

SCIENCE ♦ PREPARATION ♦ EXPERIENCE

You've got the flights. Now what?

On 12 August 2026, a total solar eclipse will cross Iceland and northern Spain, the first visible from Western Europe since 1999. The window is narrow. The experience is extraordinary. And the difference between a prepared observer and an unprepared one is the difference between a life-changing experience and a beautiful blur you can't quite remember.

- The science, made vivid - from the corona to Bailey's beads
- Iceland vs. Spain vs. Cruise - a complete destination comparison
- Gear, safety, and the non-negotiables - ISO filters, photography, eye protection
- A phase-by-phase eclipse day timeline - first contact to fourth
- The Totality Passport - a built-in workbook to take into the field

Jared Koh has witnessed four total solar eclipses - two from land, two at sea. His father, Koh Joo Beng, MSc in Astronomy, has chased fourteen totalities across four continents over more than two decades; his photography and "Veteran's Notes" appear throughout the book.

Don't just chase totality. Make it yours.

CHASING TOTALITY

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The Complete Handbook for the
2026 Total Solar Eclipse

JARED KOH / KOH JOO BENG

J A R E D K O H
K O H J O O B E N G

Chasing Totality: The Complete Handbook for the 2026 Total Solar Eclipse

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About the Authors

Jared Koh

Jared Koh has witnessed four total solar eclipses across two continents — two from land and two from the deck of a cruise ship. He brings the perspective of an experienced eclipse traveller who understands both the logistical complexity and the emotional weight of chasing totality. Jared is based in Singapore.

Koh Joo Beng

Koh Joo Beng has travelled to fourteen solar eclipses across four continents over two decades, successfully observing the corona eight times. He holds a Master of Science in Astronomy and brings a rare combination: the technical precision of an engineer and the hard-won field wisdom of a veteran eclipse chaser. In this book, Joo Beng's voice appears in dedicated sidebars throughout each chapter offering personal stories, technical insights, and the accumulated wisdom of a lifetime spent standing in the Moon's shadow.

How to Use This Book

This book is organised in four parts:

Part I: Understand (Chapters 1–3) starts off with science. What a total solar eclipse is, what makes the 2026 eclipse distinctive, and what phenomena you will see — from the corona to shadow bands to the 360-degree sunset.

Part II: Prepare (Chapters 4–6) explains the planning process. Where to go, what to bring, how to stay safe, and how to prepare yourself — logistically and emotionally — for the most compressed spectacle in nature.

Part III: Experience (Chapters 7–8) gives you the real-time guide and the recording tool. Chapter 7 walks you through eclipse day. Chapter 8 is the Totality Passport — a fill-in workbook designed to be completed before, during, and after the eclipse. Bring a pen.

Part IV: Carry It Home (Chapters 9–10) helps you process the experience, develop your photographs, tell the story, and — if the shadow has taken hold — plan the next chase.

The Appendices provide reference material: city-by-city contact times (Appendix A), a glossary (Appendix B), and recommended resources (Appendix C).

Read Part I at your leisure — weeks or months before the eclipse. Read Part II as you finalise your travel plans. Read Chapter 7 the night before eclipse day. And keep Chapter 8 in your hands when the shadow arrives.

Downloadable PDF Companion

The fill-in pages in Chapter 8 (The Totality Passport) are designed for pen and paper. A free, printable PDF companion containing all workbook pages is available for download at: www.chasingtotality.org/workbook



Print it. Fold it. Bring it with you.

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Foreword: Two Voices, One Shadow

A Letter to the Reader

By Jared Koh

You are about to spend a significant amount of money to stand in a very specific place at a very specific time and stare at the sky for less than two and a half minutes.

I know how that sounds. I've done it four times.

The first was in 2012, aboard a cruise ship in the South Pacific. I was twenty-something, exhausted from a career in hotel management, and only half-aware of what my father had been planning for months. He had four cameras set up on the deck. Other passengers had champagne. I had a smartphone that I pointed at the Sun like a tourist photographing a cathedral. And when the moment came, when the light failed and the corona flared and the ship erupted in cheers, I realised I had spent the most extraordinary ninety seconds of my life watching it through a three-inch screen.

I regretted it immediately. I have regretted something after every eclipse since.

That is the first thing I want you to know about this book: there is no getting a total solar eclipse "right." The event is too brief, too overwhelming, and too layered for any single human being to absorb it perfectly. You will miss something. You will wish you had looked left when you looked up, or that you had put the camera down, or that you had picked it up sooner. This is not a flaw in your preparation. It is a feature of the experience. A total solar eclipse delivers more sensory information in two minutes than your brain can process in two hours, and the gap between what happened and what you noticed is where the longing lives. The longing that makes people chase the next one, and the next one after that.

So if perfect is off the table, what is the goal?

The goal is that you deeply enjoy yourself. Not in a passive way, but in the specific and intentional way that a sommelier enjoys a great wine. Understanding what you are about to see does not diminish the wonder, it deepens it. The science in this book is not there to make the eclipse clinical. It is there to make the wonder articulate.

Without the preparation, the wonder has no context. Without the context, the moment washes over you and is gone. This book exists to make sure that does not happen to you.

I wrote **Chasing Totality** because I have been on both sides of the eclipse experience. I have been the unprepared first-timer who wasted his ninety seconds on a bad smartphone



video. And I have been the member of a well-drilled family team, each of us assigned a specific role (my father on the telescope, my younger brothers on the drone and manning a video rig, me on the 360-degree panoramic camera) working a rehearsed timeline down to the second so that we could capture everything and still, in the end, look up with our own eyes and **feel** it.

The difference between those two experiences was not talent or luck. It was knowledge.

This book gives you that knowledge. Not the specialist knowledge of a scientist — my father provides that, and you will hear from him in a moment — but the sometimes embarrassing knowledge of someone who has shivered at pre-dawn on a farm in Idaho, sat in traffic for four hours after totality in a field outside San Antonio, watched his brother propose to his girlfriend after the diamond ring flashed on a ship off the coast of Australia, and held his breath through seventy-percent cloud cover in Texas until the clouds parted at the last possible second.

I know what it feels like to invest thousands of dollars, fly halfway around the world, and then stare at a cloud bank wondering if you have just made the most expensive mistake of your life. I also know what it feels like when the cloud parts.

On 12 August 2026, a total solar eclipse will cross Greenland, Iceland, and northern Spain. It will be visible from cruise ships positioned in the Arctic and the Mediterranean. You are probably already booked somewhere along that path, or you are deciding where to be. Either way, you have committed to chasing the shadow.

This book is your companion for that chase. It will walk you through eclipse day in real time, phase by phase, so that when the moment comes, you will know exactly what is happening and you will be free to stop thinking and simply experience it.

There is no perfect eclipse. But there is your eclipse. Let's make it count.



Standing in the Shadow

By Koh Joo Beng

In 2008, I stood south of the Gobi Desert with four cameras, a wife who was far more interested in the two-week holiday than in the two minutes of darkness, and a piece of advice from Fred Espenak (the legendary "Mr. Eclipse") ringing in my ears: **Don't bother with cameras. Just use your eyes.**

I ignored him.

I had rigged up the four cameras at our eclipse site: one for wide-field video, one for close-up photography through the telescope, one pointed behind us, and one aimed at the horizon. I had written a timeline: actions mapped to the second, from five minutes before second contact to one minute after third contact. It was, looking back, an absurdly ambitious plan for a first attempt. The professional eclipse tour group that had bussed us to this cordoned-off patch of desert had set up buffet tables, cold drinks, and even dug latrines in the sand. They had done everything right. All I had to do was execute my sequence.

When totality came, I did. Every camera fired. And when it was over, I looked at my wife, and we held each other in the sudden warmth of the returning Sun, and I realised two things:

First, Fred Espenak was right. You must look with your own eyes. No camera, no matter how well prepared, captures what the human eye sees in that moment. The pearly streamers of the corona reaching out into space, alive and shimmering, extending three, four, five solar diameters from the black disc of the Moon. Your eyes have a dynamic range that no sensor can match.

Second, Fred Espenak was also wrong, at least for me. Because with a rigorous plan, you can have both. You can fire every camera **and** look up. You can be the engineer **and** the witness. The timeline is what gives you permission to stop and experience the moment, because you know that everything else is already taken care of.

That tension, between capturing and experiencing, between the engineer and the human being standing in the dark, has defined every eclipse I have chased since.

I have now travelled to see fourteen solar eclipses, eleven of them in pursuit of total darkness during daytime, while the other 3 were annular eclipses. Of those eleven, I have seen the corona eight times. The other three, the clouds won. In Shanghai 2009, I was completely rained out. A failure I trace directly to not studying the historical cloud-cover data carefully enough. That single mistake became the most important lesson of my eclipse career: **cloud statistics first, scenery second.** I have never made that error again.

Each successful eclipse has taught me something different. In Chile, I saw shadow bands for the first time. Shimmering ripples of light racing across a white sheet spread on the ground, gone in seconds. In Texas, with a seventy-percent cloud forecast, everyone in our group was holding their breath. When the clouds tore open just after second contact, the elation was sharper and more visceral, than any clear-sky eclipse I have witnessed. The chase is as much about faith and resilience as it is about science.

During those two minutes of totality (sometimes less, never more than about six and a half) something happens to me that I have never been able to fully explain. I become very focused, very distant. I am not a father. I am not a husband. I am an engineer with a mission, capturing photographically every detail I can. The emotion does not come during the darkness. It comes at third contact — the diamond ring — when the first bead of sunlight blazes back around the Moon's limb and the world gasps and I reach for my wife's hand. That is when I am human again.

Each total solar eclipse's corona is unique, and it identifies a particular eclipse definitively. I have a collection of these fingerprints now, spanning nearly two decades and four continents. But if you asked me why I keep going back, after all this time, the honest answer is not the photographs.

It is the sharing.

When my children first joined me, I gave them all the same instruction: **If anything goes wrong with your equipment, drop it. Just enjoy the eclipse.** The technical system exists so that, ultimately, the people in it can safely surrender to the awe. That is the whole point.

Standing in the shadow of the Moon is the greatest demonstration of the power of science I know. Only through rigorous science can we predict to the second when and where the Moon's shadow will touch the Earth. And yet, when you are standing in that shadow, what you feel is not intellectual. It is something older and deeper. It is the same thing that made ancient peoples fall to their knees.

Astronomy is the pinnacle of all sciences. The geologist, the biologist, the philosopher. They all meet in the shadow.

I wrote my portions of this book because I want you to stand where I have stood and see what I have seen. Not through my photographs, but through your own eyes. If this handbook helps you understand the mechanics well enough that you can stop worrying about them and simply look up when the moment comes, then Jared and I will have done our job.

You can only put yourself in the right place at the right time. And God willing, you will witness this wondrous marvel of nature.

Chapter 1: The Anatomy of a Total Solar Eclipse

The Two Minutes That Change Everything

It begins with the light.

Not its arrival, its departure. You have been watching through your eclipse glasses for the better part of an hour as the Moon slowly eats into the Sun's disc, and it looks like a calm, predictable event. A celestial geometry lesson unfolding on schedule.

But now, in the final minutes before totality, the world starts to betray you.

The sunlight turns strange. Not dimmer, but wrong. The Sun is still blindingly bright. The shadows at your feet sharpen into something almost surgical: every edge razor-cut, every leaf casting a crisp double outline, because the Sun is no longer a disc but a thin crescent, and a crescent light source produces shadows unlike anything you have seen before. If you are standing near a tree, look at the ground beneath it. The dappled patches of light that normally pool under the canopy have transformed into hundreds of tiny crescents, each one a pinhole projection of the eclipsing Sun, scattered across the earth like a scattered deck of cards.



As the partial phase deepens, every gap in the foliage becomes a pinhole camera, projecting tiny crescents of the eclipsing Sun on the ground below.

Photograph: Koh Joo Beng

The temperature drops noticeably, as though someone has opened a window in a warm room. Three, four, five degrees in ten minutes. If you are in Iceland, you will feel this acutely. If you are on a cruise ship, the breeze will carry it. In temperate climates, the drop is noticeable within minutes. At altitude or at high latitudes the effect is sharper still.

The colours shift. The sky does not darken evenly the way it does at sunset. It remains blue overhead but takes on a strange metallic quality, as though the contrast has been turned up and the warmth drained out. The landscape around you begins to look like a photograph with the saturation pulled down. Greens deepen. Skin tones turn ashen. Animals, if there are any nearby, go quiet.

And then, in the final sixty seconds, it accelerates.

If you are lucky and prepared you may see **shadow bands**: faint, rippling lines of light and dark racing across the surface, like the patterns seen on a sunny day at the bottom of a swimming pool. They are caused by the last narrow sliver of sunlight refracting through turbulence in Earth's atmosphere, and they are one of the hardest things to see in all of astronomy. They appear for a few seconds before and after totality. Many people miss them entirely. Shadow bands are nearly impossible to photograph so this is a visual treat for the keen observer.

Then the shadow comes.

You may be tempted to try to see the shadow approaching. But you shouldn't bother. The shadow is so large that if you concentrate on trying to see its approach, you will waste precious seconds experiencing the actual moment. When it arrives, everything happens at once.

The last bead of sunlight blazes from behind the Moon's edge: the **diamond ring**, a single brilliant blob of light with the faint glow of the corona already visible around the Moon's silhouette. It lasts for a second. Then the blob fragments into a string of bright dots along the Moon's edge: **Baily's beads**, named for the astronomer Francis Baily, who described them in 1836. The beads wink out as quickly as they appeared.

And then: totality.

The Sun vanishes. The corona erupts into visibility. It is the thing you cannot prepare yourself for, no matter how many photographs you have studied. It is alive. It shimmers. Its streamers extend one, two, three solar diameters from the black disc of the Moon, sculpted by the Sun's magnetic field into shapes that are unique to this moment and will never be repeated.

Protruding from the edges of the Moon, you may see vivid pink or red points of light: **prominences**, loops of superheated hydrogen gas arcing from the Sun's surface. They are

visible only during totality, when the Moon blocks the overwhelming glare of the photosphere.

The sky is not black. It is a deep, dark blue. Not twilight, but something stranger. Around the horizon, in every direction, a band of warm colour glows: oranges, pinks, yellows. This is the **360-degree sunset**, and it is perhaps the most disorienting sight of all, because your brain expects a sunset to occupy one edge of the sky. During totality, you are standing inside the Moon's shadow, and the sunlight that still falls on the landscape sixty or seventy kilometres away in every direction reflects back toward you off the atmosphere, creating a complete ring of sunset light on the horizon.



During totality, you stand inside the Moon's shadow. Sunlight still falls on the landscape beyond the shadow's edge, reflecting back to create a 360-degree ring of sunset colours on the horizon — the most disorienting and beautiful sight in all of eclipse chasing. Photograph: Koh Joo Beng

Look up. If the sky is clear, you will see what looks like stars but are more likely planets. Venus and Mercury are often visible during totality, bright points of light that have no business appearing in the daytime sky. Jupiter, Saturn and Mars may join them, depending on their positions. You are experiencing night in the middle of the day.

This is what you are travelling for. This is what this book prepares you to see.

It will last, at most, a few minutes. In 2026, from the best locations along the centreline, totality will reach two minutes and eighteen seconds. And then the process reverses: the diamond ring blazes back on the opposite limb of the Moon, the corona vanishes, the light returns, and the temperature climbs, and something inside you releases.

People cheer. People weep. People hold each other. You will react in your own way. You do not need to plan it.

A Cosmic Coincidence

The entire spectacle of a total solar eclipse depends on a coincidence.

The Sun is approximately 400 times larger in diameter than the Moon. It is also approximately 400 times farther away. These two facts, which have no physical relationship to each other — one is a matter of nuclear physics and stellar evolution, the other a matter of gravitational orbital mechanics — conspire to make the Sun and the Moon appear almost exactly the same size in our sky: each subtending an angle of roughly half a degree.

This is why, during a total solar eclipse, the Moon can **just barely** cover the Sun. Not by a wide margin, not with room to spare, but precisely enough to block the blinding photosphere and reveal the corona (the Sun's faint outer atmosphere) in all its glory. If the Moon were slightly smaller, or slightly farther away, there would be no total eclipses. Only annular eclipses, where a ring of sunlight surrounds the Moon's silhouette. If the Moon were significantly larger, totality would be commonplace, and the corona would be significantly obscured.

This coincidence is temporary on cosmic timescales. The Moon is slowly receding from Earth at a rate of about 3.8 centimetres per year. Roughly the speed at which your fingernails grow. A hundred million years ago, the Moon was significantly closer, and total eclipses would have lasted much longer, with no annular eclipses at all. A hundred million years from now, the Moon will be far enough away that it will never quite cover the Sun, and total eclipses will cease entirely.

We are alive during the window. Earth is the only planet in our solar system where this happens: where a moon is precisely the right size and precisely the right distance to produce a total solar eclipse as we know it.

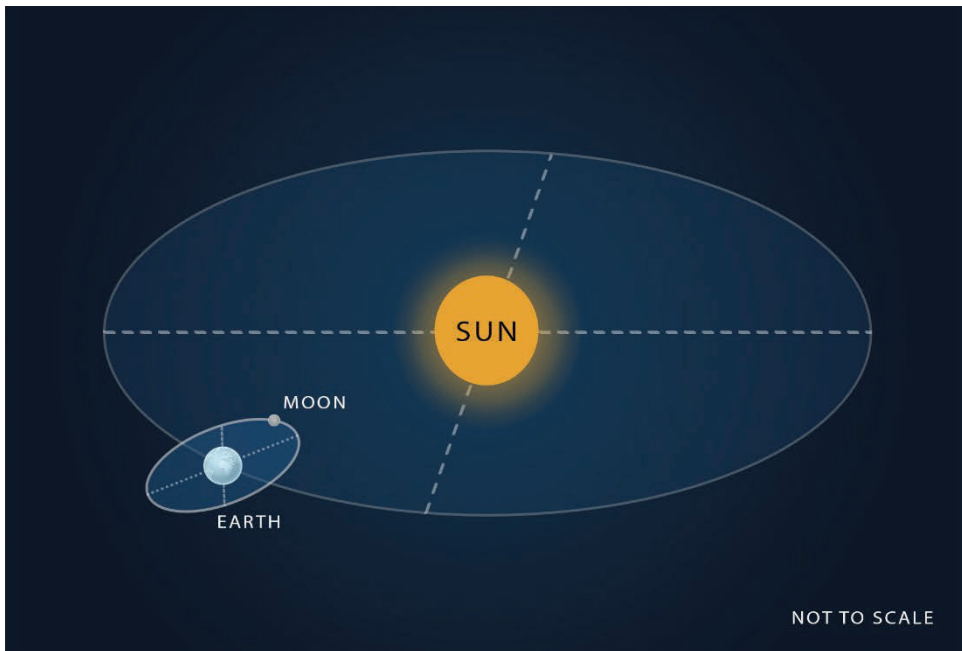
Why Eclipses Don't Happen Every Month

If the Moon orbits the Earth roughly once every 29.5 days, and a solar eclipse happens when the Moon passes between the Earth and the Sun, why isn't there an eclipse every month?

The answer lies in a five-degree tilt.

The Moon does not orbit Earth in the same plane as Earth orbits the Sun. The Moon's orbital plane is tilted approximately five degrees relative to the **ecliptic** — the plane of

Earth's orbit around the Sun. This means that, most months, the New Moon passes slightly above or slightly below the Sun as seen from Earth. It misses.



The Earth-Moon orbit is tilted relative to the Sun-Earth orbit.

Diagram: Koh Joo Beng

The two points where the Moon's orbit crosses the ecliptic plane are called **nodes**. A solar eclipse can only occur when the New Moon happens near one of these nodes. The Moon, the Earth, and the Sun must be aligned not only left-to-right but also up-and-down. This alignment happens roughly twice a year, during periods called **eclipse seasons**, each lasting about 34 days. Within those seasons, at least one solar eclipse of some kind will occur. But a **total** solar eclipse requires an even more precise alignment. The Moon must be close enough to the node, and close enough to Earth, that its shadow actually reaches the ground.

Because of this, total solar eclipses occur somewhere on Earth roughly once every eighteen months, on average. And because the Moon's shadow is narrow, any given location on Earth will statistically experience a total solar eclipse only once every 375 years or so. If you wait for the eclipse to come to you, you may have to wait a very long time.

That is why eclipse chasers travel.

Thank You for Reading

We hope this sample has provided valuable technical insight into your preparations for the August 2026 total solar eclipse. This handbook was designed to move beyond basic observation, providing the logical framework and precision required for a successful expedition.

Get the Full Handbook

Order your copy directly from Amazon:

<https://www.amazon.com/dp/B0GYHRRR5C>

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