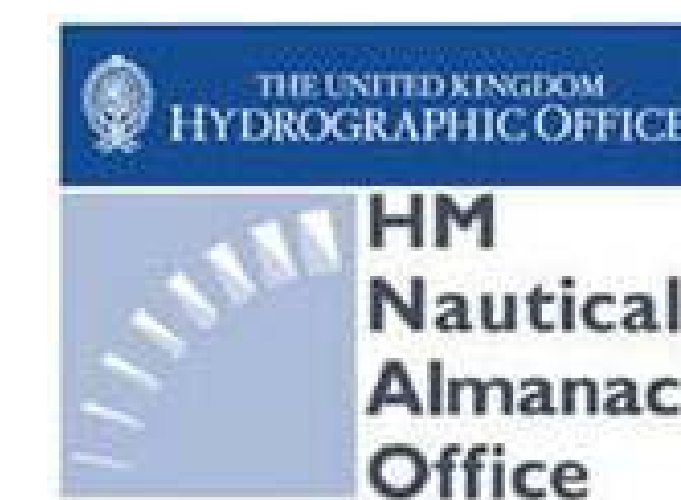


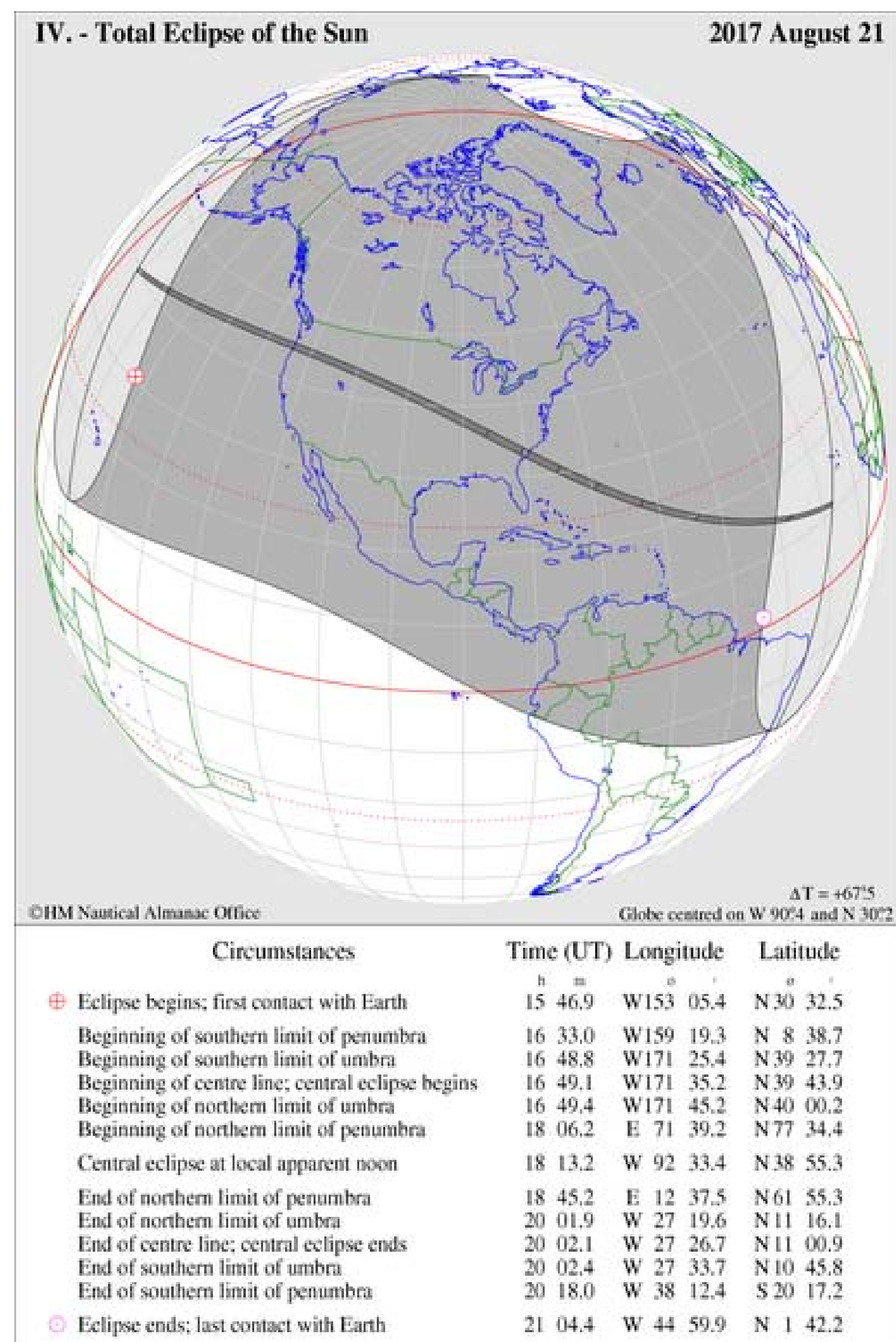


7 Minutes of Totality in 7 Years: Planning Ahead for August 2017

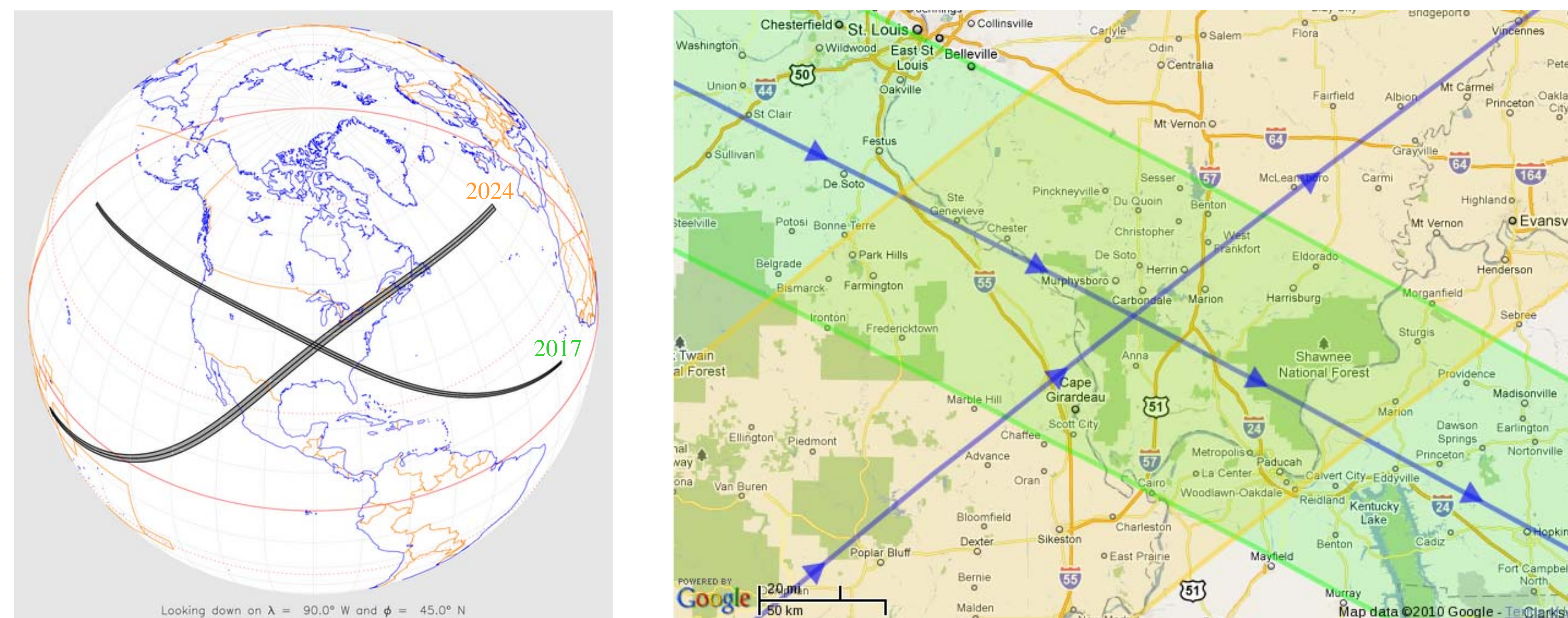


Jennifer Lynn Bartlett (U. S. Naval Observatory) & Steve Bell (HM Nautical Almanac Office)

2017 August 21—Total Solar Eclipse



Intersecting Eclipse Tracks



Intersection $37^\circ 38.2' \text{ N}$, $89^\circ 15.4' \text{ W}$
 Totality (2017) 2 min 45 sec
 Totality (2024) 4 min 13 sec

At the intersection point of the two umbral tracks, the path of the 2017 eclipse is 73 mi (118 km) wide and that of the 2024 eclipse is 117 mi (189 km) wide.

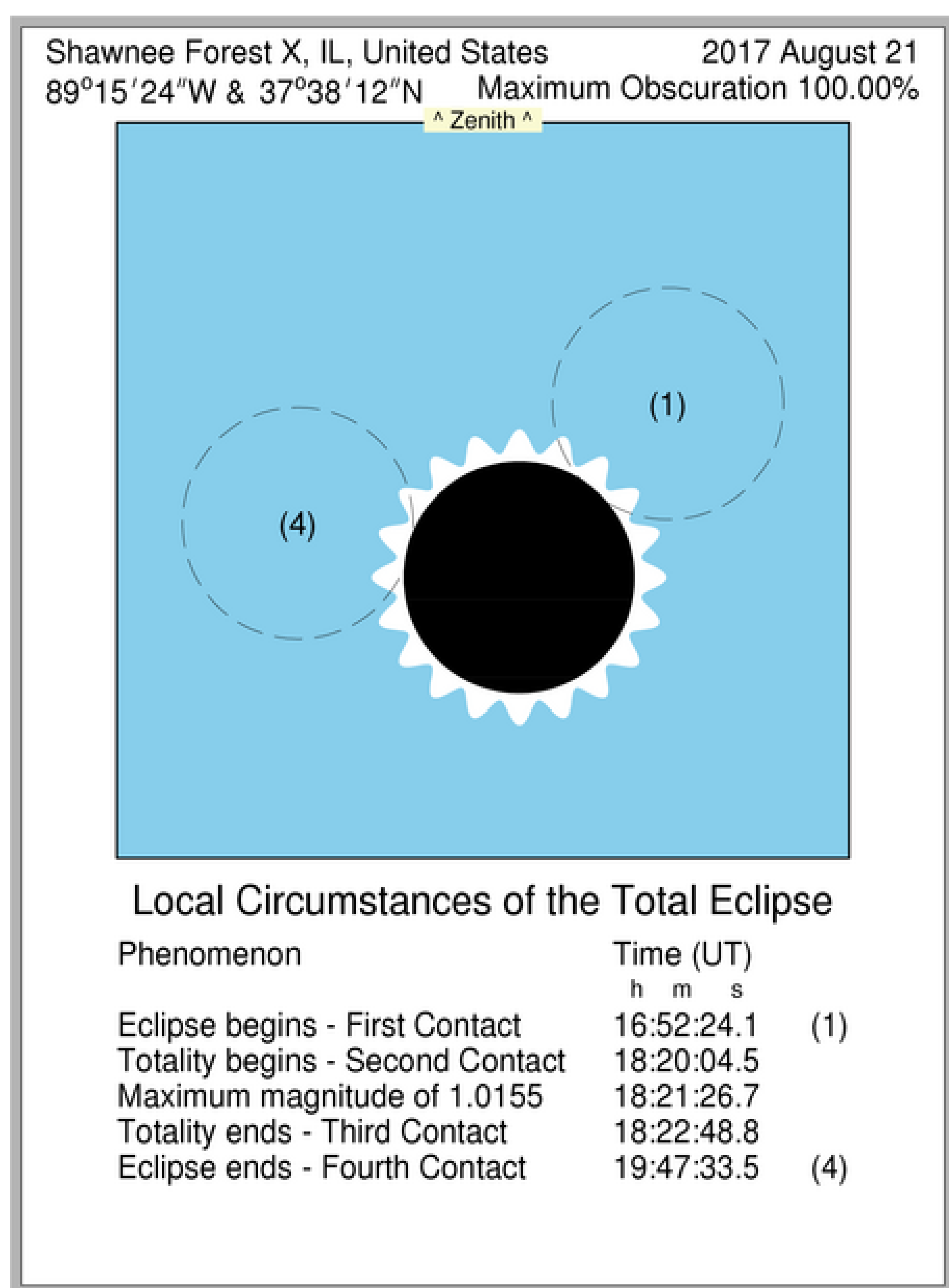
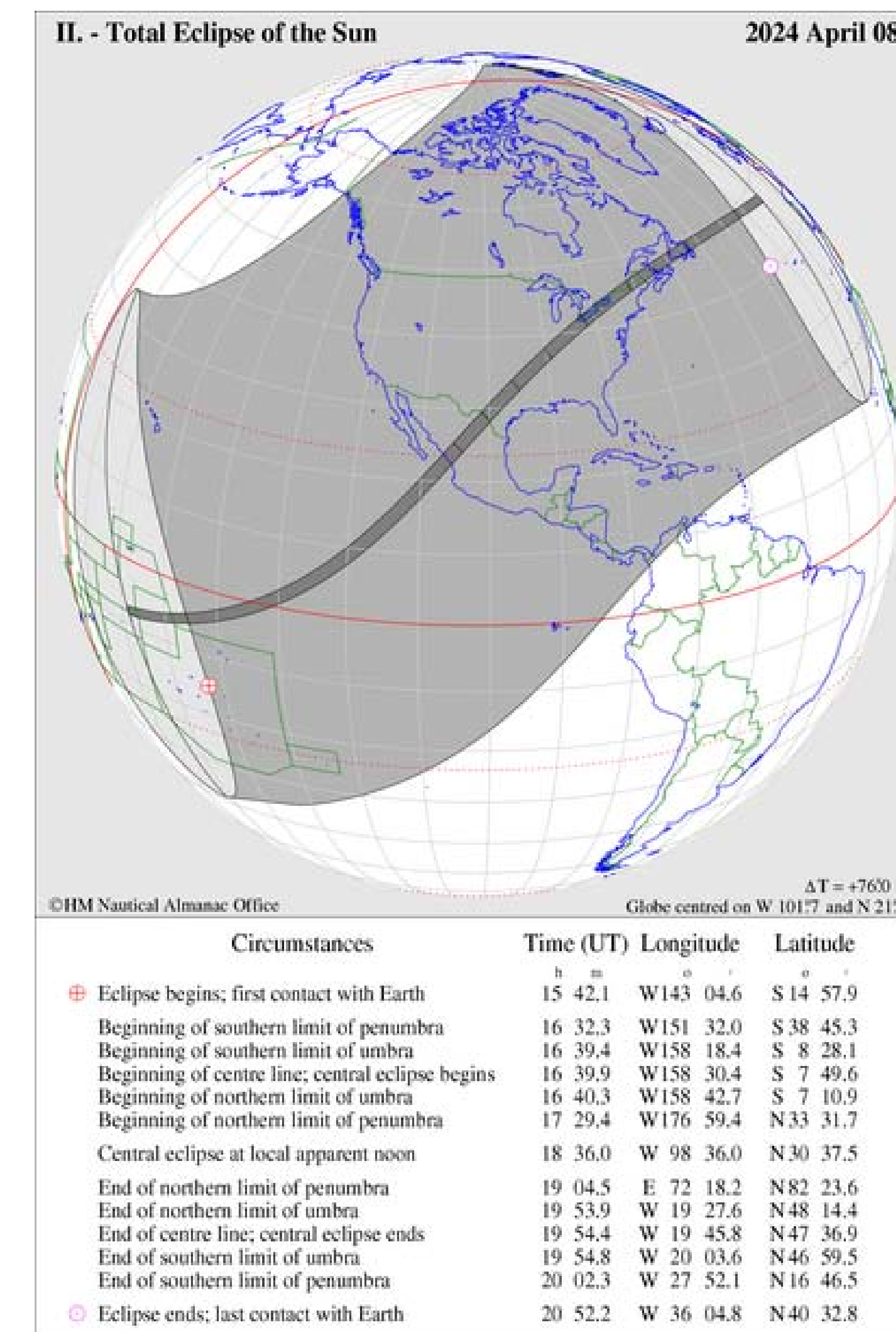
Within 37 mi (59 km) of the intersection point, you should see totality during each eclipse. However, in reality, because of the mountains and valleys on the lunar limb, you probably need to be within about 31 mi (50 km) to see a total eclipse rather than a “beaded” eclipse.

Historical weather data indicates the viewing conditions should be favorable.

Late August
 29% of precipitation
 6% of clouds
 87° F (304 K) ave. high
 65° F (291 K) ave. low

Early April
 31% of precipitation
 23% of clouds
 65° F (291 K) ave. high
 44° F (280 K) ave. low

2024 April 8—Total Solar Eclipse



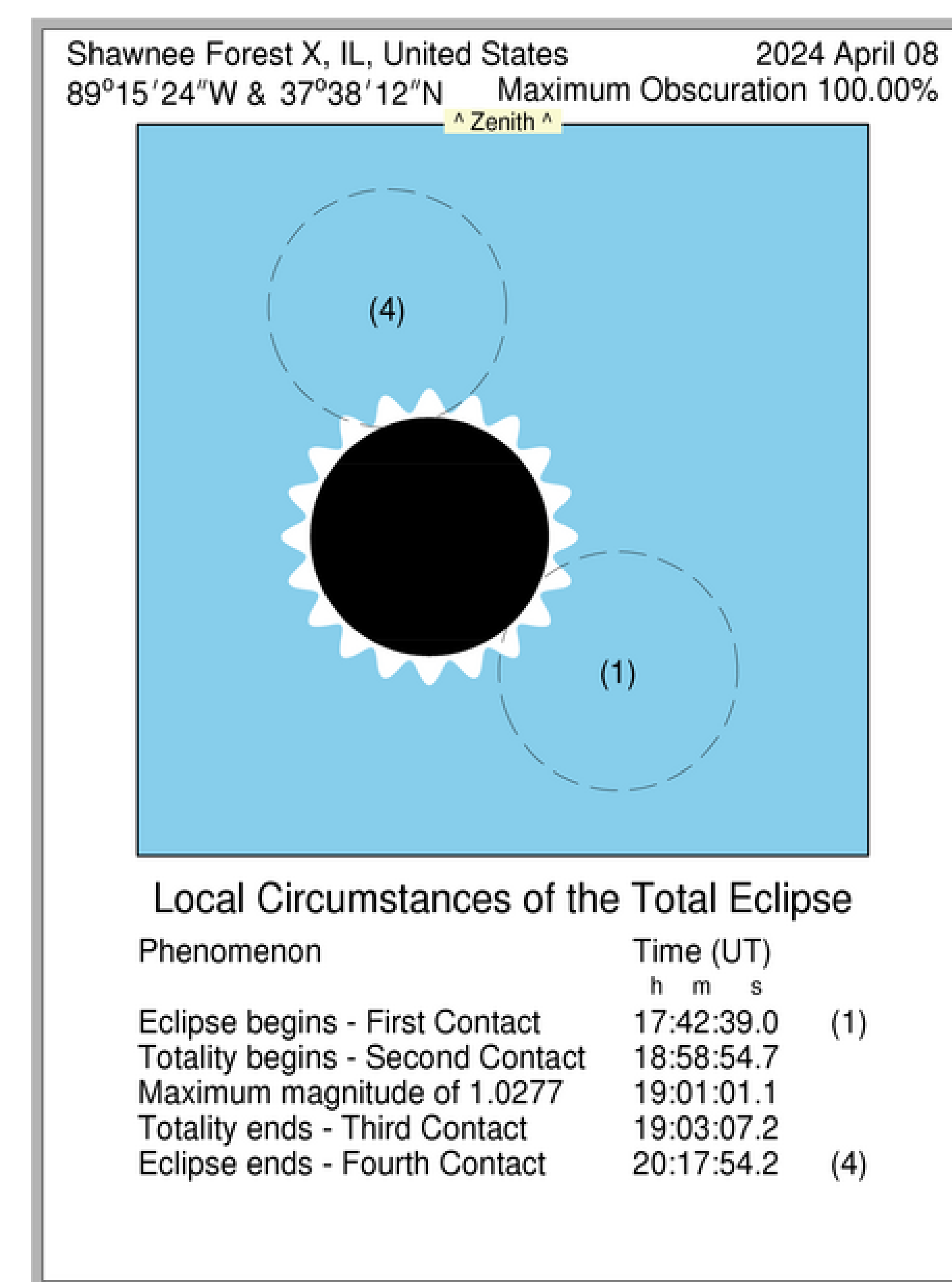
Abstract

In rapid succession, two chances to experience a total solar eclipse will soon occur over the middle of the United States. Usually, a total solar eclipse is, at most, a once in a lifetime event at a particular site. However, the celebrated shadows will race over the Shawnee National Forest, near Makanda, Illinois, twice in less than 7 years. The center lines of the 2017 August 21 and 2024 April 08 eclipses will cross at this convenient location. If you are planning a trip to that legendary heart of darkness, you should consider a site just northwest of Makanda for both events.

The two eclipse center lines are expected to intersect at $37^\circ 38.2' \text{ N}$ and $89^\circ 15.4' \text{ W}$, in the Shawnee National Forest. In 2017, totality lasting about 2 min 45 sec is expected at this location, which is the maximum duration for that eclipse. In 2024, nearly 4 min 13 sec of darkness will occur at the crossover point, but the longest period of totality for this eclipse will be seen in Mexico.

Historically, southern Illinois is mostly sunny in late August and early April. If rain or clouds mar your 2017 experience, you can hope for better weather when you return in 2024. A number of activities can enrich your outreach program: spotting planets and stars, locating shadow effects, monitoring climate changes, and watching wildlife responses. In addition, you will be able to compare and contrast your observations during the two eclipses there. Planning an expedition to this rare intersection reduces your flexibility in case of inclement weather—a small price for the novelty of multiple visits.

Unless you are a dedicated eclipse chaser, 2017 may not seem imminent. However, your outreach program choices now may shape your plans for the eclipse to come.



For More Information

Contact the authors: jennifer.bartlett@usno.navy.mil
 Visit the USNO Eclipse Portal: http://www.eclipse.org.uk/ecibin/query_usno.cgi

Acknowledgement

Experimental software based on the Google Maps JavaScript API V2 generated the crossover political map.

Reference

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