Welcome to our weekly public open evening. Tonight John Richer will be revealing New Views of the Cold Universe: Witnessing the Birth of Stars and Galaxies with ALMA. The talk begins promptly at 7.15pm in the lecture theatre, and it will be followed by an opportunity to observe if (and only if...) the weather is clear. If we are observing, two of the historical telescopes will be open, and the Cambridge Astronomical Association will provide a show on the observatory lawns relaying live images from three modern telescopes. Next week Melanie Keene will be talking about Pinafores at the Observatory? The Story of the Female Computer. Her talk links in to performances of The Observatory Pinafore during the Science Festival on 20-24th March, at the Corpus Playroom. (What happens when a sinister group of men from a rival institution plot to steal Harvard’s star observer? Travel back in time to meet squabbling scientists and malfunctioning instruments in this reworking of a classic operetta.) If you have any questions, suggestions or comments about the IoA Open Evenings, please don’t hesitate to get in touch with me, Carolin Crawford, at csc@ast.cam.ac.uk. You can also follow us on Twitter as IoACoA.

Cambridge Science Festival is on its way!
As well as the Observatory Pinafore, other astronomical highlights to consider are:

- Holst’s The Planets, will be performed at Road Concert Hall on Friday 9th March, 7.15pm. The music will be accompanied by stunning planetary images, and there’s also a pre-concert talk. Tickets required.
- A talk about the Sounds of the Universe on Friday 16th March, 7.30pm at the Babbage Lecture Theatre, at the New Museums site. No need to book, but first come, first seated...
- Radio stars: Dramatising Astronomy on Monday 19th March 7.30pm, here in the Sackler Lecture Theatre at IoA. Playwright Steve Waters will talk about his new play Radio Stars, which dramatises the clash between astronomer Fred Hoyle and radio astronomer Martin Ryle over the nature of the universe, and examines the consequences of this breach for their lives and for the fate of British astronomy. The event will mix extracts from the play with Waters talking about his writing process. Free, but booking required.

And last, but by no means least, don’t forget the IoA’s Open Afternoon on Sat 24th March, 2.30-6.30, followed by public observing if the weather is clear. There will be talks, displays, demonstrations and hands-on activities for everyone to learn more about Astronomy and the kind of research we do here. Watch out for the exhibition Take me to your reader!, based on the historical archives in our Library. You can find everything online at www.cam.ac.uk/sciencefestival/

Planets Galore!
I hope you’ve been enjoying the beautiful array of both Venus – brighter, and lower down to the horizon – and Jupiter straddling the southwestern sky in the early evening. Keep an eye on them as they steadily approach each other in the Sky; they will be closest in mid-March to form what is known as a conjunction. This week is also your best time this year to observe little Mercury – it lies on the line joining Jupiter and Venus if you extend it down towards the horizon. Try before 6.30pm, and as it’s so low down in the sky you’ll need a clear horizon to the West. The figure to the right (c/o Stellarium) indicates the relative positions tomorrow evening at 630pm. Mars is now rising in the southeast by 7pm, bright and made distinct by its orangey-red colour; the red planet is approaching ‘opposition’, where it will be exactly opposite the Sun and as close to Earth as it will get in 2012. Finally, if you’re out and about after 11pm, you can even see Saturn in the East.

Planets without a home?
We have a mental image of planets only in the context of an orbit around a host star. But could this be misleading? A new study suggests that there could be huge numbers of unattached planets wandering through the interstellar space of our Milky Way. Such ‘nomad’ planets were only discovered for the first time less than a year ago by the way that their mass distorts the path of background light around them. A new theoretical study extrapolates from such observations (and a whole lot of physics) to suggest that orphan planets could outnumber the stars in our Galaxy by 100,000 times. They could have been ejected from planetary systems by gravitational interactions.
with other planets in the early stages of formation, or stripped from the environment of a star as it moves through an interstellar gas cloud. How we find them, though, is a different matter. Without the reflection of nearby starlight, such objects appear dark and dim – any direct detection may have to wait to the next generation of infrared instrumentation.

NO MORE FASTER-THAN-LIGHT NEUTRINOS
So neutrinos really do obey the laws of physics. Phew. The latest on last September’s puzzling experimental results (which suggested that neutrinos travelled between CERN and Italy somewhat faster than light-speed) is that they are probably false. It seems that a piece of faulty wiring may have been to blame, creating a discrepancy between the arrival and the timing. It looks like Einstein’s theory of relativity – and all the physics that rests on it - is safe... for now, at least.

WINDY BLACK HOLES
Last week’s handout mentioned the discovery of extremely fast winds of matter issuing forth from a stellar-sized black hole in our Galaxy. Well, it turns out it’s not the only one at it. More new results show that many of the supermassive black holes – ones with masses of some millions to billions times that of the Sun - that lurk at the cores of nearly all large galaxies also produce phenomenally fast winds in the form of ‘ultra-fast outflows’ (aka, I’m afraid, as UFOs...). These winds might have an important role to play in shaping the galaxy that plays host to such an object. It’s long been known that there’s a direct link between the mass of a central black hole and the galaxy it resides in, in that the galaxies with the more massive black holes at their core are themselves much more massive. What hasn’t been clear is how a giant galaxy could be influenced by what goes on at its very centre – how a tiny region of space, comparable in size to our Solar System, could affect the contents of space over a volume millions of times larger. But if some of the material accreting towards a black hole is flung outwards in the forms of winds and jets, these outflows can deposit a lot of energy further out into the galaxy, either heating cold gas clouds that might otherwise condense under gravity to form new stars, or even just blasting away the gas so that it is too dispersed to continue star formation. The new survey of black hole activity was undertaken with X-ray telescopes, and suggests that such fast outflows might be common amongst active galaxies. The flows measured certainly seem powerful enough to curtail, or at least regulate, any star formation in the surrounding galaxy... and hence provide a link between the mass of the black hole and its host.

ROLLING BOULDERS ON THE MOON, PART 2...

I can’t resist showing you another of the wonderful detailed images of the Moon that keep turning up from the camera on NASA’s Lunar Reconnaissance Orbiter satellite. Not only do we see the trails across the lunar soil where rocks have tumbled and bounced down slopes – presumably shaken loose by local meteorite impacts - but a new image release (above) shows where two have rolled and then shattered into pieces. The dotted paths left behind shows that the boulders often seem to bounce rather than just roll downhill, due to the lower gravity on the Moon. It could be that this bounding motion makes them more likely to crumble into pieces when they come to rest, particularly if they originally had tiny faultlines or fractures. But why the debris from the one on the left should then be so widely dispersed remains a mystery.