WEYMOUTH ASTRONOMY

Sky Watcher

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Trips / Events

Ideas for trips and events always welcome!

events@weymouthastronomy.co.uk

- ***15 Mar CADAS—John Gifford: Astronomy before relativity***
- ***18 Mar BNSS—James Fradgley: Bad Science-Things one hears that annoys me***
- ***4 Apr WAS— Chris Starr: Dawn of the Solar System***
- ***11 Apr BNSS—Dr Lilian Hobbs: How Astronomy has Changed***
- ***19 Apr CADAS—Bob Mizon: Eight great astronomers***
- ***2 May WAS—David Whitehouse—Journey to the Centre of the Earth***
- ***9 May BNSS—Mark Gibbons: Gravitational waves***
- ***17 May CADAS—Dan Oakley: Dark Skies: South Downs National Park and beyond***
- ***6 June WAS—David Boyd—Spectroscopy: What? How? And Why?***

WAC Upcoming Events:

7 Apr– A life on Mars—Bud Budzynski

12 May— AGM—Binocular Astronomy-Stephen Tonkin

9 June—Ask the Panel

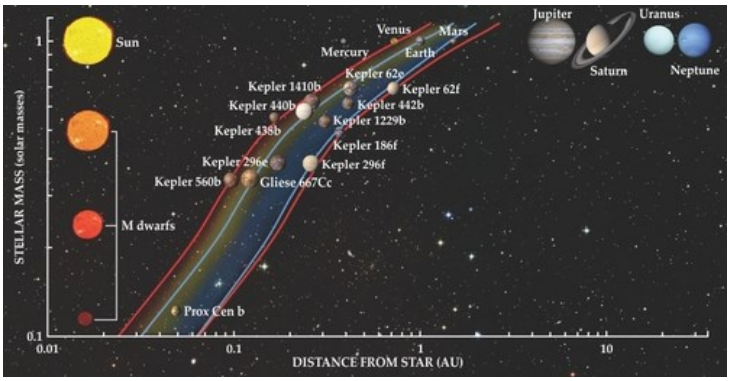
14 July—Strife among the canals– James Fradgley

11 Aug—Open evening at SACC

More to come in 2017!

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

WAC News—PHYSICS TODAY



This article caught my attention this month... Where are they?
The search for extraterrestrial life is increasingly informed by our knowledge of exoplanets. Within three decades, we may know whether extrasolar life is rare. —*Mario Livio and Joseph Silk* It is a topic that since the 1995 announcement of the first detected exoplanet has been grabbing headlines regularly. How long will it be before we find out that 'we are not alone'? http://physicstoday.scitation.org/doi/full/10.1063/PT.3.3494?utm_source=Physics+Today&utm_medium=email&utm_campaign=8060019_NQ+-+March+2017+TOC&utm_content=Feat3&dm_i=1Y69%2C4SR5F%2CE1OC7F%2CI2L0F%2C1&

Until next month ~SK

Solar Eclipse Provides Coronal Glimpse

By Marcus Woo

On August 21, 2017, North Americans will enjoy a rare treat: The first total solar eclipse visible from the continent since 1979. The sky will darken and the temperature will drop, in one of the most dramatic cosmic events on Earth. It could be a once-in-a-lifetime show indeed. But it will also be an opportunity to do some science.

Only during an eclipse, when the moon blocks the light from the sun's surface, does the sun's corona fully reveal itself. The corona is the hot and wispy atmosphere of the sun, extending far beyond the solar disk. But it's relatively dim, merely as bright as the full moon at night. The glaring sun, about a million times brighter, renders the corona invisible.

"The beauty of eclipse observations is that they are, at present, the only opportunity where one can observe the corona [in visible light] starting from the solar surface out to several solar radii," says Shadia Habbal, an astronomer at the University of Hawaii. To study the corona, she's traveled the world having experienced 14 total eclipses (she missed only five due to weather). This summer, she and her team will set up identical imaging systems and spectrometers at five locations along the path of totality, collecting data that's normally impossible to get.

Ground-based coronagraphs, instruments designed to study the corona by blocking the sun, can't view the full extent of the corona. Solar space-based telescopes don't have the spectrographs needed to measure how the temperatures vary throughout the corona. These temperature variations show how the sun's chemical composition is distributed—crucial information for solving one of long-standing mysteries about the corona: how it gets so hot.

While the sun's surface is ~9980 Fahrenheit (~5800 Kelvin), the corona can reach several

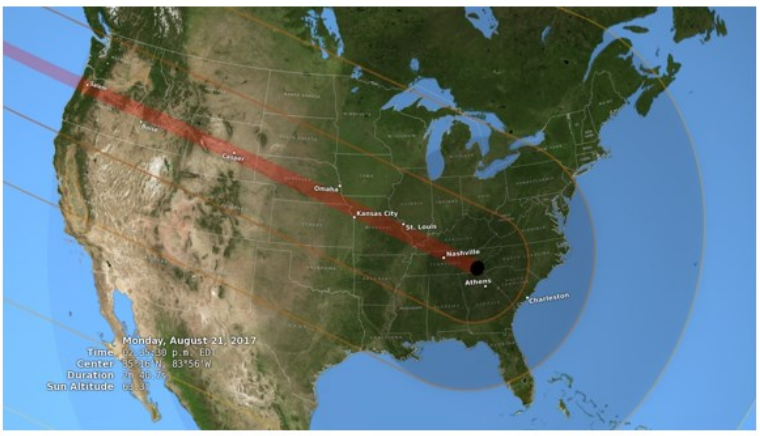


Illustration showing the United States during the total solar eclipse of August 21, 2017, with the umbra (black oval), penumbra (concentric shaded ovals), and path of totality (red) through or very near several major cities. Credit: Goddard Science Visualization Studio, NASA

Eclipse (continued)

millions of degrees Fahrenheit. Researchers have proposed many explanations involving magneto-acoustic waves and the dissipation of magnetic fields, but none can account for the wide-ranging temperature distribution in the corona, Habbal says.

You too can contribute to science through one of several citizen science projects. For example, you can also help study the corona through the Citizen CATE experiment; help produce a high definition, time-expanded video of the eclipse; use your ham radio to probe how an eclipse affects the propagation of radio waves in the ionosphere; or even observe how wildlife responds to such a unique event.

Otherwise, Habbal still encourages everyone to experience the eclipse. Never look directly at the sun, of course (find more safety guidelines here: https://eclipse2017.nasa.gov/safety). But during the approximately 2.5 minutes of totality, you may remove your safety glasses and watch the eclipse directly—only then can you see the glorious corona. So enjoy the show. The next one visible from North America won't be until 2024.

For more information about the upcoming eclipse, please see:

NASA Eclipse citizen science page

https://eclipse2017.nasa.gov/citizen-science

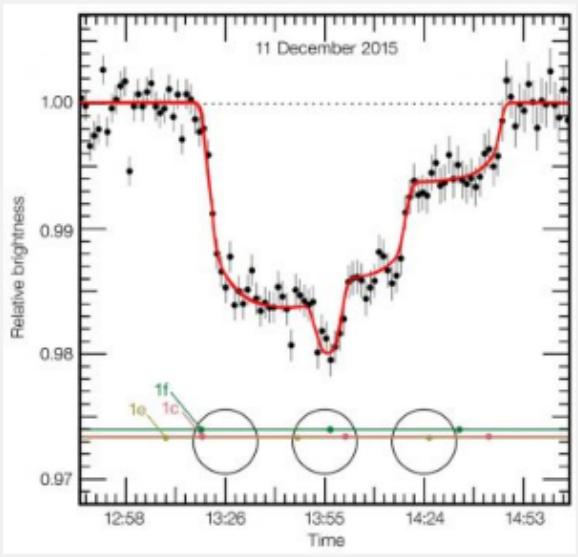
NASA Eclipse safety guidelines

https://eclipse2017.nasa.gov/safety

Seven Earth-Sized Planets Found Orbiting Dim Star By: Camille M. Carlisle

The star TRAPPIST-1 is an unassuming, *M*8 red dwarf star. It lies 39 light-years away in the constellation Aquarius. With a diameter only one-tenth that of our star, the dwarf puts out less than a thousandth as much light as the Sun. Last year, Michaël Gillon (University of Liège, Belgium) and colleagues announced that a trio of small exoplanets orbits this pipsqueak star (although the third world was of dubious reality). Now, after an intensive follow-up campaign, the team has discovered that there are actually *seven* planets, not three. All are likely rocky. Three lie in TRAPPIST-1's putative habitable zone — the region where, given an Earth-like composition, liquid water could be stable on the surface. But all, with enough hand-waving, might have a chance at liquid water.

The astronomers detected the exoplanets using the transit technique, which catches the tiny dip in starlight when a planet passes in front of its host star from our perspective. The discovery roller-coaster began when the team found that what it had thought was a combined transit of planets #2 and #3 was in fact the crossing of *three* planets. The observers next assailed TRAPPIST-1 with an impressive flurry of ground-based observations. But the big breakthrough came with the Spitzer Space Telescope, which observed the star for 20 days. These data caught 34 clear transits. The team was then able to combine their ground- and space-based observations and slice and dice them to determine that the signals likely came from seven different planets.

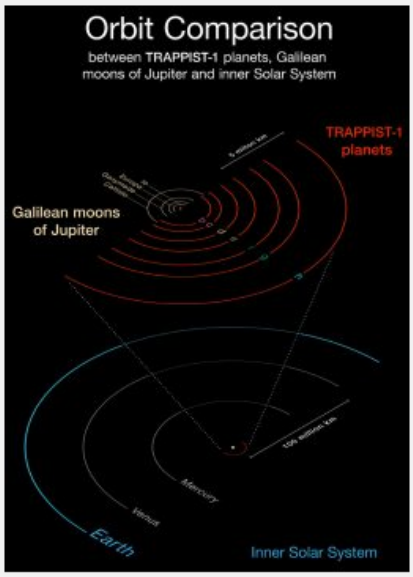


This plot is a light curve, showing how the brightness of the faint dwarf star TRAPPIST-1 varies as three of its planets pass across its face in a triple transit on December 11, 2015. Data come from the HAWK-I instrument on ESO's Very Large Telescope. All three planets are probably rocky, and e and f are in the star's habitable zone.
ESO / M. Gillon et al.

Only six of those are firm detections, however. Number 7, or planet h, is iffy in its specs: The team only detected a single transit for it, and astronomers prefer to see three transits before calling something a candidate planet. Expect astronomers to haggle over this one in months ahead.

Read more at Sky & Telescope.

http://www.skyandtelescope.com/astronomy-news/seven-planet-star-ageless-maybe-deadly-0603201723/



All of the seven exoplanets discovered around TRAPPIST-1 orbit much closer to their star than Mercury does to the Sun, as shown here in this comparison of the TRAPPIST-1 orbits with the Galilean moons of Jupiter and the planets of the inner solar system. But because TRAPPIST-1 is far fainter than the Sun, the worlds are exposed to similar levels of irradiation as Venus, Earth, and Mars.
ESO / O. Furtak