

Cache Valley Clear Skies

The Journal of the Cache Valley Astronomical Society



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www.cvas-utahskies.org

**Total Solar Eclipse Countdown:
59 days (as of June 23rd)**



Total Solar Eclipse Image courtesy NASA

No Meeting This Month – We are now in Star Party Mode!

There is no club meeting scheduled for June. During spring and summer we instead hold club (private) and public star parties. Most of the public star parties will be held around first quarter moon and most of the private star parties will be held around new moon.

The main location for public star parties this year will be **Heritage Park** which is located at 2456

South 800 West, Nibley. Please see the club website, the **Upcoming Star Parties** section of this newsletter or contact a member of the executive committee for more information. Our next scheduled meeting is the Annual General Meeting in September. Our first public star party is Friday, June 2nd. We also have our annual Pot Luck dinner on June 23rd.

The President's Corner By Dell Vance, CVAS President



Let the Star Parties and Solar Parties begin. The weather is great for watching the stars. The other

night I got my telescope out and had a great time looking at the stars and particularly the planets. The temperature was mild and the sky was just right. I had to work out some of the cobwebs in my observing process, but the view was worth it. I have a Celestron NexImage 5 camera for imaging the planets. It is a tool with lots of capability. I am learning some of the options that you have in getting better pictures. I finally got a decent picture of Jupiter and the red spot. It was a fun evening.



Jupiter and Great Red Spot - courtesy Dell Vance

We had our final Club Meeting for the Winter Season in May. Lyle Johnson reviewed observing stars in your backyard and Star Party etiquette, Dale Hooper and I reviewed some of the items that CVAS provides to members, and Tom Westre introduced us to the new Membership Packet being developed for our members. It was informative and sets the stage for the next few months of Star Parties.

Our first Public Star Party is going to be held at Nibley Heritage Park June 2nd. We hope to have a good turnout. We will also have our Annual Club Potluck and Star Party on June 23rd at the pavilion there at the same park. Be sure to bring your families and a pot luck item. We will do some observing afterwards, so don't forget to bring your equipment.

Summertime is always a busy time for each of us. Be sure to share your knowledge about the skies with your friends and families. There is a lot of excitement mounting for the Great American Solar

Eclipse in August. Be sure to go north and enjoy the total eclipse. Don't settle for anything less.

Clear Skies!

CVAS Loaner Telescope

CVAS provides a 10 inch Dobsonian telescope to club members. Contact Brad Kropp to make arrangements to use this telescope.

Brad can be contacted by email at brad.kropp@usu.edu.



Utah Skies June 2017

By Tom Westre

Astronomers at the 3.6-m telescope located at the Roque de los Muchachos Observatory on La Palma, Canary Islands, Spain have discovered a new Super-Earth exoplanet orbiting Gliese 625 a red dwarf star in the constellation Draco. Gliese 625 is located 21 light years away. The exoplanet Gliese 625b is located in the habitable zone of Gliese 625. Gliese 625 orbits its star every 14.6 days at a distance of 0.078 AU and has a mass of no less than 2.8 times that of Earth. The planet might have liquid water.

They estimate the surface temperature to be 171 degrees Fahrenheit, an Earth-like greenhouse.

Gliese 625b is one of a number of rocky planets found orbiting red dwarf stars. This is an exciting development as red dwarfs are the most common stars in the universe and represent 70% of all the stars in the Milky Way galaxy. These types of stars last at least 10 trillion years which makes them a main target for finding habitable planets. Using the transit method astronomers hope to determine if other planets may orbit Gliese 625 as well as gathering more data on the atmosphere of Gliese 625b.

3600 exoplanets have been found, the number of exoplanets near our Sun is unknown. At 21 light years from our Sun Gliese 625 is one of 100 nearest stars to our Sun while Gliese 625b is one of 30 nearest exoplanets found and the 6th nearest potentially habitable exoplanet.

Gliese 625 can be found in Draco at the following coordinates:

RA 16h 25m
Dec +54 deg 18'
Magnitude: 10.17

Jupiter is well placed in Virgo in June a few degrees west of the bright star Spica. Jupiter is two months past opposition and is getting smaller and fainter yet at magnitude -2 it is still very impressive and is brighter than any star. Jupiter is retrograding or moving west each night, but on June 9 it resumes its eastward motion and will move closer to Spica throughout the summer.

Venus can be seen low in the east before sunrise. Venus is moving away from us and gets smaller in apparent size from 24" to 18" while its face becomes more and more lit by the Sun.

Saturn reaches opposition on June 15th and rises in the east just after the sun sets in the west and makes its closest approach to the Earth in the constellation Ophiuchus. Saturn is due east of the bright star Antares in Sagittarius. Note Saturn's rings which are tilted more than 26 degrees towards us. This will be a grand sight in the telescope.

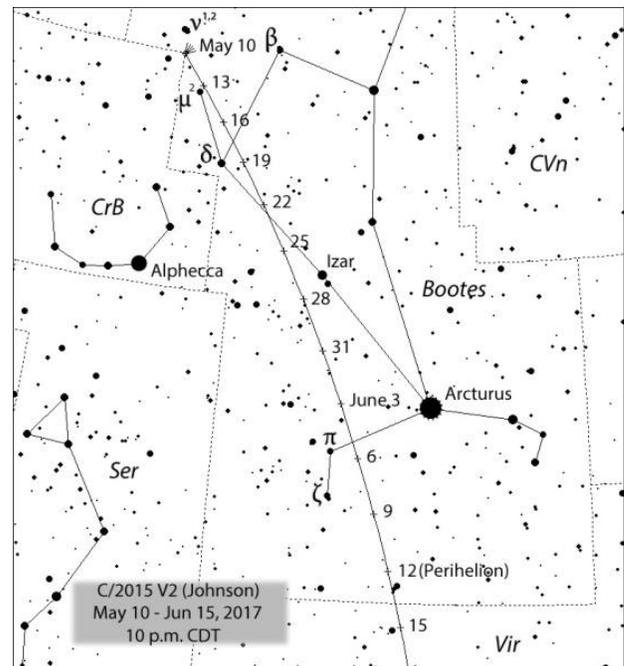
June 15 the Lyrids meteor shower peaks near the star Vega in Lyra.

June 20 Venus and the waning crescent Moon are near each other in the morning sky before sunrise.

June 21 marks the beginning of summer, the northern Solstice, the most northerly point in the sky for the year.

June 24 New Moon

Comet C/2015 V2 Johnson continues to move south down the constellation Boötes the Herdsman. Johnson can be seen in binoculars not far from the bright star Arcturus. It is expected to peak at magnitude +7.5 or so around mid-June. Johnson is sporting two faint tails. You should be able to see one of the tails.



Comet Johnson (C/2015 V2) crosses from Boötes into Virgo from May through mid-June. Tick marks are shown every three days at 10 p.m. CDT (3:00 UT the following date) with stars to magnitude +7.5. On June 3–4, the comet passes just 5° east of Arcturus. Map: Bob King; Source: Chris Marriott's SkyMap

Binocular Supports

The club now has available a number of mostly completed binocular supports. These supports are

being sold to club members at cost. These supports just need the binocular attachment – which is tailored to the type of binocular being mounted.

Please contact Ned Miller or Dell Vance if you are interested in purchasing a binocular support. The images below show what they look like with binoculars attached as well as an image showing them folded for storage.



Completed Binocular Support (with binos attached) - Courtesy Ned Miller



Binocular support (folded for storage) - Courtesy Ned Miller

Spotlight on Draco, the Dragon

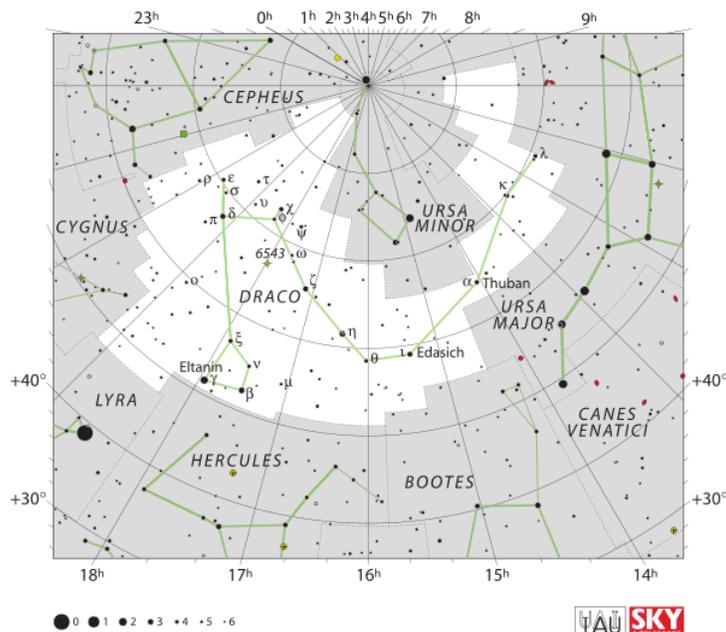
By Dale Hooper

Draco is another rather dim constellation which, speaking for myself, I should learn a bit better. I tend to say that it is a dim constellation which winds around the bowl of the little dipper. The brightest star in Draco is fourth magnitude Thuban. Its claim to fame is that it was the pole star from around 4000 BC to 2000 BC.

Draco is another constellation which makes up for its dim stars with some nice deep sky objects. Draco includes a number of fine galaxies which can reasonably be seen with an eight inch scope. It also includes the “lost” or substitute Messier object Messier 102. Draco also includes the very iconic Cat’s Eye (planetary) nebula. You can memorize its NGC number by counting down from six. In other

words, the NGC number for the Cat’s Eye nebula is NGC 6543.

Objects which rank at least three stars in *The Night Sky Observer’s Guide* (Draco is in Volume 2) which can be observed with an eight inch scope, have been included. As usual, the table is organized according to increasing Right Ascension values.



IAU and Sky & Tel - Roger Sinnott & Rick Fienberg



NGC 6543 - Cat's Eye Nebula - Composite of data from NASA's Chandra X-ray Observatory and Hubble Space Telescope

Object	R.A.	Dec.
NGC 3147 (Galaxy mag 10.6)	10h16.9m	+73°24'
NGC 3403 (Galaxy mag 12.2)	10h16.9m	+73°24'
NGC 3735 (Galaxy mag 11.8)	11h36.0m	+70°32'
NGC 4125 (Galaxy mag 9.7)	12h08.1m	+65°11'
NGC 4128 (Galaxy mag 12.0)	12h08.5m	+68°46'
NGC 4250 (Galaxy mag 11.8)	12h17.4m	+70°48'
NGC 4256 (Galaxy mag 11.9)	12h18.7m	+65°54'
NGC 4291 (Galaxy mag 11.5)	12h20.3m	+75°22'
NGC 4319 (Galaxy mag 11.9), Markarian 205 (Quasar Mag 14.5)	12h21.7m	+75°19'
NGC 4386 (Galaxy mag 11.7)	12h24.5m	+75°32'
NGC 4589 (Galaxy mag 10.7)	12h37.4m	+74°12'
NGC 4648 (Galaxy mag 12.0)	12h41.8m	+74°25'
NGC 4750 (Galaxy mag 11.2)	12h51.1m	+72°52'
M102/NGC 5866 (Gal. m 9.9)	15h06.5m	+55°46'
NGC 5879 (Galaxy mag 11.6)	15h09.8m	+57°00'
NGC 5905 (Galaxy mag 11.7)	15h15.4m	+55°31'
NGC 5907 (Galaxy mag 10.3)	15h15.9m	+56°19'
NGC 5908 (Galaxy mag 11.8)	15h16.7m	+55°25'
NGC 5963 (Galaxy mag 12.5)	15h33.5m	+56°35'
NGC 5965 (Galaxy mag 11.7)	15h34.0m	+56°42'
NGC 5982 (Galaxy mag 11.1)	15h38.7m	+59°21'
NGC 5985 (Galaxy mag 11.1)	15h39.6m	+59°20'
NGC 6015 (Galaxy mag 11.1)	15h51.4m	+62°19'
16 & 17 Draconis (Triple star)	16h36.2m	+52°55'
21 Draconis (Triple Star)	17h05.3m	+54°28'
NGC 6340 (Galaxy mag 11.0)	17h10.4m	+72°18'
Σ2155 (Double Star)	17h16.1m	+60°43'
NGC 6412 (Galaxy mag 11.8)	17h29.6m	+75°42'
25 Draconis (Double Star)	17h32.2m	+55°11'
31 Draconis (Double Star)	17h41.9m	+72°09'
NGC 6503 (Galaxy mag 10.2)	17h49.4m	+70°09'
NGC 6543- Cat's Eye Nebula (Planetary Nebula mag 8.1)	17h58.6m	+66°38'
NGC 6643 (Galaxy mag 11.1)	18h19.8m	+74°34'
Σ2308 (Triple Star)	18h00.2m	+80°00'

CVAS Minutes – May 2017

The meeting was held on May 24th in room 171E in the Main Campus building of BATC. Dale Hooper discussed current sky events including the recently discovered (type IIp) supernova in NGC 6946 and Saturn reaching opposition.

The time was then turned over to the various presenters concerning our feature topic of star parties and how astronomy clubs can help amateur astronomers develop new skills and enjoy the hobby.

Lyle Johnson discussed backyard observing along with the various types of objects that can be observed. He also discussed the essentials for observing such as free star chart, a red light for examining star charts, planispheres, and a green laser. He then mentioned ways that amateur astronomers can expand what they can observe by using binoculars with a support and telescopes with several eyepieces.

Dell Vance then discussed club and private star parties including star party etiquette. He mentioned that white light flashlights should be avoided. He also discussed how star parties help us grow as members and also allow us to try different types of telescopes before considering a purchase. He also mentioned that star parties are even better when more people attend.

Dale Hooper shared with us the magazine discounts that are available to club members and discussed some of the features of the individual magazines.

Tom Westre then discussed the member packet and outline. He would like input about our fifty favorite targets and our favorite astronomy websites.

Lastly it was mentioned that we will have a public star party on June 2nd at the Heritage Park in Nibley. We will also have the annual club Pot Luck on the south end of Heritage Park (850 W. 2450 S) on June 23rd.

Upcoming Star Parties

- | | |
|--------|--|
| 02 Jun | Public Star Party – Heritage Park (2456 S. 800 W., Nibley)
9pm – 11pm |
| 23 Jun | Annual Pot-Luck Dinner and Star Party, 7:30pm (850 W. Nibley Park Ave, Nibley). Enter Nibley on 800 W And drive south until you reach Nibley Park Ave. and turn west one |

- block before the pavilion.
- 24 Jun Solar Party – Logan Library
10:30am – Noon
- 30 Jun Public Star Party – Macy’s Parking
Lot, 9pm – 11pm
- 21 July Club Star Party – Further details
coming

Upcoming Events

- 01 Jun First quarter Moon
- 03 Jun Jupiter 2° south of Moon
200 inch Hale Telescope dedicated
(1948)
Ed White, first American to walk in
space (1965)
- 08 Jun Giovanni Cassini born (1625)
- 09 Jun Full Moon
Saturn 3° south of Moon
- 13 Jun Pioneer 10 leaves solar system (1983)
- 14 Jun Flag Day
- 15 Jun Saturn at opposition
- 16 Jun Neptune 0.7° north of Moon
Valentina Tereshkova, first woman in
space (1963)
- 17 Jun Last quarter Moon
- 18 Jun Father’s Day
Sally Ride, first American woman in
space (1983)
- 20 Jun Venus 2° north of Moon
- 21 Jun Summer solstice
- 22 Jun Aldebaran 0.5° south of Moon
Royal Greenwich Observatory
founded (1675)
James Christy discovers Pluto’s moon
Charon (1978)
- 23 Jun New Moon
- 26 Jun Charles Messier born (1730)
- 27 Jun Regulus 0.03° north of Moon
- 29 Jun George Ellery Hale born (1868)
- 30 Jun First quarter Moon
Tunguska impact (1908)
Cassini arrives at Saturn (2004)

Estimating How Many People Will Travel to the Path of Totality

By Michael Zeiler, GreatAmericanEclipse.com

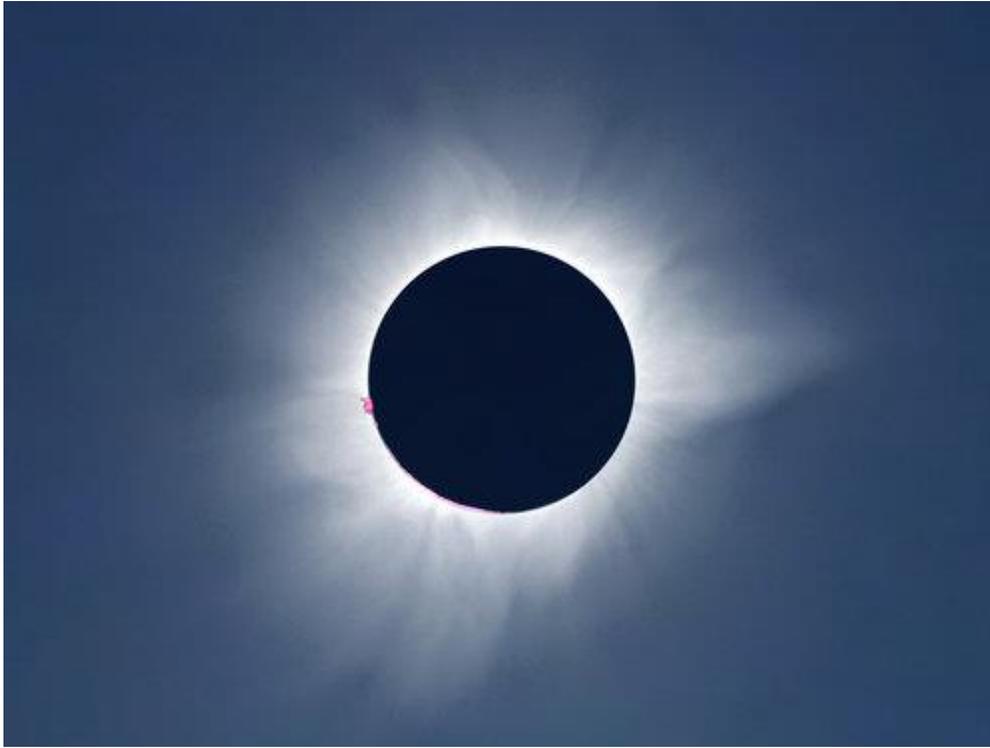


PHOTO CREDIT: RICK FIENBERG, ECLIPSE.AAS.ORG

TOTAL SOLAR ECLIPSE OF MARCH 9, 2016 IMAGED FROM INDONESIA

This infographic summarizes how many people are expected to travel to the path of totality and where they will congregate. The patterns of converging lines to the path of totality represent the quickest drive paths from throughout the nation to the path. These lines are color-coded by destination state. The blue circles in the path are destinations for eclipse travelers, proportionally sized to the expected traffic impact. The black dots are metropolitan areas throughout the country scaled to population.

Clearly, the state with the greatest impact on eclipse day will be South Carolina. It is the closest destination for the entire Eastern Seaboard. Other states with major impacts will be Tennessee, Missouri, and Oregon.

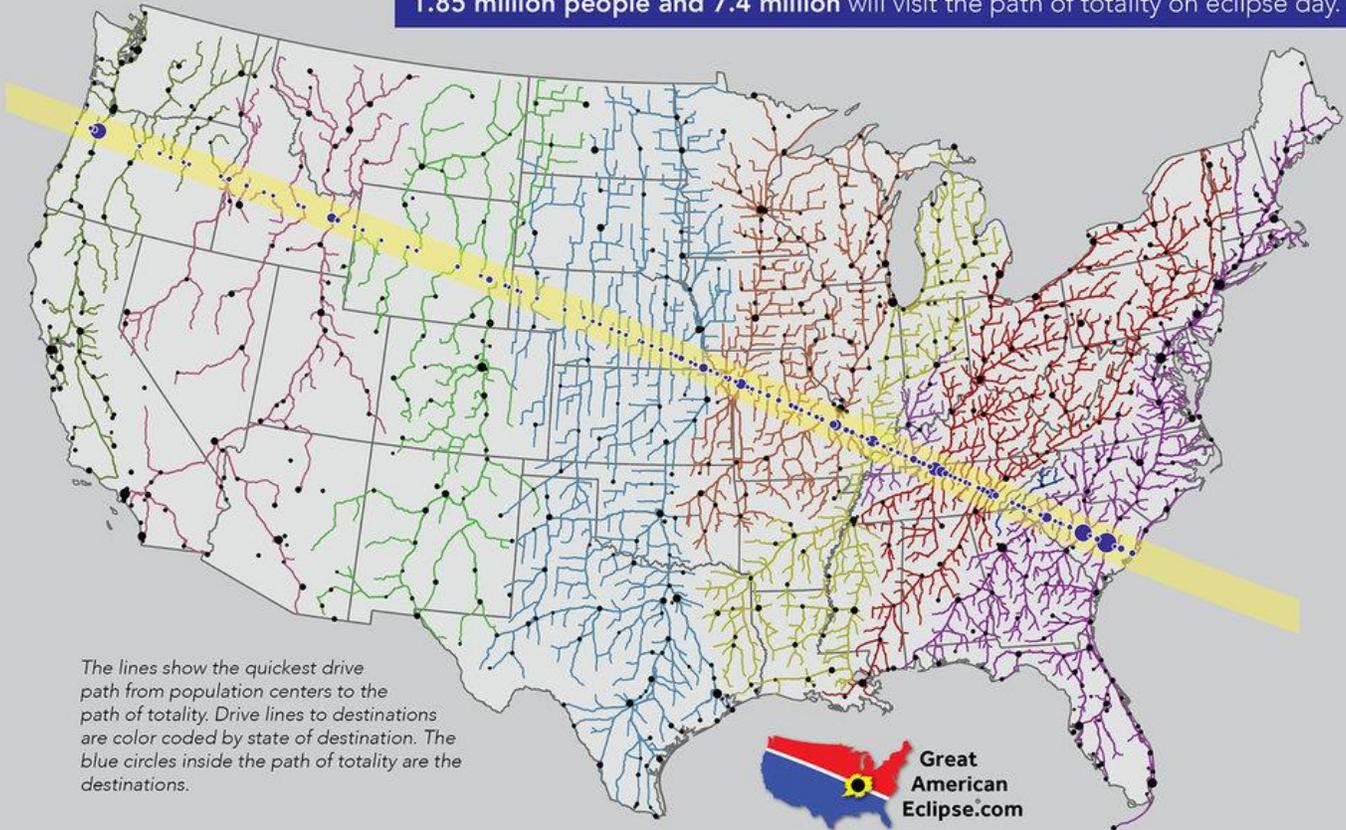
The method I use in these computations starts with these assumptions:

A person who is 200 miles away from the centerline of eclipse will have certainly heard about the eclipse within the week before from TV or social media. This average person will receive the impression that the total solar eclipse is something very special to see.

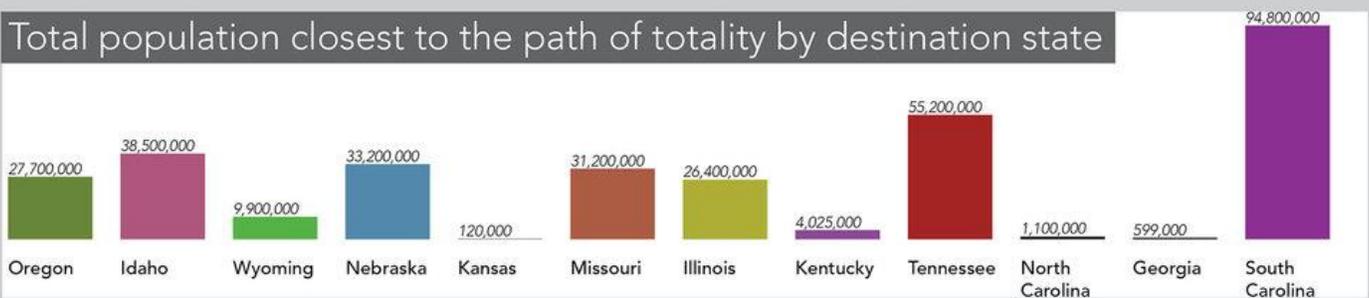
Population access and estimated visitation on eclipse day

On August 21, 2017, a total solar eclipse crosses the United States from Oregon to South Carolina. The closest destinations for the contiguous United States are summarized, as well as high and low estimates for how many people will travel to the path of totality. The methodology for our estimates is summarized at www.GreatAmericanEclipse.com/Statistics.

12.25 million people live inside the path of totality. We estimate that **between 1.85 million people and 7.4 million** will visit the path of totality on eclipse day.

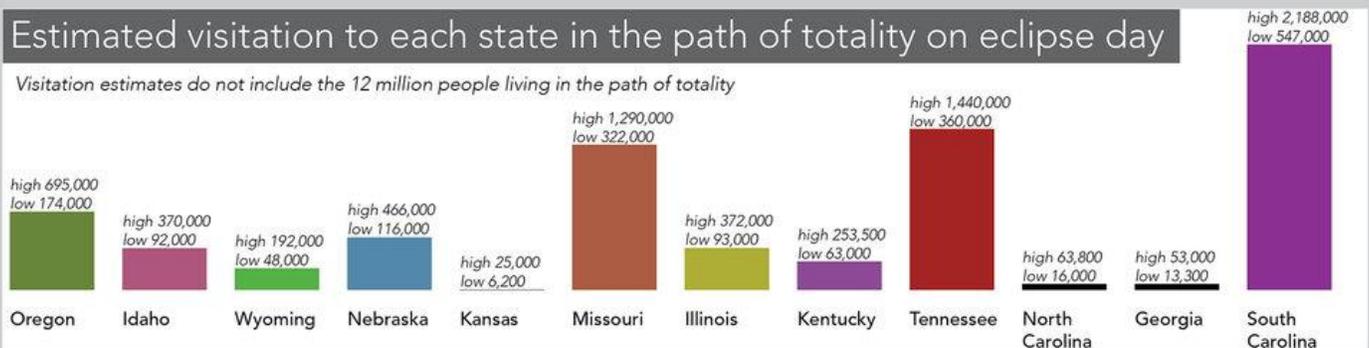


Total population closest to the path of totality by destination state



Estimated visitation to each state in the path of totality on eclipse day

Visitation estimates do not include the 12 million people living in the path of totality



- Not every one has the freedom to travel. Monday is a work day and for some, a school day. Some may also be deterred by myths about viewing the eclipse or scary stories of traffic congestion.
- Despite the many news stories about the spectacle of the eclipse, some people will be completely disinterested in the eclipse.
- Based on this profile of an average person living 200 miles away, I estimate that this population has a high probability of 2% to drive into the path of totality and a low probability of 0.5%.
- I halve these estimates for people living 400 miles away. I further halve these estimates for people living 800 miles away.
- I apply this formula to every populated area in the United States using [ArcGIS](#) software by [Esri](#).
- The sum estimate from this analysis is that between **1.85 and 7.4 million people will visit the path of totality on eclipse day**.

There are a number of other factors which can alter these estimates:

- The impact of social media might be extreme and visitation might possibly be greater than estimated here, especially from nearby metropolitan areas such as Portland OR, Boise ID, Salt Lake City UT, Denver CO, Lincoln and Omaha NE, Kansas City and St Louis MO, Chicago IL, Indianapolis IN, Cincinnati OH, Chattanooga TN, Atlanta GA, and Charlotte NC.
- Poor weather will depress eclipse visitation in areas obscured by clouds. Some people will relocate to another state with better weather prospects. Another risk is smoke from wildfires in the American West which may affect large regions and force eclipse visitors east or west.
- Some large events will capture regional visitors. For example, a very large [eclipse viewing event at St Joseph MO](#) will draw visitors from Kansas, Nebraska, and nearby states.
- We do not attempt to model the number of people driving from Canada or Mexico, flying from within the United States, or arriving from Europe, Asia, or other international regions. It is more difficult to model these types of travelers and we don't believe they will substantially alter these estimates.

