Eyes wide open

EDITORIAL There's nothing very surprising about professors who grope – but Geoff Marcy's resignation from the University of California at Berkeley caused a stir, despite his behaviour being something of an open secret for years. The new element in Marcy's case was the spotlight of internet journalism and commentary, such as the AAS's Women in Astronomy blog. It's clear that we do have a problem. And we have to deal with it by noticing and objecting to this type of bullying, rather than pretending it doesn't happen. Because while we look the other way, too many women will choose other careers.

Women scientists should be valued for their science, not just because they are women – anything else is just weird. Banning relationships is no solution; lifelong friendships and marriage are natural outcomes of working together. But it is possible to develop such relationships without bringing academic power into the equation. It is even possible to be courteous to everybody without resorting to the sort of clumsy chivalry that sidelines women. We have to be aware of this and other forms of unconscious bias, because they limit our science. We all tend to see the differences in other people first. Focusing on the scientist instead would go a long way to redressing the imbalance between the types of people who are scientists, and everybody else. Gender, sexuality, using a wheelchair or having different coloured skin – these don't determine whether or not someone is a good scientist, any more than baldness or a fondness for steam trains does. The better we manage to see the scientist, the better scientists we will have.

Sue Bowler, Editor

Setting the scene for SKA science

SKA Science goals and challenges are becoming clearer for the Square Kilometre Array – as are the challenges in managing the avalanche of data to come when the telescope starts operations.

These were the themes of an SKA Science Meeting in Manchester on 4 November. Plans for the observatory as a whole are now much more concrete and scientific priorities are established. It is expected, for example, that the "Key Science Projects", which will occupy up to 70% of observing time, will be chosen in 2018, so now is the time to get involved and develop proposals. Plans are also in train to manage data ownership and release.

The collection, storage and transport of data for the SKA is a challenge – and one that needs to be addressed at this stage because it affects science priorities.

The SKA will produce so much data – as much as currently moves across the internet, worldwide – that choices will have to be made about how and where to process it, what to keep and what to discard. "The MID array, in full resolution, maximum bandwidth spectral line mode gives rise to image cubes which are 3 PBytes each," said Rosie Bolton, project scientist for the SKA Science Data Processor Consortium at the University of Cambridge. "If such a cube is generated once every 6 hours then the input data rate into the storage facility would be 1 Tbit s^{-1}. While this is conceivable for a local link, it would be very expensive to transfer the full cubes across long-distance fibre."

Keeping all the raw data is just not feasible. According to Bolton's calculations, the raw visibility data comes in to the Science Data Processor from the correlator at a rate of around 3 Tbit s^{-1}, 30 times faster than a 100 Gbit s^{-1} link could remove it. Managing these volumes of data at reasonable costs and in reasonable times might mean discarding some of the raw data immediately, to ease data transport. Or observers might need to limit the frequencies, spatial extent or time they need, in order to collect their highest priority data. Or it might make sense to establish regional data centres to store and process the data locally before moving data products to researchers.

Any limitation of the data that are stored has implications for the SKA science return and for its legacy. New horizons opened by the SKA are likely to bring unexpected new research fields. Discarding data in line with today's priorities runs the risk of limiting tomorrow's science opportunities.

● The UK SKA Science Committee wants feedback from researchers about data management and the possible value of Regional Data Centres. Details of the survey will be placed on the UKSKASC pages of the STFC website, where there is also a list of UK university contacts.
http://bit.ly/1Mjti2e

Greenland ice confirms solar storms

SOLAR ACTIVITY Peaks of cosmogenic carbon have been found in ice cores at the same time as in the tree ring record, indicating two major solar storms around 1000 years ago that were 10 times bigger than any recorded in recent decades.

Solar storms send energetic particles towards the Earth, some of which trigger the formation of distinctive isotopes in the upper atmosphere which are deposited on ice in polar regions. Radioactive carbon is formed in this way and is absorbed into living things. The radiocarbon record in tree rings shows a spike in the years 774/775 and 993/994 that might indicate major solar storms, but could arise in other ways. Now increases in cosmogenic isotopes have been found in the Greenland ice record at the same times, confirming their solar origin. The findings were published in *Nature Communications*.
http://bit.ly/1leBBWm

RAS seeks diversity ambassadors

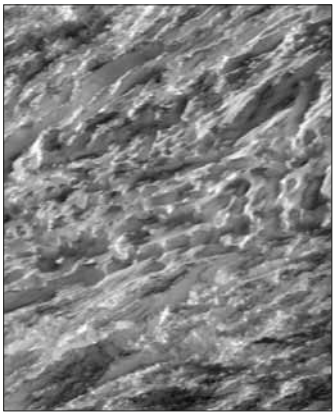
OUTREACH The RAS and STEMNET have created a diversity ambassador scheme to support researchers going into schools. This is part of the Society's continuing work to engage people from more diverse backgrounds with astronomy, space science and geophysics.

The Society encourages researchers to engage with schools, particularly those in areas of socio-economic deprivation, where attainment is low and where the population is underrepresented in our sciences. The RAS has identified "diversity schools" where such support would be especially helpful.

The RAS will provide resources and training to diversity ambassadors, and will pay travel expenses. They will need to give the RAS feedback about their activities in the schools.

STEMNET already has an ambassador scheme; RAS Fellows who are part of this can also become diversity ambassadors. If you want to get involved, please contact RAS Diversity Officer Sheila Kanani. Full details are on the RAS website.
http://bit.ly/1WHVPc3

Cassini dives into Enceladus's plumes



CASSINI At the end of October, the Cassini spacecraft took a close look at the plumes of water vapour and ice emerging from Saturn's moon Enceladus, in its closest pass yet. At its closest, Cassini was just 50 km above the surface of the moon, near its south pole, where jets emerge from fissures in the surface. This close-up view of the surface, from about 124 km altitude, shows the pattern of ridges and fissures in detail. The area shown is about 3 km across, centred at 57°S 324°W. (NASA/JPL-Caltech/Space Science Institute)
http://go.nasa.gov/1SvSKWx