

WEYMOUTH ASTRONOMY

Sky Watcher

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Trips / Events

Ideas for trips and events
always welcome!

events@weymouthastronomy.co.uk

- ◆ 20 Jan CADAS—Cosmic Miscellany—James Fradgley
- ◆ 2 Feb WAS—Tablet Astronomy—Lillian Hobbs
- ◆ 17 Feb CADAS—A life on Mars—Bud Budzynski
- ◆ 1 Mar WAS—Apollo Science Packages—Keith Wright
- ◆ 16 Mar CADAS—Dawn of the Solar System—Chris Starr
- ◆ 5 Apr WAS—Eclipses—Chris Bowden
- ◆ 20 Apr CADAS—Names in the Sky—Bob Mizon
- ◆ 3 May WAS—Images of the Universe Vol 2—Paul Money

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!!

WAC Upcoming Events:

- 12 Feb—Open Night for New Members
- 11 Mar—Calendars, Cultures and Clocks—James Fradgley
- 8 Apr—TBA
- 13 May—The Names of the Stars—Bob Mizon

More to come!

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



WAC News— Happy New Year! Hope you all had a happy festive period. I hope some of you were lucky enough to see the Quadrantids this week. On New Year's Eve I was lucky enough to be celebrating in the village of Cullen Bay at a hotel with north facing windows. What a coup! A very clear night and a Kp index of 7.67 indicated that the aurora borealis should be visible... Watching out the window with the warmth indoors a Quadrantid appeared in a brightening northerly aspect until the green auroral arc appeared unmistakably across the horizon. During the course of an hour, a second ribbon aurora appeared beneath the larger arc. Periodically pillars of light appeared to spring vertically from the ribbons. The best image which showed what we saw is in the Spaceweather gallery http://spaceweathergallery.com/aurora_gallery.html



Jim Henderson—Torphins, Scotland

Until next month~SK



How will we finally image the event horizon of a black hole? By Ethan Siegel

One hundred years ago, Albert Einstein first put forth his theory of General Relativity, which laid out the relationship between spacetime and the matter and energy present within it. While it successfully recovered Newtonian gravity and predicted the additional precession of Mercury's orbit, the only exact solution that Einstein himself discovered was the trivial one: that for completely empty space. Less than two months after releasing his theory, however, the German scientist Karl Schwarzschild provided a true exact solution, that of a massive, infinitely dense object, a *black hole*. One of the curious things that popped out of Schwarzschild's solution was the existence of an event

horizon, or a region of space that was so severely curved that nothing, not even light, could escape from it. The size of this event horizon would be directly proportional to the mass of the black hole. A black hole the mass of Earth would have an event horizon less than a centimeter in radius; a black hole the mass of the sun would have an event horizon just a few kilometers in radius; and a supermassive black hole would have an event horizon the size of a planetary orbit. Our galaxy has since been discovered to house a black hole about four million solar masses in size, with an event horizon about 23.6 million kilometers across, or about 40 percent the

size of Mercury's orbit around the sun. At a distance of 26,000 light years, it's the largest event horizon in angular size visible from Earth, but at just 19 micro-arcseconds, it would take a telescope the size of Earth to resolve it – a practical impossibility. But all hope isn't lost! If instead of a single telescope, we built an *array* of telescopes located all over Earth, we could simultaneously image the galactic center, and use the technique of VLBI (very long-baseline interferometry) to resolve the black hole's event horizon. The array would only have the light-gathering power of the individual telescopes, meaning the black hole (in the radio) will appear very faint, but they can obtain the resolution of a telescope that's the distance between the farthest

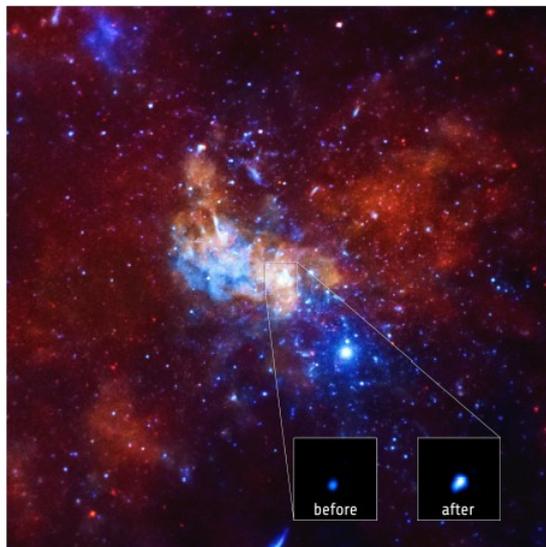


Image credit: NASA/CXC/Amherst College/D.Haggard et al., of the galactic center in X-rays. Sagittarius A* is the supermassive black hole at our Milky Way's center, which normally emits X-ray light of a particular brightness. However, 2013 saw a flare increase its luminosity by a factor of many hundreds, as the black hole devoured matter. The event horizon has yet to be revealed.



Event horizon (continued)

telescopes in the array! The planned Event Horizon Telescope, spanning four different continents (including Antarctica), should be able to resolve under 10 micro-arc-seconds, imaging a black hole directly for the first time and answering the question of whether or not they truly contain an event horizon. What began as a mere mathematical solution is now just a few years away from being observed and known for certain!



Articles from Members:

By Sara Harpley

It was the happy coincidence of a school inset day coupled with a Southwest trains £15 return to London promo that brought us to the Science Museum at 10.30am on a Monday morning. We started by booking to go into the new Cosmonauts: Birth of the Space Age exhibition followed by the loo, coffee and cloakroom! We then went and booked the internal IMAX cinema, my 10 year old requesting 'Under the Sea', however upon purchase, we were informed that 'Hidden Universe' was half price on production of the exhibition tickets, so after 10 seconds of bribery the deal was done!

The Cosmonaut exhibition was amazing with an authentic USSR feel, red lighting, information boards in appropriate font, Russian translation and awesome stuff to engage a 10 year old. Of particular note was the original 1960 footage of Cosmonaut training at what is now Star City, which compromised seemingly of a lot of running through woods in saggy underpants, trampolining and scuba diving. We spent longer than necessary looking at the cross section of a toilet that is on the ISS trying to work out the 'poo route', there were stories, memorabilia and a considerable nod to Yuri Gagarin. I can vouch for his icon status having visited Moscow when it was USSR and again in the Russian Federation and having seen the monument and the adulation and esteem with which he is still regarded.

Hidden Universe.. in 3D.. on one of the biggest screens in Europe.. neither of us understood or cared for the science or theory, it was just 'awesome' in his words (and my head), so hopefully that is how a young person gets interested and hooked. Of course we ended up in the shop, buying stuff we didn't need; however the Cosmonaut 'Ice Cream Sandwich' space food was a given. So, if you are in London, happen to be passing with your children or grandchildren, it would be rude not to pop in!



Feature Image:

APOD: 2015 December 31 - Solstice Sun at Lulworth Cove

<http://apod.nasa.gov/apod/ap151231.html>

