in awe of the second Diamond Ring and watching the shadow retreat during the total eclipse in Yiwu, China, 2008. © Daniel Lynch

last minute or thirty-seconds before totality, everything just speeds up so much and your senses are in overdrive, trying to comprehend everything that is happening. You know what that an eclipse is happening, yet it is odd to see the environment dramatically changing. There are noticeable changes in the environment all around—the light gradually reduces, but the shadows that are cast are different to shadows that you would see ordinarily. The light appears eerie, and it seems like colours are fading as you observe around you. You notice changes in behaviour in birds and animals that happen quite suddenly. Some people observe the approaching shadow—a wall of darkness approaching from the west. The darkness from the shadow sweeps across during the final seconds before totality—and this is when the crowd screams and then becomes hushed. It is the combination of all these things that makes the eclipse experience unique and dramatic. (see Fig. 4.2—the ominous shadow).

2 Travelling to see Totality with Dava Sobel

What is it is like to experience totality for the first time? Dava Sobel, author of several bestsellers including *Longitude, Galileo's Daughter*, *Letters to Father, The Planets,* and *A More Perfect Heaven,* has written an account of her seven day trip on a cruise to see seven minutes of totality back in 1991, which was published by the magazine *Travel Holiday* (reproduced here in full with permission). The story is particularly noteworthy as Dava is writing from the perspective of an eclipse

virgin, and following her experiences on that trip she has subsequently become an eclipse chaser. Her writing captures the newness, excitement, and key aspects of taking a trip to experience a total eclipse for the first time.

Dava's Story

> For twenty years I had dreamed of taking an eclipse cruise, sailing to a place – it did not matter where – expressly to see a total eclipse of the Sun. The attraction was not merely the rareness of the event. I wanted to see dawn and dusk occur twice on the same day. I wanted to feel the temperature plummet and watch the stars come out with the Sun still overhead. I hoped to sense the bizarre disorientation that birds and animals must share while they hasten toward their nests or burrows through the sudden midday darkness that an eclipse spreads in its wake.
>
> And now I am steaming down the coast of Baja California filled with happy anticipation. "I'll be at sea seven days," I had told my family, "for an event that lasts seven minutes." That seemed proportionately perfect. The seven days would give me a luxurious ocean vacation, itself a rest and an escape. The seven minutes would provide even more, for to see a total solar eclipse is to witness a miracle, one that I believe is worth any expenditure, whether of time, trouble, or money, to observe.
>
> A solar eclipse is an accident of gravity and geometry that defies expectations. The Moon, only 1/400 the diameter of the Sun, nevertheless lies 400 times closer to Earth, thereby exactly matching the Sun in apparent size, as though they were two halves of the same grapefruit. When it passes in front of the bigger, brighter heavenly body, the puny Moon obliterates the Sun from view. This happens so predictably that astronomers can tell you the time and place of all expected eclipses over the next several centuries with near-perfect accuracy.
>
> You go to see one as you would travel to a coronation or a command performance. But unlike those spectacles, an eclipse is tentative in the extreme. A sudden squall, a blanket of clouds could obscure it, dashing all your dreams and expectations. That risk adds an element of sport to the eclipse adventure.
>
> Even under ideal conditions, an eclipse is a short-lived phenomenon. Totality can never last more than seven minutes and 31 seconds, because of the continuous motion of the Moon circling the Earth and the Earth spinning about its axis. The eclipse I saw on July 11, 1991, now rightly regarded as the eclipse of the century, lasted six minutes and 57 seconds. There won't be another that lengthy for the next 141 years.
>
> The eclipse packet, the Southward, a luxury vessel chartered by GroupTrav National, sails from Los Angeles on Monday evening July 8, so as to arrive at a perfect vantage point for viewing the eclipse off the west coast of Mexico the following Thursday at noon.
>
> Among the 710 passengers are six astronomers specifically contracted to supervise stargazing by night on deck, give formal talks on their areas of special research interest, and be available for questioning. Chief among this exalted company is my longtime friend Frank Drake, professor of astronomy and astrophysics at the University of California, Santa Cruz, who urged me, over a year ago, to make the trip.
>
> Frank's special duty will be to narrate the eclipse itself, over the ship's public-address system. This task requires not only the knowledge of an astronomer but the diction of an actor and the reverence of a clergyman. I have no doubt that Frank can carry it off. He has already seen four eclipses but views the prospect of a fifth with undiminished enthusiasm, eager to share this event with his wife and two preteen daughters.

My husband opted to stay home on land with our two children (one of whom fell below the ship's minimum age of eight years), so I have along as my companion Diane Ackerman, a fellow contributing editor to *Travel Holiday* and author of the best-selling *A Natural History of the Senses.* I thought Diane would love seeing the eclipse and hoped, furthermore, that she might immortalize the event in a poem.[1]

Most of the passengers are 50-plus and members of alumni associations affiliated with various universities. A good number of the alums' husbands or wives at first view the eclipse as rather a bonus, somewhat on a par with the scheduled opportunities for snorkelling, sightseeing, and shopping along the coast of Mexico. Certainly they have no knowledge of astronomy. Their questions ("What is the difference between a planet and a star?") at the preparatory talks attest to this, yet they pack the ship's lecture hall to standing-room capacity at every opportunity, and their interest grows noticeably as the days pass. At coffee breaks during lectures, ever larger groups surround the speakers, buttonholing them for more detailed information.

Several passengers have long been space cadets like me; a few have been eclipse chasers from childhood. Of these, some are veterans of two, three – one 90 year-old gentleman has actually witnessed *14* total solar eclipses. If I could examine his eyes, I would probably find crescent-shaped scars on his retinas from injudicious Sun gazing. (I still remember the partial eclipse my mother drove me to see early one morning before school started, only a few miles from our home in the Bronx. She took care to cover my eyes with several layers of black-and-white negatives, through which I watched the eclipse. Minus that protection, I could have been blinded.)

On Tuesday, the night of the Captain's Gala, I sit at dinner with Bernard M. Oliver, retired vice-president for research of the Hewlett-Packard Corporation. Oliver tells me he once had the opportunity to watch an eclipse from a special research aircraft that literally chased the Moon across the sky, stretching out totality to an unnatural eight and one-half minutes.

"It wasn't really as good as the other two I've watched," Oliver says. "Being at such great altitude, we could see full daylight at the horizons, and that lightened the colour of the sky in a way that diminished the overall effect."

By Wednesday morning, as Diane and I make our way to the sports deck for early-morning aerobics class, Tuesday's clouds have thickened, turning the Pacific the colour of stainless steel. We kick and step to the music as the ship rolls gently underneath us, but we are beginning to worry that the weather will grow worse and keep us from seeing the eclipse. The concern is on everyone's lips. As though to cheer us at that moment, a pod of dolphins materializes to starboard, leaping far more gracefully than anyone in our fitness group.

At 11 pm every night on the Tropicana Deck, star parties gather to take advantage of the better view of the heavens from the sea, far from city lights and air pollution. The amateurs and astronomers eagerly spot and discuss the planets and stars that can be seen between the encroaching clouds. There's good attendance at these star parties, as at the lectures, with the added incentive of a sumptuous midnight buffet awaiting the stargazers in the dining room. Most of the passengers prefer the natural wonders to the usual cruise-ship nightlife available, including a disco, casino, movies, musical entertainment, and magic shows.

The night before the eclipse, a strong wind blows all the clouds aside at last, exposing the full panorama of the Milky Way and a glut of constellations. We count three named for birds – Corvus the Raven, Cygnus the Swan, and Aquila the Eagle – and look through Sagittarius the Archer toward the centre of the galaxy. Every few minutes, a meteor, or "shooting star," burns its way across the moonless sky.

Now the excitement of the impending eclipse is palpable everywhere on board. The star party shifts gradually into a slumber party, as diehards carrying pillows and blankets

[1] See poem on page 184

define their turf prepared to sleep on deck chairs so as to secure their chosen spots for viewing tomorrow's darkness at noon.

"Do you really think such claim staking is necessary?" I ask Frank, who knows that he at least will have a box seat reserved for him on the bridge.

"Not on this ship," he replies. "It has such a large expanse of open deck that you'll have no trouble finding a good place."

Down in our cabin, Diane and I find the Madonna-style protective eyeglasses laid upon our pillows next to the bedtime mints, and we study how they look on each other. The shocking neon pink of the paper frames goes much better with Diane's black tresses than with my short red hair. But then, these glasses are not made to be seen; they are designed expressly for seeing the most impressive of celestial sights. Of aluminium-coated Mylar, they will admit only 1/1,000 of 1 percent of the Sun's light, enabling us to look safely at the stages of partial eclipse leading up to totality – provided we don't look for more than 20 seconds at a time. We doze off owing to the late hour, despite the anticipation growing in our stomachs.

Up on the bridge, Captain Jan Fjeld-Hansen passes a sleepless night. Satellite photographs show him that the cloud cover will roll back over the Sea of Cortes tomorrow morning, possibly eclipsing the eclipse. Determined to deliver on the promise of the cruise, he plots a new course, heading for the one break in the weather within our reach along the centre line, which arcs from Hawaii to Brazil. The detour, however, will delay our first landfall and upset the schedule of sightseeing excursions there.

At daybreak, the concerned captain approaches Melita Thorpe, president of the tour company that organized the cruise. "Will the passengers be disappointed if the new course makes us arrive late in Mazatlan?" he asks. Melita, who stands several inches taller than Fjeld-Hansen, fixes him with her green eyes.

"Are you kidding?" she asks. "You could skip Mazatlan altogether as far as this group is concerned. Just do whatever you have to do to let us see that eclipse." Relieved, Captain Fjeld-Hansen returns to his charts.

Now it is morning, and most passengers, wearing hats and smelling of Sun block, are milling about the decks, sporting the eclipse T-shirts given out as a cruise premium. These are black, with a ruddy image of the Moon-covered Sun and a field of white stars in the background. The T-shirt is a worthy addition to those already flaunted on this cruise: souvenirs of the Voyager flybys of Jupiter and Saturn; commemorations of various stratospheric missions of the National Centre for Atmospheric Research; whimsical turns of astronomical fancy (Albert Einstein, dressed as a speed cop, warns that 186,000 miles per second is not only a good idea: "It's the law!"). Best of all is a custom-made T-shirt depicting the wearer's own, magnificent photograph of a previous eclipse.

We will be outside in the bright heat for a good three hours, from "first contact," at 10:30, when the Moon just touches the Sun and prepares to take its first little cookie-bite, to "second contact," around noon, when the Moon covers up the Sun and totality begins, through "third contact" some seven minutes later, when totality ends, and "fourth contact," about 1:30, when the bodies disengage. I fortify myself for the ordeal with a several-course breakfast. One of the joys of cruise dining is being able to order not just *anything* on the menu but *everything*.

By 9:30, Diane and I are settled on towels on the synthetic turf of a work area, littered with lifesaver rings, ropes, and odd machinery, that has been opened up to provide more viewing room. We revel in the clear air and the flying fish zooming alongside the ship, but we are thinking excitedly about the advice offered the day before by Robert Chambers, chairman of Pomona College physics and astronomy department, about how to view an eclipse: "Look up, look up, look up!"

An amiable father-son pair standing near us has readied an eight-inch telescope and invite us to examine some sunspots through it. A serious-looking photographer in safari dress has secured his camera to the ship's railing with a C-clamp. Tripods abound, but most of us

use our cameras to photograph one another. We wouldn't want to attempt a subject as majestic as a solar eclipse or dull the enjoyment of it with even one moment's concern over focus or filters.

After first contact, Diane's heavy binoculars come in handy for gaining a Platonic view of the Sun and Moon in partial eclipse. She holds the binoculars away from herself at about chest level, with their wide ends to the sky. They project on the deck a double image of the crescent Sun, so that we can gauge the progress of the eclipse by looking down, with no risk to our retinas. But looking up is irresistible. Minute by minute, the Moon encroaches, repeating in reality the same series of runic images that we have been seeing all week on cocktail napkins and other paper paraphernalia: the Sun full circle; the Sun dimpled, then crescent, then eclipsed.

Finally, the long-awaited moment is upon us. Frank, who has been making announcements or suggestions over the loudspeaker all morning, is now almost whispering into the microphone. His voice, calm and authoritative, keeps us fully informed as the inexorable events of the eclipse continue.

"Baily's Beads," he breathes, naming the phenomenon now visible. The Moon has slid almost completely into place, so the fire of the Sun shines through the chain of mountains on the Moon's rim, looking like a string of bright baubles.

"Diamond Ring." The last flash of sunshine sparkles atop the remaining thin sliver of light before the Moon completely swallows the Sun.

"Totality."

Now it is time to remove the pink glasses, lie back, and gaze naked-eyed at the two celestial bodies superimposed on each other. After the foreplay of partiality, teased out over an hour and half, this union is explosive in its impact. The temperature drops 10 or 15 degrees all at once. The sky switches abruptly from the hot glare of a July noon to a crepuscular, almost sepulchral blue. The blackness of the Moon is a pool of soot, flat as flannel or felt - not shiny black, as it looks in glossy photographs of eclipses. And all around that black pupil shines the Sun's glorious corona, usually invisible but now an enormous, spreading presence, glowing like burnished platinum.

Because of the current degree of sunspot activity, experts predicted that the corona would be small and hug close to the Moon. Instead, the corona is several times the diameter of the Sun. Its five far-flung streamers of ejected hot gas luminescent and irregular, resemble nothing so much as a child's drawing of a star.

The same Moon that muffled the Sun has silenced the 1,000-plus passengers and crew members gaping skyward. No one says a word. I feel such a lump in my throat that I have to will myself to breathe normally. Diane squeezes my hand, and I can tell that she is shaking. We have just seven minutes to absorb this heart-stopping mystery.

Staring hard into the corona, I am startled by the sudden appearance of two flaming red whorls at the top and bottom of the Moon's black disk. These are solar prominences – huge humps of pure hydrogen gas towering above the Sun's surface. Each one must be 50,000 to 80,000 miles high.

I look away from the main attraction just long enough to see the planets Venus, Mercury, and Jupiter, lined up like an arrow and pointing at the eclipse, as though to call attention to it. The constellation of Orion the Hunter, a winter constellation gone from the night sky for several months, also shows up; he, too, is aiming arrows at the eclipsed Sun. All around the horizon hangs a faint golden glow, like distant fields of wheat waving in the water.

How much time has passed? I don't know. It feels by turns like an instant, like an eternity. Irrationally, I wonder if the world will stay like this forever. And I feel I know something of the primal terror an eclipse must have engendered in our ancient ancestors.

"Third contact," Frank announces as the Moon begins to reveal the Sun again. The spell is broken. Voices return. People sit up, look around. It's amazing how many faces are tearstained.

> We all ignore the partial eclipse now in progress as if it were a boring backdrop to shipboard activity. Ordinarily, a partial solar eclipse is a major event, which many people go to much trouble to see. But after witnessing totality and the series of increasingly dramatic partials that led up to it, no one, not even the most avid astronomer with the largest assortment of camera equipment is interested in waiting out the hour until fourth contact. Everyone repairs to the rear deck for a group photograph and then to the dining room for an after-eclipse champagne luncheon.
> "On a scale of one to ten," observes the man ahead of me in line, "that was a twenty." A lively topic of conversation at many tables is the *next* eclipse, in January, and people are vowing to attend it, proposing toasts to the reunion of present company.
> "After twenty-five years of teaching and research in this field," says the lecturer Julie Lutz, president of the Astronomical Society of the Pacific, "I have finally seen my first total eclipse and feel like a real astronomer at last." She was "clouded out" on several previous attempts and came on this cruise with her husband to celebrate totality and, coincidentally, their wedding anniversary.
> As for me, I have come away with a new insight. I'd always envisioned the total solar eclipse as a once-in-a-lifetime experience. You're not quite complete until you see one, but after you do, you move on to other things. The Pyramids. The Inside Passage. The Great Wall of China. Now, I know the truth: the first eclipse merely whets the appetite for the next.

Interpretation of Dava's Narrative

Dava starts her story by noting that she had wanted to see a total solar eclipse for a long time. Like many, an eclipse experience during her childhood had already captured her imagination. As a science writer Dava would have been more aware than most of the significance and rarity of this event, and she hints that she is especially wanting to experience the more mystical and romantic aspects of the eclipse. She was clearly seeking the sensory aspects of totality—"*I wanted to see… I wanted to feel… I hoped to sense….*" she writes, almost like a giddy teenager.

Dava highlights to her family the perfectly proportioned aspects of the trip she is about to take—seven days for seven minutes. She relates this symmetry to the perfect proportions of the Moon's size relative to the Sun. Dava counters the apparently frivolous nature of the seven days for seven minutes by likening the eclipse to witnessing a miracle, again giving hints that she is aware that this will be an experience worth any hardship, but finding it difficult to convey the reasons why. She introduces the actors about to play the main role in this celestial play—the 'puny Moon' and the stronger and brighter heavenly body—inferring that the Sun is the main attraction of the show. She then introduces the uncertainty, as the unpredictable nature of the weather can indeed interfere with your ability to see the main event—the performance will occur regardless, but it is you who may miss it.

Dava reveals that it was Frank Drake, one of the expert astronomers on board and the co-author of her book *Is Anyone Out There* who had pressed her to come along and see the eclipse. She was aware of his important role which would require

"the diction of an actor and the reverence of a clergyman". On such a trip he would be revered by others, not only through his ability to maintain focus and attention and to communicate clearly at a time when excitement and anticipation is high, but also due to his previous experience and scientific background.

She notes that her fellow eclipse chasing passengers are above 50, and have university connections, suggesting that the passengers create a more homogeneous group than what is normally experienced on board a cruise ship. However, the husbands and wives of these alumni have little awareness of astronomy. Dava makes an interesting comment that these accompanying partners *"first view the eclipse as rather a bonus, somewhat on a par with the scheduled opportunities for snorkelling, sightseeing, and shopping along the coast of Mexico"*. For eclipse chasers, the eclipse itself is the main event and it is the other activities that are seen as the bonus. It was delightful to see Dava describe herself as a '*space cadet'*, suggesting that she felt comfortable on board this ship given her background and interests, and she clearly shows admiration for others who had seen eclipses in the past. She, like other eclipse chasers, is there for the main event of the eclipse. It is as if she already knows that she is aligned with eclipse chasers and primed to become one after this eclipse. She notices the strong interest in the lectures by the other passengers and the preferences for the natural spectacle of the nightly star parties, rather than the more traditional forms of entertainment.

Ominous clouds make their appearance in Dava's narrative, which is the pre-occupation of every eclipse chaser prior to eclipse day. In the close proximity of a ship at sea, it is hard to escape the anxiety that is expressed about the weather—the one thing that the eclipse chaser just cannot control. Dava does outline the dilemma of the captain of an eclipse cruise—having to balance the expectations of everyone on board for remaining close to the itinerary with the flexibility required to see the eclipse. There was a clear message that the eclipse was the priority for this cruise.

There was obvious fun and enjoyment over the eclipse glasses, although Dava is clearly aware of the seriousness of eye safety and the dangers of looking at the Sun. Noting that Mylar glasses are not renowned as high fashion, she turns her attention to the essential fashion accessory of eclipse chasers—the T shirt. Everyone on the cruise is given eclipse T-shirts, but the experienced eclipse chasers wear their other shirts like badges of honour.

Dava comments about the serious photographers on board, but notes that others were taking photographs of themselves. She seems to be aware that using a camera would be a distraction during the eclipse, although like others she takes a few pictures to capture the scene (see Fig. 4.3—Diane and Dava). Interestingly, the moment of first contact is not marked in Dava's account—normally a time of great thrill and excitement as it becomes clear that the eclipse is about to happen, followed by the long wait for totality. Instead, Dava goes straight into talking about projecting the image of the eclipsed Sun. The approach of totality is heralded by Frank's hushed tones into the microphone, in reverence for the show that is about to unfold.

Fig. 4.3 Diane Ackerman and Dava Sobel looking glamorous whilst enjoying the 'eclipse of the century' during the total eclipse off the coast of Mexico in 1991. ©Dava Sobel

As totality unfolds, Dava uses sexualised language to describe what is happening, as she gazes '*naked-eyed at the two celestial bodies superimposed on each other'*. She describes the preceding partial phases as the foreplay to this main act of union, which is explosive. She notes the changes that she feels—the drop in temperature, the vivid colours. She notes that the Moon looks flat against the sky, and like an eye, "*around that black pupil shines the Sun's glorious corona*", and she tries to set the scene in terms of what she is experiencing all around her. She describes the corona, glowing and unexpectedly alive, and similar to what children draw when they represent a star—as she relates herself with child-like wonder.

In addition to the atmosphere around, she comments on the puny Moon 'muffling' the Sun—showing surprise at the previously unrecognised power of the Moon. The crowd is also silenced by the Moon—there is no sound. For Dava, the lack of sound relates to her not being able to breathe. There is a lump in her throat. She is aware of Diane's hand shaking—these effects are heart-stopping. She becomes aware of the science behind the eclipse with the vision of the spectacular red prominences, normally occurring but never visible except during totality. It is as though the planets and constellations are all pointing at the eclipse, as though the Universe is completely focused on totality and nothing else matters.

Dava then makes some fascinating observations about the perception of time. *"How much time has passed? I don't know. It feels by turns like an instant, like an eternity."* All things you relate time to no longer matter, and this disorients your sense of time. She also recounts connecting with ancient ancestors, and wondering whether it will stay like this for the future. She connects with her ancestors and their feeling of primal terror, suggesting that in addition to the wonder she also

experiences fear. But suddenly the magical spell is broken, and she is no longer held captive in that moment of time. The show is over. She develops an increasing awareness of normal life resuming, as light returns and noise levels rise again—seeing tear-stained faces. She hints at the disinterest in the continuing partial eclipse that was so captivating before the eclipse—that no one is now interested in after such a dramatic experience. Dava also captures the immediate reactions of others wanting to experience it again, making plans to see the next one.

Dava ends her story by pointing out the importance of the eclipse experience for those who saw it. She describes her own new insight—the eclipse is not just a once-in-a-lifetime experience, but the start of a cycle of so much more. Her life has changed—she has become an eclipse chaser.

Overall, not only does Dava's account beautifully and elegantly portray the adventure of a seven day trip to see the eclipse and the eclipse itself, but it also captures the elements of an eclipse that are sometimes overlooked when people write reports that focus more on facts and observations than felt experiences, such as time disorientation. Since her first experience of this trip, Dava has gone on to experience seven more eclipses. That was how on 8 April 2005, somewhere to the west of the Galapagos Islands, we stood together under the same shadow.

Chapter 5
The Science of Totality

1 What is an Eclipse?

An eclipse is the phenomenon in which a celestial body disappears or partially disappears behind another body or into the shadow of another body.[1] This could be the Moon moving between the Earth and the Sun, referred to as a solar eclipse; or the Earth moving between the Sun and the Moon, referred to as a lunar eclipse. In an average year, there are two lunar eclipses and two solar eclipses. Over a long period, solar eclipses outnumber lunar eclipses in a ratio of about 5:3. However, from any one location on Earth, lunar eclipses can be seen more frequently. This is because they can usually be seen from more than a complete hemisphere of the Earth. In contrast, a solar eclipse is only visible from a much smaller area of the Earth, along the path of totality.

A *lunar eclipse* occurs when the orbit of the Moon takes it to the opposite side of the Earth to the Sun—that is, the Earth is now between the Sun and the Moon. A lunar eclipse can only occur at full Moon. As the Moon moves across the sky, the shadow of the Earth can be seen passing over the Moon, leaving a darkened shadow which sometimes becomes deep red in appearance. A lunar eclipse obviously occurs at night, and can be seen from any location where the Moon is above the horizon during the eclipse. A lunar eclipse is beautiful, although it has none of the dramatic features of a solar eclipse. There is a lunar eclipse somewhere on Earth every 6 months on average.

A *solar eclipse* occurs when the orbit of the Moon positions it directly between the Earth and the Sun, blocking out the view of the Sun from the Earth. A solar eclipse can only occur at new Moon. There are different types of solar eclipses because the orbit of the Moon is elliptical, so that at certain times of the year the Moon is closer to the Earth, therefore appearing larger in size, and completely blocking the Sun. This is called a *total eclipse* (see Fig. 5.1—the black disc of

[1] Full information about how eclipses occur and details of past and future eclipses can be found on the www.mreclipse.com website run by Professor Fred Espenak, retired NASA astrophysicist and renowned eclipse chaser.

K. Russo, *Total Addiction*, DOI: 10.1007/978-3-642-30481-1_5,
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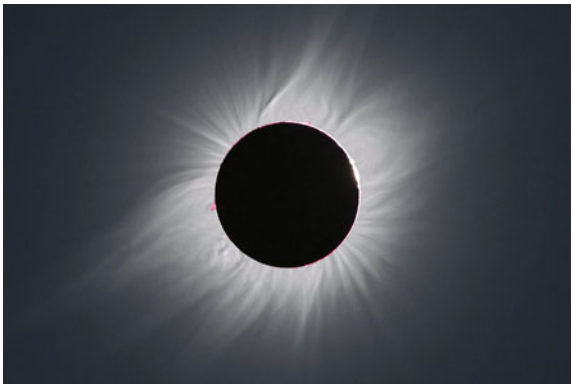

Fig. 5.1 The total solar eclipse of 2005 was captured aboard ship in the Pacific Ocean. Seven digital exposures over a range of shutter speeds (1/15 through 1/2000) were combined in Photoshop to produce a photograph capturing the naked eye appearance of the corona during totality. Photo © 2005 by Fred Espenak

totality). A total eclipse will occur somewhere in the world every 18 months on average. At other times the Moon is further away and therefore appears smaller in size. The Earth's orbit is also slightly elliptical, thus the size of the Sun in the sky appears to vary. Where the Moon does not fully cover the Sun, a ring of Sunlight remains surrounding the Moon. This is known as an *annular eclipse* (see Fig. 5.2—annular eclipse). There are also occasions when only part of the Earth enters the Moon's shadow, giving only a partial eclipse. There is one more type of eclipse called a *hybrid eclipse*. In this case, along the same track, the eclipse is first annular, then becomes total, before returning to an annular eclipse. These are even rarer and tend to be much shorter in duration. The last hybrid eclipse was in 2005, and there will be another in 2013.

Depending upon the location of the Moon relative to Earth, the centre of the Moon's shadow passes well above the Earth and into space (during a partial eclipse); or else the shadow may indeed pass over the surface of the Earth (during an annular or total eclipse). Where the main or umbral shadow of the Moon is projected on to Earth is known as the *path of totality*. At any point along that path of totality a person can observe a total eclipse of the Sun.

A basic analogy is this: if you hold up an object, say a basketball, to a light, the ball's shadow is cast on the ground. If you are standing in that shadow and look up, the basketball will completely block out the light. If you move your head to the left or to the right outside of the shadow and look up, you will be blinded by the light—this is because you are not looking from within the shadow of the ball.

Due to an amazing coincidence, the Moon and the Sun appear to be the same size in the sky. The Sun's diameter is 400 times larger than the Moon's, and the Sun is also 400 times further away than the Moon. This coincidence in scale gives the appearance of the same size, allowing the Moon to fully obscure the Sun during a total eclipse. When this occurs, the corona - the outer atmosphere of the Sun, can be seen with the naked eye.

By the time the tapering shadow of the Moon reaches the Earth it is a maximum of 160 miles in diameter. Also, as the Moon moves across the sky, the Earth rotates, resulting in the shadow of the Moon during an eclipse moving across the

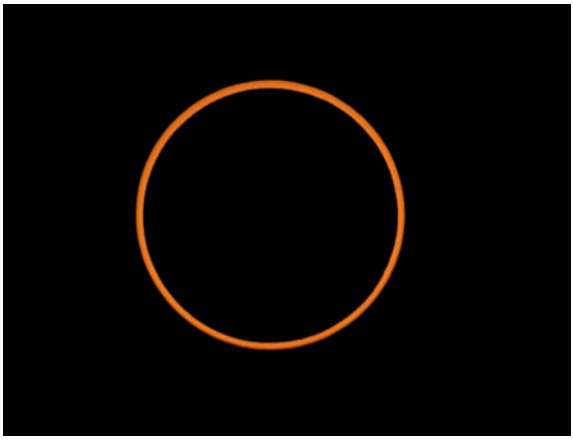

Fig. 5.2 An annular eclipse in Spain in 2005. During an annular eclipse, the Moon appears to be smaller than the Sun, leaving a ring of light. The corona cannot be seen, and filters need to be used for the whole eclipse. © Daniel Lynch

Fig. 5.3 Stages of the total eclipse. This photograph shows the Baily's Beads about to lead into the Diamond Ring at second and third contact. Chromosphere and prominences can also be seen. © John McKune

surface of the Earth at the incredible speed of around 1100 miles per hour near the equator, and up to 5,000 miles per hour near the beginning and end of the track.

2 The Stages within a Total Eclipse

There are several stages that occur during a total solar eclipse. These are known as 'contacts', to describe the process of contact that the Moon has with the Sun (see Fig. 5.3—stages of the total eclipse). During a total eclipse of the Sun, it takes the Moon between two and a half and three hours to move completely from one side of the Sun to the other, that is, from first contact to fourth contact. The length of the eclipse in minutes is referred to as the length of time between second and third contact, or the length of totality. The longest time that totality can occur is 7 minutes 31 seconds, *the theoretical maximum*. Observation of all stages of the total solar eclipse requires the use of solar filters except during totality.

First contact (C1). The new Moon is not visible as it moves across the sky from west to east (the exact movement depending on your location) and approaches the Sun. The first sign of an approaching eclipse is when a tiny little 'bite' appears out of the Sun. This is known as **first contact**. As time goes on the Moon continues along its path and the arc bitten out of the Sun increases in size. As the Sun becomes more obscured by the Moon, the image of the crescent Sun can be projected through any object with holes—including gaps between leaves, and pinhole cameras. The temperature will decrease because there is less Sunlight warming the local area, and this then influences the wind, which can increase or decrease depending on local circumstances. The light becomes gradually dimmer, and markedly so after 95 % of the Sun is covered. At this point, shadows on the ground become much more noticeable. The final twenty-seconds or so in the lead up to second contact are very intense, dramatic, and thrilling, and a few phenomena occur quite rapidly—Baily's Beads and the Diamond Ring. Baily's Beads are the final beads of light that appear between the mountains and valleys of the edge of the Moon. The final Baily's Bead that appears to shine out brilliantly from behind the Moon is known as the Diamond Ring. Since the light has decreased so much the inner bright part of the corona is now visible around the Moon, giving the ring effect.

Second contact (C2). The brightness of the Diamond Ring suddenly reduces as the Moon completely covers the Sun, blocking all light—this is the start of totality, **second contact**. The Moon looks like a black disc completely covering the Sun, with the corona streaming out from around the black disc. The corona is a magnificent pearly-white extension of the ring of light around the Sun, and varies unpredictably in appearance from one eclipse to the next. There may be red prominences—eruptions of gas above the Sun's surface—visible as well as the corona. Viewing the totally eclipsed Sun with the naked eye is now safe as there is no direct light from the Sun and the corona is not bright enough to cause eye damage. It is not completely dark during totality as some people think. The sky at this point appears to be a dark violet/inky blue, and one can usually see some planets, depending upon their location in the sky. The horizon all around will be lit as if there is 360 degree twilight. This is the normal Sunlight that can be seen outside the path of totality. Thus, the wider the path of totality, the darker it will appear. If you are lucky you may actually see the shadow of the Moon race towards you from the west at the start of C2, and then away towards the east at the end of totality.

Third contact (C3). After totality comes third contact. This starts when the Diamond Ring reappears on the other side of the eclipsed Sun as the first bit of brightness following totality. This is quickly followed by Baily's Beads. The corona can no longer be seen. This is just as exciting and dramatic as just before C2, although it signals the end of the totality experience. Light from the Sun returns very rapidly, and the eclipsed Sun is no longer safe to view with the naked eye. While people are hugging and sharing experiences, the final movement of the Moon across the Sun takes a further hour, as the bite out of the Sun gets ever smaller. This third contact is the reversal of what happens during first contact.

However, many people choose not to observe it, as the most dramatic part of the eclipse is now over.

Fourth Contact (C4). This is where the Sun appears to be whole again, and there is no longer any evidence of the Moon in the sky. The eclipse is over.

3 Location

To see a total solar eclipse you must be within the path of totality. Position yourself outside of that shadow and you will only witness a partial eclipse. The difference in experience between a total and a partial eclipse is immense, so eclipse chasers will always ensure that they are well within the path of totality. Glenn Schneider provides an interesting comparison of a partial to a total eclipse:

> This is like saying I travelled across the ocean to go to Paris and went to the front door of the Musee du Louvre. The resulting experience, though, is quite different if one enters through the door and proceeds to see the multitude of multi-generational masterpieces on display, or stands outside eating a crepe. A total solar eclipse is the former, a partial solar eclipse is the latter—but without the crepe.

Where the Moon covers more than 95 % of the Sun you will witness all of the phenomena that are described in C1, but you will not experience the phenomenon that happen after that—there is no totality. As you will notice in the accounts in this book, eclipse chasers all say that the most dramatic and awe inspiring features of the eclipse occur during totality. If you are not in the path of totality you will miss the most amazing aspects of totality. It is like going to a music concert of your favourite band and leaving after the warm up act.

No two total eclipses are ever the same. This is because there are so many other factors which affect the presentation and experience of an eclipse, including local weather conditions, time of day influencing the angle of the Sun in the sky, geographical location, and even the solar cycle which affects the appearance of the corona.

4 Eye Safety

It is never safe to look at the Sun with the naked eye. Doing so can cause permanent damage to the retina, leaving blind spots or even resulting in complete blindness.[2] This also applies to observing the Sun during the partial phases of any

[2] The early explorers were required to use the Sun for navigation, and many navigators became blind in one eye as a result of having to measure distances using a sextant looking directly at the Sun. Hollywood movies now inaccurately portray most pirates as being blind in one eye, hence the eye-patch.

Fig. 5.4 The appearance of random locals. It can be useful to carry spare filters and glasses. Just prior to totality in Mongolia in 2008 we were suddenly joined by a family and were able to share extra filters for everyone to safely enjoy the eclipse. © Kate Russo

eclipse, or during the whole of an annular eclipse. The only safe way to observe the Sun directly at any time outside totality is by using solar filters or projecting the image. This is required during the partial phases of the eclipse in the lead up to totality, and also during the partial phases following totality. However, during totality the Sun is completely covered by the Moon and therefore totality can be observed directly with the naked eye. The Diamond Ring and Baily's Beads are spectacular and occur with greatly reduced light. You will find that experienced observers will be more than happy to advise on eye safety during the eclipse, and if you are in a crowd you will most certainly hear shouts announcing the imminence of the Diamond Ring when filters can be removed.

Children should always be supervised during an eclipse, and they should be clearly instructed only to look without their solar filters when told it is safe to do so. People are often pointing out events and objects to look at in the environment, such as the colours in the sky or on the horizon, and children should be instructed that whenever they look back at the Sun they are to hold their filters in place.

Many people use binoculars and telescopes to view an eclipse, with specially designed solar filters. Any form of magnification of the Sun raises the risk of eye damage, so care is needed to ensure that filters are on when required. Children must be supervised when using binoculars and telescopes at all times during an eclipse.

If you are travelling with a tour company specifically to view the eclipse, special safe solar filters will be made available to you. Solar filters are also

sometimes available at public viewing sites, either for free or for a small charge. If you are travelling to remote areas, it may be useful to carry extra solar filters for the local population (see Fig. 5.4—the appearance of random locals). Ensure that the filters you are to use are not damaged by holding them up to a light to check for any scratches. These filters are fragile and can easily be damaged by sand, oils from sun cream, and other substances, so ensure that they are protected. Solar filters and eclipse glasses can be ordered online. If you are planning to use a telescope or binoculars order filters before you travel.

A final word of caution—if you are fair skinned and burn easily like me, be aware that when you are observing an eclipse you can still get sunburned during the partial phases, especially if you are observing when the Sun is high in the sky. So protect your skin as well as your eyes.

Chapter 6
The Experience of Totality

1 An Overload of the Senses

Experiencing totality is an overwhelming of the senses—you identify that something very unnatural is about to occur, and your innate response is to pay attention and be alert and ready for action. Observers are also experiencing a range of emotions and physical sensations over a relatively short period of time. People who experience a total eclipse often describe it as one of the most moving or significant positive events of their lives, and are often surprised by the intensity of that experience. Often immediately after an eclipse, particularly a first eclipse, people are left speechless. After reflection, however, most people are able to name the range of emotions they felt.

Why do we respond to totality in such a strong way? We know from historical accounts that people eclipse observers that people often responded to totality with fear and terror, and saw eclipses as foretelling doom and death. We have more information and understanding about eclipses now, yet a total eclipse still triggers this fear response in many people.

The eclipse survey I conducted aimed to identify responses to totality by asking eclipse chasers about their experiences; both the emotional and the physiological reactions to totality. Many gave responses which summarised the whole eclipse experience:

> On the lead up to totality I feel excited thinking about and admiring the celestial mechanics. When totality starts, the adrenaline rush of the lead up (last five minutes) to totality is replaced by deep tranquility and awesomeness of seeing the full and usually hidden beauty of the Sun.

> The stress of getting to the site and setting up is hopefully behind me in the hour before totality. This stress seamlessly dissolves into excitement and adrenaline which peaks in the moments before totality and becomes out of body in the umbra [during totality].

> Awe at the power of nature, overwhelm at the physical beauty, gratitude that I am able to attend, regret that I have no one special to share it with.

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> Growing anticipation from first contact onwards, a few minutes of stunned awe, then general satisfaction and a big grin for the next few days.

> Excitement and anticipation during the partial phases. An other-worldly thrill during totality. Extreme happiness after successfully seeing totality.

> Joy, exhilaration, a sense of accomplishment, and once third contact occurs, a sense of sadness realising it will be quite some time before I can have the experience once again.

> Worry (did I pick the right spot?), anticipation, exhilaration, joy, happiness. Calm nostalgia.

> Overwhelming sense of anticipation in the lead up to the eclipse; eeriness, excitement, amazement, wonder, anticlimax afterwards. It's always over too soon and there is an emptiness.

2 The Emotional Rollercoaster

For eclipse chasers, excitement builds up from well before the event, and is keenly felt at the start of the journey:

> I'm excited days before the eclipse, from the time I jump on the plane and I start the journey.

> I'm very excited starting before the eclipse and well aware of it. The excitement builds leading up to totality. I'm never unaware of the emotional response.

There is a gradual build-up of excitement on eclipse day as people start looking forward to the experience. There is anticipation:

> Even before the start of the event I am aware that something very special is going to happen, even that sends shivers down my spine. When it actually starts and all the way through, this feeling increases.

> In the hours leading up to totality I am flush with excitement and energy and joy. The undeniable lift in spirit causes all kinds of sensations—including being out of my body altogether.

When the first bite of the Sun can be seen at first contact, it is thrilling. There is a sense of relief that it is going to happen. This excitement soon dies down as the partial eclipse unfolds, and there is even a little boredom as the bite of the Sun gets bigger and bigger. There is impatient watching, amazement, curiosity. Then, around the time that there is only a small sliver of the sun remaining, there is an ominous feel:

> I start feeling intense during the last ten minutes when the light is changing and the environment is slightly losing its colours. There I feel the presence of the eclipse coming.

Anticipation starts to build again, and a heightened awareness occurs as you pay attention to the more obvious changes in the surroundings:

> [I get excited] when the sky begins to take on a strange hue, roughly two thirds into the eclipse, and people around me begin to get excited.

This then leads to a further increase in excitement, which is mirrored by an increase in fear, although you are not sure what the fear is about:

> I cannot describe it exactly, but it is a mix of 'holy fear', excitement, respect for nature and a strong spiritual feeling that I do not know what it is.

> I always get goosebumps when the temperature drops—not because I'm cold, but because it to me represents the start of the whole thing. I feel the excitement, feel fidgety.

> [There's an] Increase in adrenaline, and increased heart rate.

The visible part of the Sun gets smaller, and as the light is noticeably different in those final moments, you know that something exciting is going to happen, you can feel it. For many, a strong physiological reaction occurs in the moments when the shadow is approaching—with goosebumps, chills on the back of the neck, and shivers.

> Overwhelming sense of anticipation in the lead-up to the eclipse; eeriness, excitement, amazement, wonder.

> Goosebumps, slight pleasurable panic, palpitations, elevated sense of perception.

> The last 30 seconds before totality are unbearably intense and my eyes usually fill with tears that I cannot stop.

> When the light changes, and the temperature does a dramatic drop—so probably close to 95 % totality—there is a noticeable shift in the air, and you know that the shadow is rushing somewhere not far from you and will be with you imminently—nothing can stop it. It really is a very primitive feeling.

> You can already feel the excitement long before, and the adrenaline flow in the last moments. Very primal emotions and spiritual experience.

> You generally have a hard time thinking, similar to oxygen deprivation. It can give goosebumps and/or some kind of shivering.

> High excitement, rapid pulse, gooseflesh.

> I doubt many would be able to avoid shouting "wow" or some other expletive as the shadow moves across the Earth, darkness falls and a shiver of joy moves through the crowd of people who are able to witness this.

Then the final moments rush through—Baily's Beads and the Diamond Ring. The excitement and tremor builds in your chest. All your senses are on edge, just absorbing what is happening around you:

> Watching the shadow sweep in (when it's visible) as the Sun is covered at second contact. That's when the world seems to turn upside-down and is for me the most powerful moment.

> The Diamond Ring. This is the truly dynamic moment. At that moment you both see, and feel in your surroundings and in yourself, the Moon moving before the Sun.

> I tend to scream, as do a lot of people from what I can tell.

Totality is the time when these reactions peak. People start yelling in pure thrill, excitement, and ecstasy. The tension is at its peak—and the felt sensations suddenly switch into something much more emotional. You are no longer aware of your thoughts, you become purely amazed and emotionally overwhelmed by the sublime beauty of what is in front of you:

> The moment second contact occurs—it just seems to 'click' into place, and just feels right. The emotions and physical sensations match up and it's overwhelming.

> At the moment of totality I well up and often cry—the intensity of the emotions is just overwhelming.

> There are tears that cannot be stopped.

This is accompanied by a sense of high exhilaration, amazement, wonder, awe, and euphoria:

> Elation. I am highly pumped! Jubilation! Love for all! Deep fulfilment at being present. Awestruck with the power and beauty of our world.

> Euphoria; a feeling that I have seen something absolutely impossible to believe exists.

> Exultation, victory, amazement.

You find yourself breathing heavily, repeating the same words over and over, mumbling randomly. The number of feelings and emotions experienced in such a short period of time is likely to be unlike anything you have ever felt before. You feel small, you feel insignificant:

> Now I just feel like a small man (but a very lucky one when there are no clouds)!

You are excited, you are serene. It is as though the world is at a standstill, and everything has stopped—nothing else matters except what is happening in front of you. You feel a sense of immense connection with the Universe:

> I feel as if I could/should run up the shadow to the Sun—as if that is where I belong; where I came from.

> The emotional rush is literally out of this world.

> I feel I am at one with the cosmos.

You can see the darkness of the Moon's shadow moving slowly above you and all around you. You become aware that the end of this glorious moment is near. The arousal escalates once more—the exhilaration is again enhanced. In the fleeting final moments, and there is an internal scream of not wanting it to stop but knowing that the end is inevitable.

> I always feel like it's over too soon. It's exciting catching the end Diamond Ring, but I'm never prepared that it's just normal again. I always wish I could suspend time during totality.

> Once third contact occurs, a sense of sadness realizing it will be quite some time before I can have the experience once again.

With the second Diamond Ring and Baily's Beads you are crying out for the experience never to end. You want to suspend time, you feel an incredible loss. As the full light returns, and the shadow races away, you are suddenly aware of how intense it has all been, as if you have just woken up—and now it's all over:

> Both joy and sadness at the same time, but a great sense of accomplishment.

> Anticlimax afterwards, it's always over too soon and there is an emptiness.

> Like a huge crash. It's over.

This sudden drop in tension is noticeable, and the reaction is often a feeling of intense relief, or even exhaustion:

> Sweating, heavy breathing, then calmness leading to slower breathing and heart rate, tiredness, need to rest.

> I feel incredible release and let-down for the rest of the day, and sunset of eclipse day is incredibly spiritual.

You feel peace, and you are aware of your body feeling that it can let go of all the tension it was holding during totality, while you were taking it all in. Your body relaxes, you breathe out. You feel regret that certain people are not there to share it with you, and you also feel an incredibly strong desire to repeat the experience. You feel the urge to connect with others who have just shared this incredible experience:

> Immediately talking with others about what we had just seen and experienced.

> I can't stop smiling, laughing, jumping.

> Need to share the joy and success. Happiness.

You feel disappointed that it is all over, and you just want it to happen again. And again. You feel desperate to repeat the experience, and you understand how eclipse chasers can indeed be 'hooked':

> When is the next one? How do we get there!

> Exhaustion and high emotion, tears, anticipation of the next one.

But it is not yet over—there are still intense physiological and emotional reactions to the eclipse:

> I usually feel exhausted an hour or two after the eclipse.

> After totality I remember that I'm extremely hungry and quite sleepy since I haven't slept for more than 72 hours.

> Then in the hours after, the post-eclipse blues set in. So much build up—sometimes for months or years—then the big moment. It is natural to feel an exhaustion or emptiness.

> Then—once home—the predictable Post Exotic Excursion Disorder.

As seen from the above quotes, the excitement of totality can be intense but the build-up and the after-effects can last a long time. However, excitement peaks in the lead-up to second contact. This clearly suggests that those who see a partial eclipse will miss all of the intense experiences that can only be seen during totality.

3 Theoretical Understanding of Our Reactions During Totality

Many people who have not yet seen a total eclipse do not realise that observing one involves several intense physiological responses. For many, this intensity is overwhelming and unlike any other experience they have ever had. But exploring the survey responses of the eclipse chasers, it seems that the emotions and feelings that eclipse chasers experience follow a similar pattern. This pattern mirrors the phase response curve that is found during the release of adrenaline, and maps onto other natural responses that occur, including the stress response and the sexual arousal response.

Overview of the Stress Response

The 'fight-or-flight' response was first identified in 1929 by Walter Cannon, an American physiologist, in order to describe the basic behavioural reaction exhibited in animals in response to a stressor. This response is triggered by observing potentially threatening or harmful events, such as a car coming directly towards us, or if we are about to be attacked by a large dog. The sympathetic nervous system is activated by an initial surge of adrenaline which allows for immediate muscle response to a stressor—for example, the totally alert, highly charged body we feel when we see the dog coming towards us in obvious attack

mode. This is then followed by the release of noradrenalin, aimed to dampen down the stress response to return the body to homeostasis. This leads to the relief we feel when the dog runs away without attacking, or we have escaped and are safe. The fight-or-flight response can also be triggered by our thoughts—when we think we are in danger. This may contributes to panic about situations or objects that are not harmful and explains why people can be frozen in fear when faced with a harmless animal, for example when I see green tree frogs. Although I am aware that frogs can do me no harm, my irrational fear of them will trigger my fight-or-flight response at the very glimpse of something green. Even though I know there is no danger, my body reacts otherwise.[1]

In the 1930s, German scientist Hans Selye identified a pattern of response to stress, which he termed the *General Adaptation Syndrome*. The first stage is the alarm stage, where the fight-or-flight response is triggered by a specific stressor. Then there is the recovery or resistance stage, where the body works to overcome the reaction, attempting to return to homeostasis. Finally, there is the exhaustion stage, where the body tires of being on constant alert, impacting upon the immune system. Selye was careful to point out that the stress response was not always negative—some stress is good for us. American psychologist Magda Arnold and later Richard Lazarus further developed the stress model and highlighted the importance of emotions and *appraisals*—the way we think about things. We can think we are in danger and this will then trigger off the stress response.

Whenever stressful events occur, it is now acknowledged that this three stage pattern of response to stress (alarm, recovery, and exhaustion), known as the *stress response curve*, follows an inverted U shape pattern which effectively describes the physiological changes that occur as a result of adrenaline and noradrenalin being released. The response ends with the release of endorphins which aim to counter the body's reactions and leave us with a feeling of calm. The above accounts of the eclipse chasers mirror this same inverted U shape curve, giving support to the claim that the fight-or-flight response is triggered during totality.

If you have never experienced a total eclipse, you may be wondering why the fight-or-flight response is being triggered. Our appraisals are key in the stress response, and it may be that it is triggered by thoughts such as *"This feels wrong and unnatural"*. One can see that having these thoughts would indeed trigger the stress response. However, eclipse chasers report that the stress response during a total eclipse is triggered by something other than these thoughts, or appraisals. Eclipse chasers refer to this as a 'primal fear'. They suggest that their body is reacting in a primitive way to the approaching eclipse, in some basic response that they have no control over. Interestingly, they seem to describe this primal fear as being very different to the kind of fear that is experienced in daily life.

[1] Growing up in the wet tropics of North Queensland, many girls experience this fear due to the abundance of frogs. We have had repeated situations of panic, such as having them placed down the back of our shirt by the boys at school, having them jump on us in the middle of the night, or too many frog-in-the-toilet encounters.

Similarities with the Sexual Response

Totality also shares an interesting parallel with the sexual response curve, with the euphoria, excitement and pleasure. There is a similar build up of tension that reaches a peak and then rapidly falls off. Some eclipse chasers have commented on this:

> The build-up is not dissimilar to an extended foreplay session.

> It shares some aspects with afterglow, but it is more akin to when you have accomplished something good.

> An intermediate "afterglow" effect, perhaps akin to a great powder day on skis (my primary hobby/addiction), or great sex with a close partner.

Emotions are intense, with some breathing heavily, screaming, or crying, and others just simply enjoying the moment. If an audio of totality is heard, the heavy breathing and continued exclamations, such as "*Oh my God*!", could be mistaken for the soundtrack of a porn film! People feel detached from their ability to speak, and it is as though there is no 'social filter' to what is being said, just a pure response to events. Totality and orgasm both result in feelings of euphoria as endorphins, our feel-good hormones, are released in the brain. There is no body release during totality, but it all happens in your mind—it is an 'intellectual orgasm', for want of a better description. The brain, as they say, can be the sexiest organ.

4 A Closer Look at 'Awe' and 'Primal Fear'

It is interesting to note the words that people use to describe their emotions during totality. The emotions expressed by eclipse chasers do not really feature in everyday conversations about life—such as euphoria, exultation, awe, and primal fear. These seem to attempt to convey the significance and intensity of the experience and to mark them as different to everyday experience. Out of all the emotions expressed by our survey takers, the most consistent were awe and primal fear (also described as primeval or primordial fear). These two emotions are worth exploring further as they seem to be the core and most intense emotions experienced during a total eclipse.

Awe: The Emotion

Most eclipse chasers mentioned awe in their accounts of seeing an eclipse. The Oxford English Dictionary defines awe as:

> The feeling of solemn and reverential wonder, tinged with latent fear, inspired by what is terribly sublime and majestic in nature.

Awe is not a commonly experienced emotion, but most people have experienced moments of awe in their lives. Generally, people experience awe at the sight of natural phenomenon such as powerful waterfalls, canyons, or even a beautiful sunset. We can also be 'in awe' of someone—we admire them and look up to them, and can be overwhelmed by their presence. When experiencing awe, there is awareness that the object we are looking at is more powerful, or that the person is seemingly superior to us, leaving us with a general feeling of insignificance.

On a physiological level, awe can leave us with goosebumps, it can make the hairs on the back of our neck stand up, send chills up and down our spine, fill our eyes with tears, choke us up with emotion, and take our breath away. Some believe that goosebumps are a marker of the awe experience, and this may be related to primal fear (see next section), which seems to go along with awe—either subconsciously or consciously.

Awe makes you feel humbled. As an emotion, it is unique, since awe allows us to feel several emotions at the same time—excitement, euphoria, love, fear, and terror for example.

Awe: The Theory

Given the power of awe and the impact that it can have on people, it is surprising that it has not been the subject of more research and greater understanding. It has, however, been acknowledged in areas including psychology, religion, philosophy, and sociology as a very powerful and transformative emotion which affects us deeply, and tends to leave a lasting impression.

Naturalist Charles Darwin, in his 1872 book *The Expression of the Emotions in Man and Animal,* identified facial expressions for the emotions that he argued were seen across cultures. Although he did acknowledge the emotion of awe, no typical facial expression was identified. Awe was also identified as one of the 25 features of a 'peak experience', as studied by psychologist Abraham Maslow in the 1960s. However, despite the powerful nature of awe, it is often left out of classification systems of emotion. This was noted more recently by psychologist Paul Pearsall in a book called *Awe*, where he referred to awe as the neglected 11th emotion:

> …the one least studied but yet more powerful than the other ten basic feelings that psychologists recognise.

American psychologists Jonathan Haidt and Dacher Keltner described two central characteristics of the awe response—*vastness and accommodation*. According to them, *vastness* is described as things that are experienced which are much larger than the self and related to power; and *accommodation* involves the confusion and disorientation as the experience challenges our existing mental structures, which are unable to make sense of the event. This could be terrifying when one fails to understand, and enlightening when one succeeds in understanding.

Awe: During Totality

Much of the intense emotional and physical response felt by eclipse chasers during totality is due to feeling awe, in addition to many other emotions at the same time—excitement, joy, elation, wonder, and exultation. Eclipse chasers are often able to clearly recognise the difference in each of the emotions occurring at the same time. The vastness of the experience, as outlined above, may help to explain why it is so difficult to describe totality to those who have not experienced it—it lies outside our usual experience.

As mentioned earlier, many natural events can elicit awe in people. However, there is something qualitatively different about the awe experience during say, a sunset, and the experience of totality. Perhaps it is the presence of primal fear, that feeling of 'wrongness' that makes eclipse chasers feel under threat. Perhaps it is the intensity of the euphoria that is felt during totality—our brains are being flooded with feel-good hormones that make it a natural high, but more so than other experiences that also elicit awe. Perhaps it is because the experience is immersive and alive. It would follow that anyone wanting to research the awe experience can easily do this with eclipse chasers, as awe is central to the totality experience and eclipse chasers experience awe repeatedly.

Primal Fear: The Emotion

The second emotion we will focus upon is that of primal fear, which many eclipse chasers report as part of their totality experience.

Unlike awe, fear is a common emotion in our daily lives. We experience general fear in our lives, such as the fear of harm to ourselves or our loved ones, the fear of dying, or the fear of being on our own. When our general fears are extreme, we experience panic attacks, which are periods of fear so intense that we often believe we are going to die. We can also have extreme fear of specific objects—phobias, which are often based upon irrational beliefs. In my experience as a psychologist, I have found that people are able to recognise fear, panic, or phobias. However, I have never heard the term 'primal fear' being used to describe everyday emotions. My colleagues, many of whom specialise in trauma, also agree that people do not usually refer to primal fear, even in situations where they thought they were about to die. It is a term that is not commonly used. Therefore, to have so many people describe primal fear as a reaction during the total eclipse suggests that something interesting and out of the ordinary occurs during the totality experience. It is not the same type of fear experienced when people think something bad is going to happen to them, for example, if they are about to experience pain, or to give a talk in front of an audience. It is a qualitatively different fear, a fear that occurs on a subconscious level-a non-cognitive fear. For me personally, this primal fear is something I feel to be very much centred in my

chest, and the best word I can think of to describe it is a "knowing". But I am aware that this does not adequately describe it!

Primal Fear: The Theory

There are some who suggest that we have archetypal fears etched within our DNA and that we have evolved to be wary of certain situations—the unexpected, the unfamiliar, and the unknown. We are predisposed to jump at shadows, be scared of the dark, and create supernatural explanations for situations where things do not seem logical. In the modern world where our survival no longer depends upon these deep innate reactions, it is interesting that our leisure pursuits sometimes tap into such innate fears—we read and watch horror films, we go to theme parks to scare ourselves senseless on rides, and we visit supposedly haunted places to see what we can see. Our popular culture is awash with ghosts, zombies, and vampires. We seem, somewhat paradoxically, drawn to experience these archetypal fears. Perhaps this is what draws eclipse chasers to experiencing totality—the fact that it elicits those deep, archetypal fears.

Lifestyle Theory as outlined by Glenn Walters offers an understanding of primal fear. He suggests that there are three levels to our perception of threat. The first is the *survival strain*, which is found in organisms lacking an integrated nervous system and therefore unable to experience fear, but which can still occur in humans too. This is when there is an instant reaction to threat, such as when we immediately recoil because we touch something hot or sharp. The second is *primal fear*, which requires a more complex nervous system, but is still a primitive response allowing the coordination of action without conscious thought. Primal fear involves an emotional response, in contrast to the survival strain, where no emotional response is elicited. However, in primal fear, the emotional response is not at the level of consciousness—we are aware of it, but we have no conscious thought about it. The amygdala acts as a relay station, processing the threat and emotional information, but below the level of conscious thought.[2] Then, the highest level of fear, *existential fear*, is unique to humans and based on our self-awareness of two important issues—firstly, that we all die, leading to anxiety about the fear of dying; and secondly, that we are separate to our environment, leading to fears of separation or alienation. With existential fear, our conscious thoughts add interpretation to our more basic fear responses. This is how we mostly perceive fear and threat—by identifying events in the environment and then interpreting those events. Each of these three levels of threat is an extension of the previous, and requires a more complex nervous system. Therefore, the primal fear we experience is our more primitive brain structure responding to innate fears, without

[2] The amygdala is a structure within the limbic system of the brain responsible for the processing of emotions.

our conscious mind being involved. This would perhaps explain why we are not able to communicate this primal fear response during totality—it occurs without thought, without language.

Primal Fear: During Totality

Before eclipse chasers roamed the planet, a total eclipse would have been an unexpected event for most of the population. Historical accounts of totality highlight fear and even terror as a general response to totality. The fear was that the Sun—the very thing that represents life—was being destroyed and would never return. The event was considered to be ominous and supernatural, and a fore-warning of doom. Even to this day, people of all cultures still hold superstitious beliefs. For example, the eclipse of 2012 is seen by some doomsdayers as a sign that we are nearing the end of the world. These superstitious beliefs are difficult to dismiss. This may be a reason why end-of-the-world scenarios generate so much interest: they may be eliciting primal fear responses in people, who then seek explanations (often supernatural) to make sense of their fears.

Perhaps the best explanation is that primal fear is experienced as a result of the rapid changes to the environment during a total eclipse. The dimming of the light, the approaching shadow, the visual effects of the Sun being covered by the Moon—these things are not typical events, but are unusual, unexpected, and unknown. There appears to be a mismatch between the thoughts (it's here, the eclipse is happening; I've waited a long time to see this, I'm so excited) and the physiological response (fear, dread, panic, the unknown). Eclipse chasers acknowledge that there is something about the approach to totality that feels unnatural, that it is a radical change in the natural order of things. Therefore, on a more primitive level, these things are deeply threatening—they simply do not compute! These environmental cues are being identified without our conscious awareness, and therefore they feel 'primal' to us. There are strong, embodied emotions during totality—emotions that are powerful and overwhelming to many. It is not until after the shadow and into second contact, when the sublime beauty of totality actually appears, that we experience euphoria and other intensely positive forms of excitement.

We now have a better understanding of how totality affects us, at each stage of the total eclipse process, based upon information from the survey of eclipse chasers. We understand that awe and primal fear are central reactions during totality. We know what will happen during the eclipse-we are expecting it to happen, we understand how and why it is occurring—yet when it happens, it feels eerie and dramatic, and we react accordingly. Our logical minds understand what is happening, but our basic primitive warning systems go into overdrive, and a primal fear is experienced. Awe is also experienced—leaving us feeling trans-formed by the event. Then we are left with intense positive emotions—euphoria and exultation.

5 Animal Responses to Totality

People have often commented on the reactions of animals to various events, such as eclipses and earthquakes, believing that animals have a 'sixth sense'. Seeing unusual animal behaviour is a part of the totality experience that adds to the eeriness of the event. Frequent anecdotal comments have been made about animal behaviour during eclipses.

Many have directly observed the behavioural responses of animals. For example, during the total eclipse on Easter Island in 2010, one farmer noted that his chickens froze and stood on one leg for the entirety of totality, but at third contact they started walking again. There are two explanations that account for changed animal behaviour during totality. The first is related to the primal fear response above; that is, some animals respond to environmental cues that signal danger. The second is that many animals have an internal mechanism for behaviour which is directly influenced by light and temperature. Humans also have internal regulatory systems; however, these are not as sensitive as those found in nocturnal and diurnal animals. As we have already discussed primal fear (albeit in humans), we will now focus on the second explanation, that of animals being influenced by changes in light and temperature.

Some animals are active during the twilight hours, that is, at dawn and dusk, and perhaps on moonlit nights. It is believed that crepuscular activity, that occurring during those twilight times, avoids the attention of predatory nocturnal animals, in addition to avoiding the excessive heat of the day. Examples of such activity are roosters crowing at dawn, and bats leaving caves at dusk and returning at dawn. Many mammal species are crepuscular, such as dogs, cats, rats, rabbits, deer, moose, and many birds. Domestic animals have been trained to fit into the daily routine of humans, but by nature they are actually crepuscular. These animals are highly influenced by modified light levels, so changes in behaviour will be seen during a total eclipse as the light from the Sun diminishes.

Nocturnal animals such as owls and wolves sleep during the day and hunt at night. The presence or absence of light is one of the key factors in regulating the body clock of nocturnal animals, and its influence can be observed in their behaviour. Even polar bears that hibernate during the winter period modify their behaviour due to low levels of light in the arctic, ending their hibernation when the light returns in the spring. The behaviour of nocturnal animals may alter during a longer total eclipse.

Humans and other mammals have an inbuilt internal clock which regulates bodily functions such as sleep, blood pressure, and temperature. In humans, this endogenous rhythm is called the circadian rhythm. Although this internal body clock of just over 24 hours is moderated by parts of the brain and the release of hormones, it can be influenced by external factors such as the presence or absence of light. We have all experienced how light can interfere with this rhythm—most people would experience difficulties sleeping in a bright light, and it can be difficult to start our day in the darkness. We also experience shifts in our internal

clock when we travel to different time zones—this 'jet lag' has the effect of needing to adjust the natural body clock by several hours, and it can take a few days to adapt to the new circumstances. The internal body clock can reset itself according to local circumstances, for example, when travelling across different time zones, or even during shift work. Healthy functioning of the body relies on harmony between the internal clock and the external environment.

During a total eclipse the gradual dimming of light and decrease in temperature appears to be an external trigger which can reset the regulatory system of certain animals—ones that are determined by changes in light levels. Therefore, crepuscular and nocturnal animals are most influenced by eclipses. These short but dramatic changes in light must be confusing for animals! Eclipse chasers, however, will be more affected by the resetting of their body clock due to the jet lag they experience in actually getting to the path of totality than by the eclipse itself.

There was scientific interest in the observation of animal behaviour during the 2009 total eclipse in China, with several newspaper reports and news clips focusing on the behaviour of animals in the zoo. Researchers in India also focused on the reactions of animals during an annular eclipse with their 'Eclipsewatch' program, which documented the behaviour of animals during the long annular eclipse over the country in 2010. Animal observations are planned for the 2012 eclipse. Researchers are slowly becoming more interested in observing these reactions in animals during totality.

Part III
Being an Eclipse Chaser

Daniel Lynch, Teacher, Ireland

My first total solar eclipse, aged 15, was an experience that changed my life. As a young amateur astronomer, I'd read everything I could about eclipses. I thought I knew what to expect. The excited accounts of ancient astronomers led my imagination to run riot. But how often is it in life that your wildest expectations are met, let alone surpassed and shattered? At that impressionable age, I stood, transfixed by totality, in a powerful mixture of awe and terror. The limitations of language condemn eclipse-chasers to failure in trying to describe the experience of a solar eclipse. My best description of totality is that it is sublime in the truest sense of the word—greatness beyond all possibility of calculation, measurement or imitation.

I have grown up eclipse chasing. It has formed many of my experiences and informed most of my travel itineraries. Being able to share eclipses with friends, loved-ones and family over the years has been enormously fulfilling. I have been fortunate enough to visit some of the most beautiful and interesting locations on Earth while doing so. I would be far poorer (although monetarily richer!) had I not seen that first total eclipse. Eclipse chasing has already brought me memories and friends to last a lifetime.

Chapter 7
Introduction to the Interviews

1 The Interviews: Using a Phenomenological Approach

The remainder of this book draws upon the detailed analysis of interviews with eclipse chasers using Interpretative Phenomenological Analysis (IPA). IPA is informed by the philosophy of Husserl and Heidegger, and was first outlined in psychology in the late 1980s by Jonathan Smith, a professor of psychology in the UK. In this approach, emphasis is placed on using a rigorous approach to researching subjective experiences.

Phenomenological research is especially when researching novel and emotive experiences, just like a total eclipse. I have been using IPA as a research approach for approximately 8 years. It was back in 2004 when I was presenting at an IPA National Conference that I shared my love and passion for eclipse chasing during a social evening meal. IPA researchers present suggested that eclipse chasing would make an interesting research topic. Of course, they had a hidden agenda—they wanted to accompany me on my eclipse chasing adventures and then interview *me*!

The strength of this approach is that it acknowledges that the person interviewed is seeking to make sense of their experiences; and the researcher is trying to interpret those experiences. After the analysis, writing up the themes that evolve then makes the experience come alive. Therefore, when you read the next few chapters, these are my interpretations of other eclipse chasers' attempts to make sense of their eclipse experiences. Most of the interview participants have had an opportunity to comment further after seeing my interpretations and many were pleased at how well this process captured their experiences, with one person being quite surprised, feeling that I had understood their deepest thoughts!

K. Russo, *Total Addiction*, DOI: 10.1007/978-3-642-30481-1_7,

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How the Eclipse Chasers were Selected

A phenomenological interview requires in-depth and detailed accounts of people's experiences. This approach does not suit everyone. The person needs to be able to talk in detail about their experiences. The challenge is that people often struggle to communicate about their totality experiences—many cannot find the words to describe the experience.

After the survey responses were returned, I approached those who were open to further contact if they had written rich and detailed responses in their survey—indicating that they would be suitable for this type of approach. The best accounts are those where people tell stories with a wealth of imagery and metaphors, allowing readers to immerse themselves in their experiences. I initially identified five SEML eclipse chasers and all agreed to participate. A further four eclipse chasers, who were not a part of the SEML, were also interviewed

During these interviews, the eclipse chasers were able to 'tell their stories' about their totality experience and being an eclipse chaser. My role as interviewer was to prompt for further detail and examples and allow them to raise the issues that seemed important to them. The length of interviews ranged from 50 minutes to two and a half hours.

The aim was not to be representative of the eclipse chasing community generally, nor to provide a 'who's who' within this community. Instead, the aim was to provide detailed first-person accounts of how individuals make sense of their eclipse experiences so that more can be understood about this complex experience.

The interviewees came from various backgrounds, some scientists, some with no formal qualifications, some who are so passionate that eclipse chasing has become very much embedded in their lives, and others who have a less driven approach to eclipse chasing. The analysis of each person's interview is presented separately, in order for the reader to get a detailed understanding of each eclipse chaser. These are people who have experienced this once-in-a-lifetime event, and have then decided that once in a lifetime is just not enough.

Chapter 8
Amateur Astronomer Chasers

This first chapter of our interviews involves two people with a background in amateur astronomy. Firstly, we have Sir Patrick Moore. Sir Patrick is an internationally renowned author, broadcaster, amateur astronomer, and eclipse chaser living in England. He has been presenter of the longest continuously running TV show in history—*The Sky at Night* with the BBC, since 1957. I approached Sir Patrick for interview since he describes himself as an eclipse chaser, having seen seven total eclipses over a period of fifty years.

Then we have Terry Moseley. Terry is the Media and Press Officer for the Irish Astronomical Association (IAA). He has been an amateur astronomer since meeting Sir Patrick Moore when he was a teenager. Terry has seen three total eclipses to date, and has plans to see many more. He co-arranges eclipse chasing trips on behalf of the IAA, and is an active member of the SEML. I approached Terry to contribute in an interview due to his passion for eclipses and other astronomical events. Terry also interviewed me, as recounted in Chap. 1.

These two chasers share a common love and passion for astronomy generally - their ability to inspire others to explore the wonder of the Universe, and their scientific way of thinking. They have both played an important role in communicating, educating, and facilitating others to see eclipses.

1 Sir Patrick Moore, 88, England

With his distinctive voice and trademark monocle, Sir Patrick Moore has been the British face of amateur astronomy, best known for presenting *the Sky at Night* series for the BBC. This show has been on air monthly, uninterrupted and always with Patrick at the helm, for over 50 years, and as a result he is often cited as being the inspiration for people to get into astronomy. He is also a highly regarded author, and has written over 200 books on astronomy. His most recent book—the *Databook of Astronomy*, took him well over ten years to compile, At 88, his

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limited mobility now interferes with his observations, although he remains passionate about the night sky. He continues to present, broadcast, and write.

I interviewed Sir Patrick in September 2011 specifically about his experiences of totality, and his eclipse chasing. The interview was at his home in Selsey, England, the location of his famous observatory, where he continues to broadcast. He has seen 7 total eclipses and two annular eclipses, and most of these trips were broadcast by the BBC.

Sir Patrick is a great storyteller. He had many entertaining stories about his eclipse chasing adventures. I found it difficult to obtain detailed descriptions of his experiences during totality specifically, so this meant that there was less material available for phenomenological analysis compared to other eclipse chasers featured in this book. However, I spent an absolutely delightful afternoon with him, where we ended up talking about our mutual passion, and also our love of travel and volcanoes, as well as his dislike of psychologists!

Analysis of his interview then resulted in three main themes: *Self-determination from an early age; totality—the world at a standstill;* and *the desire to inspire others.*

Self-Determination From an Early Age

It is widely known that Sir Patrick developed his early interest in astronomy as a young child. As he had a heart condition, he was unable to attend school with others. He was home-schooled by his mother and subsequently developed an avid interest in reading. He became fascinated with astronomy after reading the *Story of the Solar System* by Chambers, published in 1898. He recalls reading about eclipses in this series of books at the age of 11, and knew that he wanted to see one. He became particularly fascinated by the Moon. His attention to detail and fastidiousness in his early years helped him to master these skills in his role as a NASA Moon mapper later on in his career. He was particularly proud of his reproductions of a partial eclipse, observed from his home in East Grinstead when he was 12. Despite his physical limitations, Sir Patrick always found a way to achieve what he wanted to; especially when it related to something he was keenly interested in. This self-determination and self-drive, as well as ensuring he was in the right place at the right time to put himself forward, appears to be how he has accomplished so much in his life.

Sir Patrick takes the view that he is very lucky in most things in life, and has an optimistic outlook that things will always turn out in the end. For example, he talked about how his optimism resulted in him capturing a photograph of totality in the Philippines in 1988, when others had given up due to the weather:

> Everyone disbanded except me. I kept my camera handy, and there was one patch of blue sky, before the clouds drifted slowly across. It just passed in front of the eclipse, and I had 30 seconds that I could see totality, and I took a picture. I was so lucky; no-one else got anything at all.

Sir Patrick also talked about his determination to see the transit of Venus which last occurred in 2004, and again in June 2012, and will next be seen in 2117.

> A transit is a real rarity. If you see one in your life you are so lucky. I've seen one. The one in 2012 will not be seen from here; you have to go further to the east. The transit will be beautiful in north Norway. If I get half a chance I'm going to get a flight over.

Sir Patrick expressed frustration at how his age and disabilities now restrict him from doing things he wants:

> My observatory is there. It is very widely used by a lot of people. I can't use it anymore. Frustrating for me, there is no possibility of any improvement. I'm 88 now, I can't have many years left, I'm not going to improve, and I know that. So you just accept it and do what you can.

Although he was realistic and aware of his limitations, he still expressed hopes and dreams of seeing future events. For example, he outlined his dream to see the 2015 total eclipse by flying into the track above the Arctic Circle, commenting that his passion for eclipse chasing will never end.

Totality: The World at a Standstill

Although Sir Patrick was knowledgeable about eclipses, and knew what to expect, he was amazed at the experience when he was finally able to see his first eclipse in Sweden in 1954:

> I had read descriptions of it. I had seen pictures of it. So I knew more or less what to expect, but what I didn't realise was how awe-inspiring it is. You can't really describe it.

He has often talked of the fact that eclipse chasing can be 'addictive'. When asked to describe his favourite part of the eclipse of 1954 or of any eclipse, he stated that the whole experience of totality was amazing:

> It's all superb. The first appearance of the corona, and the last seconds when the photosphere vanishes. And you get it. The light fades, and the stars come out, and everything seems to stop. The world comes to a standstill. At the end the world suddenly wakes up again. You have been in a kind of a mystical world, and you come back to the modern world, and it's one that I don't particularly like.

In this quote, Sir Patrick highlighted the features of the eclipse that are beautiful and frequently photographed. However, he also mentions his perception of time coming to a standstill during totality, where the world stops. Different rules apply during totality. Not only that, he describes it as being like an alternative mystical world, one where the daily concerns of the modern world do not apply. He alluded to his dislike of the modern world at other times during the interview. For example, he does not use email, and he prefers to write on his old typewriter, although he is unable to do this now due to arthritis. Perhaps he is making references to their being no limits within the mystical world of totality.

He felt it was important to spend the precious moments during totality enjoying the experience, and although taking pictures was important, it was equally important not to be too preoccupied with photography.

Sir Patrick recounted how an experience like an eclipse can be an event that unites scientists, astronomers, and even groups who are at war. For example, he spoke about his visit to the Philippines in 1988 to see the eclipse:

> There were three groups of terrorists over there. They all shot at each other. But when we went there, the three terrorist groups issued a combined statement that they weren't going to shoot at us, and they didn't. It was jolly sporting of them! We were quite happy about that.

The Desire to Inspire Others

By far the most inspiring thing for Sir Patrick is to recognise early determination and interest in astronomy in others, perhaps in recognition of his own interest as a youngster. Ultimately, he feels his legacy is to inspire others:

> If I have done anything useful, I have tried to interest other people, particularly youngsters. If I've done that, I think I've done my job. I'll let others be the judge. Certainly it's true you meet a lot of people who began their astronomy by watching my programme or reading a book of mine. I'm getting behind now obviously, but I do my best.

He has also been very happy about helping others through writing, or publishing and donating the proceeds, which is what he did when he wrote a book about the 1999 eclipse in Cornwall.

Sir Patrick is still as busy as ever—he has recently completed his largest project—his *Databook of Astronomy*, and *Bang* along with Brian May and Chris Lintott, fellow astronomers and eclipse chasers. He was at the time of interview working on several other books. He has plans for future projects, including updating his book on *Total Eclipses*.

Most of Sir Patrick's eclipse chasing has been broadcast for the BBC, and he recounted many interesting tales of his adventures. His stories are now immortalised in his books, particularly his autobiography *80 Not Out*, and includes the time of the 1961 eclipse in the former Yugoslavia—during the live broadcast, the film crew unexpectedly turned on floodlights at the start of totality to record the behaviour of mountain oxen. He also recounted his story of having split his pants during totality at the 1973 eclipse on a cruise ship off Mauritania.

Sir Patrick's eclipse chasing has led to interesting experiences around the world and he recounted them with great humour. It was interesting to note that the approach needed for eclipse chasing—you go where you need to go, do what you can, and hope for the best—seemed to reflect the way he has lived his life. Having a strong passion has allowed him to go where he wanted to go, doing what he has loved to do, and as a result he has achieved so much and has inspired so many. And the passion continues.

2 Terry Moseley, 66, Northern Ireland

Terry is a recently retired civil servant living in Northern Ireland, who has had a lifelong interest in astronomy. In his early years, he completed an honours degree before teaching. He then joined the Civil Service, working as an Environmental and Energy Advisor. He served three 3-year terms as President of the Irish Astronomical Association (IAA), before taking up a very active role as media officer in the IAA, and often undertakes media interviews on all things astronomical. As well as being a council member of the IAA, he has speaking engagements all over Ireland.

Terry organised a tour for approximately 70 members of the IAA to see the total eclipse of 1999 in Bulgaria, which was also his first total eclipse. He subsequently organised other eclipse tours with the IAA to Turkey in 2006 and China in 2008, and is also involved in one to Australia in 2012.

Analysis of Terry's interview revealed three themes – *When scientific explanations are not enough*; *being lost in the moment;* and *appreciating the beauty of nature*.

When Scientific Explanations are not Enough

Terry developed an interest in amateur astronomy that was, as for so many people, fostered by contact with Sir Patrick Moore, whom he met in his early years and with whom he has maintained contact throughout his life. Although very active in the astronomical community in Ireland, Terry only saw his first total eclipse in 1999. He explains that his lack of awareness of the experience of totality was the main reason why he did not start chasing eclipses earlier:

> I figured that I knew all about eclipses, and it wasn't worth spending a large amount of money just to see what I knew exactly I would see. I had read all around it, I knew how it happened, and I knew that you would see the Diamond Ring and the prominences and Baily's Beads and the corona, maybe some planets nearby. I thought well, that would be nice, but it was not worth going out of my way to see. And nobody really at that time had managed to convey to me just the sheer thrill and the emotional effect of seeing an eclipse as a human experience, as opposed to a scientific observation, and that's what makes the difference.

When Terry started to become interested in astronomy, emphasis was placed upon making detailed notes in order to ensure the scientific validity of observations, rather than simply enjoying the spectacle:

> You didn't just go out for the sake of just enjoying an event. Just say a meteor shower—saying that you saw a dozen or so an hour, that was great. But you had to record them, what time, what magnitude and all the rest. It wouldn't stop you enjoying it, but it gives you useful scientific information that could fill up a whole database on that particular meteor shower. So I started off in astronomy as an amateur scientist always to record my observations as accurately as I could and to make it useful to the Astronomical Associations. My first approach to eclipses was like that.

Terry thought he was unable to offer anything unique to observing the world of eclipses, as so many others were involved in researching the Sun. Eventually, in 1999, he organised a tour of approximately 70 others to see the total eclipse in Bulgaria. His intention was to make observational notes on an audio recorder, to take photographs on his SLR and his compact camera, and to observe the corona and prominences through his telescope and binoculars – in addition to being responsible for the others in the group. As a first eclipse experience, he realises in hindsight, he was a little over-ambitious:

> I had seen five partial eclipses. I thought I knew all about it. I thought there was nothing that I could go and see in an eclipse that could be any sort of surprise to me whatsoever. It would be quite nice to see it, but that would be all. And I was gobsmacked.

Being Lost in the Moment

Being gobsmacked was an interesting experience for Terry, who prides himself on always being able to explain things. He was completely unprepared for this emotional aspect of the eclipse experience, and was overwhelmed:

> I was amazed at just how much I was affected emotionally by seeing it all. I don't think up to that point I actually realised how emotional I could be at something which I knew was just an ordinary predictable scientific phenomenon.

After this first eclipse experience, Terry recognised that he needed to alter his scientific approach to observations. Through his eclipse chasing, Terry has discovered a connection with the experience of eclipses, instead of his usual 'hard nosed' scientific approach, and it is this connection that he particularly enjoys. He has become more comfortable with just simply enjoying the experience, and allowing himself to be lost in the moment:

> After that first one, I thought well, I'll leave the science to others, and I'll just go and enjoy them. I love going along seeing an eclipse and seeing what's happening in the Sun, seeing the prominences and so on. But that's a very, very small part of it now, compared to the hair standing up on the back of your neck when it actually happens.

Terry expressed regret that he only recently discovered this emotional side of eclipses. He understood how others relate it to a spiritual or religious experience, although he does not necessarily share those views. He also describes how his science background might perhaps be considered a hindrance with regards to alternative explanations of the eclipse experience, although it does not detract anything from the experience of totality:

> I can enjoy the spectacle, and the emotion, and try and appreciate how primitive people who didn't know about this happening would have felt. I almost feel the same way myself. No amount of calculating of all the parameters and first contact, second contact, and the gamma and all the rest of it, prepares you for what you actually see and experience.

Terry really enjoys the emotional experience of the eclipse, and gets a very strong physiological reaction, which he describes as quite a primitive response:

> I don't believe in a soul you know, at least something that resides deep inside you, in your limbic system, or whatever. But there is something primitive inside that reacts to the eclipse.

The primitive response seems to be the way his body responds on a physiological and emotional level to totality. In particular, Terry reported that hearing the crowd response during his first totality experience was incredibly powerful, and elicited a strong physiological response:

> It was the reaction of people. By this particular site there were other sites within earshot. We could hear other people as the shadow came towards them and us, just yelling and screaming and whooping, just as they saw the Diamond Ring. The video that one of our group produced was fantastic, absolutely fantastic. He had the sound on all the time, so you heard the reaction of others all around. That gives me goose bumps, just playing it.

But, as Terry described, it is impossible to capture the whole eclipse experience on video. He explained that it is the unexpected nature of the phenomenon, and having such an intense personal response, that makes the eclipse experience difficult to communicate:

> Until you experience it, you don't know. I don't think even now I could tell anybody who had not seen an eclipse what it's like. You cannot convey to them until you actually see it.

Seeking Out the Beauty of Nature

Terry has always been drawn to natural phenomena, and goes out of his way to witness events that allow him to experience awe:

> One of the things l love doing on any sort of holiday is to go and see nature at its most beautiful and most spectacular and awe-inspiring. Some of the most amazing and beautiful things I've seen in life have been natural experiences.

During the conversation about eclipses, Terry recounted an experience that occurred when he was in his early twenties, where he observed the most beautiful sunset he had ever seen, on his own, on top of a mountain, with the peaks of surrounding mountaintops floating above the golden sea of clouds. This experience appeared to have a profound impact upon him, and when recounting this experience, he was clearly reconnecting with the emotions he felt on that day. In fact, as he relived those moments, I was brought to goosebumps by his vivid descriptions and emotions. When I reflected this back to him, it made him connect even more:

> I'm getting emotional myself. It brought tears to my eyes, it literally did, and for the first time in my life, I literally danced around that mountain top, whooping and laughing and yelling for joy. It's amazing, that was nearly 50 years ago, and it still gets me. It was by far the most beautiful thing I had ever seen in my life. An eclipse is more spectacular and awe-inspiring, but not as beautiful as that was. My great regret was I didn't have anyone to share it with.

This feeling of regret appears to relate to the experience of connectedness: whenever he experiences a moment connected with nature, he feels the need to share it with others around him. He recounted another connection moment about 15 years ago, after spending the night observing a vivid aurora display:

> I was so overcome by what I was seeing, that I wanted to share it with everybody, and throughout that night I typed six or seven emails and sent them out to everybody telling them what was happening.

Terry describes a desire to connect with others during these intense moments, and he does this for eclipses by arranging tours so that others can also experience totality. He describes how helping others to have such a personal experience is almost as satisfying as the eclipse itself.

Terry believes that people are naturally curious about such events, and that everybody should experience the power and awe of nature by experiencing an eclipse or aurora, since this leads to an appreciation of life. He notes, however, that some are more open to it than others:

> If you are prepared to let yourself go and be in the position where you can experience these things, you can have some fabulous experiences. If you are never going out and experiencing nature, you are missing a tremendous amount. I think everybody has some sort of a philosophical side in them that they can appreciate things beyond the humdrum of daily life and work going on, getting your salary at the end of the month. A lot of people just don't give themselves that chance.

He also feels that he has been incredibly lucky by being in the right place at the right time for the events that he has seen, whether it be eclipses, aurora, or his beautiful sunset:

> It was me being there at the right time, with the right meteorological conditions, and at the right time of year. I don't think that it was a God saying to me "here's a present for you, Terry", you know, "I'm going to show you this beautiful sight", and so on. I do accept that it was like winning the lottery—some people are just lucky and the vast majority aren't. I just happened to be there at the right time.

Given his long established appreciation of natural events, it was surprising that he had taken such a long time to discover the eclipse experience. However, as he stated, his focus on the scientific aspects of astronomy impeded his understanding that some events can be hugely immersive and emotional. He now seems to be making up for lost time, as he allows himself to become lost in eclipse experiences as another example of the power and beauty of nature. He is left with a profound sense of appreciation for what he has experienced.

Chapter 9
Enterprising Chasers

This chapter provides the narrative of three eclipse chasers that I have termed 'enterprising chasers', because they have all identified a way of being able to get their eclipse chasing activities sponsored in some way, or covered by other people in return for their services.

First we have Dave Balch, an American who has recently retired from his IT computing business, and in recent years has become an author and speaker on living with cancer in the family. He has been a professional speaker on eclipse trips, and is a professional speaker about his eclipse experiences, finding that even businesses are interested to learn about the passion and how this can be applied to productivity. He has seen twelve total eclipses and four annular eclipses. He volunteered to participate in the interview through the SEML.

Then we have Rick Brown, an American commodities broker who runs his own eclipse chasing tour company. After witnessing his first eclipse, he realised that he could coordinate travel plans to eclipses for small groups, resulting in minimal costs for himself. Over the years, this has grown to be a reputable specialist eclipse chasing tour company. Rick runs this in his spare time, and involves himself in the preparation and planning on the ground in remote countries before each eclipse. He has now seen twelve total eclipses and three annular eclipses. Rick also volunteered to participate in the interview through the SEML.

Finally, we have Jay Anderson, a Canadian meteorologist. Jay is well known within the eclipse chasing community due to his extensive involvement with weather predictions for each and every eclipse and for co-authoring the eclipse chasers' bible—the *NASA Eclipse Bulletins*. Most eclipse chasers use information provided by Jay in order to select locations along the path of totality. He has been a meteorologist with the Canadian government for over thirty years, and has recently retired. He continues to contribute information on weather forecasting for eclipses, and acts as a guide on eclipse trips. In recent years he has re-kindled a passion for storm chasing. Jay has seen seventeen total eclipses and eight annular eclipses. Jay volunteered to participate in an interview through his involvement on SEML.

K. Russo, *Total Addiction*, DOI: 10.1007/978-3-642-30481-1_9,

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These three eclipse chasers are representative of people generally who try to figure out ways in which to get their eclipse chasing expenses funded, rather than those who earn a living directly from such activities. All three have held employment in other areas, and have undertaken their interests around their primary source of income over the years. These eclipse chasers take advantage of their unique skills and abilities, and over time have identified how best to use their passion to help others.

1 Dave Balch, Aged 63, California, USA

Dave is a speaker and author, focusing on his experiences caring for his wife through four episodes of breast cancer. He also speaks about his eclipse chasing experiences and living a passionate life.

Analysis of Dave's interview revealed four key themes regarding his life as an eclipse chaser. These main themes are: *Recognising freedom of choice; capturing memories of the magical world; prioritising the passion in life;* and *sharing the passion.*

Recognising Freedom of Choice

Dave described an early interest in astronomy, and a fascination with things related to nature. Having seen a partial eclipse at a young age, the phenomenon had struck him as interesting and he knew he wanted to see a total eclipse one day. However, eclipses were not actively on his 'radar' until 1979, when in a hotel on a business trip, he accidently flicked through to a live eclipse broadcast on TV. He raced outside and was excited to witness the partial eclipse that could be seen at his location. He then decided that it was finally time to see a total eclipse:

> I made a pledge right then and there that I was going to the next one, no matter where it was in the world. I didn't care where it was, I was going to go. And when I got home, I did some research and found out it was in Africa. And I went 'oh, I can't go to Africa. You know, I'm not this big game hunter, rich guy, traveller and all that stuff. Africa is just too exotic for little ol' me".

Dave's sudden doubts about being able to travel to the eclipse were more about what exotic travel meant—being some kind of wealthy big game hunter—all the things that Dave did not relate to. So he ruled it out, although it kept playing in the back of his mind:

> After being disappointed and thinking about it for a few days, it suddenly occurred to me that all I had to do to go, was to go.

In that interesting comment, it appears that Dave came to the realisation that nothing was actually stopping him from doing what he felt was important. He realised that he had the freedom to make choices about what he really wanted to do, rather than feel limited by the things he felt he should not be doing. After making this discovery and deciding he would indeed go to the eclipse, he started making inquiries and made another surprising discovery:

> I found out there are actually people like me, who actually go in groups in order to see them! And I found a group at a local observatory in LA, Griffith Observatory, and I signed up.

Feeling he was not alone certainly gave him the confidence to travel to see the eclipse. He did indeed travel to Africa in 1980, and was overjoyed with the experience. He realised that it was such a significant experience that he felt he had no choice but to see another—and he was determined to make it happen. It was at this moment that he became an eclipse chaser:

> So we did see it, and it was great. And then I said "I'm going to go to every eclipse for the rest of my life. I have to do this, I just have to do this."

Capturing Memories of the Magical World

Being Present in the Moment

Dave has since gone on to see 14 total eclipses. He describes the time immediately before an eclipse as one of anxiety and fear—that it will not happen or that he will not be able to experience it:

> First contact is always very exciting because there is always this nagging doubt that somebody made a calculation error (laughs) and it's either the wrong place or the wrong time. But the first eclipse I recorded the audio, and at first contact I could hear myself – I don't remember this, but I heard myself on a recording: "my God, it's really going to happen! It's really going to happen!"

After first contact, Dave states that he usually gets lost in the excitement and emotion of totality. He found it difficult to clearly communicate what it was like for him during totality, simply acknowledging that he gets rather emotional:

> I cry. And, I'm gasping, and um (pause). It's very emotional for me. There is something that is so grand about it. It just kind of overwhelms the senses.

Dave described the time in totality as like being in a different world, and in those moments the 'real world' ceases to exist. The boundaries between the two are for him usually impermeable. However, Dave recounted an occasion where the boundaries of this unique world were intruded upon by events occurring in the 'real world':

> We were on an island right off the coast of Aruba, this was a small island. It was right off the coast from the airport. And during totality I heard this roar of a jet engine. I looked behind me, and there is a plane. Landing! During totality! It was just so shocking that anything on Earth could be normal! (laughs). During totality! (laughs). So that was pretty weird. On the solar eclipse mailing list there was quite a discussion about that, because a lot of people saw it and they were all shocked.

This real world intrusion was obviously shocking, not only for Dave but for other eclipse chasers. It is interesting how Dave describes the simple act of a plane landing as weird—after all, he was in the close vicinity of an airport. This quote suggests that totality is like a separate world to him, where normal everyday events just do not exist or matter. All that matters is that moment of time, and totality. Being 'shocked' out of his experience to pay attention to a real world event was what was strange for Dave, not that the real world no longer existed. Thus, totality was the norm, and the real world became weird.

This real world intrusion has also been experienced by Dave, to a lesser extent, in his preoccupation with his cameras during his first eclipse experience:

> I had practiced taking pictures, and I had a big long lens and all this stuff. When it was over I realised I missed the chance to really experience the eclipse - too busy with the camera. That is one of my big pieces of advice to everybody – don't take pictures, unless you are a professional or serious hobbyist, because you are going to miss the eclipse. And you don't want to do that.

During his first experience he did not completely enter the world of totality as his preoccupation and focus on operating cameras prevented full immersion in the experience. He then went on to find a way to capture the moment with minimal fuss, using video and audio, and general photographs, allowing full immersion into the experience.

For many people, including Dave, totality is so beautiful and the experience is so powerful that it is only natural to want to capture it. However, he has realised that extra magical moments become etched upon the memory in a way that easily allows him to relive these experiences. Such memories are just as vivid to Dave as a photograph or video. For example, he experienced an incredible moment observing the approaching shadow during the 1995 eclipse in India:

> I turned around and looked behind me, and you know how from a distance you can see the shadow of a cloud projecting down? I saw a big cone-shaped shadow, coming out of nowhere, behind me, like a tornado (motions with arms). That sort of shape. It was narrow enough that you could actually see the definition of it. It was only a 40 seconds eclipse so the shadow was small. I could actually see this. My video was going, and I can hear myself saying "oh wow, look at the shadow". Did I turn the camera around? Did I take any pictures? (shaking head). You get really stupid, you know, when the pressure is on. But I saw it. And it's up here (points to head).

Dave has been a speaker on eclipse tours in the past, and has had the role of explaining how to prepare for the eclipse. Although he tries to prepare others for the overwhelming experience that they are about to have, he reported that people just simply do not understand until after the event:

> One of my jobs was to explain to everybody on the tour what was going to happen, the sequence of events, what to look for, how to protect your eyes, all that kind of stuff. There were a couple of women on the train who had never seen an eclipse and I was telling them that it is very powerful and can be very emotional. And they were like, "yeah yeah, yeah." They just wanted to go on this trip, and the eclipse was just a bonus. To me, everything else on the trip is a bonus, the eclipse is the thing. We saw the eclipse in perfectly clear, really good conditions. I went around videotaping people afterwards to get their reactions; I usually do that. I went to them, and I said "What did you think?" And they went "(very long pause)". They couldn't talk. They were so overwhelmed, they couldn't speak. One of them went off to a field about 100 yards away from everybody, and just sat down in the field and just tried to gather her thoughts, she was so completely overwhelmed by it. That's the effect it has on people.

Dave's passion for eclipses has allowed him to experience so much in life, and one only needs to see him talk about his eclipse chasing adventures to see that passion ignite and come alive.

Maintaining the Thrill

Dave has been to enough eclipses to know what to expect from totality, and reports that he gets little excitement during the partial phases as he waits for the main event:

> I find all the partial phases to be excruciatingly boring. What I really like is maybe 30 seconds before the Diamond Ring because of all the anticipation. That's when the light is really the weirdest. It kind of gets grey and silver. Diamond Ring – nothing like it. And then totality. And then the final Diamond Ring. And then I'm ready to go home. I don't care about the last phases. I don't pay any attention to it; to me it's almost anticlimactic. It's the cigarette afterwards.

All of Dave's excitement is focused on the 'big high', that is, the most exhilarating moments of totality. Being bored during the slow lead-up to totality suggests a certain amount of habituation to the thrill—he no longer gets excited about things that he would have been excited about during his first eclipse experiences. And immediately after totality, for him, the show is over, it's time to go home. He has witnessed three annular eclipses, but without the totality element he did not feel the same excitement:

> It was interesting – it wasn't thrilling. And I told myself – no, I'm not going to do this again unless it's really convenient.

Dave's comment suggests that he gets a huge thrill from totality itself, and that it is one of his motivators for continuing to chase eclipses. He has in recent times expressed a curiosity about edge phenomenon—these are the more unique events that can be seen only at the edge of the path of totality:

> Have you ever seen the video from the Edge expedition, where they go to the edge of the shadow? Isn't that weird? It's really amazing that people would do that, and that's always tempted me to see something like that. I'm not sure I'm willing to sacrifice the Grand Pooh-bah, though, just to see that (laughs).

Although he has also expressed interest in seeing a Diamond Necklace, where there are Baily's Beads seen all around the Sun during a rare hybrid eclipse, it is clear that interest in edge phenomena does not take priority over the experience of full totality. He does, however, have admiration for others who take chasing to extremes, and understands the excitement that can be gleaned by these different experiences. For example, he talks about his admiration for Glenn Schneider, and the eclipse flight Glenn had taken in the 1980s:

> Just trying to think about it, where he describes the whole thing, what he was trying to do, what he did do. And then the photos which are… they are just amazing. He was, like 10,000 feet up, and he was sticking his head out of some sort of opening at the top of the plane. I mean, he was really off the chart!

Prioritising the Passion in Life

Tolerating the Hardships of Travel

Dave described how eclipse chasing was one of the most important things in his life. He recognised the passion and energy that his eclipse chasing adventures provided, and prioritised seeing eclipses over other events. He described how his passion is clearly understood by his wife, who has shared some of his eclipse experiences but does not share the same passion. Therefore, he travels to most eclipses on his own, albeit usually with a specialist tour group:

> Yes, I've been very fortunate. I've done pretty well, and this is a huge priority for me. And it's fine with my wife. She's happy that I can do something that I enjoy so much…as long as I can still make the mortgage payment.

Travelling to see an eclipse does not actually lead to a guarantee that the eclipse will be seen. As any eclipse chaser knows, there is always uncertainty about the weather, with the possibility of clouds covering the sky at the key moments. As well as enduring the hardships, Dave also feels the weight of the suspense of near misses—times when even people in the near vicinity were being clouded out. However, for some reason, Dave perceives that he has a lucky streak, in that he always appears to have clearer skies where others are clouded out, like his experience in Hawaii:

> We saw it through partial clouds. People just a mile or two down the road missed it completely, that's how close it was.

The perception of luck—being in the right place, choosing the right location, making the best decisions, is positively reinforcing for Dave. He also has a generally optimistic outlook, so when things have gone wrong, he is easily able to identify alternatives and solutions. This flexibility in thinking has also allowed him to remain positive despite being clouded out during an eclipse in Mongolia:

> Snow was everywhere. And we all got upset, because we are dire optimists, and it got dark [because of the eclipse] and everyone was screaming NO! NO! But still, there were interesting things to see. You could see the shadow racing along the tops of the clouds. You could notice the light changes – things that you wouldn't really notice if you were looking at the eclipse.

However, despite the optimism, there were times when Dave realised that the travel he tolerated to see eclipses was tiring and excessive.

Finding Meaning in a Crisis

There are times when normal life intrudes upon the plans of the eclipse chaser. Dave and his wife had booked to go on a two week cruise to see several countries before repositioning for the eclipse in 2006. Just a few days before they were to leave for the cruise, Dave's wife suddenly had a life-threatening health crisis, which signalled the return of her cancer. The unexpected nature and dread of what the incident meant resulted in the immediate cancellation of the cruise, and a refocus on the care his wife required. However, once the immediacy of the situation had been further assessed, his wife insisted that he find a way to go, as she was aware of how important it was for him:

> She said "you better find some other way to see this eclipse, because you are not missing one because of me!"

This highlights the extent to which Dave's wife recognises his passion for eclipses, and it was an incredibly selfless gift to him. Dave was able to make alternative last minute arrangements, and he made his way to stand under the shadow of the Moon, before quickly returning home. That eclipse was an extraordinarily meaningful event for him, and highlighted how special life was:

> And not only that, but how important it is to do what you really love. I have found that during totality, just those few minutes, is just about the only time in my life that I am completely at peace.

Sharing the Passion

Talking to Dave, it is clear that he has a passion for sharing his passion. For the past 10 years, he has established himself as a public speaker, focusing on caregiving and coping with serious illness, eclipse travels, and passion in life and its effect on productivity. He has also written a book about his experiences of living with cancer in the family. He describes having energy and enthusiasm for talking about what he loves and what is meaningful, and he enjoys inspiring others:

> I have finally figured out that the big benefit is, to me, when you have a passion and you pursue that passion, no matter what it is, it fills you full of energy that you can then apply to other things like your work. When you add passion to one part of your life, you add energy and enthusiasm to all parts of your life.

He also talks to people on eclipse tours, helping them to make sense of their experiences. He has learned that when you follow the things that are important to you, it takes you out of your comfort zone but allows you to have a rich and fulfilling life. He muses at the thought of his earlier hesitation to travel to his first eclipse, and how he now uses that in his speeches:

> I figure I've been to 29 countries (so far) in eclipse-related travel. About 28 of those I would NEVER have gone to otherwise (laughs). Ever!

2 Rick Brown, Aged 59, New York, USA

Rick has been a commodity futures broker since 1977 and also runs a specialist eclipse chasing tour company. His job has given him the flexibility to take time and travel to put these tours together. He is an amateur astronomer, and looked forward to seeing his first eclipse from a young age.

For Rick, three main themes arose following his interview – *Becoming a professional eclipse chaser; a unique but universal experience;* and *being passionate about your passion.*

Becoming a Professional Eclipse Chaser

Falling into the Eclipse Tour Business

Talking with Rick quickly reveals that he is a person who always finds solutions to problems in life – there is no problem that cannot be sorted out. This outlook, and being an organiser and a doer, explains why from very early in his eclipse chasing career he was organising the plans of others. He talks about how simple this was when making plans to see his second eclipse:

> I mean, I saw that this was not a hard thing to do and that's where the interest came from, for putting a little trip together. I found that I could get free airfare and free hotel and everything just worked out so well. And all of a sudden I was in the eclipse business.

Over the years, his tours have increased in popularity, and he has become more involved in planning and education activities for local populations, a role that he particularly enjoys, and which started in Antigua for the eclipse in 1998:

> I had gone there a year in advance just to make sure everything looked right. They ended up getting me involved in local politics there, working with the government and the

> tourism ministers and the education ministers. Teaching the teachers there how to go around the island and teach the kids how to safely watch the eclipse. I was working with the hotel association down there, explaining to them exactly what to expect for this whole thing.

Rick has no formal science background. However, he found that he was the right person for planning and organising, and then found that there was a need for expert information in the places he visited. In addition to this, his connections within the eclipse chasing world were helpful, not only in terms of planning, but also to help the local community. For example, he talked about how he has been able to bring resources in for the local population who would not normally have access to eye protection to view the eclipse safely:

> Normally when I'm going to a third world country, for instance Africa, both Africa trips, and even Turkey, [my friend] supplies me with thousands of pairs of eclipse glasses. He's got overruns on what he's manufactured and stock from previous eclipses that just can't be really marketed for any kind of profit, because they've got the wrong location and the wrong date on it. They were perfect to give out to the local population there so that they can watch the eclipse safely. And that works out very well.

Pushing the Boundaries on What is Possible

Rick was involved in coordinating the 2010 eclipse flight (eflight) from Tahiti, along with Dr Glenn Schneider. The path of totality for this eclipse passed over limited regions of land, which included Easter Island and Patagonia. Access to other areas of the path was limited due to the remoteness and lack of infrastructure to bring in groups of people. Furthermore, it was recognised that the unique geometrical properties of this eclipse made it perfect to be seen from the air. To ensure an eclipse flight was possible, many logistical problems had to be overcome, which appear to have been an exciting challenge for Rick, Glenn, and others involved. It turned out to be an amazing experience for all 41 passengers and six crew members who were on board:

> The actual trip itself was just fantastic, the idea of being able to see from 39,000 feet. We had made a turn that allowed us to see the oncoming shadow from the west and that was a phenomenal sight. We had the clouds, a little bit of cloud cover below us, but perfectly clear skies at 39,000 feet. As the shadow approached we could see this wall of darkness coming at us, it was just, it was really, it made you shiver. Then we proceeded to make the turn to follow the eclipse track, and to watch the clearest view of an eclipse that I've ever seen.

The approach of the 'wall of darkness' paints a vivid picture of the wider phenomenon of the eclipse experience—it is not just about seeing the image of totality in the sky. Although Rick does not specifically name any emotions in his account above, he clearly describes his physiological response to that moment—a shiver. This is the body's response to such an ominous scene.

There was a significant amount of interest in this flight, from the local people and media in Tahiti to international press, and of course, other eclipse chasers. Rick was delighted that he was able to successfully plan and coordinate the trip, along with others who were involved. He was also delighted that he was able to facilitate such a unique opportunity for a small group of eclipse chasers:

> When we landed back in Tahiti there was all kinds of hoopla. There were people asking us all kinds of questions and the media was there. It was really a lot of fun. We are supposedly going to be in the 2013 edition of the Guinness Book of World Records as being the first commercial flight that viewed nine minutes and 23 seconds of totality from an aeroplane. I don't know if it's something we will ever be able to duplicate again, at least in my lifetime. But it was fantastic, it was just great.

Rick found the experience extremely thrilling. There seem to be many levels to the excitement of that flight—overcoming all the hurdles, finally getting the flight off the ground, experiencing the shadow, seeing the eclipse, returning back to base, managing the media interest, and then having the event acknowledged publicly. Despite the difficulties and challenges of organising the eflight, the many rewards seemed to be naturally reinforcing, resulting in a high level of satisfaction.

Rick felt that, compared to eclipses that were seen from the ground, there were a few key experiences missing for him—that of the build-up to being fully immersed within the changes in atmosphere, and also being able to contribute to and observe the reactions of others on the ground:

> Well it was a totally different perspective and it was exciting. From my own personal experience, there were a lot of things that I missed not seeing, which is something that you could see from being ground-based. Obviously that is the change in temperature and the wind, and the shadow bands. It's all the people which are inexperienced in eclipse sightings and watching their reactions to it. It's the animals that kind of start reacting strangely. There's a different anticipation level when you are on the ground, and I kind of enjoy that, I miss that. Of course I was overwhelmed by what I was seeing anyway because it was something new and different for me, and I certainly wouldn't exchange it for anything in the world. But if I had a choice of being guaranteed good weather on the ground or seeing it from the air, I would probably choose the ground.

Rick refers to the extra elements of the eclipse experience that are unexpected, but provide the thrill and the excitement, and the atmosphere of the event. For him, it highlights that when those things are missing you may see the eclipse but you miss some important experiences.

Planning and Managing Uncertainty

When arranging eclipse tours, Rick is aware that eclipse chasers are hugely invested in actually seeing the eclipse, and there will always be uncertainties such as cloud or bad weather that are out of his control:

> I realise how important it is to see the eclipse. If nothing else, I'm there for me to see the eclipse. I don't want to get clouded out. The luck that I've had probably speaks for itself. I don't know if it's luck, or a little bit of skill.

Rick, with his pragmatic approach to problem-solving, appears to believe that it is his skills, as well as luck, that ensures the highest chance of seeing the eclipse. He also has the tenacity to overcome the many uncertainties and logistical problems that occur in organising tours, continuing to look for solutions. For example, after overcoming so many challenges setting up the eflight, he refers to final issues that could have compromised the whole operation:

> The actual scheduling was difficult to have everything nailed down, because as it got closer to eclipse time the French people went on strike again, and the air personnel were on strike. And if there was a strike, we wouldn't have been able to take off. So at the last minute we invited the minister of Tourism and Transportation. We figured if he's on the plane with us, there would be no way that he, being in charge of the airport, is going to not let the flight take off.

Despite the practicalities and unpredictability of eclipses, Rick felt again, optimistically, that there were different choices that could be made with regards to location. Some locations appealed more for the purpose of organising a tour, as they had other activities or sights that could be seen, in addition to a good eclipse location:

> Generally speaking, there is more than one optimum area to go to where weather prospects are good. There are some where the weather prospects are just not good along the entire path of the eclipse. You just have to choose something. The people that went to Patagonia for the last eclipse, those people were totally lucky to see what they saw. You just never know.

Rick was highlighting the 2010 eclipse, the path of which went over Easter Island and ended over Patagonia, as a case point. Patagonia had a statistically high probability of cloud cover for the time of the eclipse, and many eclipse chasers avoided the area. The 'lucky' eclipse chasers who found themselves in Patagonia for the eclipse (including David M, see next chapter) had a small chance of viewing the eclipse, but ended up on the day with one of the clearest views, producing amazing images. Therefore, using probabilities of cloud cover to select a location does not necessarily guarantee what you will see on the day.

A Unique but Universal Experience

A Totally Unique Experience

Rick believes that totality is a unique event that shows nature at its very best—the colours, the light, the whole experience. Even though Rick has seen twelve total eclipses, he still struggles to find the words to describe the experience of totality, and even resorts to making up words:

> I don't think that colour black exists anywhere. It's not dark, it just - it looks like you can see into it. I just find that fascinating. It's just - unduplicatable, if that's such a word, and

> it's just phenomenal. It's an unbelievable thing to see. I get chills and goosebumps every time I see it, as does everybody else.

Despite not being able to find the words to describe the experience, Rick's quote above does capture the emotion of the experience, with words such as phenomenal, unbelievable, and physical reactions of chills and goosebumps. Those words make it understandable that such an experience cannot be coherently explained. However, like other eclipse chasers, Rick continues to seek ways of describing totality:

> I still haven't read what I consider to be an appropriate account of how a person really feels after an eclipse. I just haven't found anybody that's really been able to put it into words. Because you probably agree that it's a fairly indescribable sort of thing to translate as far as what it feels like and what it's like. To me it's pretty evident just from watching those who are seeing their first eclipse – I can't even explain how they are reacting. When the whole thing is done they don't really know how to explain it either. Other than saying that it's totally not what they expected it to be. But it's amazing because people, you know as well as I know, there are people there that start howling and crying and praying and weeping, and it's just incredible, it really is. It's not something you understand until you've seen it.

Rick therefore recognises that perhaps it is impossible to describe to others who have not seen it, as it is an experience like no other. He also feels that pictures can capture the beauty, but do not convey the experience of totality:

> For somebody who hasn't seen one, they don't understand that at all. They think they've seen enough pictures. There has never been a picture of an eclipse that makes you feel like you are sitting there watching the eclipse. And there probably never will be.

Rick is in a position where he is present and able to share this experience with others. He often tries to talk with people immediately afterwards, to try to help them make sense of what they have just experienced:

> The best description I've heard of what totality looks like is when you are looking at that lunar disc, with the corona around it. I've heard it described as the eye of God. That's as appropriate a description as I can think of.

He finds that there is a spiritual element when observing eclipses. Although he acknowledges that he is not a religious person, he wonders about the beauty of eclipses being based on completely coincidental celestial events, and for this reason, he questions how this can exist without some higher power being involved:

> I'm not a religious person by any means, but to me it shows the power of nature and what can be created and what exists out there. I mean, the idea that we are really the only planet that experiences an eclipse that has the geometry to allow this to occur with the apparent equal size of the Moon and the Sun. How could this be unless there really was some sort of higher power that was in charge of all of this?

That such a coincidence can occur without being planned is something that Rick struggles with understanding, and he acknowledges that neither science nor religion provides any satisfactory answers for this.

Rick does a great job at conveying his passion and love of eclipses to others, on his tours, in his everyday life, and at every opportunity. For himself, and for most of the others attending his tours, he finds that immediately after seeing an eclipse, most people on his tours are highly motivated to find out when and where the next one is, so that the experience can be repeated:

> Within two or three seconds after C3, is "when is the next one". That always comes up, "I've got to start planning for the next one". They pay no attention to the time between C3 and C4. But that's the biggest topic of conversation - when is the next one, where is the next one.

Sharing Intense Reactions with Others

Rick has provided hundreds of people with the opportunity to experience an eclipse on his tours. Furthermore, as a tour operator, Rick engages with local people from all around the world in the lead-up to the eclipse, and has therefore shared totality with thousands of others from many different countries. He believes that the reactions people experience during totality are universal, and commented that he has never come across anybody who was not fascinated with totality, or who did not feel awe over the experience. Rick comments that sharing this experience with others has become a core part of his own eclipse experience. He particularly enjoys the individual personal transformation of people before and after the eclipse experience. Every eclipse chaser has been there, and so to observe this transformation in others is really special:

> Although I would probably enjoy being by myself on some beautiful island watching an eclipse, I don't think it would be half the experience without having people around. And especially kids - sharing this stuff with the kids was just so much fun.

Local people are mostly unaware of the intensity of the experience. They are, however, usually aware of the intense interest from eclipse chasers, and do make plans to manage the increase in numbers. Rick particularly enjoys liaising with local people who are oblivious to what they are about to experience:

> Oh, it's so much fun getting involved with the local people, it really is. They are just so appreciative. Then of course you are there, and they don't know it yet, but you are there to share an experience which is something that they are never going to forget. They just don't realise it until after it's occurred! (laughs).

Like other eclipse chasers, Rick has had the experience of individuals who, because of misinformation, mistakenly believe they have seen a total eclipse when instead they have seen a partial, or even a lunar eclipse. Or people who have seen an eclipse on YouTube and therefore have no interest in seeing one in real life:

> If a person doesn't have an interest in it, all you can do is look at them and be sad for them that they are going to miss an experience like this. Because I don't think anybody has seen one eclipse and said they had absolutely no interest in seeing another one. They may not get to see another one because they don't have the financial means or they don't have the

> time, but heck, nobody, nobody has ever said "You know, that was pretty good, what's for dinner?" I've just never had that at all. But for somebody who hasn't seen one, they don't understand that at all .

Rick gets excited when he talks about eclipses, adventure travel, and his long history of eclipse chasing. He never gets tired of communicating this to others, although he acknowledges that when others do not understand the passion, he can come across as a little weird:

> The ones that haven't expressed any interest in seeing an eclipse, they just think I'm crazy and a little bit nutty, and you know, why would you want to spend all this money and travel around and spend all this time putting this stuff together?

Being Passionate about your Passion

There are many people who observe an eclipse at a particular location; however, only a small proportion of these go on to be eclipse chasers. Rick feels that there are individual differences between people in terms of where their interests lie, and 'what floats their boat', and opportunities to be able to travel to exotic locations to see future eclipses:

> I don't know, some people can stand and look in front of the Mona Lisa for six hours without moving, and others they look at it for a couple of minutes and they say that's gorgeous, that's beautiful, ok what's next. I guess it's whatever kind of floats your boat.

Rick acknowledges that eclipse chasing is not an easy passion to have:

> The travel is difficult. I mean, some of these places you get taken to are very remote, expensive to get to, with lots of logistics to keep in mind. This is where I come into play. It's not an easy thing to do, and it takes a commitment to decide you really want to do this.

But despite the difficulties and practicalities of eclipse chasing, Rick is able to identify so many benefits for his passion, where he feels he is essentially able to travel with a purpose:

> I love travelling and this really gives me the opportunity to travel with a purpose. I don't have to sit and look through magazines and brochures and figure out with my family where my next vacation is going to be, because it's kind of dictated by where the eclipses are.

Ultimately, Rick loves this aspect of his life. He feels incredibly lucky that he can do his eclipse chasing and tour organisation alongside his paid employment. He also would encourage everyone to see a total eclipse.

3 Jay Anderson, Aged 64, Canada

Jay Anderson is another name very familiar to eclipse chasers. Since his early days of chasing, Jay has established himself as an eclipse chasing guru. As a meteorologist, he produces weather statistics and predictions for every eclipse, right along the eclipse path, and this is published in the *NASA Eclipse Bulletin*—the eclipse chasers' 'bible'—produced along with Fred Espenak, another eclipse guru. In these bulletins, the path of totality is outlined and Jay provides information about general climate patterns along the path and average weather for the day.

Jay's first eclipse was in 1979. Since then, he has seen 17 total eclipses and eight annular eclipses. He regularly accompanies a specialist eclipse chasing tour company.

Analysis of Jay's interview revealed three themes – *Will work for travel despite the responsibility; tempering the spark for totality;* and *enjoying life's Merlin moments.*

"Will Work for Travel" Despite the Responsibility

Jay found himself in a privileged position in the early days of eclipse chasing, when he was motivated by his strong passion for travel:

> When people just started to offer to pay my way to go to eclipses as long as I gave them a weather forecast and talk to some of their people in presentations and things like that, I was thinking "wow, this is just too good to believe!" That somebody would actually pay me for stuff you like to do like that, and take you all over the world.

As a meteorologist, Jay observes weather phenomena and other aspects of totality that others do not appear to observe, such as watching the flash spectrum and colour spectrum, or polarisation. However, he acknowledges that a big part of the eclipse experience is the emotional experience, and he often likes to focus on this aspect:

> It's a magical moment, and it is for everyone. Even with my twenty-odd eclipses it is still a magical moment to watch it happen, and feel all the energy and to look around you, and see the changes and the colours and animals and things like that. It's an immersive experience.

Each eclipse for Jay is the culmination of a rather long cycle of about five years of work, starting with scouting trips, hundreds of hours of research and preparation, and report writing. So, totality is not just an event that happens every 18 months or so for him:

> Eclipses are to me far more immersive than just the event because of the website and weather and all the work I put into that. Whenever the eclipse occurs that is the culmination, the end of a long process. And then I move on to the next one. So to me it's a cycle

> that involves not only the phenomenon and the travel, but the maintenance of whatever reputation that I have.

The role he plays in making weather predictions on eclipse day, however, comes with a lot of responsibility. When he is on trips, he is constantly updating forecasts and always at the ready to make decisions to relocate if necessary. Others defer to him to make these decisions:

> When I go to an eclipse, I try to go on a trip where the eclipse is the first thing in the trip. So that way the stress is relieved early. It doesn't always happen that way, in which case I find myself heading out to internet cafes in order to look at downloads of weather, while everybody else is running off touring and seeing other places.

As the best person to make decisions based upon the weather, Jay is often sent to the places that threaten challenging weather on eclipse day, so that he can be on the ground to maximise the chances of successful viewing. As a result, he reports that he gets clouded out more than most people. Jay also described how, during eclipse chasing trips, he often has to put his own needs on hold whilst making the best decisions for the group. As a former operational meteorologist, Jay is accustomed to making decisions that impact upon people, such as opening and closing airports and issuing warnings for severe weather, so this means that he is 'always on' during an eclipse trip, relaxing only when the eclipse is over. He has at times made decisions to move groups of people at the last moment in order to escape heavy cloud concealing an eclipse, and often updates warnings on the SEML for others.

During times when he has been unable to coordinate last minute movement, and the group has subsequently been clouded out, he acknowledges that he feels sympathy for eclipse virgins:

> The people I feel really sorry for are the ones that are doing it for the first time. You get a feeling of the excitement but it's not quite there, and so you wish they had managed to squeeze something out of it.

However, he has a certain philosophical approach to this which highlights the things you can control and things you can't:

> The only thing I would want to say is that there is always another eclipse. [If clouded out], you gotta be pessimistic, be annoyed, have a beer, maybe even get a little drunk. But there is another one. That's the beauty of eclipses; it's not like a tornado where it's there and then it's gone.

However, he acknowledges that, despite the restrictions of responsibility, there are many rewards for his activities—he has had the opportunity to experience totality in many places around the world. Jay also acknowledges that he gets a lot of recognition for his role, and enjoys the status that this brings with it.

> You know, it's kind of a neat feeling that people will invite you to come to India and talk, or down to the local high school to talk. I think as humans we all need a certain amount of status, either by getting rich or getting famous or doing something important.

Tempering the Spark for Totality

Jay is a well established and key member of the eclipse chasing community. It is safe to assume that all eclipse chasers use his information and weather statistics in order to make their own plans. He acknowledges that the eclipse chasers on SEML are the 'hard core' chasers – a different group compared to those who accompany him on his tours:

> When you are on the SEML, you see people who have a very intense emotional investment in eclipses, a very high investment. But in a typical tour group crowd of a couple of hundred people, only about half of them have been to several eclipses before. So you end up with people who are there just to watch it for the first time.

Despite Jay being an eclipse chasing guru, and a member of the 'hardcore' SEML, he does not appear to get involved in 'scorekeeping' eclipses. He feels that this is because to him the excitement is for the whole package, and not just the eclipse itself. What was unexpected and totally surprising was his level of motivation for eclipse chasing—something he put as around 30 %. He acknowledges that his wife was more emotionally invested in eclipse chasing than he was. He recognises that the magic of totality is still there, although over the years he has lost the excitement—he has lost some of the spark for totality.

Out of the nine eclipse chasers featured in this book, Jay has seen the most total eclipses, and is also the most able to speak about the habituation that has occurred for him during totality:

> I mean, I'm definitely emotional, even from the first contact. I still get emotional, but it's not the same exhilaration so much. In some respects that initial magic that I first saw in 1979 isn't there anymore. I think I'm more dispassionate. This sort of, like an attitude I have - you seen one you seen them all - that's not the way it happened. The first eight to ten eclipses that I saw, the eclipse took a bigger part of my experience, the actual physical event.

Jay still gets a buzz from eclipses, and he tries to make each eclipse interesting by focusing on specific phenomena:

> I try to do things a little differently at eclipses, I look for different things, and it gives you a little more time or depth to the experience. You get habituated to it, but there are things you can do to make it feel a little more interesting. In my eclipse chasing it's the circumstances of the eclipse and the phenomena that you see that rule my excitement.

Jay has also identified other more interesting ways of feeling the excitement during totality, with his aptly named 'eclipse vampire' activities:

> I kind of rekindle the enthusiasm sometimes by standing beside people who are seeing an eclipse for the first time, and I take a certain amount of delight in their delight for the event. If you can immerse yourself with people, and especially if you know the language, then it's very exciting. I call myself an eclipse vampire sometimes because I feed off the excitement of other people seeing totality for the first time. I really get a lot of pleasure out of that.

Despite the habituation to the eclipse itself, Jay still does get excited about astronomical and weather events:

> I know storm chasers who are as passionate about storms as the most passionate eclipse chaser. Storms are different because with storms you are always trying to decipher mother nature. It's more of a chase. Jay Pasachof has always objected to the name eclipse chasers because he says "I don't chase eclipses, I go somewhere and they come to me." But storm chasing is just the opposite. But it's an intellectual challenge, I guess the Sudoku of the weather. It's a kind of neat feeling that you can outsmart mother nature, or figure out her secrets and be in the right place. Eclipses aren't like that.
>
> The sort of pleasure that you get from a really good storm chasing, you know, it's pretty exciting. It's pretty exciting when you can go to these natural phenomena. I get a huge pickup in acceleration watching the Leonid meteor show, burning in one after another. That's like a wow moment. I'm not dispassionate about these things, they are really, really great moments, great when a new comet comes by, a good aurora, you know. Mother nature has got this giant TV screen and you just have to go and look at it.

Enjoying Life's Merlin Moments

Jay acknowledges that he takes great pleasure in feeling he is able to interpret nature's secrets, and delights in being aware of moments that others may not be aware of. For example, he talks about a moment when he was sitting on a plane with the Sun setting on one side. On the other side of the plane he was looking at the Moon rising, with anti-crepuscular rays shining down and focusing on the Moon:

> To some extent astronomy and meteorology takes me back a little bit in my mind to thinking about the alchemists. At that moment on the plane, I thought "I should tell the person beside me about that,'cos that's a spectacular alignment, Sun, Moon, cloud, shadow". And I thought – why? If they are not interested enough to figure that out, why should I show them this little secret moment? No I'll just enjoy that for myself. So an eclipse in a way is a secret little moment that you enjoy with a whole bunch of other people who DID look out the window to see that shadow formation. So it's a little bit of Merlin in us, knowing a secret. It's a kind of an 'aha' moment that is both private and quite satisfying – to get an insight like that.

He notes that in general, eclipse chasers are usually well educated and interested in the world around them, and are either reasonably well off or exceptionally determined to chase eclipses:

> Cruise organisers don't like eclipse chasers because they don't go to the bar, they don't go to the casino. They sit around on the hallways and on the back deck and they talk about life and sometimes it's about science but not always. And every evening the decks will be crowded by people looking for a green flash. At night they want the lights turned out up front so they can look at the stars. So these are people who are curious about life and phenomena in the environment.

Jay describes himself as an 'experience seeker', and has an outlook on life in which it is important to just do the things you want to do:

> One thing about life is that sometimes you just have to do totally wacky things and just say "to hell with it". It's going to cost money; it's going to take time. But just go and do it. I guess that governs my life view - you only go around once, is what I say.

He confided that many years ago his wife received a devastating diagnosis, and for a period of time they lived with the knowledge that her life and their life together, would be limited:

> So there was a three year period in our life where we thought she was going to be wheelchair bound, and you know, live till she was about 55 or 60, and that I'd be mostly looking after her. And then it went away. I think at that point both of us discovered that you've got to live life completely.

Jay and his wife appear to live by their motto—doing wacky things—in order to fully experience life. They travel to see total eclipses and other astronomical events, as it brings them great pleasure in life:

> I just bought my wife the Virgin Galactic flight into space (laughs). We are working on how we are going to pay for that right now. She wanted to go into space, so there you go.

Jay feels he has been lucky in life, having had the freedom to do the wacky things that have provided so much meaning in his life:

> I've had people say to me "God you have an interesting life", and I have to stop and think about it and go, yeah, I do.

Chapter 10
Introspective Chasers

This chapter describes two eclipse chasers whom I have termed 'introspective chasers'. They have both spent a considerable time trying to make sense of their eclipse chasing experiences, and both show high levels of self-awareness. They are more interested in the beauty and experience of totality than the scientific aspects of eclipses.

First we have James McClean, who considers himself to be a citizen of the world, although he is formerly from the USA. He is a professional artist and photographer who has now made eclipses and aurorae the focus of his work. James is an independent spirit. He chooses where to live and work as a consequence of upcoming eclipses, transits, and aurorae. He has seen four total eclipses and three annular eclipses. James volunteered to participate in this interview through the SEML.

Then we have David Makepeace, a filmmaker from Canada. David has developed an extensive collection of material about his eclipse chasing on his website, and is now also establishing himself as a professional speaker, using his experiences of and insights into totality to inspire others to live a passionate and meaningful life. He feels compelled to share his experiences, and believes this is a natural extension of being an eclipse chaser. Due to his eclipse chasing, David has identified an authentic way of living which allows him to focus more closely on being in the moment. He has seen 12 total eclipses and six annular eclipses. David volunteered to participate in this interview through the SEML.

Both James and David would also be considered enterprising chasers, in that they are both starting to use their passion as a means to establish a living. Unlike other enterprising chasers, they are also similar in the sense that, because of their eclipse experiences, they have made real and somewhat unconventional choices about how they will live their lives. They are both very clearly able to talk about the personal impact that eclipse chasing has had upon their lives.

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1 James McClean, Aged 45, World Citizen

James is an American who for the last few years has called Europe home. He is a photographer, and in recent years has focused his art on eclipses and aurorae. He enjoys travel and learning, and moves around the world taking on work projects that will also allow him to photograph things of interest. James reported that he really enjoys lunar eclipses, solar eclipses, and other astronomical events. At the time of interview he was based in Jukkasjärvi, Sweden, working on the building of the Ice Hotel, where he is also able to capture the aurorae in the darkness of winter.

Analysis of James's interview revealed three main themes—*my unconventional life*; *totality—beyond ordinary human experience*; and a *professional eclipse chaser*.

My Unconventional Life

James described himself as a nerdy child, who experienced his first partial eclipse when he was young, being the only one in his third grade class able to view the event by using black film given him by his father who was a printer. He has travelled to see many lunar eclipses and partial eclipses, and eventually saw his first total eclipse in France in 1999. He acknowledged that he was not really prepared for the emotional experience, and was lucky to see totality through a last minute break in heavy cloud cover.

James described having a background in science with advanced degrees in anthropology, although over the years he has moved towards art and photography as his main career:

> I have a scientific curiosity with a scientific background. But art and aesthetics are my profession, so I take a different perspective than some of the other bearded characters you may have been speaking to!

James leads an interesting, somewhat nomadic life. He positions himself in locations where he can photograph things such as aurorae and all types of eclipses. To fund this lifestyle, he takes on different jobs as he goes along. For example, speaking of his involvement with the Ice Hotel in Sweden:

> You want to know why I took this job? It was to see the lunar eclipse next week. I pick and choose my projects to put me in the shadow.

At the commencement of any job, there is always a discussion about the time he will need off for eclipse chasing, much to the amusement of his colleagues and potential employers:

> Yeah, a lot of people don't know what to make of it. When I take a job I tell the boss "I'm taking 3 weeks off for this solar eclipse. That is non negotiable. Non negotiable!"

James had a home base in an artist colony in Florida from early 2006 until late 2010. A modest rent and periodic employment as environmental specialist with local state government allowed him opportunities to travel far and wide in search of eclipses. James appears to have a passion for exploring the world, experiencing different cultures, and learning new things. At times he has had to take on projects for periods of time that are more traditional, although he does not like to be 'stuck behind a desk', and much prefers to be out doing what he enjoys. However, this comes at a cost:

> I put myself in debt to the gills because I couldn't imagine dying with missing an eclipse. I've been doing this on my own pocket. I've gone into tremendous debt just to follow eclipses. I know there is a payoff, because the photos are there, there is a book coming, there are gallery shows to be had. I know that this is an investment and not just a frivolous expenditure. And even if it is, I mean, it is just worth the experience.

James places huge importance on seeing eclipses, and although he recognises the debt he is in, he feels this way of life is very much a priority for him. Of course, as James notes, you can't just see a single eclipse—once you have seen one, you are simply compelled to see more.

Totality: Beyond Ordinary Human Experience

A Cosmic Connection

James was mostly clouded out for his first total eclipse experience in 1999, seen from a crowded urban environment in France. He realised at that point that a total eclipse should be seen away from human environments, although he was amazed when he witnessed the intensity of the human response. Then finally, in Egypt in 2006, he was able to experience the full beauty and immensity of totality in a cloud-free desert setting. It was for him mind-blowing, intense, and spiritual:

> It was like this cosmic connection to the divine that was beyond human experience really. It was an intensely psychedelic and religious feeling, and everyone feels it, don't we? I mean, there is something amazing that happens at that moment.

The above quote gives quite a bit of insight into how James makes sense of his eclipse experience. He uses the words 'cosmic connection' to describe the experience—a connection to something bigger, where you are aware of being part of a larger Universe. He uses the words 'beyond human experience' to refer to his experience during totality. If totality is beyond human experience, then why and how is it possible that he was able to experience it? He is very likely referring to the fact that the experience makes him feel beyond human. He clarifies later that totality is so far out of the ordinary realm of mundane human experience that the event propels people to question their own existence, resulting in renewed appreciation for life.

It is noteworthy to see that James refers to religious and drug experiences in his explanation. When questioned further, James explained that he is not a religious person, but rather a spiritual seeker. In the absence of any other explanation, the religious framework is used, perhaps in order to get closer to the mystical feeling that the scientific mechanics of totality were not able to portray. James also makes reference to primitive reactions he felt during totality, and likened them to psychedelic feelings. That is, he feels it produced chemical reactions in his brain that literally made him buzz. However, upon reflection, he adds that the drug explanation does not really go anywhere near to the eclipse experience:

> Well, there was a lot of, let's say, preparatory research with psychedelics. And so after an experience like the total eclipse, I realise who needs that stuff? Reality alone is just weird enough. I come from that exploded consciousness, so it's natural to chase eclipses and aurorae.

Within James' world, eclipse chasing is a natural activity, in that it would seem unnatural for him not to chase eclipses. Once his mind was expanded (or exploded as he phrases it) by such experiences, it was difficult to live a conventional life, and so eclipses are now simply a natural and ordinary part of his extraordinary life.

Just a Tiny Little Dot on a Moving Planet

For James, the eclipse experience is very much about being in a situation where everything is put into cosmic perspective:

> I tell people it's an opportunity to stare directly into the eye of God. In a sense, it puts your existence as a human being into perspective. And that's an overwhelming experience. Nothing can quite put it into perspective like that in those moments. No partial eclipse does that, no annular eclipse does that, no lunar eclipse does that.

The total eclipse, therefore, allows James an opportunity to think about life on a grander scale—getting the bigger picture, and seeing things in a way that doesn't usually happen in daily life. James has encountered other situations where he has been aware of life being put in perspective on a grand scale—when he has gained a sudden awareness of the fact that we are moving through a profoundly large Universe:

> I remember studying Zen meditation when I was in college. One day we were sitting in the temple, and I could experience the movement of the Earth by the shadow moving through the temple. For this hour of meditation, I realised "wow". I'm this tiny little dot on this big moving ball that is in line with these other moving balls, which are all interconnected through conscious energy. It was just like—wow. I love that feeling.

This perspective of being small on the face of the planet within a moving system allowed James to feel a part of the Universe, connected with the bigger world that is normally beyond everyday awareness. He equates this connection to 'conscious energy', a bi-directional feeling that makes him feel powerful. The love

of that feeling is one of the main drivers for James' eclipse chasing, and clearly influences how James sees himself in the world:

> Anytime you get that feeling of being aware of cosmic motion it makes you feel small. And then you take the next jump and you realise that you are a part of that, and you feel big and open, if you make that connection.

This two-step process for James involves an awareness of perspective, and then connecting that with who you are. James appears to believe that in order to make that second connection, you have to let part of your 'self' go. That is, you can't be caught up in the sense of who you are, your 'self', your ego, but you have to let that go:

> My ego is so colossal and so dead at the same time I become connected to the Universe. So I lose my self, there is a lot of ego death there, and I feel myself connected to something bigger. So I feel NOT insignificant, but completely connected.

Therefore, as James explains, when you lose yourself in that moment, you grow even more and connect to something larger. Ordinarily, the idea of losing the sense of who you are would be frightening, or something that people imagine would be isolating, whereas James explains that the complete opposite happens for him—he feels connected to a larger, universal continuum. James describes this as a beautiful feeling, and elaborates further:

> It has come to my awareness through reading about modern particle physics in the popular scientific literature in combination with my years of comparative religious study that both systems of belief come to the same conclusion- that we are all interconnected to an all encompassing, omnipresent "Supreme Being". For the physicist this Supreme Being is the natural Universe, an immensely huge empty space teeming with energy, sometimes taking on the form of mass and sometimes vibrating as formless waves, which whiz about obeying the laws of Nature. The cosmology of the astrophysicist tells us that everything we know in our solar system has its origins in the primordial furnace of our Sun. The Bible and Rig Vedas say basically the same thing. Throughout time immemorial human beings have recognised the Sun as a powerful, procreative force. The New Age cosmology would have us believe that everything we know is composed of star dust. We are "beings of light" and the Sun is our original Mother. To be given the opportunity to see the otherwise hidden secret of the solar corona during totality is to be initiated into this mystery. To see our original Mother with our own eyes is to be marked for life as one who has been given a glimpse of the true spiritual nature of the Universe. This is part of the deepest mystery of experiencing totality, to witness for ourselves the splendour of the corona, that solar wind made manifest to our senses for those few moments. It is like witnessing your own birth, the birth of our species, the birth of planets, the birth of physics and time, the birth of all that is knowable and unknowable. This is a powerful revelation of the true nature of the Universe compacted into a few minutes that might otherwise take a lifetime of searching and studying to realise.

For James, then, the eclipse experience signifies the answer to all the big questions in life.

James found his first cloud-free totality experience 'mind-blowing', spectacular, and terrifying. The terror, he describes, was due to the unexpected appearance of the corona:

> I mean, the corona was moving so much, I almost dropped to the ground in fear at one point. It was just frightening, and I just couldn't stop staring at it through the camera. Finally I had to tell myself—take the camera away and gaze at this thing. But to see it magnified was terrifying. I guess I wasn't prepared for that much motion. It just had this (pause) eye of Sauron, out of Lord of the Rings, you know. And the blackness was so unfathomable. Unfathomable contrasted to that pearly white with the red prominences. It was, it was… frightening.

James noted that the colours seen during the very hazy total solar eclipse of July 2009 as viewed from Hangzhou, China, were shades of nature that were so beautiful and could not be recreated in any way:

> I saw a pale, purple, lilac-coloured corona, and it was dancing but I thought that is the most miraculous shade of purple I have ever seen.

Subsequent eclipses have also produced a fear response, but James reported that the corona has not moved as much as it had for that eclipse in 2006, which had occurred at a time of solar maximum. He also felt that other eclipses have not been as dark as the near pitch black which was reached in France in 1999 and again in China in 2009, and this reduced the fear reaction.

Keeping the Experience Alive

James recognises that it takes time to digest the eclipse experience, and to some extent it is an ongoing process that he continues to integrate with his life experiences when he can:

> I've been taking audio recordings to get the crowd feedback and excitement. Every time I listen to them with somebody, I mean, we all just feel this tingle, every time. I break down and cry sometimes when I listen to the recordings made in Egypt.

James reported that it was difficult not to compare his eclipse experiences, and when he does, each subsequent eclipse has never quite lived up to the magic of his first experience of cloud free totality. For example, he described his thoughts about the July 2010 eclipse he observed at Easter Island:

> Well, the corona was not moving at all, it was fairly static. And I remember just gazing at it and thinking "this is just beautiful. This is just beautiful." God, I hate to sound blasé, but I was like…of course, we were freaking out, and I was losing myself and jumping up and down. But at one point I just thought, "Yeah, this is good, but Egypt was STUNNING". And maybe because I'm getting used to it.

James was surprised at his feeling of being blasé about the eclipse. He explained that as a result of this feeling, he wanted to explore additional features of an eclipse. He is now trying to observe and capture the approach of the Moon's shadow, and also plans to position himself so he can more closely observe animal reactions. He is aware that other eclipse chasers appear to go to extremes in order to try to have more intense eclipse experiences to overcome this blasé-ness, and describes the actions of a fellow eclipse chaser he met on Easter Island in 2010:

> So he climbed on the side of the volcano, naked, after swimming in the surf for two kilometres, and lay there in full glory watching totality. Bare naked, on the side of razor sharp lava rocks. And that's what gets him going.

The Yin-Yang of the Celestial World

Although James has not yet felt the desire to engage in more extreme behaviours during totality, he has in fact wanted to explore the corona more fully, and in recent years made the connection between the eclipse experience and the northern lights during a revisit to Alaska:

> I was in the library, and I was reading about the northern lights. I had seen the northern lights once when I was a teenager in Alaska, and I thought, that's right, it's fuelled by the solar corona. This is the perfect activity to fill my time between eclipses. So I've become an aurora hunter as well, which is the other reason I try to spend my winters here in Lapland. And some of the aurorae have been so stunning that they are even more terrifying than an eclipse.

James describes how the eclipse and the aurorae elicited similar experiences for him. He describes a memorable aurorae display, which bore many similarities to his eclipse experiences:

> One of the first, say two or three displays of aurorae I saw in Alaska was Jan 17, 2007. And it was, again it had that deep mystical feeling. Because it started with this green band, this very static hour long of green. Then that convoluted and turned into what looked like an angel's wing. A lot of people talk about them being angels and the spirits of the recently departed. This angel wing then opened up, and it seemed to just reach out and hug everybody who was standing out in the snow watching this. Then it just went INSANE. Or maybe I went insane? You are the psychologist, you tell me. Maybe I went insane for a moment. I mean, it was so incredibly pink that I couldn't even photograph, I just fell to the ground and shrieked. It was as stunning as totality. As stunning as seeing that corona in Egypt.

The similarity that James feels during totality and the aurorae is not surprising—they are both manifestations of the same phenomena. Interesting also is the angel analogy, although this is a well known folklore surrounding aurorae. His comments about the sky going insane and then questioning whether it was actually he himself who went insane—again referring to the mind-blowing physiological responses that he feels—are similar to mind-altering psychedelic experiences. He is also suggesting a strong connection between himself and the Universe during a powerful auroral display that he also refers to during totality, as they are similar:

> I think of them as this—the eclipse is a manifestation of darkness where light is expected, and the aurora is the manifestation of light where darkness is expected. There is an inverse, male–female; yin-yang sort of thing.

He is fascinated by these experiences which remind him about life, and put his human life into cosmic perspective.

Being a Professional Eclipse Chaser

As mentioned earlier, the first few attempts at seeing a total eclipse and subsequent annular eclipses did not go well for James—he was clouded out, and did not have the information needed in order to plan appropriately:

> What I learned from Egypt was how stupid I was in France in 1999 for my first eclipse—I just got lucky. I was really ignorant in Iceland in 2003, we just had a rental car, no smart phones back then, no weather forecasts, no idea which side of the island to be on. We wound up sitting in the rental car watching rain beat on the windshield in a parking lot, and it got slightly darker.

James now thinks of eclipse chasing activities as an investment—he is collating photographs and experiences that he then plans to sell in exhibitions. Obviously being unlucky is a threat to this plan, and therefore over time James has learned to modify his approach to photography during his chasing adventures:

> What I learned is that sometimes you get rained out. So I spent 2 months in Egypt backpacking, making sure I got a lot of other photos that were sellable. I've learned to build up the story, and I keep this eclipse chasing log where I talk to myself on my voice recorder. That is all archived as well. Memories for me and notes to myself about what to improve on in the future.

James feels that the continued motivation to chase eclipses is about capturing and sharing the experience with others, by using the unique skills he has as a scientist and artist:

> As a photographer, what really drives me is to capture something that can try to make sense of this psychologically complex phenomenon. No single photograph can do it justice. I think poetry has to be the best medium. Painting won't do it. Video doesn't do it. Yeah, you have to talk about it, digest it. You have to bathe in it. For me, it's to capture that moment and to share with others. I don't know, I was looking for something to focus my art on. And so this is just the perfect combination of my scientific and artistic background.

One can understand the immense satisfaction James will feel as he continues to develop a mastery of the things he is passionate about. The desire to capture and share the experience is very strong, and this is the drive that allows James to continue with his unconventional way of life, prioritising his time to focus on these experiences. James recognises that it may be difficult for others to understand the way that he chooses to live his life:

> That's what I was trying to describe to someone that, you know, it's only four minutes. "You go through all that trouble for four minutes?" I'm like, man, you have NO idea what these four minutes are like! I'm going to Kenya for a minute and a half!

Part of the Eclipse Chasing Community

James expressed a strong desire to start linking in with the more professional and serious eclipse chasers. He expressed extreme gratitude to those who provide resources in order to help with eclipse chasing. He wanted to be able to go to a recent eclipse chasing conference in order to tap into this important resource, for several reasons:

> I plan with all these tools, Google Earth, Xavier Jubier—I can't wait to shake his hand and buy him some dinner, his Google Earth mapping tools are indispensable. And to meet Fred Espenak, just sit down with these guys and share their generational experience. I'd like to do some more ambitious experiments. I'd like to get involved with more academic teams. I'd like to pool resources with other people so that, you know, we can all go in together and socialise. I want to be a larger part of this community.

The other thought that James has regarding the eclipse chasing community is that the eclipse experience is very much a passion that is shared, and eclipse chasers all experience this intensity and mutual connection in a repeated way:

> A solar eclipse is a distillation of human consciousness. In that moment you have rarefied spirits come together, and it sort of raises the consciousness of the whole species I think, even if only a few of us see it.

Therefore, not only is James connecting personally with the Universe, he is also wanting to connect with others who have experienced that connection, thereby creating a unified, powerful, shared experience.

2 David Makepeace, Aged 49, Canada

David is a professional film maker based in Toronto, Canada. He makes his living directing, filming, and editing a range of television and video projects through his small production company. As he works in a creative industry, he uses storytelling through video in order to pass on his message about living a passionate life.

David runs a website with information and his personal experiences and thoughts on how eclipses have changed his life. He has also spent his time working with video, creating short films about eclipse chasing, in addition to other video material. He has presented at high profile events about his experiences of totality and relationship with the Universe, and has become a public speaker, calling himself the "Pitchman for the Universe"—inspiring audiences to discover how the simple beauty and mystery of our world can open the door to a greater awareness of what we are and our place in the Universe.

Analysis of David's interview revealed four main themes: *a shift in my identity; the Universe as my guide; going with the flow (but don't take my eclipses from me!) and completing the cycle by sharing the passion.*

A Shift in My Identity

David saw his first eclipse in 1991—it was not something that he had originally planned to see. His girlfriend at the time was going to the eclipse to work with a local travel industry that was struggling to handle all the visitors arriving for the event. David then went along too—more out of motivation for spending time with his girlfriend. He was not prepared for the profound impact that totality had upon him. He has made a feature of this story on his website (see "A search with Amy"). He describes this first experience of totality as like going through the eclipse doorway, whereupon he was able to see his life and who he was as a person in a completely different way:

> The doorway was opened when I saw my first total eclipse. The bigness of that rushed in and filled me. Something else moved in and I had this change of occupancy. Where all of a sudden, what I call myself, or what I refer to as me, got larger. It led to this radical shift in my identity, where I now include the Universe when I think of myself. Eclipses are just such a major part of my identity and my passion and flow of things.

David makes many references to that experience changing him as a person. He uses the doorway as a metaphor for opening up to a new viewpoint that was closed to him before. He describes how during totality he made a connection with something bigger, that is, the Universe, making himself feel stronger as a result. This shift in identity, where he considers the Universe as a part of the way he views the world, started with his first totality experience, but clearly continues throughout his everyday life. Different to other eclipse chasers, David does not feel insignificant—instead, he very much personalises the experience, explaining that it adds to his self, rather than diminishes it:

> Instead of the separation reinforced (seeing the self as a small part of the Universe), I have the opposite of that. I see my nature that grand. I actually see that I am a part of this system.

During totality, David described himself as moving away from his everyday thoughts and concerns to developing a purer connection with the Universe. He recounts that what totality allows for is the complete and undivided focus upon that particular moment. For David, time becomes irrelevant:

> There is an in-the-moment nowness that is being reinforced during totality. It's happening exactly at that moment. I don't need my mind. I don't need a thought or a concept. In the moment where that is happening, there is a rich flow of experiential energy, and that is what you are. When it's over you go back into your head, and you start your thinking, and you are locked into this thing called time which doesn't even exist in that moment of totality. Right now is just right now, you don't need a thought or a concept. It's just to be there and have that experience.

David has learned through his eclipse experience that positioning himself in time, such as in the past or future, results in restriction that stops him from being the person he really is. This learning has significantly changed his life, where he now prioritises activities, interests, and even relationships and where he can just be

whoever he is in the moment. David describes here the letting go of his identity, or sense of who he is, during totality, resulting in the pure celebration of being in the moment. Rather than this being a frightening experience, David reflects that this is a hugely powerful experience. Something is enhanced, rather than lost.

As a result of his repeated eclipse experiences, David has felt more part of the world around him, and is aware of how people perceive that they have limited choices in their lives. He does not wish to be moulded into something he is not, and is now enjoying the freedom of doing what is important for him, rather than living how others expect him to be. This change of viewpoint has resulted in him seeking out the company of others with a similar life view:

> It draws me towards certain people, certain situations, places, and experiences where there is a very non-programmatic response, it's very much in the moment. That stuff really attracts me because it's more truly what I am, and not what I think I am or what I should be.

Very clear in David's paragraph is the importance of freedom—of being with people who accept him. He almost feels restricted by the societal way of living, where expectations of others are like chains preventing him from being who he really is. He refers to this process as an 'awakening'—seeing an alternative way of living in today's world where there is freedom and autonomy, and not restriction and unhappiness. After discovering this awakening for himself, following his first total eclipse, he is motivated to share it with others.

The Universe as My Guide

For David, each eclipse is an opportunity to reconnect and renew his presence in the company of the Universe. During some of these experiences the connection he has felt was so strong for him that he has interpreted this as the Universe acknowledging all that he was doing, as exemplified by his powerful experience in Libya in 2006:

> When you are connecting you will feel a tremendous embrace that everything is right in the world, you are where you are supposed to be, and you are doing what you were supposed to do. And God, I felt that in the desert in Libya. I can't even describe. That my mission and the time I was spending doing this—the talking, the writing, the pitching. The Universe was going: "way to go David, well done, just keep doing that. Keep doing it, you are right on." I felt that, and I can't tell you how much that's worth, deep inside to feel that you are taking risks on behalf of the Universe and it's rewarding me. You can call that intangible or you could call that flaky, I could not care less, because it does make a difference to my life.

For David, the Universe is almost like a mentor, watching through the eye of totality, and taking that moment to communicate directly with him that he is on the right path, at the right time, doing what he is supposed to be doing. He reflects that

before his eclipse-induced transformation, he had little awareness or thought of these issues. However, in hindsight he believes that he was being 'nudged' by the Universe—little signs that the Universe was there all along, guiding the way. All of these events he sees as the Universe leading him to that moment of his first eclipse:

> It's so interesting, the course this has taken. The Universe has conspired to push me in this direction, you know! This is true with anybody's life, when you look back all the little paths to the left, the right turns. It's life, of course! It all makes sense (laughs)! Certainly while this was going on, I wasn't connecting any dots into it. Only when I look back now I see the collusion of the Universe to push me in the direction of this thing. A book, meeting the girl, the eclipse, and I was just old enough to appreciate what that might mean. It all came together in a perfect way.

Go with the Flow: But Don't Take My Eclipses From Me!

David describes how he stumbled upon totality, and the significant way that totality has changed his life. He was in no way seeking anything, or going on a personal journey to find himself, when he experienced his first eclipse:

> It's funny, as I wasn't looking for meaning. I was a perfectly happy, young man, 27, 28 years old, fallen in love with a girl who seemed all sophisticated and exciting, and that's what was going on. I didn't have an existential thought! I wasn't searching for meaning, not at all. And all this spiritual seeking—I've never been a seeker for a second, I'm not seeking anything. If there was any brief moment of seeking, "oh, what is that, what does this mean", it was as totality arrived on me in the first few seconds in 91. It was for three or four minutes I was a seeker—where did it go, and it was all over, and all this stuff flowed.

David uses the word 'seeker' to define how some go in search of themselves in external events or situations—something that he strongly felt did not happen with him. Instead, he spoke about the almost serendipitous way that this new insight and way of life occurred for him. For him, the fact that it happened when he wasn't 'looking' ensured an even more powerful effect.

David repeatedly makes reference to the mantra—don't be too attached to the outcome. He tries to live his life by this mantra, but there are times when it becomes difficult. For example, David describes how his arrangements for seeing the 2010 eclipse were repeatedly cancelled or changed by others. He managed this well, making alternative plans each time. However, the last straw came when he was on the flight making his way to El Calafate, Patagonia, in preparation to join a special eclipse flight, when he learned by reading his email that it too had been cancelled. At this point, he found it was impossible not to be attached to the outcome—he had so much of himself invested in seeing the eclipse:

> They were saying there is a problem with the plane, sorry, we are not actually flying. So I was, um, the right word is L-I-V-I-D. Because if you take my eclipse from me WATCH OUT!! It was just heartbreaking. Terrible. Anxious. It was just absolutely awful. So I'm flying. It's a long way from Lima all the way down to El Calafate, let me tell you, you are

> covering the other half of the globe. We arrived there, minus 20, freezing, ice everywhere. Completely overcast. I had no flight for the eclipse in 2 days time. I'm going "what am I doing here?" That was a very dark time.

David recognised that when he is attached to the outcome, even for eclipses, he turns into an aggressive, unpleasant person fully of anxiety and darkness. After much negotiation, David found himself at an alternative viewing site, up high in the mountains. It was unexpectedly beautifully crisp and clear:

> We saw the eclipse in a basically crisp sky in that great video where we see the shadow coming and then race off again. It worked out amazingly well, given all the negativity and the drama that had just taken place in the days before and how I was all grrrr. Not a nice guy, at all. I was attached to the outcome, and it was not going my way (laughs). But look what happened. It was perfect. Was there any need to worry? Was there any need to swear and jump up and down?

He was able to see, in hindsight, that he needn't have been so attached to the outcome of seeing the eclipse as it all worked out in the end. However, at the time, because he has so much invested in totality, it was hard for him to follow his mantra. He also learned during that trip to put his other mantra—'go with the flow'—into practice in relation to capturing totality on film:

> I knew how I had to operate the camera, which is almost not at all. I just let the thing play in front of the camera. It looks simple enough when you watch it, but that was so conscious! The choice to not do anything!

David's approach to recording the eclipse as he outlined in the quote above nicely parallels his outlook on life—don't try to control things, don't impose restrictions, just let things play out, and it will be amazing.

Completing the Cycle by Sharing the Passion

Repeated experiences of totality allow David to reconnect with this intense enhanced identity, leaving him feeling connected and energised:

> I'm loving and living that flow, and having that come out in different kinds of ways. It is just like a Bunsen burner went on underneath me. Now here it is, always bubbling, and things coming out in different colors. The fullness to me is so overwhelming, I guess it's why I want to give it to people. When you do something that gives back to that [i.e., talking and presentations], it completes the electrical circuit of sorts. This thing flows and there is this feeling of wellbeing or coolness that is very compelling.

This extra energy David feels drives him to want to share his experiences with others. In more recent times, he has been speaking more about his experiences, giving life-affirming and dynamic presentations:

> The film making is really a storytelling medium, and the eclipses have a great story to be told. Whether it's on their own, the phenomenon and the mechanics of it, or what it does to people and what they do about that. Making the films and building the website, and now

> getting on the talking circuit—it's also a way for me to explore it, to come to terms with it, and to try to give it away.

From his eclipse experiences, David now feels he has a purpose in life —to help inspire others to live more in the moment, and to recognise the freedom they have in living their lives. He speaks at conferences, and is aware that he needs to ensure that he talks at a level that is easily understood:

> I would be the crazy guy that they have on at the end (laughs). But it can't be too out there. So I'm trying to make it accessible and interesting. I need to make it relevant, and lay out properly what it is about for people who never really thought much about what we are doing here in the Universe. So they walk out of my talk and go—"Shit. Wow. Maybe".

David is aware that some of his experiences could be interpreted by others as a little 'out there', as a result of the content of what he is saying about his experiences, and also because of the level of passion he has about his awakening in life. However, he does not get caught up in the worry about what others think, and instead is strongly motivated to do what he feels he needs to do. That is, to communicate and inspire others in the same way that he has been inspired through his eclipse experiences.

Chapter 11
Occasional Chasers

This final chapter of eclipse chaser interviews includes two chasers who I have referred to as 'occasional chasers'. These two eclipse chasers represent those who enjoy their eclipse chasing, but are not linked into the wider eclipse chasing community, and make choices that at times do not prioritise their eclipse chasing.

Firstly, we have Sue Garlick, a drainage engineer from England. Sue has seen one total eclipse and one annular eclipse, and definitely has her sights on seeing more in the future. Her primary passion is for travel, which occasionally overlaps with seeing eclipses. She has financial constraints which results in her having to prioritise her eclipse chasing in a different way. She was invited to participate in order to give an account of someone interested but not passionately driven by eclipses, and also as another female eclipse chaser.

Secondly, we have Chris Pigott, who is involved in the film industry in the UK. Chris has seen four total eclipses and describes himself as a passionate eclipse chaser. He describes his love for totality as very high. He is more strongly motivated to experience totality than Sue, and he will travel anywhere to experience totality. He enjoys learning about astronomical events, although he does not invest the same time and energies into eclipse chasing activities as the other eclipse chasers featured in this book. He likes to simply go along and enjoy the experience.

1 Sue Garlick, Aged 48, England

Sue, a drainage engineer living outside of London, has experienced several types of eclipses, including one total eclipse, and has plans to see more in the future. She does not describe herself as an 'active' or 'practising' eclipse chaser. Sue does, however, have a strong passion for adventure travel, and enjoys going to places on her own that are off the beaten track, where she can immerse herself in different cultures, and experience the wonder of nature. She has an interest in some astronomical events, although she is not connected to astronomical societies.

K. Russo, *Total Addiction*, DOI: 10.1007/978-3-642-30481-1_11,

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Analysis of Sue's interview revealed three main themes—*only in an appealing location; an intimate connection with nature;* and *eclipse chasing—no guarantees.*

Only in an Appealing Location

Sue was aware from a young age that a total eclipse is rarely seen from any particular location:

> I can't remember how old I was, but during a total eclipse there was information on the TV and in the papers that said the next total eclipse that could be seen from the UK would be in 1999. I worked out then how old I was going to be. And I thought "My God, I'm going to be ancient!" So I knew about it from a long, long time ago.

She had no real plans to observe an eclipse until that time did arrive, in 1999, when the eclipse passed near to where she lived, allowing her to experience a 96 % partial eclipse. It was only when she experienced the effects of that partial eclipse that she vowed to experience a full total eclipse, and then started to research. She was captivated upon learning that the next one, in 2001, could be seen from Madagascar, a place she had wanted to visit:

> I looked to see where it was to be. I didn't know anyone who had been to Madagascar, so I thought "I'm going to go and see it there."

For this trip, she joined a small adventure tour of the country that would also take in the eclipse, and she did not do any more research regarding local circumstances for the eclipse. She states that she was going on 'blind faith' that the tour group leader would be able to get them to the place in time, and this is indeed what happened.

Sue's love of travel can be attributed to the many different life experiences it gives her, and she particularly enjoys unusual locations. Seeing totality adds to this experience, but she would consider it only in particular locations:

> The eclipse makes me look, and the place cements the fact that I want to go and see it there. It's an excuse to go somewhere. If it coincided with somewhere I wanted to be, yes, I would go out of my way to see a total eclipse.

Her dream location for seeing totality involves ice—Antarctica, or other polar regions. Antarctica was out of her reach financially in 2004. She did go to Iceland in 2003 for the annular eclipse, and the next eclipse she is planning to go to is the total eclipse in Svarlbard in 2015.

Although the location is key and is her primary motivator as to whether she will see an eclipse, she also has financial constraints to consider.

An Intimate Connection with Nature

Sue likens the experience of totality to other powerful nature events, particularly electrical storms which she also enjoys. During these events, she reports feeling a strong connection to nature. She had difficulty naming the feelings she has during those moments of connection, but was certainly aware that it was pleasurable, powerful and energising. She was captivated by her experiences of totality, and describes feeling awe:

> I think I had a feeling of incredulity at the perfect black disc in the sky. It was like a hole had opened and I was seeing straight out to space and nothingness. I was fascinated - it was hard to believe that it was the Moon I was looking at and not a hole. I could fully understand why those who wouldn't have understood what was happening in the good old days would have felt terror at seeing it.

She clarifies her own beliefs, ruling out a religious or spiritual interpretation of the eclipse experience, but is able to relate to primitive people worshipping nature:

> That's why people worshipped the Sun, because they believed it gave life. So if it just suddenly disappears, and they don't understand why, then they would feel the end of the world has come. I can understand that, and relate to that.

Sue's first experience of a total eclipse was in a very remote location on a beach in Madagascar, having travelled with a small group of people for many days via dug-out canoe, and connecting with the local people who shared the eclipse experience:

> I was spoiled on my first one. There were no crowds, it was just us, and it was remote. There were the local people there too, and it was their first one as much as my first one, so they shared the same excitement.

She feels strongly that totality should be experienced within a nature setting, where the connection with nature is amplified. Understandably Sue therefore attempted to create similar conditions to view her next eclipse—the annular eclipse in Iceland. Along with a group of friends, she identified a remote location on a dramatic cliff edge with a stunning view, and set up camp in preparation for the eclipse. Sue was then horrified when their quiet ledge was abruptly descended upon by several coach-loads of eclipse chasers, just prior to the start of the eclipse. The intrusion of the crowd into her quiet, natural, and peaceful world detracted from her experience:

> The contrast in experience between Madagascar and Iceland was shocking. It was only an annular eclipse and not total. However, it really did spoil the experience. Too many people spoil it. You can't get fully immersed in it. That was one of the things I took into consideration when deciding whether to go to Easter Island for the eclipse.

For Sue, the eclipse experience is more powerful when the surroundings enhance nature and where you can focus solely upon the eclipse during totality, rather than feeling the intrusion of strangers. However, she explains that it is not a completely solitary activity:

> I like to share it with someone, but that's why Madagascar was so nice. I wasn't there with anyone, but I was with a small group of people who I had got to know to some extent by then. I would either have to see it with people I know, or else go away from the crowd completely. That's why I don't go to see every eclipse – I've been spoilt.

Sue also feels that connecting with nature during the eclipse is key—hence seeking very remote, unpopulated areas to have that experience. The connection with nature is a fundamental part of the experience for her, and crowds of people interfere with this connection.

Eclipse Chasing—no Guarantees

Sue has not had the experience of being clouded out. But it was upon learning more about eclipses that she started to become unsure whether eclipse chasing was for her, due to the risk of not being able to see totality. This then presented a dilemma for her when she was looking into going to Easter Island for the 2010 total eclipse. She desperately wanted to go to Easter Island, but the increase in travel costs to see the eclipse meant that seeing totality would be the only highlight of the trip for her at that time, rather than going a few months later and being able to spend several months travelling around, getting 'value for money'. With no guarantees of her actually seeing the eclipse, in addition to the increase in numbers on the island detracting from the atmosphere, she had to make a difficult decision:

> I think in some ways that it's a shame I had looked up on the weather predictions for that eclipse. I was still wavering until I learned of the possibility of not being able to see it. There was such an increase in cost in getting there for that time, and because it was a high risk of cloud I could not justify spending that much money.

Sue finally decided to go to Easter Island in 2010—but not at the time of the eclipse. Instead, she had the island very much to herself, without crowds, and as part of a month long trip of South America which also included other activities she thought were unique and special. She did, however, express some disappointment about her decision:

> When I hear that some people had a great view of totality, I feel really disappointed that I didn't go then to see it. But at the same time, if I had gone and not seen it I would have been.. sick. Especially as I was able to have such a good, long extended holiday instead.

Sue values her holiday time away from work, and feels she needs to prioritise this limited time in a way that is going to give her the most return in terms of adventure. Therefore, Sue acknowledges that travelling specifically to see an eclipse, when there is no guarantee that there will be clear skies, is not 'worth it' for her, except in exceptional circumstances.

2 Chris Pigott, Aged 61, Scotland

Chris has been involved in the music and film business, and lives in Scotland. He saw his first partial eclipse when at primary school, and since that time has had a curiosity about astronomy. He travelled to Cornwall to see his first total eclipse in 1999, and although he was clouded out for that eclipse, he found it an incredibly moving experience. Following Cornwall, he travelled to Madagascar where he successfully saw the 2001 total eclipse. He has also travelled to Mongolia and China, and has now seen four total eclipses.

Analysis revealed three main themes: *recognising what is important in life*; *trying to recreate the perfect moment*; and *separating the science from the thrill*.

Recognising what is Important in Life

Chris described his total eclipse experiences as a positive addition to his life:

> I find it extremely, I don't know, enriching, life-affirming. Those few minutes are really, really great, a big high. I like that a lot.

Chris believes that the eclipse itself, without knowledge of anything about it, is a dramatic moment to be experienced. He felt that there was scope for the eclipse to be even more dramatic:

> There's no fear, definitely not fright. I certainly find that awe-inspiring, and I think it would be great if it did do something frightening! Yeah, I'm definitely saying "I'm ready, I'm up for it, strike me down. End the world now!"

Chris does not have a religious interpretation of the eclipse, although acknowledges that the event is a very spiritual experience for him.

Chris really enjoys the adventure travel required to get to the path of totality, and believes that the fact that there are no guarantees of actually seeing the eclipse adds a bit of 'spice' to the trip. He describes his passion for totality as very high, and says that he gets fired up about anything related to eclipses. Chris realises that he can get excited when he talks about his eclipse experiences, making him appear to others as a 'bit of a nutter'. He recounted a rather amusing example of this:

> It was during a wedding in the south of Spain two years ago. I was quite hung over, and was staggering about the next day. Suddenly I saw in a car windscreen something reflected - and the bloody Sun was in half eclipse! I was pointing and going 'look, look', and people thought I was crazy drunk (laughs). They just completely ignored me. I couldn't understand their lack of reaction - I was so surprised and really excited.

Whenever he sees an eclipse, Chris expresses a strong desire to see another. Yet he acknowledges that there have been several total eclipses that he has missed as they clashed with significant personal events of family and friends. Chris would appear to place more emphasis upon being with people at significant moments than

being at totality. He does, however, acknowledge that he feels some disappointment but certainly no regret for the choices he has made to do so. He therefore appears to have a balanced view about eclipses, and isn't as 'obsessed' as other eclipse chasers.

Chris is a superstitious person regarding his luck, and being clouded out during totality. Although he tends to travel on his own with his eclipse chasing friends, the one time that he was accompanied by his wife Miranda to China in 2009, they were unfortunately clouded out. He is therefore somewhat superstitious, in a joking way, that his wife is a bad omen:

> I would really love for Miranda to see one, I really would. But now I think she is a jinx so that is a slight problem.

Trying to Recreate the Perfect Moment

For Chris, an eclipse is amazing, but he has recognised that the location of the eclipse also plays a huge part in the emotion he feels during the event. For his first clouded eclipse, the location appeared to more than make up for the fact that he did not actually witness the event directly:

> Even though it was cloudy, it was fantastic because of the location. It was stunningly beautiful. It didn't matter to me that we were under cloud – it was just such a beautiful location. I have to say that the total darkness, chill, and stillness was very, very nearly as good an experience as actually seeing the Moon-Sun action.

Chris repeatedly stresses that location quality is critical in determining whether he will go to see an eclipse. He feels that eclipses need to be appreciated somewhere beautiful, suggesting that the beauty of nature enhances the experience for him. This allows the beauty of the eclipse to shine through, almost as though there were a connection between the natural surroundings and the eclipse experience. The urban eclipse that Chris experienced in China was, in his own words, 'grim'.

Totality is a very special time that is rarely experienced. So for Chris he feels it is important to select a beautiful location and not allow for too many other distractions, so that he can get the experience 'right':

> I could find myself very upset. Because it's only a matter of minutes, it's a bit critical that you don't have somebody getting right up your nose during those moments. It's just for that magic moment, I don't want to be with anybody really saying that much.

What Chris is alluding to is that the presence of other people can intrude upon the deeply personal eclipse experience. Silence and losing himself in the moment, in a beautiful location, appear to be key aspects to Chris's experience. If others are present or the location is urban, then he potentially loses this control of the experience, and this would interfere with his enjoyment of totality. Therefore, it is easier to maintain control by separating himself from others, or only sharing the experience with others he knows well:

> That's one of the things I think about, not wanting to be with people who are overdoing the emotion, or actually being too emotional for my taste. I don't really fancy all that hysteria – makes me hysterical (laughs).

Chris makes a distinction between those who are experiencing totality for the first time and those eclipse chasers who have had repeated experiences of totality. Although he liked being more on his own during totality, he did comment that he found the pure reactions of the local eclipse virgins an interesting and exciting part of the experience in his previous eclipses:

> Because I must say, during those great eclipses, I definitely chose where I wanted to be for those few minutes. Rather than just letting it happen. I made a conscious decision I didn't want to be in the middle of the majority, I wanted to be on the edge. But I also particularly enjoyed Madagascar and Mongolia because of being close to and with the indigenous people, and being part of their experience of the event.

The interesting thing about the above quote is that, although Chris is referring to his eclipse experience, this also appears to be how he approaches his life, as this theme comes up again in his discussion. Having the freedom to choose what he wants, on his own terms, is key.

Separating the Science from the Thrill

Ultimately for Chris, it is the experience of the event that captivates him, and not the science of it. He tries to get complete immersion in the experience of totality:

> I do think that the fun and the amazement and the excitement is far more of interest to me than the dry science of it all. You can look at the science any time, you don't even need to be there to do that, really. I think I'm probably much more frivolous about it. I just really, really like it. I don't want to spoil it.

Chris's dislike for the 'dry' science during the experience is also extended to those who are monitoring and making scientific observations or photographing at the time of totality—the 'geeks and beardies'. This is an interesting paradox, as Chris himself actually enjoys the science behind the eclipse, and in fact owns a telescope and is interested in astronomy. He appears to particularly value the experiential aspects of the totality experience. Separating out the science—and scientific people—makes him feel he can just be himself and identify his own way of figuring it all out. So, perhaps for some people with a non-scientific background, the science can be seen as irrelevant, or even off-putting, as it is not important for appreciating the event itself. He certainly describes it as distracting at the moment of totality, where he just wants to lose himself in the moment:

> In Cornwall and Madagascar I was virtually alone, which was I think a major part of it for me. I like to be nearly alone. Probably not completely alone, but you know, nearly alone. And certainly not with people looking into telescopes and computers and talking about prominences and spectrums and degrees and all that stuff, and not saying anything other than WOW. I've been quite spoilt by those first two occasions.

The downside to not learning more about the science and physics of the eclipse is that one needs to rely on others to be able to determine where to view the eclipse. Chris expressed his gratitude to those who go out of their way to plan and organise trips for other people. But he prefers not to make decisions on where to go, as he finds the lack of certainty difficult to manage:

> I have been fretting about the choices for Australia already – coast or inland. I probably want somebody else to make up my mind for me on that one. I don't like to have to do that.

Despite trying to keep a distance from the science aspects during totality so that the focus is on experience, Chris does enjoy talking to others about the eclipse, and explaining and learning how it happens. He is anxiously awaiting to see whether Miranda is indeed a bad omen, as she will be accompanying him for the next total eclipse in November 2012.

Chapter 12
Summary of This Part

1 Putting it all Together

This part of the book has revealed the experiences of nine eclipse chasers. All nine of them highlighted the fact that the total eclipse is the most intense natural phenomenon they have ever experienced. All were totally unprepared for the physical and deep-seated emotional responses they experienced. It cannot be understated how deeply moving totality is for these eclipse chasers.

It is hoped that the reader has obtained a greater understanding of what it is like to be an eclipse chaser, and what eclipse chasing means for these individuals. We have heard from eclipse chasers with a scientific background who were acknowledging the emotional aspect of totality as something that was unexpected, but central to the eclipse experience. We have heard from the enterprising eclipse chasers that sharing their eclipse experiences with others is extremely satisfying, and that they have identified ways in which to earn a living from their eclipse chasing. The introspective chasers have given us very detailed insights into the personal impact of totality, and how eclipse chasing has changed their outlook on life, while the occasional chasers describe how they enjoy eclipse chasing, but have different priorities, and therefore try to ensure that they get the most out of their eclipse experience in a way that is important for them.

After reading through these interviews, you might be developing a sense of the common experiences recurring throughout these accounts. This is what the next part of the book will explore. The experiences of all of these eclipse chasers will be used to answer two key questions -Why is the totality experience so intense? Why does our passion and motivation as eclipse chasers appear to be so strong?

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Part IV
Making Sense of Eclipse Chaser's Experiences

Michael Zeiler, eclipse chasing cartographer

I agree that the psychology of eclipse chasing is a fascinating subject. For me it's simple: a total solar eclipse is the most amazing spectacle we can witness on Earth. It's a surprisingly emotional moment with so many dimensions.

Chapter 13
The Pull: Why is Totality so Powerful?

Totality: The mystical experience with a 'kick'

In Chap. 1, I emphasised that to understand the eclipse chaser, one must first understand the experience of totality. We will now focus on the main themes from the analysis of interviews with the nine eclipse chasers, whom I will refer to as 'our eclipse chasers'.

Overall, the experience of totality can be described as a *mystical experience with a kick*. It feels mystical due to the eerie atmosphere and the intensity of our reactions during totality. After the rush and withdrawal of totality, there are the *physiological after-effects* which produce the immediate desire and craving to re-experience totality—the 'kick'.

During totality, we feel *SPACED*, to coin an acronym—there is a Sense of wrongness, Primal fear, Awe, Connectedness, Euphoria, and Desire to repeat the experience. A *heightened sense of awareness* is also experienced, where people feel the irrelevance of time. They feel they are in a different world, and there is a union of the self with something bigger. After the short-term physiological effects (the kick), there is a personal transformation which becomes all-consuming and drives the motivation to continue eclipse chasing.

These main points are summarised in Fig. 13.1, and will now be explored in more detail.

1 Our Reactions During Totality: Sense of Wrongness, Primal Fear, Awe, Connectedness, Euphoria, and Desire to Repeat (SPACED)

There is no doubt that the totality experience has a profound effect on people. The central components of this profoundness appear to be a *sense of wrongness*, *primal fear, awe, connection, euphoria,* and the *desire to repeat* the experience—SPACED.

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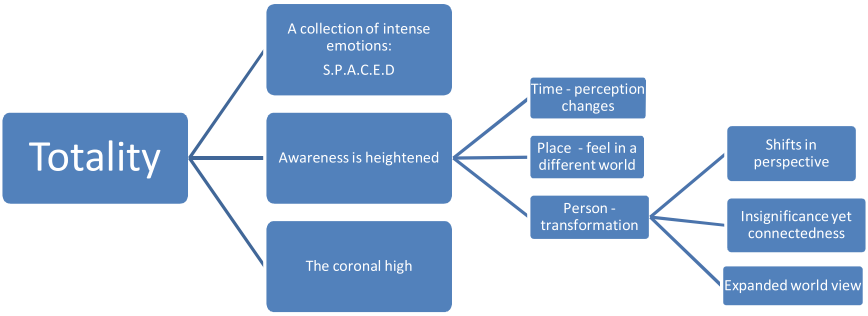

Fig. 13.1 An visual overview of what it is like to experience totality

Each one of these core reactions to totality is significant and intense. One of the most unexpected aspects of the total eclipse experience is how it affects us—both physically and emotionally. Goosebumps, chills up and down the spine, hair on the back of the neck standing up, feeling choked up—these are the common physical reactions when people experience totality. Common emotional reactions included a sense of wrongness, primal fear, awe, and euphoria. All our eclipse chasers stressed that they were completely unprepared for these reactions when seeing their first eclipse. Having such an overwhelming and unexpected reaction is perhaps one of the main reasons why eclipse chasers find it difficult to explain it to others—they have been caught off-guard with the overload of both physical *and* emotional reactions. They understand the mechanics of an eclipse, but it is difficult to make sense of their reactions. The overwhelming aspects of totality can be separated into the following key experiences.

Sense of Wrongness and Primal Fear

Before totality, our eclipse chasers describe how there is a sense of wrongness about the world—there is the suspension of the 'normal' order of things. The changes in light make the experience quite eerie. Combined with other things, this then results in the primal fear reaction which was outlined in Chap. 6. Terry provided a more detailed description about his unexpected experience of primal fear:

> My primal fear at the onset of totality was completely unexpected, and as a result all the more intense, because I understood the celestial dynamics involved. In spite of that, I still felt the primal fear, which scared me even more!

Eclipse chasers frequently comment that they can understand the reactions of primitive people who would have responded in terror as they did not know what was going to happen. However, Terry is highlighting the key feature of the primal

fear as the unexpectedness of it. As someone who knew what to expect during totality, he was still completely unprepared for the emotional reaction that occurred. This experience allowed him to interact with a celestial event in a way that he had never done before, despite his decades of being an amateur astronomer.

For me, this unexpected reaction was the most memorable and significant part of my first total eclipse experience. It played out as a strong physical sensation in my chest; giving me chills and making me shudder. The primal response does not just occur for the first eclipse—the primal fear response is experienced for every eclipse, and it is something over which you have no control. For example, James described a moment of 'primal terror' when he discovered the corona was moving as if alive during his third eclipse experience in Libya.

These overpowering responses confirm that totality provides us with awe and wonder at natural beauty. The primitive reactions we feel make it even more powerful, as we are not used to experiencing fear in this way. Seeing the Sun momentarily banished from the sky is not a normal occurrence and is seemingly something that we will never get used to.

Awe

As outlined in Chap. 6, awe occurs when we are in the presence of something considered more powerful and greater than ourselves, and this brings about a feeling of insignificance. All of our eclipse chasers experienced awe. There is, however, something qualitatively different about the experience of awe in relation to totality, as compared to the awe that can be experienced in other situations, such as seeing the Grand Canyon for the first time or meeting a person you idolise. When compared to other awe-inspiring scenes, the total eclipse appears to be completely immersive—it is changing and moving, and it is experienced all around us and perceived through most of our senses. We feel primal fear. It seems to be a more intense awe moment.

Connectedness, Euphoria and the Desire to Repeat

The connectedness that is felt during totality relates to a connection to something bigger. This connection seems two sided—a feeling of personal ego insignificance but a simultaneous sense of being part of something larger. The euphoria and exuberance that is experienced at the peak of totality is incredibly powerful, and it is such a fantastic feeling. There are most certainly biological factors at play, related to the release of dopamine, our feel-good hormone. This rush we feel with the euphoria is quickly followed by a desire to repeat the experience. These factors will all be examined further in this chapter when we look at 'the kick'.

2 A Heightened Sense of Awareness

During the interview with James he was talking about his experience of an intense auroral display, and made the comment: *"It went insane. Maybe I went insane? You tell me, you are the psychologist.*" In his attempt to verbalise his experiences, he was trying to offer an alternative explanation—that perhaps it is not the world that changes, but the person experiencing it. Whilst I personally do not believe James went insane, perhaps what he is really describing is entering a heightened state of awareness.

Our eclipse chasers describe feeling connected, in the moment, grounded, ecstatic, and the most alert they have ever been. There is no disorientation—they are aware of whom they are and where they are, but their perceptions of time, place, and person appear to be altered. Their senses are heightened. From the interview accounts, changes in the perceptions of time and a perception of being out of the normal world during totality occur for most people. Even though there is some sense of seeing themselves in a different way, there is no loss of who they are (despite James describing this as ego death). Instead, the self is perceived to merge with something else. That is, the personal identity seems to become connected to something bigger, although the self-other boundary is not completely lost (as would occur in a psychotic experience). It may be that those who found the totality experience particularly frightening did not like the altered sense of time and place they were experiencing. Let's look in more detail at these heightened perceptions.

Time: Changes in the Experience of Time

One of the most interesting experiences reported during totality is that our perception and experience of time is altered—our relationship with time changes.

When we perceive that we are in danger, our perception is enhanced. This is due to the release of adrenaline as part of the fight-or-flight response. Our experience of time then seems to slow down. This is believed to be because our mind has to work overtime to select what is important and not so important. We also lay down more of the sensory detail associated with the event. Our brain is also working overtime in laying down more memories. Because so much is being condensed into the space of a few moments, our senses sharpen in response, making it seem like everything is in slow motion. You may have felt this yourself if you have been involved in a situation where there was imminent danger, such as when about to have a car accident.

Our eclipse chasers commented that this slow motion effect occurs during totality, where time seems to slow and then stand still. However, it is not just the slow motion perception of time that occurs, as triggered by fear and outlined above—so much more happens. During totality, the world also *appears* to stop—the Sun, the giver of life, is no longer giving light in the sky. Something

fundamental about our human existence appears to change during totality. This is why totality can be experienced as so momentous. We will never get used to our powerful Sun being momentarily overthrown. Time is a fundamental law of nature, a feature of the Universe. The arrow of time has a direction—it is always moving forward. Eclipse chasers report, however, that during totality time appears to stop. There is then a direct experience of time that occurs in a way that is unique. Although not all eclipse chasers grapple with larger questions such as '*what is time'*, it certainly allows those more introspective chasers to recognise the importance of time itself, and what it means to them. David notes that there is a sense of freedom—and recognition that it is time that locks us into our daily lives. Totality allows for a moment of freedom from the ever-present restriction of time:

> When (totality) is over you go back into your head, and you start your thinking, and you are locked into this thing called time which doesn't even exist in that moment of totality.

Following totality, it is easy to see the connection that time is *your* time alive—limited and precious. It is this realisation that often leads to different priorities and changes in life.

Our eclipse chasers describe how their experience of time has changed, and almost becomes irrelevant during totality. Dava's narrative alludes to the irrelevance of time—*It feels by turns like an instant, like an eternity*, and she comments that totality might even continue forever. During totality, it no longer matters whether we are in 2012 or in 1487. Many eclipse chasers describe a feeling of connection to primitive people—a connection to the past. Although it is irrelevant whether we are located in the past, the present, or the future, what is clear is that during totality people feel very much 'in the here-and-now'—without any concept of where they are in time, or even what time itself actually means. It is a moment where we are able to let go of all of our concerns in life, and just be. Nothing about the world matters anymore—during totality we are just experiencing ourselves in the moment—our senses are enhanced and we are drinking it all in. Dave B puts this across best when he says that totality is the only time where he can experience true peace. These experiences are different to the way in which we usually relate to time.

Psychologists call the state where we are completely immersed in the moment as 'flow'. In flow, we lose our temporal focus and exist in the moment, fully absorbed and engaged within an activity that we enjoy, such as reading, gardening, playing the piano, and work. Mihaly Csikszentmihalyi is a Hungarian psychologist in America whose work focuses on the experience of flow. He is considered to be one of the key researchers in positive psychology (as well as having a challenging name to pronounce). He describes that this temporary state of mind—flow—occurs when we are achieving our goals or doing things that engage us fully, and is associated with positive emotions and feelings of wellbeing. This flow experience seems to imply a state of absorption where we lose ourselves in an activity. Recent neurological studies using MRI scans have shown that dopamine is released when people are engaged in flow activities. Interestingly, the key markers of flow are when we lose sense of time, and also our sense of self.

From the accounts of our eclipse chasers, totality does appear to be a flow experience—with a capital 'F'. It is more than just the flow that is described when being fully immersed in a pleasurable activity—the extra things such as the feeling of connection with something bigger, the awe at the beauty of totality, seeing life from a different perspective, along with the intense physiological reactions make this very much an incredibly powerful example of a 'flow experience'.

Place: Experiencing an Alternative Reality—Shadowland

Our eclipse chasers describe how, for those few brief moments of totality, they are in a different world where different rules apply. For all our eclipse chasers, this alternative world is a positive, powerful, and emotional place to be. Each has their own experiences and interpretations of this world. Sir Patrick describes it as a 'magical world', preferable to the normal world. Rick and Jay also use the world 'magic' to describe the feeling during totality, confirming the mystical connection. Dave B felt it was the only time where he was able to feel completely at peace. Sue and Chris both highlight that the world during totality is so special that they do not want to have a bad experience there for fear of 'spoiling' the uniqueness of that world. James and David take their interpretations further, commenting that it is a world where they are in the company of the Universe. My own experience is that it is also a magical, unique, and free place to be. It seems appropriate to give this world a name, and '*Shadowland*' would seem to fit the description well.

Although Shadowland is a positive place, for some entering this world for the first time can be frightening. Dava's fear response was fleeting—she recognises that fear took hold, but she was able to remain in the moment and was then consumed by the awe, beauty, and magic of totality. The feeling of being in a different world draws strong parallels with a drug high. Perhaps, like the drug experience, there are some who do not like the feeling of being in a different world and not knowing how things really are. The essay Total Eclipse by the American writer Annie Dillard is a graphic example of how entering the world of totality can be experienced as disorienting and frightening.

Interestingly, our eclipse chasers also noticed moments when the 'normal world' and Shadowland interconnected—or more accurately, where the real world intruded upon Shadowland. Examples of these moments will be discussed in the next chapter. What these experiences highlight is how, during totality, Shadowland is a separate and special world. 'Normal' events that continue and even intrude into Shadowland are seen as bizarre. This is because, during our heightened awareness in Shadowland, the world as we know it appears to cease. Totality allows an escape from the 'real' world of banal and habitual daily distractions. Shadowland is the place where we can simply 'be'—everything else is stripped away, and we can just exist in the moment. We are no longer weighed down by any concerns or pressures, and are momentarily free from the restriction of time. All eclipse chasers recognise the uniqueness and specialness of Shadowland, and

eclipse chasers feel drawn to it—they love their time in Shadowland and never want it to end. Perhaps totality is an escape *to* this reality—even if for only a few minutes. Indeed, it may even be suggested that Shadowland *is* reality—a reality that is rarely glimpsed.

Person: Shifts in Perspectives and Connection to Something Bigger

Shifts in Perspective

During totality, it is impossible to ignore the presence of the Universe. It is all around—the three-dimensional aspect of the Universe and the solar system as a whole can be experienced directly. The Moon is moving in front of the Sun, the shadow passes over us, and other planets can be seen at the same time when they are only usually observed at night. Central to the experience of our eclipse chasers was the feeling of understanding the 'bigger picture'. That is, suddenly becoming aware of being in the Universe, as James explained:

> It puts your existence as a human being into perspective. And that's an overwhelming experience. Nothing can quite put it into perspective like that in those moments.

We experience our lives from within our own unique self-centred perspective. It's hard to be human and not have humanity—and ourselves—as the centre of the way we view our world. During totality, our frame of reference does indeed appear to shift. Instead of having our own egocentric view at the centre, suddenly we see our lives as part of something much grander in scale. This shift in perspective appears to have quite a long-lasting impact upon our eclipse chasers. David expresses this vividly in the following comment:

> It led to this radical shift in my identity, where I now include the Universe when I think of myself.

Totality allows for this shift in perspective in a dramatic way and with immediate effect. During totality, eclipse chasers come to an understanding that there is more to our lives than this human-centred perspective we usually have. Each experience of totality then just reinforces this perspective.

Insignificance and Connection

Directly related to this is the experience of insignificance during totality. It would follow that not having your 'self' at the centre of your experience leads to a feeling of insignificance. One would imagine that a feeling of insignificance would be distressing, upsetting, or negative in some way. Whilst eclipse chasers might feel insignificant compared to the grand scale of the Universe, this does not leave them

feeling isolated, or personally smaller or unwanted. Our eclipse chasers are united in their accounts that the realisation of insignificance during totality is not a negative experience. It is not a feeling that they do not matter in this world as a person. Instead it seems to result in a strengthened feeling and one where you realise that you are not alone. One of the most basic human needs is our need for attachment, and much of our distress in life is due to the fear of being alone. The eclipse experience allows us to feel, momentarily at least, that we need *not* feel alone. In Shadowland we are never alone—we are connected to something bigger. This is a feeling which leaves our eclipse chasers humbled and empowered, and is life-affirming.

It was our introspective eclipse chasers who were most able to verbalise their experiences in this regard. James comments that he enjoys this feeling of insignificance, often brought about for him during moments where he is reminded that he is on a moving planet. It can be difficult to explain to others how this feeling of insignificance can make us feel more enhanced. But, as James explains, it comes with a sense of being part of the bigger Universe, and therefore the feeling of connection:

> So I lose my self, there is a lot of ego death there, and I feel myself connected to something bigger. So I feel NOT insignificant, but completely connected.

David also reports something similar, essentially describing that his self merges with something bigger, which he refers to as the Universe. For David especially, his experiences during totality have led to profound changes in the way in which he sees himself and relates to others:

> The doorway was opened when I saw my first total eclipse. The bigness of that rushed in and filled me. Something else moved in and I had this change of occupancy. Where all of a sudden what I call my self, or what I refer to as me, got larger.

When we feel this connection, our 'self' is no longer our central concern. That is, we are no longer preoccupied with perceptions, judgements, or worries. Instead, we just 'are'—in flow in that moment and in tune with our surroundings. The feeling of connecting in the moment becomes all-encompassing. (see Fig. 13.2—connecting with the Universe).

Not all our eclipse chasers spoke about their 'self' merging with something else, so it may not be central to the eclipse experience for all eclipse chasers. Or it may just be something that cannot be easily verbalised. When I reflect upon my own experiences as outlined in Chap. 1, I can recognise strong feelings of connection, although I struggled to find words to describe what that was. I can instantly relate to how James and David are expanding this—the feeling of losing your 'self' and connecting with 'something bigger' definitely resonates for me. In my case, the connection appears to be with nature—the environment all around, rather than the Universe. All eclipse chasers appear to feel a connection with *something*—some connect with the past and others connect with the environment or the Universe, or perhaps even religion. This sense of connectedness is heightened during totality, and each then interprets what that means for them personally. The feeling of

Fig. 13.2 Connecting with the Universe. In this artists' depiction, the total eclipse and the chaser (David Makepeace) have become one. ©Lorne Bridgman 2006

connection appears to be something that is very comforting, very grounding. In ordinary life we can feel connected to individuals, places, communities, hobbies, tangible objects, cities, countries, the world—it is not unreasonable to conclude that we could also be connected to nature, the Universe, or those in the past, or to have a shared experience with others.

A Person Transformed

The impact of totality varies from one person to the next—some appear to have a more profound reaction than others. This is similar to our own eclipse chasers—some do not comment too much about the personal impact, such as Sue, Chris, or Sir Patrick; but clearly loved the experience. Others are very detailed about how it changed their life. Mark Bender, an American eclipse chaser who has produced an eclipse chaser documentary, has put this simply:

> Before an eclipse you are one human being. After an eclipse you are another human being.

This whole experience of losing the 'self' as the central concern appears to have a profound impact upon many eclipse chasers, leading them to consider their lives

in a different way. Having gained a new perspective and understanding, this then leads to the eclipse chaser feeling incredibly positive.

We cannot integrate the totality experience into our normal, everyday experiences. As James mentions, totality is beyond normal human experience until you experience it, and then it expands your mind. The experience of totality requires us to expand our mental structures in order to understand—not unlike the experience of childbirth or other significant life-changing experiences. This is why we cannot explain it to those who have not experienced it. Of course, it is hard to know what to expect when we do not know what it is that we are expecting; and it is difficult for others to convey it to us. It seems, for many eclipse chasers, that we have reached the limits of our own experience and language.

Despite the eclipse experience being difficult to explain to those who have not experienced it, many eclipse chasers want to communicate what it is all about. For example, Dave B and David are professional speakers, incorporating their eclipse experiences into general talks. Jay and Rick lead tours whose many participants are eclipse virgins, and Sir Patrick communicates with his many broadcasts and books. Even I have a strong desire to communicate the eclipse experience with this book. However, the power of the event, how it can impact personally, and the 'addictive' nature of totality is not something that is widely known amongst eclipse virgins and remains difficult to convey.

Whilst undertaking research for this book, I was amused at the number of prefixes and suffixes that were used when eclipse chasers were trying to describe their experiences. These words were a striking example of how we struggle to use our existing language. I have written 'specialness' in this chapter, which seems wrong out of context but was the best word to use to convey my point. Rick coined the term 'unfathomability' when describing the blackness of the Moon during totality, and the 'unduplicability' of the colours. Terry used the word 'unstoppability' to describe the 'inevitableness' of the experience of totality that contributed to his primal fear. On each occasion, the individuals were aware that the word was perhaps not grammatically correct, but that it seemed to be the 'best fit' for the point they were making at the time.

This expansion of what we know reminds me of Plato's allegory of the cave[1].

[1] In this parable, Socrates, Plato's teacher, is explaining to Plato's brother about a group of prisoners who have lived since their childhood chained to the wall of a cave, facing a blank wall, their arms and legs and even heads fixed to face only towards the wall. A huge fire is burning behind and above them. There is a raised walkway between them and the fire, along which people used to pass by carrying statues and figures of animals. The shadows of these wooden and stone animals are then projected by the fire onto the back wall of the cave. The prisoners can also hear echoes when some of the objects are being carried across the walkway. The prisoners do not realise that these shadows are simply shadows—as it is all they know, they take the shadows to be real things, and not reflections of reality. Socrates highlights the idea that making sense of how the shadows appear would be a sign of a great understanding of that world. He then suggests that if a prisoner were to be released from his chains and dragged to look at the fire or the men causing the shadows, he would refuse to believe that that was reality. Instead he would want to return back to the shadow world—the only world he knows. If the man were then dragged out of the

In this story, Plato's message is that what we perceive to be true is often not the 'truth', but just representations of one reality. He is also highlighting the fact that one needs to experience a new reality in order to understand it. The role of philosophers and kings, he argues, is to help others understand that what they see and experience is perhaps not all there is. The story may sound familiar, as it is the underlying premise of the book *Flatland*, or more modern movies such as *The Matrix* and *The Truman Show*. However, this allegory has parallels with these heightened sensory experiences of eclipse chasers—they occasionally leave the cave, experience something very much out of this world, and return to the cave, where they try to communicate about this new reality. The ramblings of eclipse chasers do not make sense to those who have remained in the cave. The eclipse chasers then wait until they can experience totality again.

3 The Biological After-Effects: The Kick of the 'Coronal High'

In Chap. 6, the eclipse chasers who completed the survey described how experiencing totality was like a natural high. Our eclipse chasers also described this, with James explaining that the power of the natural high makes drug-induced highs unnecessary:

> Well, there was a lot of, let's say, preparatory research with psychedelics. And so after an experience like the eclipse, I realise who needs that stuff? Reality alone is just weird enough.

Once totality is over, as we have seen, our eclipse chasers want to immediately repeat the experience. I am not aware of any words or definitions that are used to describe the natural high felt during and after totality—and it certainly warrants its own term—perhaps the 'coronal high'. Currently there is general use of addiction terms—being 'high' on totality or 'hooked' on the shadow. What people are trying

(Footnote 1 continued)
cave and into the brightness of the real world, he would be angry, and blinded, and unable to see the shadow reality and the new reality of the objects. Over time, and through direct experience, he would be able to experience this new world, and he would come to acknowledge that there is a different reality. He would take a wider view of the world, and would see the shadows as only representations of reality. Socrates then outlines how the man would come to consider his previous world where shadows were reality, and would take pity on such beliefs. If he returns to that world after being enlightened by the Sun and wider world, he will no longer be able to see the shadows in the same detail on the wall. The other prisoners will believe that his sight has been corrupted, that the man is no longer able to make sense of their world, predicting the appearance of shadows. Moreover, they will not understand the things he is saying, considering the man to be less clever, stupid even, as he is unable to see the shadows—their reality. They will then wish to avoid being released for fear of their eyes also is being corrupted, leaving them unable to see their reality, that is, the shadows on the wall

to describe is the euphoria, the exhilaration, the thrill that leaves them 'buzzing'. This is essentially the coronal high.

Chemical changes in our brain lead to the feelings of euphoria during drug-induced or natural highs. There is a biological reward system in the brain which is naturally activated by the release of dopamine when engaging in pleasurable activities such as eating, drinking, and having sex. Other activities can also result in a release of dopamine—such as taking drugs, engaging in extreme sports, certain emotional states induced by music, and, we assume, experiencing totality. Increases in dopamine result in a feeling of euphoria and enhanced well-being. Very high levels of dopamine have also been shown to trigger goosebumps. Whether the triggers are natural or drug-induced, the physiological effect is the same—dopamine is released in the brain.

For many eclipse chasers, talking about their eclipse experiences or watching videos of the approaching total eclipse seem easily to trigger off this same response, allowing them to re-experience the high. That is, dopamine seems to be released just by remembering or talking about experiences during totality. Perhaps there is something about the intensity of the experience that allows this re-living to be so powerful. It might be that some people—the ones who become eclipse chasers—are more reactive and responsive to changes in dopamine levels, leaving them with an insatiable desire to repeat the experience in order to feel that buzz again. This may explain why some people can observe totality and really enjoy it, but do not become compelled to repeat the experience. Perhaps the level of dopamine released is not the same, or they are not sensitive enough to react in the same way.

Relating to the Literature

It is interesting that the key themes from the experiences of our eclipse chasers share strong similarities with existing literature and research in a number of areas. For example, research by the American psychologist and philosopher William James in his seminal book *The Varieties of Religious Experience* (1902) detailed four essential characteristics of the mystical or religious experience:

> *Transient*—the experience is temporary in nature, and is outside the realm of normal perception of space and time.
>
> *Ineffable*—it is difficult to find the words to describe the experience.
>
> *Noetic*—new levels of knowledge have been obtained that are normally hidden and different to what we know.
>
> *Passive*—the experience was something that happens to the individual with minimal conscious control.

These four characterises share strong commonalities with the themes derived from our eclipse chasers' experiences. William James stressed that not all mystical experiences were interpreted as religious—nature mystics were inspired by their sense of oneness with the natural world, whereas religious mystics identified their

connection with a god. These experiences were found to be prevalent across different cultures, suggesting a common and universal ability to connect to a high consciousness. He believed that every person has the ability to access higher levels of consciousness:

> We may go through life without suspecting their existence; but apply the requisite stimulus, and at a touch they are there in all their completeness.

The experiences identified by our eclipse chasers are also similar to that of W T Stace (1960), who undertook a study of historically documented religious experiences and identified nine core features, including: *unity, transcendence of time, deeply felt positive mood, sense of sacredness, noetic quality, paradoxicality, ineffability, transiency,* and *persisting positive changes.* Again, these sound remarkably similar to our eclipse chasers' accounts.

Interesting research was also undertaken by Timothy Leary in the 1960s to determine whether such mystical experiences could be induced by the use of drugs, such as LSD and psilocybin (mushrooms), using the core characteristics of religious experiences as outlined by Stace. This and more recent research has confirmed that drug-induced altered states of consciousness are possible, and that people who undergo such experiences similarly report profound life changes. Again, there are strong similarities between these experiences and those of our eclipse chasers, with participants commenting on the personally significant, life-enhancing and life-changing experiences of their controlled, drug-induced altered state of consciousness. The similar accounts from our eclipse chasers suggest that one does not need drugs to experience heightened states of awareness.

Abraham Maslow undertook research on 'peak experiences' in the 1940s, defining these as moments where people transcended their normal experiences. Examples of peak experiences are watching a beautiful sunset, or our reaction to a piece of beautiful music. Maslow summarised by saying that the highest level of peak experiences involved a sense of self-dissolving into an awareness and unity with something greater, which our eclipse chasers clearly define. Maslow also defined the highest level of peak experiences as including:

> […] feelings of limitless horizons opening up to the vision, the feeling of being simultaneously more powerful and also more helpless than one ever was before, the feeling of great ecstasy and wonder and awe, and the loss of placing in time and space.

Maslow also found that peak experiences resulted in increased free will, self-determination, creativity and empathy. He also discovered that those who had peak experiences reported themselves to be 'lucky'—a strongly recurring theme amongst our eclipse chasers too. Maslow commented that those with the clearest sense of identity were those who were most likely to experience an ego-less state during their peak experiences, that is, to lose their sense of self and feel part of something stronger. Again, I am mindful of our most introspective chasers—James and David, who gave detailed accounts of this occurring during their totality experiences. James and David also appear to have experienced the most personally significant change as a result of their totality experiences.

Overall, there is consistency in the literature which lends support to the experience of eclipse chasers as being similar to that occurring in peak experiences, mystical experiences, and drug-induced altered states of consciousness. I am using the term 'mystical experience' here to imply a deep personal experience, and not one that is immediately connected to any particular organised religion. The totality experience does not require drugs and is not based upon mental illness or meditative states. All our eclipse chasers reported positive benefits including an enhanced sense of well-being and positive life changes. This consistency across the literature is an exciting finding, and can and should be explored further. Researching eclipse chaser experiences seems useful to further our understanding of these higher states of awareness, especially given the positive benefits and how easily they can be accessed.

Summary

To conclude, this heightened state which allows us to feel altered in terms of time, place, and person is perhaps triggered by the primal fear response. That is, we become hyper-aroused and alert following primal fear, and this sharpens our senses and allows us to feel an intensity that is different to our usual way of being. This heightened awareness seems to be characterised by changes to how we experience time, and in particular, a feeling that the world has stopped and we have stepped into another magical world, whereupon our sense of identity dissolves and leaves us with a connection to something bigger. This state leaves us feeling euphoric, enhanced, excited, and positive. This heightened state of awareness occurs spontaneously during the first eclipse experience. Eclipse chasers then aim to re-experience this way of being during subsequent eclipses. This may explain the huge importance that eclipse chasers place on the experience of totality.

It is hoped this chapter has given you a deeper understanding of the eclipse experience. Some eclipse chasers may feel that these themes do not apply to them. These findings are not meant to apply to all eclipse chasers for every eclipse experience, but it is hoped that these themes will help some to make sense of their own eclipse chasing experiences, and give eclipse virgins a taste of what the experience of totality can be like.

Chapter 14
The Push: What Motivates Eclipse Chasers?

Now that we have explored the 'Pull' of totality, let's take a look at what motivates eclipse chasers—the Push. Motivation is the drive we have to engage in certain behaviours. People vary in their level and intensity of motivation. They vary in what sustains it over time, and where they direct it. Although much of our motivation is rewarded by external factors, the motivation that drives our behaviour for our passions is our 'intrinsic motivation', that is, it is internally driven. It is difficult to fully explain the complex motivational drive of every person with a passion. However, what I aim to do in this chapter is to provide some explanation of what drives the strong motivation—what creates that strong 'push', that drive, for our nine eclipse chasers to continue to chase eclipses.

Eclipse chasers show a powerful and all-consuming drive to chase eclipses, which spans many years—several decades in some cases. There seem to be three main drivers for our eclipse chasers—*being primed to chase, the drive to fulfil our psychological desires, and the desire to be in an intensely positive physiological state.*

1 Being Primed to Chase

All the interview participants appeared to be primed to become eclipse chasers. All it took was their first experience of totality for their passion to come alive. Our eclipse chasers describe how their interest in eclipses was triggered during childhood by the encouragement of an influential figure, or by seeing or reading about an eclipse during their childhood. All indicated that they wanted to see a total eclipse 'one day' after having had their curiosity aroused. The motivation may have been there, but it was at a low level until their awareness became focused upon a particular eclipse. However, it was not until their first total eclipse that their passion for totality came alive. Dava's story is a typical example of this—she had wanted to see a total eclipse for many years, was involved in scientific journalism, and had written on astronomical topics, and yet it wasn't until she saw her first eclipse that she became an eclipse chaser. After the passion

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has been ignited, the drive to continue experiencing totality becomes all-consuming, focused, and persistent.

It is interesting to consider what triggered the decision by our eclipse chasers to see their first eclipse—what it was that made that first eclipse appear on their radar. For Dava it was being sent to write up a story. David was simply following a girl. It was a chance interaction with a partial eclipse that made Dave B determined to see his first total eclipse. For Sue it was the lure of Madagascar. For me it was because I had to leave the country temporarily. It is surprising that it was seemingly random events that placed the first total eclipse on the radar for each eclipse chaser.

Once eclipse chasers have seen their first total eclipse, their motivational drive for eclipse chasing becomes incredibly strong and is sustained for long periods of time. In many cases, our eclipse chasers could not understand why they had waited so long before seeing their first eclipse. As David highlights:

> Now, when I look back through the *Canon of Eclipses*, I notice the ones I missed. April 28, 1986—where was I? What was so important that I wasn't eclipse chasing?

2 Psychological Needs That Drive Intrinsic Motivation

Desire for Learning and Developing Expertise

Experiencing the wonder and awe of an eclipse does not require any training, learning, or background in science. Anyone can experience the awe of totality—tribesmen in Africa, nomads in Mongolia, and farmers in the outback of Australia—all can stand under the shadow of the Moon and feel that awe. Once you start chasing eclipses, however, some basic scientific and practical information is helpful in order to determine when, where, and how you are going to see the next one. Slowly over time, eclipse chasers become more adept at learning about totality, and other things, such as how to photograph, how to read the local weather, general astronomy, and an understanding of different cultural responses to totality. For many eclipse chasers seeing totality generates an intrinsic drive for learning—they want to learn about eclipses and the best way to experience them.

A few years after I became an eclipse chaser I joined the local astronomical association and started to attend their presentations, especially those related to the Sun or eclipses. Learning in detail about one specific area is immensely satisfying, and has also led me to meet others with similar interests. This desire for learning was found amongst most eclipse chasers as a strong contributor to motivation.

Many eclipse chasers share their existing knowledge and expertise, voluntarily, in order to help others who may or may not have experienced totality. Over time, a sense of mastery and competence develops, which seems to lead to increased satisfaction. A great example of how learning and the development of expertise

can lead to strong intrinsic motivation is in Sir Patrick's story, although his motivation is to share his passion for astronomy generally and not just for eclipses. He has recently published the *Yearbook of Astronomy*—a massive reference book that took him ten years to update and complete—just think of the motivation required to complete that project! He has several further books that he is currently working on with other authors, and will be busy in the years ahead. His motivation to see rare events remains strong—at the time of interview in 2011 he spoke of his strong desire to see the transit of Venus in 2012 and the total eclipse in 2015. He took great delight in telling me that he has only held one or two employed jobs in his life, as he is far too busy doing the things he loves to do. His passion for astronomy remains strong. He is also a great example of how doing the things that are meaningful leads to a fulfilling life and happiness. In my brief time interviewing him I was struck by how positive, encouraging, and appreciative his outlook was. Sir Patrick's intrinsic drive appears to be his desire to communicate his knowledge to others—he is using his skills as a writer to share his knowledge and passion for astronomy. Public recognition occurs as a result, which then reinforces his motivation.

Jay also spoke of the hundreds of hours of his own time he volunteers into research to contribute weather information for every eclipse, benefiting all eclipse chasers, as well as satisfying his own need for developing expertise. He acknowledges that maintaining his reputation is a very strong motivational factor for him. Recognition from within the eclipse chaser community is the positive feedback which feeds his drive to continue with this role.

David, being a videographer, has invested time and energy into producing very emotive videos of different eclipse moments, and has planned to do further videos with the material he has accumulated over the years. Again, he spends time using his existing skills to produce something creative that can be seen by others. He is now further developing his skills as a speaker, talking about his experiences of eclipse chasing and connection with the Universe, thereby further fuelling his motivational drive.

For many eclipse chasers, sharing skills and knowledge enhances competence that appears to feed into the passion. David likens this to a Bunsen burner going off underneath him. Dave B similarly describes how the passion he feels during his eclipse experiences can be accessed to feed into excitement across all areas of his life. The desire is strong to share experiences, which then seems to 'complete the cycle', feeding motivation further. This leads to feelings of warmth, goodness, and happiness—a sense that they are doing something of huge personal significance.

The Freedom to Choose an Authentic Life

Psychologists and philosophers have identified that we struggle to achieve authenticity in our lives. We are restricted from expressing our own personality and choices by the demands of society, and individual conditioning such as being

encouraged to avoid negative emotions. As a result, we are living a life in the way we feel we are expected to, rather than feeling free to live in the way that is important to us. We become inauthentic.

Often, the trigger to choose to live an authentic life occurs following some significant event where we recognise the fragility of life. These moments usually happen when there is a risk to ourselves or loved ones, where we are forced to 'put things in perspective' and identify what is important. This occurred for me when faced with the possibility of Geordie dying from his illness. It is worthy to note that some of our eclipse chasers connected the health issues of their significant others as a reason to chase eclipses—they stressed the importance of doing the things they loved and living to the full—choosing to live an authentic life. Dave B has written about this in his own book. This was similar to Jay's experience with his wife's diagnosis in the early years of their marriage, which then prioritized the importance of doing 'wacky things'—effectively making choices that are of importance to them even though it may be different from the norm. Perhaps these difficult experiences in eclipse chasers' lives allow them to recognise that eclipse chasing is not a simple or selfish activity, but an opportunity to fully appreciate the fact that they are alive.

Eclipse chasing is a way to experience a safe but life-changing wake-up call and be reminded of the bigger things in life, the importance of making your own choices and living authentically. Of course there are other ways in which you can be reminded of these things. However, for eclipse chasers, this appears to be one of the most unexpected and yet most influential. The fact that many people who experience a total eclipse feel the same way is what makes totality so unique and powerful. The experience of totality is like a reminder of your limited time, and that you have the freedom of choice to live the life you wish to lead. Many seem to recognise after their first experience of totality that they can express this freedom and live by different rules. David was the most clearly about his recognition of the importance of authenticity:

> It draws me towards certain people, certain situations, places and experiences where there is a very non-programmatic response; it's very much in the moment. That stuff really attracts me because it's more truly what I am, and not what I think I am or what I should be.

James also highlighted a strong sense of freedom in living the life that he would like to live, rather than living a conventional life, by choosing jobs that locate him near to where an eclipse is going to be, or where he can experience the aurorae.

Dave B was aware of the moment when he realised he had the freedom to make choices. This was when he had already made a promise to himself to see the next eclipse, only to discover later that it was in Africa. He had to overcome his reluctance to visit Africa due to existing beliefs he held about adventure travel. Eventually the pull of totality was too much:

> …I realised that all I had to do to go, was just go.

Once Dave B realised that there was no real reason why he could not go to Africa he experienced a sense of freedom and autonomy.

Research in motivation, positive psychology, and Western and Eastern philosophies are consistent in the view of happiness resulting from freedom of choice. Having the freedom to choose to live more authentically and to do what we love to do—eclipse chasing—is a strong driver for the intrinsic motivation of eclipse chasers.

Seeking Connections—to the Experience of Totality

Humans are social beings. Sharing significant events is an important way in which we feel connected to others, and a fundamental quality of being human. The need for sharing becomes even stronger when significant experiences are involved—one just has to look at how people feel compelled to write books or blogs about events they are passionate about (such as me and this book). Similarly, talk shows provide a platform for those who have the need to communicate and connect with others about their experiences. Even the astronaut tweeting from space at the time of writing shows this beautifully in his tweet: "*experience, beautiful, regret to not share with others*". We need to communicate about the things we experience that are new or unusual—communication is the way in which we try to make sense of things.

None of our eclipse chasers wanted to experience totality in complete isolation, although I am aware of some who have tried this as a one-off experience. There is general agreement that the totality experience is a social activity, although people differ in the number and type of people they enjoy sharing this with. As identified from the eclipse chaser survey in Chap. 3 there were some who like to experience the connective element with a crowd and others who prefer to share their totality experience only with significant others. For Rick, the experience of the crowd and connecting with others is a core part of his love of totality. Sharing someone else's excitement seems to enhance his own experience. This is similar to Jay, who acknowledged that he delights in sharing the experience with eclipse virgins—and that this 'vampiric' action also allowed him to re-live his past excitement. It may be that as habituation occurs, having the opportunity to see the reactions of others may be the element that enhances the novelty of the experience.

Eclipse chasers will find themselves doing things to capture their memories in order to remain connected to the experience and to share with others. They will write trip reports on their return, contribute their stories to websites, newspapers, and magazines, write blogs, create photo displays and exhibitions, post their videos to YouTube, compile documentaries, and engage in other creative processes such as poetry and art. Whatever the format used, eclipse chasers are driven by a desire to stay connected to their experience of totality.

People also collect mementos of trips to enable them to tap into the memories and the excitement. When interviewing Dave B by Skype, I noticed many

travel-related objects in the background. Dave took me on a virtual tour to highlight the stories behind these mementos, all of which were from his eclipse chasing adventures. He was clearly re-living his excitement as he shared his memories, getting animated while recounting the stories—not of the object itself, but of how it connected to his trip experience. The intensity of the passion was high—he was tapping into this passion every time he shared these objects he had on display. Sharing the experience of totality with significant others, friends, or within a crowd, helps eclipse chasers to feel connected.

Seeking Connections—With Nature

In addition to seeking out totality, our eclipse chasers seek out other natural experiences. For Terry, it was a beautiful sunset at an impressionable age that sparked his love of nature. Sir Patrick shared a love of astronomy with a passion for volcanoes and other geological formations. For Jay, it was the power and unpredictability of the weather and storms, especially tornados. For James, it was things related to the Sun, the Moon, and the corona—northern lights and lunar eclipses. Respondents from the eclipse chasing survey described their love of nature and how it was connected to eclipse chasing:

> Why do we chase eclipses? For the same reason people are interested in rainbows, sunsets, landscapes, art, music, and starry nights—total solar eclipses are beautiful.

Our immersion in natural events remind us of the beauty and power of nature and the Universe—again triggering feelings of awe and insignificance that we have seen eclipse chasers find so compelling. Immersing ourselves in nature also allows us to experience being in the 'here and now'. When in nature, we are without the usual social concerns and rules that are present when we interact with others. Nature is the place where we can let all that go and just be. There is much research outlining the benefits of contact and immersion in nature. One area of research exploring the connection between nature experiences and well-being is called *eco-psychology*, and is based upon the assumption that humanity is very much a part of nature. Psychological research has clearly shown that when people have limited interaction with nature, their well-being suffers, with some researchers even terming this 'nature deficit disorder'. There is strong evidence now that being involved with nature can improve our well-being on many levels—we see improvements in physiological, emotional, psychological, and spiritual health. People seek out nature experiences in order to feel good about themselves, their lives, and the world in which they live. Some suggest that nature experiences make us more caring and connected with others. As we have seen, totality allows eclipse chasers to feel a very strong sense of connection to nature and their place in the world.

Seeking Connections—to Other Eclipse Chasers

We have already discussed how eclipse chasers are reinforced by the praise and respect of others from within the eclipse chasing community. Eclipse chasers appear to enjoy being a part of a community, and there is an openness and willingness to share resources, provide information, and generally help others. There is also a respect felt by those who are using the skills and resources of others. Many of those interviewed paid particular homage to Jay Anderson for his weather predictions, to Fred Espenak for his website and eclipse bulletins, to Xavier Jubier for his interactive eclipse maps, Jay Pasachoff for his expertise, and Glenn Schneider for his madcap chasing antics. James made the following comment acknowledging the decades of information that some people have compiled, and the expertise available within the eclipse chasing community:

> I plan with all these resources. Xavier Jubier—I can't wait to shake his hand and buy him some dinner, his Google Earth mapping tools are indispensable. I want to meet Fred Espenak and just sit down with him, all these guys, and share their generational experience.

It is also common for eclipse chasers to send around 'eclipse anniversary messages'. For example, people will frequently email everyone they met on an eclipse chasing trip 1 year afterwards to acknowledge the anniversary. Eclipse chasers will also mark the anniversary of their first total eclipse on significant dates—such as 10 years, or 25 years—and will frequently then recount and share memories of their first time.

This desire for connection appears to have led to a healthy community where many eclipse chasers share their experiences and work together to develop things that will help the whole community. Being part of that community is reinforcing and contributes to intrinsic motivation.

3 Biological Needs: Chasing the 'Coronal High'

There appears to be a biological component to eclipse chasing due to the primal fear, awe, and euphoria that eclipse chasers experience. We established earlier that after the primal fear response, there is a strong release of dopamine. This produces the intense euphoric state marked by goosebumps and chills that are experienced at the time of totality, and that feeling of euphoria stays for some time. All our interviewed eclipse chasers and those who completed the survey reported this euphoric state. This 'coronal high' is a pull factor; in that it is unique to the totality experience it and we are drawn to experience it. This reaction is also a push factor—the natural high experienced during totality is all-consuming and then becomes yearned for—there is a strong desire to re-experience that high.

After the rush of totality is over, this withdrawal seems to be influenced by other biological factors. It would appear that many eclipse chasers are driven to

seek out experiences that elicit strong emotional responses. Eclipse chasers also are easily able to *relive the moment* of totality and do so when reminded. This then drives them to experience the real event. Eclipse chasing may be described as a *positive addiction*, which leads to a *compulsion that becomes a new way of life*. These themes will now be explored further.

Experience Seeking

Recently one of my postgraduate students commented upon the photographs of my eclipse chasing adventures in my office. He asked about the experience of totality and the motivation of eclipse chasers. After a brief discussion, he concluded that *eclipse chasers are like adrenaline junkies then, without the danger.*

You may have heard the terms 'adrenaline junkies', 'thrill seekers', or 'sensation seekers'. American psychologist Marvin Zuckerman has undertaken years of research into sensation seeking—a personality trait defined as:

> …the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience.

Zuckerman proposes that there are personality differences that characterise whether people are high or low in sensation seeking—this explains why some find high-risk activities such as skydiving and hang-gliding or watching suspense films pleasurable, whereas others find even the idea of these activities unpleasant or even 'crazy'. High sensation seekers tend to be more open to new experiences, and actively engage in behaviours that produce arousal or a thrill. The discovery of a dopamine-receptive gene supports the view that some people are more biologically programmed to be sensation seekers than others.

Zuckerman identified four subtypes of sensation seeking. The first—*thrill and adventure seeking*—describes the pursuit of potentially risky physical activities that aim to excite and are unusual, such as skydiving and mountain climbing. The second—*experience seeking*—involves seeking stimulation through the mind and senses by pursuing unfamiliar environments and stimuli, such as travel and meeting new people. The third—*disinhibition*—involves searching for opportunities to lose inhibitions while engaging with other people, and includes drug-taking, excess alcohol use, and promiscuity. The final subtype—*boredom susceptibility*—describes those with the tendency to be easily bored by routine or repetitive situations.

One does not have to be a psychologist to see that eclipse chasers are well defined within the second subtype of sensation seeking—that of experience seeking. We are actively seeking a high level of stimulation for our minds and senses with totality. We just love when it occurs, and strongly seek to re-experience it. Eclipse chasing also involves travel to new places, cultures, and environments, creating multiple opportunities for achieving further stimulation through the mind and senses. However, eclipse chasers engage in these activities

with the primary goal to experience totality. So effectively, in order to seek the one experience we are looking for, we end up having multi-sensational experiences that enrich our lives even further.

Unlike drug addicts or skydivers, eclipse chasers do not need to put themselves at physical risk in order to experience the thrill of totality. However, it is interesting to note that primal fear is part of this experience—that is, although we are not at physical risk, our bodies respond to a perceived threat. Perhaps this is one of the key features of the eclipse experience that 'hooks' people in.

An unfortunate effect of continually seeking new experiences is the development of habituation, where the thrill involved in novel situations reduces with repeated experience. This will be explored further in the next chapter.

Reconnecting with the Intensity of the Moment

Many of our eclipse chasers identified that they could easily re-live the intensity of their totality experience—they got goosebumps at a particular memory, or felt choked up and near tears when reviewing video accounts, not only of their own eclipse experiences, but also those experienced by others. These sensations of re-living are vivid, and make eclipse chasers feel alert and alive, feeding into motivation due to the rewards of eclipse chasing.

There is not a lot of research explaining the re-living of intense positive emotions. It is well recognised that when people experience a trauma, they may later re-experience the emotions, the body sensations, and the detail of past events as if they were happening in the current time. This re-living of a negative event is known as a flashback and can be very distressing. It is believed that flashbacks occur due to the disruption in processing the event at the time. For some, dissociation occurs, which involves subconsciously distancing during the event in order to deal with the situation. Then, because the emotions did not get a chance to be processed, these remain 'stuck'. Re-living often occurs when people least expect it, such as when about to go to sleep, when dreaming, or when faced with a reminder of the traumatic event. It can take a long time for people to fully process their experience so that they no longer have these traumatic flashbacks.

A different dissociation process occurs during totality to the one which occurs during traumatic events. At the time of totality some people describe feeling detached from their thoughts instead of being dissociated from their emotions, as in a traumatic event. David highlights this beautifully when he explains:

> Right now is just right now, you don't need a thought or a concept about it. It's just to be there and have that experience.

The irrelevance of thought at the time means that eclipse chasers are not thinking or interpreting what is happening at the time of totality. Instead, they appear to be simply experiencing the moment. It is only when the experience is over that they can start to process what they experienced using language—in the

same way that it takes time for people experiencing a traumatic event to start integrating and making sense of their experiences. Re-living the totality experience is in itself positive, and reinforces the importance of going to see the next eclipse.

Positive Addiction

When we talk about addictions, people tend to think of addiction to substances such as drugs or alcohol. A 'true' addiction is a situation where a person becomes physiologically dependent upon a substance, and the substance is destructive—to themselves or to others. Despite the destructive consequences, the individual continues to engage in the addiction because it results in the chemical changes and reactions they are seeking in the brain, whether it is seeking a high or avoiding a low.

There are also other addictions which are not substance related. Psychologists use the term '*behavioural addictions'* to relate to addictions such as excessive shopping, gambling, or overuse of pornography. Some of these behaviours result in a natural 'high', but are still described as addictions, since the person is excessive in their behaviour and as a result experiences harm, such as financial ruin, or difficulties in sustaining relationships. If we think about sensation seeking, you can see that these behavioural addictions may be attempts for people to seek more stimulation.

Eclipse chasing could also be seen as a behavioural addiction—we are addicted to the way we feel during the total eclipse, although there is little of the harm that is seen in other forms of addiction. It could be identified as compulsive, and there are withdrawal and negative emotions if unable to experience totality. David nicely summed this up when he felt rage after being informed that his third attempt to see the 2010 eclipse had been changed by factors outside his control:

> You can do lots of things to me, but don't take my eclipses from me!

Eclipse chasers seem to agree that there are huge personal benefits and no harm associated with eclipse chasing. Yet many eclipse chasers acknowledge an addiction element to their interest, and describe their passion in terms that mirror the language of addiction.

William Glasser, an American psychiatrist, described some addictions that actually make us stronger rather than weaker, were not harmful to others, and actually improved life or health or well-being for the 'addict'. He used running as an example of this—once the person overcomes the initial hurdles of getting into a routine of running, they experience an addictive element to running and would experience withdrawal if unable to do so. Running also has positive benefits to health and well-being. Glasser felt that the state of mind that resulted when engaged in running was almost trance-like, allowing the mind to 'spin free', something which then resulted in a natural high. Eclipse chasing could also be seen

as a positive addiction—it leads to a state of mind that is free of the normal concerns of daily life, allowing this spin-free state.

Glasser's theory of a positive addiction is perhaps one of the best ways to understand the motivations of an eclipse chaser. It acknowledges the very strong 'non-negotiable' drive of chasers and also the many benefits that eclipse chasers describe. It also provides a helpful and accurate description for those eclipse chasers who already use a language of addiction to describe their eclipse chasing 'habit'. Being an eclipse chaser is not a dysfunctional addiction—it can be seen as a positive addiction that allows you to engage in activities that enhance your life.

The Compulsion That Becomes the New Way of Living

When we talk about being obsessed with something, we are describing a compulsion to act. A compulsion is where you feel driven to engage in some behaviour, as though you have no choice. An everyday example of a compulsion is the urge to bite your fingernails—you do it without thinking, and even when you notice and try consciously to stop, you find that you just 'have' to keep going. There seems to be an underlying core compulsion with eclipse chasers in that they are compelled to travel to see the next totality. I can look at a map of the world marked with the path of totality and I know exactly where I will be on certain dates, for each of these future eclipses. It does not even occur to me that I will not travel to see an eclipse—it is just going to happen, as though it is a new default setting in my life that I see every eclipse. It is only when circumstances arise that making it difficult that the decision is made NOT to go. James also highlighted this way of thinking. Time off from his job for him to see an eclipse is a given. So for many, eclipse chasing is like a compulsion that is turned into a life choice—there is a new default setting, a new script, that says "*you will be at the next eclipse*". This new developmental way of being is set in an autonomous way that is beyond societal conditioning. The compulsion for this simply highlights the strength of the intrinsic motivation.

4 Things That Can Affect Intrinsic Motivation

Eclipse chasers are emotionally invested in seeing each eclipse, and will do what they can to prevent things getting in their way. Again, consider the rage that David felt when his eclipse arrangements were repeatedly cancelled. Then there are those like Chris and Sue who feel that each eclipse is precious, and that the location and the other people around them need to be just right. They attempt to control their experience of totality in order to ensure that the experience remains special. It is possible that this interferes with their motivation, as can be seen with Sue who was not as driven as most other eclipse chasers:

> I know why I don't chase every eclipse—I've been spoilt. I want to keep it special and wait for the right moment for the next one.

There are some who have had to struggle with physical limitations, which may lead to frustration and then reduce intrinsic motivation. For example, Sir Patrick described how his limited mobility now restricted him from using his own private observatory to observe the night sky. Another threat to motivation is the issue of habituation—the fact that we can develop a tolerance to repeating the same event. This will be explored further in the next chapter.

Eclipse chasers describe how their hobby actually provides them with so many additional benefits other than simply witnessing an eclipse. Some eclipse chasers have mentioned that the lucky ones are those who are able to utilise their skills and knowledge to become paid experts, allowing them to fund their eclipse chasing lifestyle. What we know from research into motivation is that when tangible rewards, punishment, and competition are introduced, this tends to reduce intrinsic motivation over time. For an eclipse chaser, that would relate to financial gain for eclipse related activities, being clouded out, and focussing more on trying to outdo other eclipse chasers in time spent under the shadow. All of these things may ultimately, over time, deflate the intrinsic motivation of the eclipse chaser.

It is useful to consider Jay's experiences here, where he noted that the thrill has reduced after a period of time. His role as a consultant to a travel company does introduce an external reward, namely, funded eclipse travel. However, it also brings with it added responsibilities. These factors may have contributed to Jay's reduced internal motivation for eclipse chasing.

5 Relating to the Literature

There are a number of different psychological theories that aim to describe motivation based upon psychological needs. These suggest that when one behaviour or action is able to meet all psychological needs, that behaviour then becomes immensely satisfying. One such theory is by Abraham Maslow, a psychologist in the 1940s who believed that we all strive for a state of *self-actualisation*—where our higher order psychological needs are being met, such as the ones found for these eclipse chasers. Maslow believed that some people have 'peak experiences', as outlined in the previous chapter, and one can see that these peak experiences are all-encompassing, and lead to changes in life that make a person want to experience more.

The psychological factors that contribute towards the eclipse chasers' powerful motivation appear to be consistent with many theories of motivation based on psychological needs—including self-determination theory (SDT), developed in the late 1980s by American researchers Deci and Ryan. One part of this theory proposes that there are three basic, universal psychological needs that are essential for growth and well-being, and these needs are the driving force behind intrinsic

motivation. The first is the need for *competence*, where people want to feel that they are effective in what they do. Eclipse chasers satisfy their need for competence by the desire for learning and developing expertise. The second need is for *autonomy*, where people feel they have the freedom of choice over the activities they do. This was met for eclipse chasers by their freedom to choose an authentic life and the establishment of a new default setting in life that includes eclipse chasing. The final need is *relatedness*, where people want to feel a connection with others. Again, this was met very strongly for eclipse chasers with their drive for connections to several things—to the moment of totality, to nature, and to the rest of the eclipse chasing community.

6 Summary

In this chapter, we have explored several reasons why eclipse chasers may be so highly motivated by their passion. We identified earlier on that eclipse chasers are intrinsically motivated to chase eclipses. Eclipse chasing enhances their lives in so many ways, and this enhancement creates a powerful drive to continue in that direction. Different motivation theories can be used to explain the motivation of the eclipse chaser. Self determination theory suggests that the three basic psychological needs of competence, autonomy, and relatedness determine a person's well-being. It is clear from our eclipse chasers' accounts that experiencing totality does indeed repeatedly contribute to feelings of happiness and well-being.

The motivation is also strongly maintained due to the fact that eclipse chasers experience a buzz from totality, and they want to repeat this feeling. We also recognised that there were external factors—the pull factors of the emotional experience (primal fear, awe, and euphoria) and the heightened sense of awareness that have already been discussed—which reinforce the powerful feeling of totality, again fuelling motivation. In positive psychology, emphasis is placed upon identifying what enables people to thrive-to flourish. It would appear that experiencing totality repeatedly, as eclipse chasers do, is a great example of how people can flourish in their lives.

Chapter 15
Related Questions

This section aims to answer some additional questions which people may have related to eclipse chasing.

1 Do All Eclipse Chasers Have Beards?

Eclipse virgins often think that eclipse chasers are new-age revellers and hippies, or older men with beards who find it difficult to relate to others. That is certainly not my experience of the eclipse chasers I have met over the last 13 years. When you travel to the path of totality you see people from a wide variety of backgrounds, from a range of countries, young and old, male and female.

It is true that the respondents of the eclipse chasing survey outlined in Chap. 3 were mostly well-educated men, and this is largely where I sought people to interview. I have met many female eclipse chasers during my travels—they just do not sign up to the listserve or link in with the scientific community—only 8 % of those that completed the survey were women. However, females are represented in this book—Sue has recounted her experiences, along with Dava and myself obviously. But on the whole it is my observation that there are more male than female eclipse chasers. Anecdotally it would appear that females who do chase eclipses tend to be those who accompany their partners, or else have a strong desire themselves and have few family responsibilities, allowing the freedom to undertake adventure travel repeatedly.

You may have noticed that the eclipse chasers selected for interview for this book were from the English speaking western world. With this type of phenomenological research people are required to give a rich, detailed account of their eclipse experience which is then interpreted by a researcher, ideally from within that culture. It is important to acknowledge that there are different cultural beliefs that shape how people interpret their eclipse experiences. Exploring these different beliefs, as fascinating as that would be, is beyond the scope of this book.

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Eclipse chasing is an expensive hobby. It does, after all, require one to become a world traveller and it is therefore out of reach for many people. In the survey, cost was considered to be the main barrier preventing eclipse chasers from seeing an eclipse. However, as you have seen, there are creative ways of travelling to the path of totality. You can take longer trips to get more value for money, and compare costs for independent versus organised travel, or you can arrange to work near the location of the path of totality, or even offer your expertise and skills. Not all eclipse chasers are people with financial means – some simply prioritise their eclipse chasing over other things. Eclipse chasers value experiences over material possessions, and will save in order to prioritise an event where the impact can last a lifetime.

2 Is There an Eclipse Chasing Personality?

It is very unusual to hear of people not enjoying totality. Jay recounted the extreme reaction of a couple on an eclipse cruise some years ago. When the captain of the cruise had to make changes to the itinerary in order to ensure that the eclipse could be seen, one couple were so annoyed that they apparently remained in their cabin, refusing to view the eclipse!

Jay and Rick, who have between them accompanied thousands of people on eclipse chasing tours, report that the first eclipse experience is almost universal in response. People are unexpectedly overwhelmed. The first totality experience stirs something inside. Most people then express the desire to repeat the experience, asking when the next one is. However, it is the eclipse chaser that then acts on this desire—they are the ones whose passion is truly ignited. What makes eclipse chasers different to those who perhaps express this desire yet do not act upon it?

We have already discovered that eclipse chasers seem to seek out awe-inspiring experiences. It would be interesting to explore this further by comparing the personality traits of those who have seen an eclipse once versus those who are eclipse chasers. Also interesting would be to explore whether the values that drive our behaviours are different in eclipse chasers.

Even amongst eclipse chasers there are variations in the level of passion people express. For example, James commented that he could not imagine dying without seeing each eclipse, whereas Sue did not appear as emotionally invested. Geordie and I have been side by side during our eclipse chasing adventures over the past 13 years, yet he would rate his passion for eclipses at 30 % compared to my 99 %. Geordie's experience of totality is different to my own:

> I wouldn't have as emotional a reaction if I wasn't around others having a strong emotional reaction. I tune into what is happening with other people. The eclipse happens - and yes wow, it is interesting. I don't have the emotionality until I see what it does to you, it does something different.

Most eclipse chasers are drawn towards the experience of totality, although there are many that are drawn to the science. This suggests that there are 'subgroups' even within the eclipse chasing community.

There are many more interesting studies that can be undertaken in order to further tease out the drive within eclipse chasers, and the experience of totality. Although we understand a little more about the experience now, it remains a fascinating area and worthy of further exploration.

3 Does the Passion for Eclipse Chasing Ever End?

It is well recognised that people can become desensitised or habituated to the emotional response to events, as was mentioned briefly in earlier chapters. Habituation is a basic law of learning, where repeated exposure to an event results in reduced arousal over time. Habituation is functional—otherwise the intensity of everyday life would leave us exhausted. As adults we lose our childlike wonder and become more concerned about planning for the future, becoming preoccupied with the trivialities of daily life. We can, however, make choices to reintroduce wonder into our lives. Many people do so by taking time to appreciate things in life, such as immersing themselves in nature or engaging in things that bring them pleasure. Others try to introduce a more in-the-moment way of living—a process called mindfulness. And eclipse chasers chase eclipses.

Habituation can occur in the stress response, the sexual response, and the drug response, whereby our bodies become accustomed to the arousal experienced, resulting in a dampening down of the impact. In order to get to the same level of thrill repeatedly, we need to introduce novelty.

We can easily see habituation at work during a total eclipse, when people move on immediately after totality and do not even observe the partial eclipse that continues for a further hour. After the intense buzz of totality is over, the partial phase is no longer exciting, and as Dave B describes:

> I find the final phase of the eclipse excruciatingly boring.

Over time, it is possible that eclipse chasers habituate to the intensity of the emotional experience during totality. They remain driven and passionate, but they may not get the same buzz as they did during their first few times. As Jay explained:

> I still get emotional, but it's not the same exhilaration.

No experience of totality ever matches up to the unexpectedness and intensity of the first experience. However, there are reasons why it seems unlikely that 'saturation' will occur—that is, when we no longer experience any buzz whatsoever. Each eclipse is unique. There are always variations in the physical elements of the eclipse itself—the time, angle of the Sun in the sky, visibility of Baily's Beads Beads and the Diamond Ring, the appearance of the corona, the prominences, and the width of the eclipse path which determines how dark it will appear. All of these eclipse factors influence how totality will be experienced. Then there are the external factors, such as location and outlook, the weather, the

company you are in, experiences you have on the day, whether you are preoccupied with photography—these also vary for every eclipse, and have an influence on how the event is experienced. The randomness of the path of totality also introduces novelty to the eclipse experience—you could be high on a mountain, standing freezing cold in arctic winds in Mongolia, sweltering under the desert Sun in Libya, or sitting on a beach watching the eclipse at sunrise in Australia. An eclipse occurs on average every 18 months, so it is still an infrequent occurrence that eclipse chasers have to wait a long time for. Also there will always be a local population for whom the experience will be their first eclipse, and this ensures a great atmosphere. Therefore, the amount of novelty in every eclipse ensures that saturation is not likely to be reached. This explains why the passion can be sustained over many, many years.

Eclipse chasers are also very good at introducing novelty themselves, which increases arousal. They do this almost as a by-product of their competence—they love to learn and experience new things. Some prioritise specific phenomena to focus their attention for photography. Others try to vary the circumstances involved in seeing totality. Some try to be near others who are experiencing their first totality so that they can enjoy these reactions. The more extreme will try introducing other exciting factors into their eclipse chasing experience, such as James' account of the American chaser swimming a mile then clambering naked over razor sharp lava rocks to lay back in full glory to greet the shadow. The record-breaking eflight is another example of pushing boundaries. These are the more extreme thrill seekers!

Glenn Schneider has seen more total eclipses than most, and remains as passionate as ever:

> I have been fortunate to see more total solar eclipses than most. But after more than four decades of eclipse chasing that has resulted in my immersion for a total of about an hour and a half in the Moon's umbral shadow. That, on average, is about two minutes per year of time IN totality compared to more than half a million minutes per year OUT of totality. Perhaps an interesting (or odd) way to look at it, but now at age 56, 0.0003 % of my life has been in the Moon's umbral shadow. With such relative rarity of occurrence, and diversity of phenomena associated with eclipses, no, the "novelty" has most certainly not worn off.

4 How Does the Feeling of Connection Relate to Religion and Spirituality?

For most eclipse chasers the feeling of connection is at the heart of the experience of totality. Our eclipse chasers differed according to how they made sense of that connection—for some it was a connection with nature, for others it was a connection with the Universe, and for others again a connection with the collective human consciousness. Others were still trying to make sense of that connection experience. It could also be seen as a connection with God or other religious concepts.

Valerie Ingram, an Irish eclipse chaser who has seen five total eclipses, has a strong religious faith and was able to share her own interpretation of the eclipse experience:

> Witnessing a total solar eclipse draws from my deepest being a response of praise and worship to the Almighty, who created and sustains the Universe. I am not the kind of person who is demonstrative in their faith but as I [saw my first total eclipse] my arms raised instinctively to give glory to God. The Lord is upholding and sustaining everything from the largest galaxies to the tiniest imaginable particles. He is in control. Much of the time we are caught up in the humdrum of life and hardly notice the wonder of the order and design of the Universe. A total solar eclipse by its rarity and strangeness brings this God-designed order into sharp focus in my mind. It can be no accident that the Moon is exactly the right size and at exactly the right distance to cover the disc of the Sun and allow us to see this awe-inspiring spectacle. When we marvel at the wonders of our present Universe, perhaps that is a faint foreshadowing of the wonderful new one that is to come.

This powerful sense of connection—whether it be to the Universe, God, or nature—ultimately gives the eclipse chaser an opportunity to reflect upon their life and their beliefs. Our eclipse chasers were open to how others might interpret their own eclipse experience, but all acknowledged that for them it was intensely personal and that they all had their own way of making sense of this connection. The connection experience resulted in a change in perspective and a deeper sense of understanding of themselves. David describes this process of self-understanding which was awakened following his first experience of totality and which changed his life:

> People spend their whole lives looking for the answer. It was really easy for me. I just stumbled across this [total eclipse] and the whole thing happened, it was really easy for me. I know what my purpose is, and what things mean. I don't need answers or books, or some kind of a structure given to me validated elsewhere, saying this is the way. Some of the great books do agree—so that confirms a lot of stuff and that's great too.

The survey respondents also reflected upon their eclipse experience and how it impacted upon them:

> I haven't understood yet what exactly totality means to me and I will probably never understand. Maybe I can say that totality means a mystical experience of something deep, beautiful, and luminous, something primitive and elemental. As someone else said: "people want to see another total solar eclipse in order to try to understand what they have felt." That's why I want to see as many total eclipses as possible!

Ultimately, totality is a spiritual and mystical experience which for some people challenges them to make sense of their lives, and ask the question "what is it all about". This deeply personal process can only be truly understood from each person's position—there is no position of truth or reality—it is purely subjective.

Part V
Eclipse Chasing Information

Xavier Jubier, Passionate eclipse chaser, Engineer and IT Manager, France

When chasing solar eclipses one needs to look after two major parameters—location and weather will determine which phenomena an observer will see of the celestial event. This means having access to high resolution interactive mapping tools and detailed weather statistics/forecasts is the key to success. Because eclipse chasing can be considered as a beneficial addiction, one that will change your life forever, the worse is to not be able to observe the sheer beauty of the greatest spectacle in Nature even though it often requires travelling to the far corners of the globe. Only a couple decades ago, the needed information was only available to a limited number of people, mainly through eclipse circulars and bulletins. Nowadays wonderful new tools are available on the Internet to help you in your quest to witness the magic of a total solar eclipse. On E-day please don't fiddle too much with your camera and take the time to seep into the magic display of light over the changing landscape, the sharpness of the shadows as totality approaches, the Moon's shadow rushing towards you, the ephemeral appearance of the two diamond rings, the dancing Baily's beads and the beautiful solar corona floating in the deep blue starry sky with a surreal 360-degree sunset.

Chapter 16
The Challenges of Eclipse Chasing

This section is more light-hearted, and tells of different situations and challenges that may be faced when you are an eclipse chaser. It is like an insider's guide to eclipse chasing—the things you only pick up along the way.

1 Every Silver Lining can Potentially have a Cloud

Learning who the Fluffy Enemy Is

I used to like clouds—I never had any reason to feel otherwise. In the first few years of my eclipse chasing I was rather naive when it came to the weather, and never actually considered cloud cover on eclipse day. I had a secret strategy of always finding out where the experts were going, figuring that they would know the best places from which to observe. I always just seemed to be lucky with regards to the weather on eclipse day.

This changed on eclipse morning, 8 April 2005, on a boat about 800 miles to the west of the Galapagos Islands. The clouds were thick in the sky and the talk on board was all about the difficulties of finding a clear patch of sky within the very narrow path of totality. There was a lot of expertise on the boat—and all were concerned. Their solemn behaviour was as ominous as the clouds. The fear was palpable, and spread to everyone on board. But thankfully, with a lot of skill and luck, an opening in the clouds was found. From that day on I had an increased awareness of how clouds are the enemy of the eclipse chaser, to the point of taking on a sinister feel on eclipse day.

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Dealing with the Disappointment of Being Clouded Out

Eclipse chaser lore states that you will be clouded out for one in every seven eclipses you see. It was finally my turn in 2009—my seventh total eclipse. It was early morning of June 22. I woke up in a strange bed—but it only took me a few moments to realise that I was in a room on the 6th floor of a hotel in the coastal town of Jinshanwei, south of Shanghai, China. I suddenly sat up, waking Geordie with a startle. "Eclipse day, eclipse day!" I leapt out of bed and bounded to the window, dramatically parting the curtains that were covering the east facing windows with a view overlooking the sea. I heard myself scream in horror at the sight that greeted me. Geordie raced over, fearing something bad had just happened. What could have caused such a reaction?

Cloud. Thick, grey, low-lying cloud that covered the whole sky in a blanket of dullness. Living in Northern Ireland where skies like this are the norm, it was nothing that I hadn't seen before. But on that day, it was the most sinister, awful, dreadful thing you could have possibly imagined. No other image or event could have made me recoil more in horror. I remember telling myself to get a grip—it was just cloud, no one was going to die, it was not the end of the world. But there was an incredible heaviness in my heart—for me, at that time, on that day, the grey sky was the worst possible thing. I felt like those clouds were stopping me from doing what was most important in my life. It was the only time I had been clouded out in my seven total eclipses and two annular eclipses. It was also the worst one to be clouded out for—the longest eclipse of the twenty-first Century—an agonising six minutes and 30 seconds.

In China that day, I only got to glimpse about three minutes of the partial eclipse in the lead up to totality. I recall the feeling of desperation as time ticked away with no obvious sign of a break in the cloud. I also felt a huge disappointment once totality had begun and I realised the opportunity was gone. We sat under cloud, in total darkness while the street lights came on, glancing wistfully up at the sky. The minutes dragged on—we were left behind in the real world. To make matters worse, soon after totality was over, it began to pour with rain, dampening the miserable mood even further. It was such a different eclipse experience to any other eclipse I had seen—there was no post-eclipse celebration and debrief, no joy, no sharing of images. There were no images that were captured. Just nothingness. I do not even recall what happened afterwards, my heart was just not in it. I didn't share the optimism of others like Dave B. I couldn't tell myself—*"Everyone needs to have a cloudy experience at some point"*. But it was, and still is, hard to deal with the disappointment.

So, what should we do when the inevitable happens? There is a type of cognitive processing bias that occurs known as the peak-end rule, where we make a judgment about our experiences based upon how we experienced those events (either pleasant or unpleasant) at their peak and how they ended. For me, in China, the eclipse was unpleasant at the peak, and unpleasant at the end, and therefore my feelings of misery remain strong.

But we can use the peak-end rule to our advantage. If you happen to get clouded out during totality, do what you can in order to have a positive ending. It is worth trying to salvage the situation—and there are even some *youtube* clips of people trying to run for a clear patch of sky moments before totality. Go do something new or memorable so that the 'end' is not negative. Try to line up interesting activities for after the eclipse, so that the whole trip can end on a high note. This may help lay down more positive emotions about the experience.

Social comparison is an important way of coping in our lives—comparing ourselves to less or more fortunate others can make us feel better or worse about our own situation. We can control who we make comparisons to, and this then can influence how we feel. So, if you find yourself clouded out, sharing your experiences with others who weren't will exacerbate the negative emotions you feel. Sharing with others who were also clouded out is a better strategy. Sharing the misery, while making you feel miserable, will also allow you to know that it was not just you—you are not alone.

I'm Seeing the Eclipse here—no Wait. What about over there?

Every eclipse chaser needs to make decisions about where to go to see the eclipse—finding a good location within the path of totality that will have the highest chance of clear skies on the day. Relying on luck only gets you so far. Eclipse chasers need to develop a way of managing the risk and uncertainty, and our eclipse chasers managed this in various ways. Sue did not like to take risks at all, preferring to opt out if there was not a high chance of clear skies at her preferred location. Chris recognised that the uncertainty adds a spice to eclipse chasing, although prefers when others make that decision for him. Jay is used to making decisions about risk and takes on that responsibility for others on eclipse tours. I have found that the more I know about eclipses and weather, the more I worry. Once you begin to arrange independent travel, you need to be more aware of issues related to location and weather, and be prepared to make decisions despite this risk and uncertainty. Many eclipse chasers manage this uncertainty by having a plan B so they can relocate if need be the day before or the hours prior to the eclipse. Jay made a helpful comment:

> I learned early on in eclipse chasing that it wasn't so much whether you saw the eclipse or not, it was about how hard you tried to get into the clear skies.

A One Way Ticket to Ulaan Baatar

The path of totality is often located in parts of the world that can be difficult to access. This can make travel planning complicated and time consuming—which is

why eclipse chasers become highly skilled at arranging travel. Sometimes it is just not possible to travel independently to some of the remote locations, such as Antarctica, so specialist travel companies are required as they have the resources and knowledge of the local circumstances. Adventure travel to exotic locations usually requires a flexible approach—local transport can be unpredictable and language can be a barrier. Usually when travelling these challenges are part of the adventure. However, when you have to be in a specific location for a particular time then it is becomes more challenging and less flexible. When you make arrangements to travel independently, or even if you travel with a specialist company, things can and do go wrong. I am sure that every eclipse chaser can tell a story of when their travel plans have been thrown into disarray, resulting in chaos and extreme panic at the possibility of not being able to see the eclipse. The most dramatic experience of mine occurred in 2008 and involved a prematurely expired Russian visa, ditching the Trans-Mongolian railway, taking a mystery midnight flight out of Moscow to anywhere, finding ourselves unexpectedly in Germany, and then waiting for several days for two one-way plane tickets to outer Mongolia to become available.[1] It actually is character-building to know that you can survive these situations—land in a country completely unprepared, regroup, rethink, and then make plans to continue on your journey. Only the truly dedicated would continue—most others would give up and go home.

Wake up!!

There is an interesting thing that happens to many eclipse chasers the night before an eclipse—they share the same dream. This is the 'oversleeping dream'. It is based upon the anxiety of something getting in the way of seeing the eclipse, and usually occurs once the person is in position, the night before, in the path of totality. There are variations, of course, but the usual sequence is like this:

> It's morning. The eclipse chaser slowly orients in bed, feeling fuzzy and unfocused in their new surroundings. It takes him a while to realise where he is – in some hotel room somewhere. It is very quiet, but clearly daytime as the light is streaming in the windows. He lifts his head, and slowly drops it down again, realising that he is in Cairns on his holiday. He remembers that he had arranged to meet his fellow travellers for an early breakfast, but he decides to sleep in instead, as he is tired. What's a missed breakfast? His eyes are heavy, and it feels just so lovely to rest them. He feels himself drifting slowly back to sleep, and it feels so comfortable. He is aware, however, of a feeling of disquiet creeping into his awareness. There is something that is on his mind, but he is not sure what it is. Surely it cannot be work? He is on holiday, far away, in a hotel room in Cairns, sleeping off jetlag. He smiles at this thought, being far away and outside of the usual routines, able to sleep in. He tries to rest again. But there, again, is that small nagging doubt that he has forgotten something. He slowly opens his eyes, and reaches out for his

[1] This is another example of the peak end rule—despite the dramas which could have been a disaster the trip was brilliant!

phone beside the bed, where he lazily placed it the night before, forgetting to set the alarm as he was so tired. He looks at the time, bleary eyed. It's hard to focus. 8.30 am. He wonders what time zone it is in. Then he recalls that he set the time zone to Cairns two days ago, so it is 8.30 am local time. November 14th. It's special for some reason. Then suddenly, with a feeling of absolute dread and horror, he realises that it's the 14th November, he is in Cairns, it is 8.30 am – it is ECLIPSE DAY! He has slept in - he has missed the eclipse! The shock wakes him up with a jolt, and he sits bolt upright in bed.

And that is about the time that you waken, in reality at 2 a.m on eclipse morning. Because of the fear you lie awake, too scared to go back to sleep.

2 Real World Intrusions

The anecdote shared by Dave B where the 'real world' noise of a jet landing intruded upon totality, highlights how having the real world intrude into Shadowland seems strange. The two worlds co-exist side by side. But when there is overlap or intrusion, it feels bizarre. It seems unnatural for people to continue when the world has seemingly stopped. It should be that the real world is on pause, and Shadowland is like a little side-step that eclipse chasers take. However, the real world does indeed continue, and feeling the two worlds together is very jarring. Here are some examples.

Shoot, Why's the Camera Not Working?

Many of our eclipse chasers advised against taking photographs during a first experience of totality. Many have learned this the hard way. Fussing with a camera during totality can stop you from being immersed in the moment. Dealing with equipment requires you to remain connected to the real world at a time when what you really want is to be fully immersed in Shadowland. Automated photography programmes have certainly provided a way for those taking photographs during a total eclipse to stay happy!

I have read eclipse trip accounts where the main focus of the story is on the anxiety of getting equipment set up in time. Other eclipse chasers have recounted minor disasters such as not taking the lens cap or solar filters off during totality. Your ability to concentrate on real world tasks during the moments leading up to totality is diminished as your body is attuned to take in the changes occurring in the environment. Fred Espenak, a.k.a. Mr Eclipse, reported that during the Galapagos hybrid eclipse in 2005, due to the ship rocking, he had to experience the whole of the 28 seconds eclipse through his telescope lens in order to keep the image centred. The images he took were stunning—but he was not able to fully enjoy the experience as the concentration needed to keep the eclipse in frame required him to remain in the real word.

Gone with the Wind

I have also experienced the overlapping of the two worlds. Standing on a mountain in Mongolia, waiting for the imminent arrival of the Diamond Ring, my eclipse filters were suddenly whipped out of my hands by the wind. It was a chilling moment—everything so imminently near. I was on the cusp of the world of totality, full of eager anticipation. My logical mind had quickly let it go—I didn't need the filters as there was only seconds to go before they were no longer needed. I also had binoculars with solar filters within reach. I therefore returned my full attention to the moment where I could enter Shadowland. I was horrified to see out of the corner of my eye that Geordie had turned away from the sky and had started chasing after my eclipse filters. The wind was very strong so he did not hear my horrified gasp at what he was doing. At that moment, I felt dragged back into the real world, with real world concerns. Somehow, Geordie heroically caught hold of the filters, brought them back to me and turned back to the sky with moments to spare before the Diamond Ring appeared. What an amazing man.

On Your Marks, Get Set

A quite novel clash of the worlds is being planned in Port Douglas, Australia, for the next eclipse in 2012. For the first time an 'eclipse marathon' will be held—using the celestial clock of third contact as a starting gun—as outlined on the eclipse marathon website:[2]

> As soon as the Sun re-emerges from behind the Moon and the corona is broken the race will begin, making the Solar Eclipse Marathon the first ever sporting event with an intergalactic start gun!

That is, immediately after experiencing totality, the athletes will start running a marathon—an extremely solitary activity—for 27 miles. If you have not seen an eclipse the idea sounds very poetic—your marathon run being started by the timing of nature. However, in reality, most eclipse chasers are astounded at the impracticality of the start of the marathon and some have expressed their concerns. The marathon runners are required to be ready and in position before totality—this will actually prevent them, the organisers, and other spectators near the start of the track from fully entering the world of totality. Any feeling of connection eclipse virgin runners feel will have to be put aside immediately in order to focus on the race. Serious marathon runners are likely to be just as passionate about their race as eclipse chasers are about the eclipse. However, it seems an unnecessary shame that the opportunity for the runners to fully experience the eclipse – the central focus of this marathon - will be reduced due to the starting time. Perhaps many

[2] this was correct at the time of writing in March 2012.

runners will find themselves delaying their start to the marathon just to savour the moment of totality? As James has noted, "*there are going to be a lot of startled athletes at the starting line*".

With this Ring, I Thee Wed…

Some eclipse chasers have seen marriage proposals being made during totality, with the presentation of a ring at the time of the Diamond Ring at the start or end of totality. Whilst I consider myself to be romantic in nature, my personal belief is that anytime during totality is the wrong time to propose. The reason for this is that whether you are the one asking someone to marry you, or you are the one who has just been asked, it is a significant moment in your life and one that you would want to be fully present for. By considering a marriage proposal either at the start or end of totality, you will be preventing both parties from being able to fully enjoy two very significant events.

If there are any romantics out there planning on doing this, then waiting for a few minutes after the SECOND Diamond Ring may be the most suitable time. This will allow enough time for people to get back to and reacquaint themselves with the real world. In this way, the total eclipse, and then the proposal can be fully experienced, with no distractions—making one big double whammy of an experience rather than causing a conflict between two experiences. This does mean, however, that the proposer may have significant real world intrusions of anxiety in Shadowland, before the question is popped. I would definitely not recommend this for eclipse virgins!

3 Things that Irritate Eclipse Chasers

Eclipse chasers are generally optimistic, happy, grateful, appreciative, and passionate about life. However, there are moments when they can and do get annoyed—when things get in the way of seeing a total eclipse, and when they hear comments from people that an eclipse is no big deal. Consider the following:

I've seen an Eclipse—I don't Know What the Fuss is about

Some people in Belfast say "*Yes, I was here for the eclipse in '99, I saw it from Belfast. It was brilliant, it went really dark*". Er, no. Seeing an 80 % partial eclipse would be a really interesting experience, as you would see a 'bite' taken out of the Sun, leaving a crescent shaped Sun in the sky which over time reduces the amount of light reaching Earth. However, the dimming experienced during a total eclipse

is not really noticeable until 95 % or so. The shadow only completely covers those who are in the path of totality. The misinformation that people have seen a total when they have only seen a partial is not the thing that annoys an eclipse chaser though. It is when it is accompanied by the comment—*"I don't know what the fuss is about"*. This is because the person actually has NOT seen totality! When those who have not experienced totality question and listen intently to your explanations and descriptions and then dismiss the personal significance simply by saying "*So it just goes a bit dark*"—that is beyond infuriating!

I've seen One on TV—I don't Need to Travel to See One

The image of a total eclipse is beautiful, and one that is being increasingly used in popular media. However, seeing the image on TV is light-years away from experiencing the magic of totality. The personal accounts in this book have hopefully given the reader a sense of what it is like and how important it is to actually experience totality, rather than just read about it or watch it on TV. Nothing can convey the experience. It is like watching someone on TV eat a gorgeous gooey chocolate dessert that just melts in the middle, and thinking that by observing this you have experienced it. You may know what it looks like, and you may even have seen the reaction of the person eating it, but you miss out on the remaining 99 % of the experience because you cannot smell it, taste it, or feel the gooey texture melt in your mouth. It is the same with totality. Watching it, and thus being restricted to the visual, does not convey anything about how it *feels*.

Just a Quick Peek…

People who photograph during totality have a huge amount of preparation to do, and a number of tasks to focus upon. They sometimes have several cameras recording time sequences of the whole eclipse. Any bumps or knocks to this equipment can ruin the planned sequence of photography. Also, if operating several pieces of equipment, a great deal of concentration is required. Totality lasts a few minutes at most, and for some that time is crucial for getting the photographs they need. As a general rule of thumb, the more equipment a person has, the less likely they are to be in a position to be able to engage in conversation or to respond politely at requests to take a look during totality. If people look like they are preoccupied with their equipment, give them space and let them be. If you see a telescope already set up, do not ask someone for a quick look, and do not stand in front of them. However, if someone offers you the opportunity, then do take it!

Say Cheese

The diminishing light associated with the eclipse will mean that a camera set to 'auto' will begin to use an automatic flash near the time of totality. *Turn flashes off!* This is really important, as a lot of the totality experience is about viewing the corona, and eye adaptation to the darkness is required. Flashes of light going off don't allow this to happen and can ruin the experience for everyone. Furthermore, they have no benefit for photographs. Flashes are intended to illuminate objects within a certain distance—no more than ten metres and certainly not enough to illuminate the face of the Moon 384,400 km away! Make sure flashes are turned off well before the start of the eclipse, so you do not forget. You will see more as a result and will avoid blinding and irritating those around you.

Chapter 17
Helpful Tips for Eclipse Virgins: Getting Started

The following information may be a helpful starting point for eclipse virgins.

1 Locations of the Next Total Eclipses 2012–2020

One of my most treasured possessions is a map that lives on the wall of my office at home and which outlines where the path of totality will occur from 2000 to 2025. I have marked the places where I have already intercepted the Moon's shadow in my 13 years of eclipse chasing and I spend hours at this map, fantasising about where I will next be able to intercept the path of totality. I have always loved maps, but this map is special in that it allows me to mark out these significant moments in my life.

The map in Fig. 17.1 provides an overview of the next five total solar eclipses occurring from 2012 until 2020. Viewing opportunities are available in Australia, Central Africa, the Arctic, Indonesia and North America. The information provided here is not meant to give the detail required to plan a trip to see an eclipse—instead it is a starting point. Further information for each eclipse can be found at websites which will be outlined later in the chapter.

All dates are in keeping with Universal Time. Therefore, it is important that the details are checked for the location that you are planning to observe.

2012: Australia-13/14 November

The next eclipse due to occur will be on 13 November 2012 in North Queensland, Australia (it occurs at sunrise on 14 November local time). This eclipse is of personal significance to me, as it makes landfall in North Queensland, just north of my home town of Ingham.

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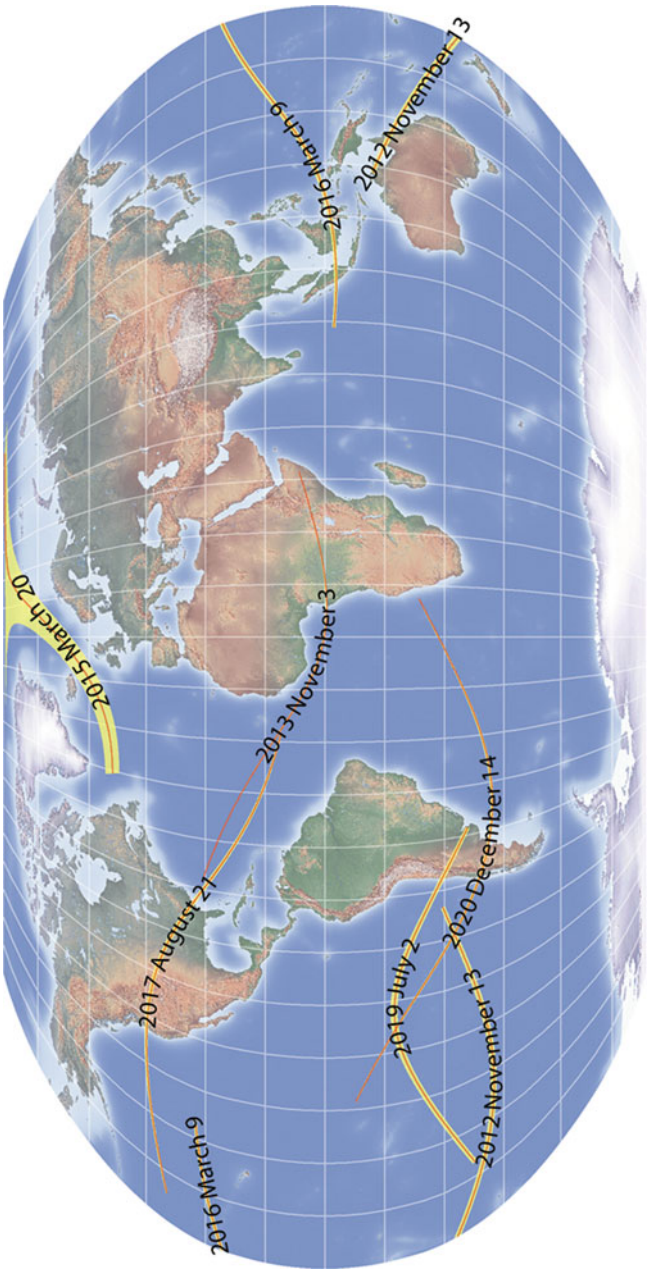

Fig. 17.1 Total eclipses 2012–2020. This map of the world shows the location of the path of totality for the next total eclipses to 2020. © Michael Zeiler

This path of totality crosses over very little land—it mainly lies across the southern Pacific Ocean. It starts at sunrise in Northern Territory in Australia, and then moves across North Queensland before heading out to the Pacific Ocean, passing north of the North Island of New Zealand. The most accessible area to view this eclipse will be along the coast of North Queensland, between Mareeba and south of Cooktown. Accessible towns along the path of totality are Port Douglas, Palm Cove, Northern Beaches, and Cairns City. There is a slight risk of cloud low on the horizon as seen from coastal areas, but this is offset by the ease of access. There is a slightly higher chance of clearer skies on the other side of the Great Dividing Range, including areas like Maitland Downs and Mount Carbine. However, mountains and vegetation may hinder the view. The eclipse will last a maximum of four minutes and two seconds at greatest eclipse out in the Pacific Ocean, and the path of totality is 179 km at maximum width.

After the total eclipse in November 2012, there is co-incidentally an annular eclipse occurring in North Queensland in May 2013. The path of totality for this annular eclipse will make landfall north of Cooktown. After the total eclipse in 2012, the next total eclipse to make landfall again in Australia will be in 2028, where it will cross over the Northern Territory, through Tenant Creek, and right through Sydney.

2013: Central Africa-3 November

The November 2013 eclipse is a rare hybrid eclipse, where the Sun and Moon are the same size except at the ends of the path of totality, where the Moon is smaller than the Sun. That is, at the start and end of the path of totality you will only see an annular eclipse, whereas in the middle of the path of totality you will see a total eclipse.

The path of totality starts in the mid Atlantic Ocean, and makes landfall over Gabon, the Congo, Zaire, Uganda, Kenya, and Ethiopia, and ends at sunset in Somalia. As it is a hybrid eclipse, the path of totality is much narrower in diameter, at most 58 km at the greatest width. This results in the very short totality time of one minutes 40 seconds at the greatest eclipse over the Atlantic, and only seven seconds at the end.

This eclipse presents unique travel challenges, with the path crossing areas that are difficult to travel to, and across some currently politically unstable regions. The best weather prospects are in Kenya and Ethiopia, towards the end of the track. A good option for viewing this eclipse is by boat, which will ensure increased mobility, with longer eclipse duration.

2014: No Total Eclipse

Occasionally there are years where there are no total eclipses. Instead of feeling intense withdrawal in isolation, eclipse chasers come together in their grief in these years for the Solar Eclipse Conference. This gives eclipse chasers time to gather themselves and prepare for future eclipses, and involves sharing the latest research and resources. The Solar Eclipse Conference in 2014 will be held in Alamogordo,

New Mexico, USA from 23–26 October. The conference is usually arranged to coincide with some astronomical event, and in this year the conference will allow for the viewing of a partial solar eclipse on 23 October. Speakers are already being arranged, and information is being updated on Bill Kramer's eclipse chaser website at www.eclipsechasers.com.

2015: The Arctic-20 March

The total eclipse on 20 March 2015 may provide a challenge for eclipse chasers as it occurs over the arctic region.

The path of totality commences south of Greenland and sweeps south of Iceland, making landfall over the Faroe Islands and Svarlbard before ending near the North Pole. This eclipse has a wide path of totality, being 463 km at its widest, and will last two minutes 47 seconds at the point of greatest eclipse.

There is high average cloud for the month of March in this area, resulting in challenges for the eclipse chaser. Given the many weather and travel-related challenges for viewing this eclipse, it may be practical to view this eclipse by air.

2016: Indonesia-9 March

The total eclipse of March 9, 2016 will provide many more viewing opportunities for the eclipse chaser.

The path of totality starts over the Indian Ocean, making landfall across Indonesia, including Sumatra, Borneo, and Sulawesi before continuing through Teluk Tomini and Halmahera in the Moluccas and then heading out over the North Pacific Ocean, to end near the Hawaiian Islands. The maximum width of this path of totality is 155 km, and maximum duration will be four minutes and nine seconds at the point of greatest eclipse in the Indian Ocean.

This eclipse is easily accessible for the eclipse chaser.

2017: North America-21 August

The total eclipse of 21 August 2017 is much anticipated as it is the first total eclipse that will be seen over continental USA since 1979. There is already a lot of excitement about this eclipse, with details being announced on the website at www.eclipse2017.com.

The path of totality for this eclipse starts in the North Pacific Ocean, and then makes landfall across the central part of North America, crossing the states of Oregon, Idaho, Montana, Wyoming, Nebraska, Kansas, Iowa, Missouri, Illinois, Kentucky, Tennessee, Georgia, North Carolina and South Carolina. The path then continues out

into the Atlantic Ocean, with a maximum width of 115 km. The maximum duration of this eclipse is two minutes and 45 seconds in western Kentucky.

The weather at this time of year is usually hot and humid with late afternoon precipitation. However, with excellent road networks, a wide path, and ease of access, this eclipse will be easily accessible to all.

2019: South America-2 July

The total eclipse of 2 July 2019 will be a more challenging eclipse to view as it makes limited landfall.

The path of the eclipse starts in the Pacific Ocean well east of New Zealand, and crosses the ocean north of the Pitcairn Islands, over the Tubai and Tuamotu islands, before making landfall over Chile and Argentina, with sunset south of Buenos Aires. The path of totality is 200 km wide at its maximum, and the maximum duration is four minutes and 32 seconds in the mid Pacific Ocean.

2020: South America-14 December

The total eclipse of 14 December 2020 covers a similar path to the 2019 eclipse.

The path of the eclipse commences in the Pacific Ocean east of the Marquesas Islands, making its way across land in Chile and Argentina, before heading into the Atlantic Ocean. The maximum width of the path of totality is 90 km, and the maximum duration of totality is two minutes and nine seconds, occurring over Argentina.

2 Personal Tips for Beginners

If you have never seen a total eclipse before, and you are thinking about seeing one sometime in the future, then the following information might be useful. These are my suggestions based upon the information that I would have found helpful when I was preparing to experience my first eclipse:

1. Don't be intimidated if you do not know much about eclipses. The eclipse experience is for everyone to enjoy, and everyone will get something out of it. Make sure you see one. For my first experience I knew nothing—and yet I still managed to become completely hooked!
2. Location is key. If you have decided to see a total eclipse, ensure that you go to a location that is well within the path of totality. If you are not within the path of totality then you will not experience a total eclipse. The difference between a 99 % and 100 % eclipse is huge. No eclipse chaser will ever position themselves anywhere other than within path of totality.

3. Find out where the experts are going. Look at where specialist astronomical tours have selected to view totality—this is likely to be the location with the best chance of clear skies. You can then join that tour group, or find another group that is also heading to the same location, or else make your own arrangements. The weather is important—the eclipse will happen regardless of sunshine or rain, but you will not see it if your location is covered in cloud.
4. The only equipment that is essential to view a total eclipse is a pair of eclipse glasses or solar filters. You don't need any other specialist equipment to enjoy the experience. If you happen to have binoculars or a telescope then they can be used to look in more detail at the corona. Solar filters must be used during the partial phases. Make sure you follow the eye safety guide.
5. If it is your first time, try to find a location where there are others around. You are bound to hear others commenting on the eclipse phenomena such as the shadow, Baily's Beads, the Diamond Ring. The atmosphere of a crowd also seems to enhance the experience for many.
6. Don't try to photograph the first one. If you are planning to use a camera, remember to take the lens cap and solar filters OFF during totality. It may seem obvious, but during the excitement many people forget.
7. Experiencing totality is likely to have a significant impact upon you. Many eclipse chasers enjoy capturing their experiences on audio or video to listen to at a later time. Consider taking a recording of the event. Using a Dictaphone is unobtrusive and you can forget about it and just focus upon totality. Otherwise a video camera that can be recording the scene is equally unobtrusive. If you decide to do this, try to comment on the things that you are noticing. You could even consider making diary notes before and after the day in an attempt to capture the change in your outlook on life, your future, and your goals.
8. Watch for a few things during the partial phases—if there are trees, look at the shadows of the leaves projected on the ground as these will be shaped like mini partial eclipses. Any object with holes can be used to project partial eclipse shadows on the ground. Be inventive! It can be useful to have a white sheet of paper to project onto so that the image is sharp. Look around you, look at the horizon. Notice the shadows, shapes, and colours. Notice the behaviour of any animals that may be around. Try to position yourself with a nice outlook where you have a clear panoramic view of the horizon.
9. After the event, try to get a photograph of your awe-face! Do not do this during totality, but just after it is all over. You will find that you are still buzzing. Try to capture that moment.
10. Consider posting your experiences online so that you can share them with others. I have set up a website that focuses on the experience of totality—see www.beingintheshadow.com for details. There are sections for people to write about their experiences. The site will also include an awe-face gallery.
11. After the eclipse, if your appetite has been whetted for more, you can find other eclipse chasers online and through your local astronomical association. Making contact with others can be useful when planning further eclipse adventures. Welcome to the club!

3 Website Recommendations

There are many websites with information about total eclipses—too many to cover in this book. Some are more user-friendly than others, but with a little searching you are bound to find something that suits whatever level of information you are looking for. Here are five websites that are useful for beginners and more experienced chasers alike:

Professor Fred Espenak—www.mreclipse.com and http://eclipse.gsfc.nasa.gov/eclipse.html

Fred is known as Mr Eclipse, is a recently retired NASA astrophysicist and renowned eclipse chaser. His NASA website is considered to be the most comprehensive website for eclipse information, with detailed maps, statistics, data references, and figures of past and future eclipses. The NASA site also contains information about all types of eclipses and other astronomical events. Fred's Mr Eclipse website is more user friendly and contains information suitable for beginners, again with lots of practical information and links, and great images. There is a treasure trove of information. Detailed information about eclipses can be found on his sites.

Jay Anderson—www.eclipser.ca

Jay is an eclipse chasing meteorologist based in Canada, and is featured as one of our nine eclipse chasers. He is the authoritative figure for weather-related information regarding eclipse chasing. Once the eclipse date and track have been calculated, the next most important element is the weather. Jay's site provides climatological information for upcoming eclipses, allowing the traveller to select a viewing site from the cloud and weather statistics gathered over the past 20 years from around the globe. Maps, tables, and graphs decipher the weather prospects, links to data sources allow quick updates during the final days before the event, and insider hints tell how to cope with cloud challenges in the last few moments before totality. The site also provides global monthly cloud charts, and describes the weather at North American star parties. This is a very comprehensive and useful site when planning eclipse chasing activities.

Xavier Jubier—http://xjubier.free.fr/en/index_en.html

Xavier is a passionate French eclipse chaser living in Paris and has over 21 solar eclipses under his belt, 13 of which were totals. Back in 2005 he pioneered the use

of interactive solar eclipse maps to optimize the planning of each eclipse and to allow his extreme eclipse expeditions in Antarctica or remote locations. Later he expanded the tool to include lunar eclipses and solar transits. The interactive maps found on the NASA website are based on his work and he hosts his own Solar Eclipse Interactive Google maps and Google Earth files which contain some unique features. Later on dedicated softwares were released to control digital cameras during an eclipse so that observers are free to concentrate on viewing the event visually. His website is an excellent practical resource which is used by most eclipse chasers. For each eclipse, an interactive map can be used to highlight specific points along the path of totality. Xavier also has information about other astronomical events—a site well worth exploring. Detailed information about each eclipse mentioned in this book can be obtained from this website.

Direct links for:

maps http://xjubier.free.fr/en/site_pages/SolarEclipsesGoogleMaps.html
software http://xjubier.free.fr/en/site_pages/solar_eclipses/Solar_Eclipse_Maestro_Photography_Software.html

Bill Kramer—www.eclipsechasers.com

Bill is an eclipse chasing computer scientist, based in North America. His website has a user-friendly interface and provides a record of eclipse chasing including photographs, log entries, calculation tools, and a variety of articles about solar eclipses, such as how to take photographs during an eclipse. There is a news section that aims to keep people updated on the latest information relevant to eclipse chasing, and links to other key websites. His website is home to the Eclipse Chaser Log, where people can enter their eclipse chasing activities and their total time within the shadow is automatically calculated and shown on a map—a nice interactive touch!

Michael Zeiler—www.eclipse-maps.com

Michael is an eclipse chasing cartographer based in New Mexico, USA. He has combined his love of maps and eclipses to produce detailed maps of the path of totality (including the map in Fig. 17.1). His recent world map of total eclipses from 2010 to 2060 will no doubt become a feature in the homes of many eclipse chasers in the years to come. If you enjoy maps, you will enjoy this site.

Chapter 18
Conclusion

1 Trying to Explain the Inexplicable

Two Aspects to Totality: The Science and the Experience

Eclipse chasers say that there are two aspects to a total eclipse. Firstly, there is the science of the total eclipse—the celestial mechanics. It is fascinating when you think about the apparent coincidence in scale and the alignment of the Earth, Moon, and Sun that allows this natural event to be experienced. This alignment and perfect symmetry gives people an intellectual buzz. It's spellbinding and mesmerising.

Then we have the immersive experience of totality which we have explored in this book. Totality is eerie and dramatic, and elicits unexpectedly strong emotional and physical reactions. That is why it appeals to everyone—anyone can connect with the awesomeness of totality. It is a mystical experience—with a kick. There is so much within the totality experience as a unique and single event —the sense of wrongness, primal fear, awe, connectedness, euphoria and the desire to repeat the experience that hooks us in. During totality we experience a different world, and a heightened sense of awareness. Although people may know what they are about to see, nothing can prepare them for the intensity of the experience.

We have also explored the motivations of the eclipse chaser, in an attempt to understand what drives this seemingly never-ending passion. This book has shown that there are many reasons why eclipse chasers are motivated to see eclipses. They become passionate about totality, and certainly appear to have obtained additional benefits from repeated viewing of eclipses, including a passion for life generally, a different perspective, a feeling of being connected to something bigger, and a prioritisation of what is important in life. Eclipse chasing also appears to meet important basic psychological needs. The experience elicits biological responses, giving a natural high which then hooks us in. Many are compellingly motivated to re-experience totality to try to make sense of their first experience. Most eclipse chasers also develop competence and share their skills related to their hobby to benefit others.

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However, when I look through these themes as ways of explaining our motivation to chase eclipses, something seems to be missing. This book may have gone some way to describe and make sense of the totality experience, but it leaves me frustrated that I have not been able to capture how *significant* totality is for eclipse chasers. It is easy to see why people struggle to understand the motivations of the eclipse chaser when they look at what eclipse chasers do. We wait for a specific time to go to a specific place on the planet where we stand under a shadow for a few minutes. Then we wait another 18 months to repeat the experience somewhere else. The rewards are difficult to see, and hard for people to relate to. Eclipse chasing might sound like a flippant or self-indulgent activity to engage in, one that creates a high carbon footprint and is a waste of money and time. However, what cannot be explained is the personal significance or the meaning of the experience. The rewards of 'connection' and 'personal meaning' cannot be easily conveyed to others, and the impact lasts much longer than those brief moments of the shadow. These are experiences that trigger a change that then stays with us for the rest of our lives. The unseen and unexpected reward is a deeper understanding of what life is about. It is a personal fulfilment. But it is this side that remains hidden to others.

The Elusive Third Aspect: Personal Transformation and Impact

For eclipse chasers the total eclipse is not just about a single event. The first eclipse is a powerful trigger that results in significant changes that last a lifetime. This personal impact is the third, and hidden, aspect to totality. It is the way in which it grabs you, shakes you, and changes your life by introducing a new way of being, a new default setting. For eclipse chasers there is a long wait to experience this special moment, and although the moment itself is fleeting, the consequences and impact of each total eclipse leave a lasting impression. Each subsequent eclipse is just as important as the first. It is this aspect of totality that remains hidden to others, and has been somewhat elusive even within this book.

There is no obvious way to see the most powerful thing about totality—the personal transformation. One can observe others having a reaction to totality—watch them get emotional, or fall silent, or listen to how it was for them. However, we just cannot see how that experience then goes on to influence that person's life. The most powerful and important parts of the experience are simply not observable. The reward is the significant personal impact that it has—how alive you feel. Once you have an experience that seems to represent something so fundamental to your life, there is no stopping the drive to do it all again.

This is why it can be devastating for an eclipse chaser to miss an eclipse or be clouded out. Each eclipse is significant and it can be difficult for others to understand the angst involved when you cannot go to one. I missed 2010 because of Geordie's illness, and the one before was in 2009 which was clouded out. Therefore it has been almost four years since I have seen my last eclipse. Seeing the next eclipse in 2012 is just as important as it has ever been. I never say to

myself that there will always be another—it is as though I mourn the loss of each one that I am just not able to experience. Each one was a significant moment that can no longer be experienced, gone forever.

Perhaps we never will be able to communicate this personal transformation to others who have not lived it. So I am left with this as a frustration. It has made me realise that a key question that needs to be asked of eclipse chasers is: how has experiencing totality *changed* you? How has it *changed your life*?

2 Going Back to the Things Themselves

In phenomenological research, we always 'go back to the things themselves'. So perhaps it is appropriate to end by looking at the ways in which eclipse chasers themselves have tried to capture this third elusive aspect to totality—the impact that totality and their eclipse chasing has had on their lives.

Eclipse chasers have no trouble recalling the exact moment when their lives were changed by their first experience of totality. The event is usually permanently encoded in their memories, so that they can re-live that moment as if it were yesterday. For eclipse chasers, that moment counts as one of the most significant events of their lives. The first experience of totality marks the day that they became *fully alive*, like an awakening. Glenn Schneider recounts his own awakening experience—he was already primed with a strong astronomical interest at the time:

> Forty-two years, as an abstraction, seems a long time ago, but March 7, 1970 (18 hours 31 minutes 52 seconds UT to be precise) is so indelibly etched in my mind, it seems but a moment ago. That was the instant when coronal photons first were imaged upon my retinas—and changed my life forever.

Glenn describes how he had prepared and rehearsed for months what he was going to be doing during the two minutes and 53 seconds of his first total eclipse—splitting his time between his telescope, binoculars, and still and movie cameras and trying to observe specific phenomena with the naked eye:

> All set and ready to go, and I was then numbed and overwhelmed as if a bolt of lightning had struck. I froze like the proverbial deer in the headlights. Nothing, I had read, discussed with others, or thought I had learned about "the event" prepared me for the grandeur of what was happening. I just stood there limp, binoculars dangling around my neck, telescope unattended; cameras untouched, and just stared at "the hole in the sky". I could not have moved if I wanted to—but at that instant I didn't "want" anything. "Transfixed" is far too inadequate a word. "Stunned" is probably better. Time did cease to flow, but somehow, before I knew it… it was over. I don't think I moved 1 mm or had dropped my purely naked-eye gaze at totality for even a second of those two minutes 53 seconds of totality. I was literally shaking as the CIII diamond ring grew brighter and the sky background swamped the corona.

Glenn talks here about the moment of personal transformation in his life. However, that first eclipse shaped how he subsequently lived his life for the next forty years. He has described elsewhere how his first eclipse experience gave him

an insight into a way of living, a perspective on life, which has not shifted. The passion remains just as intense. It has impacted upon his life choices, his career, the way he spends his time, and his outlook on life. This is true for many eclipse chasers. A response from the eclipse chasing survey highlights this:

> Total solar eclipses are almost as singularly significant as being present at the birth of your children.

The personal significance and transformation following the first eclipse is the thing that drives eclipse chasers. We feel it, we then live it.

My Own Personal Musings as an Eclipse Chaser

Throughout this past year, I have been able to think a lot about my eclipse chasing and what it means to me. There are many reasons why I continue to chase eclipses. As an event, they are such a powerful experience, mind-blowing, and so beautiful and amazing to see. I enjoy the high, the buzz, the excitement. It is a very personal moment for me—I enjoy the moment of recognising that I am not the centre of my world, and the insignificance that comes with that. I can actually experience that at any time now, I like slipping into that frame of reference which is so obvious during totality. Doing so keeps me grounded and allows me to keep perspective on the things that are happening in my life that really do not need to cause me excessive anxiety or concern. Chasing eclipses also serves as a reminder to keep a focus on how I want to live my life, and to make choices based on what is important for me. Having a total eclipse experience always ensures that my life choices are kept firmly within sight—a way of ensuring I am on the path I want to be on.

When I experienced my first total eclipse, I felt I came alive in a way that I had never felt before. Every subsequent eclipse has been a reawakening of that moment, and a reminder of how lucky I am to be alive, and how I will appreciate the life I have and live it in a way that is meaningful for me. I feel grateful for each opportunity I have had to experience an eclipse. Eclipse chasing is a part of who I am. It is not just a psychological need, it is not just based upon a biological drive—it is simply a part of the person I have become.

There are so many other ways that eclipse chasing has enhanced my life—it has allowed me to meet like-minded others, who also share this passion and similar priorities. I have no doubt that these friendships will be lifelong—after all, we now travel and seek out new experiences together. Eclipse chasing has also allowed me to find even more meaning in my travel, which is very satisfying. I feel incredibly lucky to be an eclipse chaser.

3 Conclusion

Eclipse chasers have stumbled across an event that allows them to be abruptly reminded about their place in the Universe and what life is about. Many are simply not aware of this side of the totality experience beforehand, so when it occurs it is incredibly powerful. Very few people about to see their first total eclipse will know that their life may be about to change—that they may find the event so incredibly powerful and positive that they will spend their life repeating the experience.

Hopefully what I *have* done in this book is to allow eclipse chasers to compare and make sense of their own experiences by reading about these experiences and my interpretations of the selected eclipse chasers. I also hope that it has given those who have not yet experienced this amazing phenomenon an insight into the intriguing world of totality. Perhaps I have inspired some to go and experience totality for themselves. We should all have a passion in life—it doesn't have to be eclipse chasing. But if you ever do get an opportunity to see a total eclipse, just do it. It could change your life.

ECLIPSE

By Diane Ackerman

The black dogs of hell
are chasing down the Sun
whose horns pour light,
hooves cut sparks,
eyes weep the clement sap
rippling through our veins
that keeps the heart limber
and the seasons sane.

The runner stumbles.

The air stiffens like a tomb.
Butchered light staggers
across the sea. Then day fails,
time eases its grip
and, thrashing, the world reels
upside down
as stars pant on the horizon
like a regiment of wolves.

The runner stumbles.

Darkness falls at noon.
The cold fabrics of night
cascade through skies
fantastic and grim.
A cloud cortege struts
above the ancient ruins,
where planets appear
like silent drumbeats.

*The runner stumbles.*2

A door opens to the ghost towns
of our past, and we pray
that nothing will phase the Sun
undulating
through our crops,
tethering our clocks,
sweeping the nightmares
from our dreams.

The runner stumbles.

We would sacrifice anything
–our wealth, our limbs,
our power, our kin–
to ransom that hot-blooded
infernal mate, so rash
and unruly, crooning fire,
yet immense as life,
that sweet cheat, that savage light.

Epilogue

It is March 2012. I find myself in another freezing cold situation, and realise that being raised in the tropics of Queensland means that the novelty of cold environments never seems to wear off. The air inside the room is around −5 degrees Celsius. I am in the Ice Bar at the original Icehotel in Jukkasjarvi, Sweden. The whole building is made of ice—the walls, floor, ceiling, light fixtures, tables, and the bar itself, where a row of glasses made of ice are lined up. There is music coming from speakers that I cannot see, but I imagine that they are hidden by ice sculptures in keeping with the rest of the Ice Bar.

There are six of us huddled together at the bar, standing opposite the young barman, whose arctic fur hat is the source of great amusement amongst us. He is slowly pouring our vibrantly coloured vodka drinks. We are all rugged up in our warmest clothes, hats and gloves and we laugh as we acknowledge that this is not our usual bar attire. I look around at everyone who is present—my friends and fellow eclipse chasers. Geordie, of course, always present and sharing my life's journey. John and Maggie, eclipse chasers who have travelled from Colorado with only a few weeks' notice, because, well, why not? Sue, as featured in Chap. 11, who has travelled from London to see the aurorae, stay at the Icehotel and to ski at the most northern ski resort—always trying to squeeze in every last drop of adventure. James, as featured in Chap. 10, who we have now added to our ever-growing number of eclipse chaser friends we meet in different places around the world. The motivation to come together to share these moments stems from the same passion we all share for eclipse chasing.

The young barman finds it intriguing that the six of us—eclipse chasers from three different continents—have joined together to share the experience of seeing the aurorae. All of us had previously experienced intense displays of the northern lights, and the aurorae we had just witnessed were less vivid, with gentle waves of green lingering across the sky. It was beautiful and elicited the feelings of insignificance and connection that so clearly characterises the total eclipse experience. I realise that this moment in the Ice Bar, re-living the aurorae and connecting with our friends, is another moment that will stay with me forever, another turning point where I understand how precious life is. However, this time,

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there is no health crisis. Life is good. We clink our ice glasses together, toast the completion of my book, and our shared enthusiasm and passion for experiencing life. As we return to one of the ice suites to continue the celebration, I feel completely at peace. I look at Geordie, and notice how cold but content he is. I look at our other friends and smile, my face hidden by the hood of my coat. I know we will all soon meet again, on the other side of the world during the next total eclipse in November 2012. I am comforted by the fact that our next shared moment will be much closer to my home in Australia, my family, and thankfully, somewhere warm.

Kate, March 2012

Fig. 1 Experience seekers meet at the Icehotel after chasing Northern Lights. From left - Sue Garlick, James McClean, Kate Russo, John McKune, Maggie McKune, Geordie McRobert. (c) 2012

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