WEYMOUTH ASTRONOMY

Sky Watcher

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Trips / Events

Ideas for trips and events always welcome!

events@weymouthastronomy.co.uk

- *19 Oct CADAS—Starting out in Astronomy*
- **1 Nov WAS—*Lunar geology from the comparative safety of your own home—Barry Fitzgerald***
- **1 Nov WAS—Eight Great Astronomers—Bob Mizon**
- **15 Nov BNSS—Volcanism in the Solar System—Sheri Karl**
- **16 Nov CADAS—Solar Imaging—Sheri Karl**
- **6 Dec WAS—Planets, Life and Panspermia—James Fradgley**
- **21 Dec CADAS—Christmas Social and Members Short Talks**

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.

More events to come in 2017.

WAC Upcoming Events:

11 Nov—Aurora in the Solar System—Sheri Karl

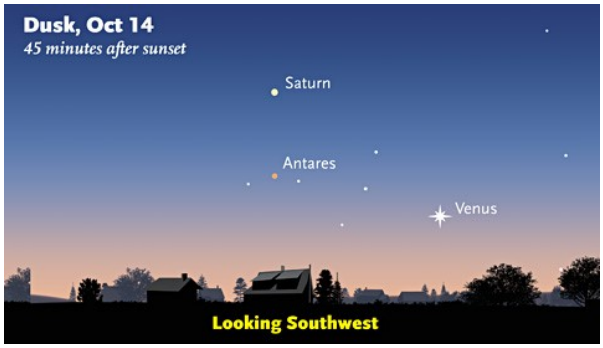
9 Dec—Christmas Quiz Night

More to come in 2017!

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

WAC News—

Sky Tour Podcasts—this month I have been looking into some of the recent developments for helping amateur astronomers make the most out of their limited observing time. As we have passed the autumnal equinox and dark skies at a civilised hour have begun, this seemed to be a useful topic. One useful source of information are the monthly Sky Tour Podcasts produced by Sky & Telescope Magazine in the US.



http://www.skyandtelescope.com/observing/astronomy-podcasts/

These provide a 10 min video of the observing basics for naked eye, binocular and small telescope observers presented by S&T's Senior Editor J. Kelly Beatty.

Until next month ~SK

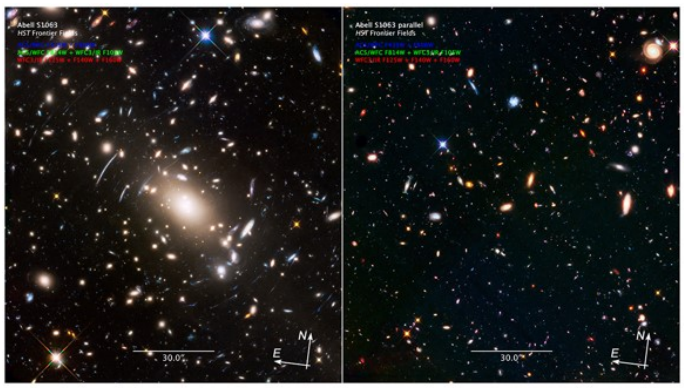
One Incredible Galaxy Cluster Yields Two Types of Gravitational Lenses By Ethan Siegel

There is this great idea that if you look hard enough and long enough at any region of space, your line of sight will eventually run into a luminous object: a star, a galaxy or a cluster of galaxies. In reality, the universe is finite in age, so this isn't quite the case. There are objects that emit light from the past 13.7 billion years—99 percent of the age of the universe—but none before that. Even in theory, there are no stars or galaxies to see beyond that time, as light is limited by the amount of time it has to travel.

But with the advent of large, powerful space telescopes that can collect data for the equivalent of millions of seconds of observing time, in both visible light and infrared wavelengths, we can see nearly to the edge of all that's accessible to us.

The most massive compact, bound structures in the universe are galaxy clusters that are hundreds or even thousands of times the mass of the Milky Way. One of them, Abell S1063, was the target of a recent set of Hubble Space Telescope observations as part of the Frontier Fields program. While the Advanced Camera for Surveys instrument imaged the cluster, another instrument, the Wide Field Camera 3, used an optical trick to image a parallel field, offset by just a few arc minutes. Then the technique was reversed, giving us an unprecedentedly deep view of two closely aligned fields simultaneously, with wavelengths ranging from 435 to 1600 nanometers.

With a huge, towering galaxy cluster in one field and no comparably massive objects in the other, the effects of both weak and strong gravitational lensing are readily apparent. The galaxy cluster—over 100 trillion times the mass of our sun—warps the fabric of space. This causes background light to bend around it, converging on our eyes another four billion light years away. From behind the cluster, the light from distant galaxies is stretched, magnified, distorted, and bent into arcs and multiple images: a classic



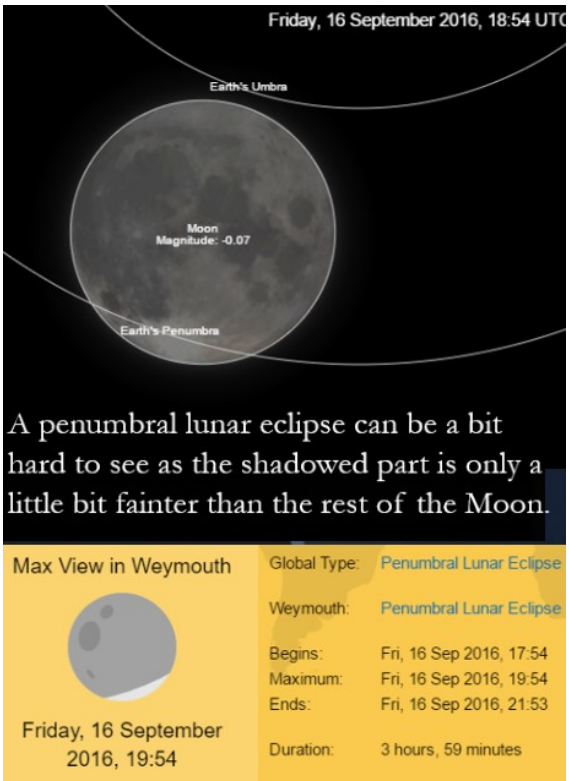
Galaxy cluster Abell S1063 (left) as imaged with the Hubble Space Telescope as part of the Frontier Fields program. The distorted images of the background galaxies are a consequence of the warped space dues to Einstein's general relativity; the parallel field (right) shows no such effects. Image credit: NASA, ESA and Jennifer Lotz (STScI)

Lenses (*continued*)

example of strong gravitational lensing. But in a subtler fashion, the less optimally aligned galaxies are distorted as well; they are stretched into elliptical shapes along concentric circles surrounding the cluster.

A visual inspection yields more of these tangential alignments than radial ones in the cluster field, while the parallel field exhibits no such shape distortion. This effect, known as weak gravitational lensing, is a very powerful technique for obtaining galaxy cluster masses independent of any other conditions. In this serendipitous image, both types of lensing can be discerned by the naked eye. When the James Webb Space Telescope launches in 2018, gravitational lensing may well empower us to see all the way back to the very first stars and galaxies.

Member Images...



19 September 2016—Penumbral Eclipse photographed by Chris Bowden.

This is a tremendous montage of the eclipse which was imaged from Dorset. As the eclipse itself is challenging to see due to the slight dimming of the lunar disk, an image montage is a great way to capture the subtle changes in shadowing which were visible during this partial event as seen from the UK.

The changing exposures required to correctly image the lunar disk are challenging. Chris has successfully managed to select the correct settings for a selection of the changes during the ingress building up to maximum eclipse as seen from his imaging location.

If you would like to know more about how to image solar system events like this, Chris is a good person to ask.