

### Trips / Events

Ideas for trips and events  
always welcome!

[events@weymouthastronomy.co.uk](mailto:events@weymouthastronomy.co.uk)

- ◆ **16 Aug CADAS—Bill Combes: The International Space Station**
- ◆ **5 Sept WAS—Steve Tonkin: Ten Ways the Universe Tries to Kill You**
- ◆ **20 Sept CADAS—Richard Miles: The Mystery of Comets Unveiled**
- ◆ **3 Oct WAS—AGM and Mike Witt: Tales from the Dark Side of the Universe**
- ◆ **18 Oct CADAS—Ask the Experts Evening**
- ◆ **7 Nov WAS—David Strange: Norman Lockyer and the NLO**

Programmes for many local Societies will be available in the near future. Check their websites for more details.

If you are interested in giving a talk or workshop, let the organisers know. They like to offer new titles in their programme line-up.

### WAC Upcoming Events:

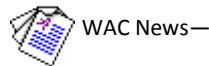
8 Sept—USA Eclipse of 2017:  
Chris Bowden

13 Oct—Binocular Astronomy:  
Stephen Tonkin

10 Nov—Impacts: Bob Mizon

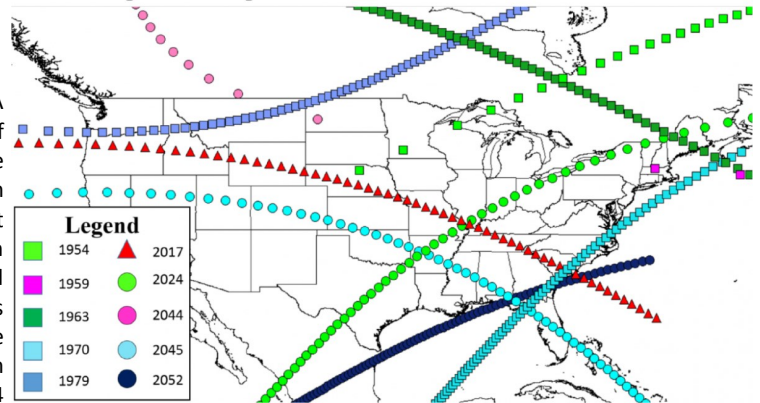
8 Dec—Christmas Quiz Night

Plans for informal viewing nights will take place after the monthly meetings, weather permitting.



WAC News—

### Map of All Eclipses over Continental US From 1950-2052



The 2017 Eclipse in the USA is almost upon us. Tens of thousands of people are expected to descend upon the eclipse track on the 21st of August. As this is such an easy to travel country, I had a look for more eclipses which will cross the continental US. I am certainly aiming for the 2024

event and hope a late winter storm does not disrupt viewing. For all of you heading across the pond for this one. Enjoy! Email your photos, sketches and stories! Can't wait to see them. NASA Edge should be broadcasting the entire event on YouTube: <https://www.youtube.com/user/NASAedge> Until next month ~SK



## A Wealth Of Science To Come During Cassini's Final Orbits

By JoAnna Wendel

After 13 years filled with surprises, paradigm-shifting discoveries, and hundreds of awe-inspiring pictures, NASA's Cassini-Huygens mission will end soon. On 15 September, the spacecraft will plunge into Saturn's atmosphere and disintegrate.

It's "a region where no spacecraft has flown before." The last stage of the mission, the so-called "grand finale" orbits, began on 22 April with a gravitational boost from Titan. Since then, Cassini has slowly descended closer and closer to Saturn to explore the space between the rings and the planet itself. It's "a region where no spacecraft has flown before," said Linda Spilker, the Cassini-Huygens mission head scientist.

Currently, Cassini is completing grand finale orbit 16 out of the final 22: It takes 6 days to complete an orbit. In these last orbits, the spacecraft has already snapped images from the never-before-seen perspective between the rings and Saturn. In a matter of weeks, it will skim the planet's atmosphere.

From now until Cassini crashes, its mission will be to start answering some long-standing questions about Saturn itself. Here are three of those questions.

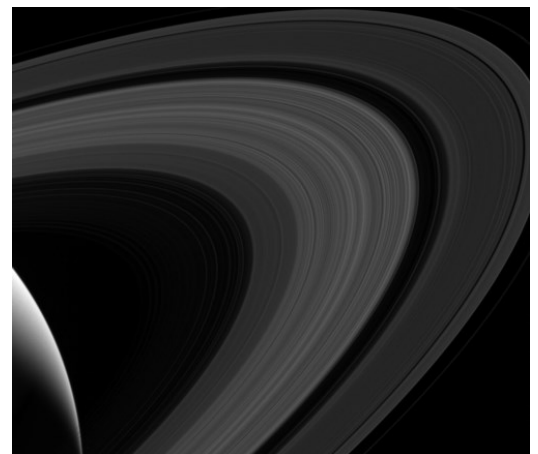
### How Old Are Saturn's Rings?

"If we had been around 4 billion years ago, what would Saturn's rings have looked like?" A long-running debate in Saturn science involves the age of the rings: Some researchers think they're young, about 100 million years old, and some researchers think they could be 4 or 5 billion years old.

Cassini sends radio waves to Earth, which are picked up by NASA's giant radio antennas around the world. While Cassini is in the gap between Saturn's rings and Saturn itself, scientists can evaluate how much Cassini gets tugged by the planet's gravity and by its rings' gravity. These tugs directly relate to the mass of the rings, which scientists hope to nail down with the final RSS measurements.

### How Long Is a Day on Saturn?

Determining the precise rotational period of the gas giant proves difficult because Saturn lacks static features and hosts no classic "surface" to speak of. It may seem like an easy question to



An image of Saturn's rings taken by Cassini's wide-angle camera in April 2017, just before the grand finale orbits began. Scientists hope that these last orbits will illuminate the mass—and therefore age—of these rings. Credit: [NASA/JPL-Caltech/Space Science Institute](https://www.nasa.gov/jpl-caltech-space-science-institute)



## Saturn (continued)

answer, but scientists aren't sure how long a day lasts on Saturn. Determining the precise rotational period of the gas giant proves difficult because Saturn lacks static features and hosts no classic "surface" to speak of. So scientists cannot decouple the dynamic atmosphere seen in

images from whatever may be below it.

So far, researchers haven't found the answer: Cassini data have shown that Saturn's magnetic field is tilted less than 0.06° from its rotational axis, not a promising tilt to determine the length of a day. Scientists think something deep in Saturn's atmosphere may be masking the signal from the magnetic field, and they hope that getting even closer to the planet may finally reveal this basic characteristic, Dougherty said.

### What's Going on in Saturn's Atmosphere?

"Titan surprised many of the atmospheric scientists with a rich set of complex ions in the upper atmosphere....Will Saturn do the same?" During the 18th grand finale orbit (or the 288th orbit since the mission's beginning), between 10 and 17 August, Cassini will, for the first time, skim across the top of Saturn's atmosphere. In the final five orbits, the spacecraft will collect data on the neutral molecules of the upper atmosphere, such as hydrogen, helium, water, and methane, said Scott Edgington, the Cassini-Huygens's team deputy project scientist.

The instruments "will also be poised to detect more complex molecules created after molecules such as methane and water are broken up by solar ultraviolet photons and electron impact," Edgington said. "Titan surprised many of the atmospheric scientists with a rich set of complex ions in the upper atmosphere, thus causing us to rethink our theories and models of the upper atmosphere," he continued. "Will Saturn do the same?"

The full article can be read at:

[https://eos.org/articles/a-wealth-of-science-to-come-during-cassinis-final-orbits?utm\\_source=eos&utm\\_medium=email&utm\\_campaign=EosBuzz080417](https://eos.org/articles/a-wealth-of-science-to-come-during-cassinis-final-orbits?utm_source=eos&utm_medium=email&utm_campaign=EosBuzz080417)



## Ten Earth-Sized Planets Found by Exoplanet-Hunting Telescope

By JoAnna Wendel

NASA introduced 219 exoplanet candidates to the world on Monday. Ten of these are roughly Earth sized and orbit their stars in the so-called habitable zone, a distance at which temperatures could be ripe for liquid water.

The candidate exoplanets appear in the eighth and newest catalog from the agency's exoplanet-hunting [Kepler space telescope](#) and the final catalog from Kepler's observations of the [Cygnus constellation](#). The new catalog includes 4034 exoplanet candidates overall.

"These Kepler catalogs have shown us that small exoplanets are common." Past "Kepler catalogs have shown us that small exoplanets are common," Susan Thompson, lead author on the catalog study and a research scientist at the SETI Institute in Mountain View, Calif., told *Eos*. "With this [latest] catalog, we can show whether this is also true for exoplanets that are in orbital periods similar to those of the Earth."

Accompanying research also reveals that the majority of known exoplanets fall into two distinct sizes: rocky exoplanets up to 1.75 times the radius of Earth and Neptune-sized gassy exoplanets. The finding, [soon to be published](#) in *The Astronomical Journal*, deepens scientists' understanding of exoplanet diversity.

**Citation:** Wendel, J. (2017), Ten Earth-sized planets found by exoplanet-hunting telescope, *Eos*, 98, <https://doi.org/10.1029/2017E0076723>. Published on 22 June 2017.

Right: An artist's rendering of a Neptune-sized exoplanet. New research using Kepler data finds that the majority of exoplanets fall into two distinct size categories: similar to Earth or similar to Neptune but not in between. Credit: NASA/JPL-Caltech

### Perseids Viewing Evening

Wessex Astronomical Society will be holding a 'Perseids Viewing Evening' at Durlston country park on August 12th (9pm). For further details please contact [Wessex Astronomical Society](#)

