Between now and 2028, Earth will witness 15 total solar eclipses. Here’s your guide to these extraordinary events.

by Michael E. Bakich

What is Earth’s most spectacular recurring natural event? Without question, it’s a total eclipse of the Sun. Experience darkness at noon just once, and you’ll never forget it.

No matter how much a talk, video, news story, or this article builds your expectations, a total eclipse will not disappoint you. But it has to be total — a partial just won’t do. Partial eclipses are like almost winning the lottery — there’s no comparison.

Astronomers have calculated when eclipses will occur for the next millennium and beyond. I’ll outline the best events in the near future. The next 20 years contain 15 total solar eclipses. Four offer totality (the time when the Moon completely hides the Sun’s face) in excess of 5 minutes. Two are even rarer eclipses that exhibit both annular (which leaves a ring of the Sun’s disk around the Moon) and total phases. All are worth seeing.

Even if this article inspires you to travel to only one, you’ll thank me for the rest of your life.

I’ve listed the eclipses in chronological order. Pick the ones that interest you, and start making plans. Get serious about the trip no less than 18 months before eclipse day. For detailed information — including cloudiness forecasts — visit NASA’s eclipse web site, managed by veteran eclipse chaser Fred Espenak. He posts information about upcoming events several years in advance. You’ll find the site at eclipse.gsfc.nasa.gov/eclipse.html.

**July 22, 2009**

I didn’t plan to list the best eclipse first. It just happened that way. By “best,” I mean this event has the longest duration of totality anyone now alive will see. At the point of maximum eclipse, the Moon will completely occult the Sun for 6 minutes, 39 seconds.

It’s a safe estimate that more people will experience this eclipse than any in history because the path of totality passes over one of the world’s most populous regions. The path of the Moon’s umbral shadow (under which you’ll experience totality) begins in India and moves through Nepal, Bangladesh, Bhutan, and China. Totality in Shanghai, China’s largest city with a population near 20 million, will last 5 minutes.

Observing from land is only one option for this event. You could choose to cruise to the point of greatest eclipse, which lies in the Pacific Ocean. By doing so, you’ll gain more than a half-minute of totality and maintain a great range of mobility if clouds appear.

If you like exotic destinations, this eclipse plunges Easter Island — famous for its huge stone statues — into darkness for more than 4½ minutes. The point of greatest eclipse, where totality lasts 5 minutes, 20 seconds, is in the Pacific Ocean north of the island.

Almost as exotic and definitely easier to reach, Tahiti and the Society Islands lie...
in the eclipse’s path some 2,500 miles (4,000 kilometers) from Easter Island. The duration of totality throughout French Polynesia lasts approximately 3½ to 4½ minutes.

**November 13, 2012**

Twenty-eight months after the Easter Island spectacle, an eclipse with totality lasting 4 minutes, 2 seconds will begin in Australia. Greatest duration of totality occurs in the southern Pacific Ocean 1,334 miles (2,147 km) east of Auckland, New Zealand. For cruise groups wishing to stay a bit closer to land, the centerline of totality passes only 375 miles (600 km) north of New Zealand. There, totality will last more than 3½ minutes. No doubt, many travelers will take this opportunity to visit the Land Down Under. I plan to be one of them.

**November 3, 2013**

In early November 2013, the first of the two “hybrid” eclipses on our list occurs. A hybrid eclipse happens when the Moon lies just close enough to Earth to create an umbra along part of the path. At the beginning and end of the event, Earth’s surface lies beyond the end of the Moon’s umbra. In these locations, observers see an annular eclipse.

Annular eclipses don’t approach the majesty of totals, so most travelers will head for the point of greatest eclipse. This location sits in the Atlantic Ocean just off the west coast of central Africa, and offers 1 minute, 40 seconds of totality. This isn’t nearly as long as the three previous eclipses, but, hey, it’s still totality.

**March 20, 2015**

A partial solar eclipse October 23, 2014, that observers across the United States will see may whet the appetites of eclipsegoers for the 2015 total event. This farnorthern eclipse tracks across the North Atlantic during a time when clouds and inclement weather prevail. If you find a clear spot near the point of greatest eclipse, you can experience up to 2 minutes, 47 seconds of totality. Because of this eclipse’s northern location, you can combine it with a land-based tour to experience the aurora borealis. The point of greatest eclipse lies 450 miles (725 km) from Reykjavik, Iceland, and 640 miles (1,030 km) from Oslo, Norway, both great locations for seeing the northern lights.

**March 9, 2016**

Remote locations abound on this list, and the 2016 total eclipse, which boasts 4 minutes, 9 seconds of totality, is another example. Although this eclipse passes over Sumatra, Borneo, and Sulawesi, the point of greatest eclipse (and probably the best weather) occurs in the Pacific Ocean some 1,350 miles (2,175 km) north of
Papua, New Guinea. Almost all of Australia will see some percentage of a partial eclipse, but none of that continent will experience totality.

August 21, 2017
Fellow citizens of the United States, take note. The first of two total solar eclipses to cross our country in 7 years occurs in the summer of 2017. Great weather should abound along most of the path of totality. It touches land in Oregon, then crosses Idaho, Wyoming, Nebraska, Kansas, Missouri, Kentucky, Tennessee, Georgia, and South Carolina before heading into the Atlantic Ocean.

Casper, Wyoming, and St. Joseph, Missouri, lie directly on the centerline. Near misses include Salem, Oregon; Kansas City and Columbia, Missouri; Nashville; and Charleston, South Carolina. Many large cities, including Portland, Denver, St. Louis, and Atlanta, sit within easy driving distance of totality. The point of greatest eclipse — which offers 2 minutes, 10 seconds of totality — lies only 63 miles (101 km) northwest of Nashville and less than 7 miles (11.3 km) from Interstate 24.

Michael E. Bakich is a senior editor of Astronomy who hopes to view the majority of the eclipses on this list.

July 2, 2019
If you plan to see 2019’s total solar eclipse, plan on water, water, and more water. If that’s OK with you, you’ll experience 4 minutes, 33 seconds of totality at the point of greatest eclipse. This location lies nearly 1,700 miles (2,740 km) southwest of the Galapagos Islands. For those that want to experience this eclipse at its longest, I think this will be one of the least accessible and most expensive of all the events on this list.

December 14, 2020
Residents in central Chile and Argentina find themselves well-placed for an eclipse with maximum totality lasting 2 minutes, 10 seconds. Although much of the eclipse path runs along oceans, the point of greatest eclipse falls over land. This event occurs within a week of Southern Hemisphere summer, so travel conditions should be good. Make sure you get out at night to see the southern constellations and two of the Milky Way’s satellite galaxies, the Magellanic Clouds.

December 4, 2021
Remote barely describes where you’ll need to be to see this eclipse. It’s total only over Antarctica, and then for a paltry 1 minute, 54 seconds. You want an exclusive event? Sign up with a tour heading to view this eclipse, and you’ll be among about a hundred people to experience its totality, out of Earth’s 6 billion inhabitants.

April 20, 2023
Our string of four distant destinations ends with the second of the two hybrid eclipses on our list. It occurs 16½ months after the Antarctic event, so more people may be eager to travel to Indonesia, despite the weather prospects. The point of greatest eclipse provides only 1 minute, 16 seconds of darkness, so many travelers might want to combine a short vacation in Australia with this event.

April 8, 2024
The second United States eclipse on our list has its point of greatest duration near the small town of Nazas, Mexico, just southwest of Torreón. Totality there lasts 4 minutes, 28 seconds. Not many of us may travel to Nazas, however, because a nice swath of the central and eastern United States will experience more than 4 minutes of totality.

Texas will be the first state to darken under the Moon’s shadow. There, the eclipse will be darkest and weather prospects will be the best. So, put on your 10-gallon hat and head to San Antonio, Austin, or Dallas, each of which lies within easy reach of the centerline. Indianapolis, Cleveland, and Rochester, New York, also lie quite close to the central...
path, but weather at those locations in April may not be as nice as that in Texas.

And here's a special treat for those living in or near Cape Girardeau, Missouri, and Carbondale, Illinois: If the sky is clear on August 21, 2017, and April 8, 2024, you'll experience totality twice without traveling anywhere.

**August 12, 2026**

At first glance, an eclipse with a maximum totality lasting only 2 minutes, 20 seconds over northern Greenland and the western tip of Iceland might seem problematic. Luckily, this one occurs in mid-August when the weather is still fair. If Iceland's lure to you is strong, here's a chance to experience Reykjavik and its surroundings along with totality.

**August 2, 2027**

The second-to-last eclipse on our list offers the longest totality anyone now alive will ever see — 6 minutes, 23 seconds. If this description sounds familiar, it's how I described the first eclipse on this list. Since then, however, 18 years have passed, and this is the new "longest-ever" eclipse. Not until February 16, 2045, will Earth again experience totality in excess of 6 minutes. Only one other 21st-century eclipse — that of May 22, 2096 — features more than 6 minutes of totality. I'm guessing I'll miss that one.

Intrepid travelers should have no concerns about the weather for the 2027 eclipse. Its track begins in the eastern Atlantic Ocean, then heads through Morocco and Spain. The weather should get a lot better for the best part of the eclipse, which passes through Algeria, Libya, Egypt, and Saudi Arabia.

**July 22, 2028**

Our list ends with another great eclipse. This one will feature 5 minutes, 10 seconds of totality and an easily reachable land path. This event tracks about three-quarters of Australia's length. For maximum duration of darkness, head to the northern part of Western Australia near Drysdale River National Park. The least amount of totality an observer from the centerline in that country will see is 3¾ minutes. This "worst case" location lies between two of Australia's largest cities, Sydney and Brisbane.

**Adventure awaits you**

With this list in hand, you can plan to see one or more of these upcoming total solar eclipses. Each offers spectacular beauty and one of the rarest of natural wonders — darkness at midday. Fare thee well, fellow travelers.

Most eclipse photographers image the diamond rings and the interval of totality between them. Astronomers call the "droplets" of sunlight visible at this time Bailey’s Beads. Ian Warfel

Image-processing techniques allow for some unusual photographs. This composite shows the eclipsed Sun’s corona, but the imager also has overlaid the Sun’s full disk as it appeared just prior to the start of the eclipse. Anthony Ayiomamitis

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