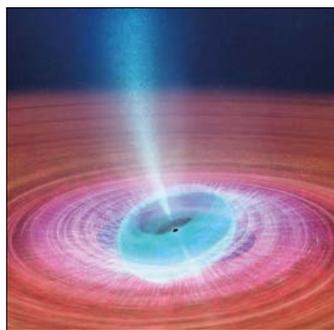


Precession produces fast-changing jets of plasma

BLACK HOLES An especially extreme black hole system shooting out bursts of plasma in different directions could arise because of a mismatch between the orientations of the accretion disc and the black hole spin.

International Centre for Radio Astronomy Research astronomers at Curtin University, Australia, observed V404 Cygni, a black hole in a binary orbit with another star first observed in outburst in 1989. The team looked at V404 Cygni in another major outburst in 2015, using telescopes including the Very Long Baseline Array. They found that the jets were spinning so fast that they threw out plasma in directions that changed every few hours. The team pinned down the cause to the accretion disc close to the black hole. "The inner part of the accretion disc was precessing and effectively pulling the jets around with it," said James Miller-Jones (Curtin University). "You can think of it like the wobble of a spinning top as it slows down – only in this case, the wobble is



Artist's impression of the jets. (ICRAR)

caused by Einstein's theory of general relativity."

The team had to develop new imaging techniques. "These jets were changing so fast that in a four-hour image we just saw a blur," said co-author Alex Tetarenko, an East Asian Observatory Fellow. "It was like trying to take a picture of a waterfall with a one-second shutter speed." The team took many 70 second images and joined them to make a movie. The results were published by Miller-Jones *et al.* in *Nature*.

<http://bit.ly/aag2HiSKMp>

A Brownie's experience of space

RAS200 As part of the RAS200 outreach programme, Girlguiding introduced a space badge for younger girls in the Brownies. Jessica Miller, a Brownie who has recently achieved the badge, spoke to RAS Outreach and Education Officer Sheila Kanani.

"My name is Jessica Miller, I am seven years old and I live in West Sussex. I like to read and to write stories; at the moment I am reading *The Worst Witch*. I enjoy swimming and riding my bike to the beach with my Mum and sister. I really love school! When I grow up I would like to be a teacher.

"Brownies is a lot of fun, we do loads of activities and go on a lot of trips. I like earning badges. I thought earning a space badge would be awesome. I liked learning about space because of all the colours in the galaxies and the planets. To earn our space badge we visited The Southdowns Planetarium in Chichester. We learnt about the planets, stars, constellations and galaxies. My best part was looking at Mars and learning about the robot that landed on Mars. There was a statue of Tim Peake in the planetarium because



Jessica Miller: "I love the badge as Saturn is my favourite planet." (S Kanani)

he is from Chichester. I think that is awesome because an astronaut lived near to where I live! All my Brownie friends enjoyed working to get a space badge too.

"My sister Isabelle is nine. She loves learning about the stars too and looks at them through her telescope. Her favourite constellation is the Seven Sisters. I got to see the Seven Sisters zoomed in at the planetarium, it was really good! I would now really like to learn more about space at school because it's really interesting!"

<http://ras200.org>

Poster success at the RAS



COMPETITION

The winners of the annual RAS poster competition for GCSE students – sponsored by Winton Capital – received their prizes from RAS President Mike Cruise at the Ordinary Meeting of the Society on 8 March, where their winning posters were on display.



The first prize went to Jack Forrest

(top, Torquay Boys' Grammar School) for his poster "Break-through Starshot, approaching light speed".

Second prize went to Benjamin Andrew (middle, St John's College, Cardiff) for "Evidence of ice volcanoes in the solar system".

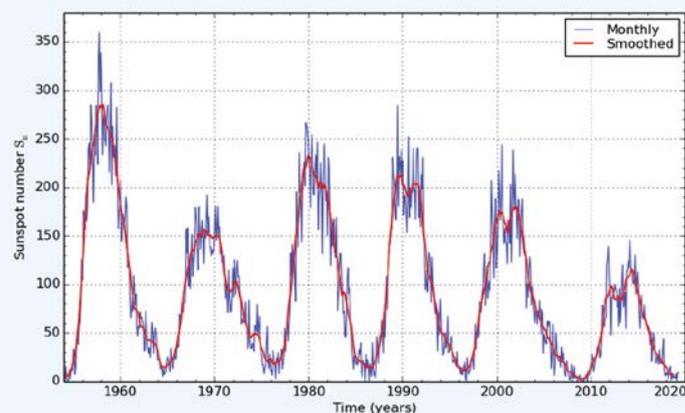
The third prize went to Natalie Shapiro (bottom, JFS School) for "Active galactic nuclei and the unified model". (RAS/H Klus)

VIEWS

A vintage year from sunspots?

LETTER From Derek Ward-Thompson
Ever since my sabbatical at the Observatoire de Bordeaux some 20 years ago, I have taken a keen interest in the years of the great vintages from the Bordeaux vineyards, and I felt I should share the fruits of my research with your readers. The greatest, and in fact "legendary" (according to thewinecellarinsider.com), vintage of modern times is widely agreed to be 1961. The next of any note was 1971, which was very good for "Pomerol and a few wines from the left bank". 1982 is considered to have produced wines that are "stunning", and the Medoc also apparently produced stunning wines in 1996.

More recently, in 2005, there was the vintage that many authorities consider to be the best since 1961, and is apparently still "one of the best Bordeaux vintages to lay down in your cellar". My sabbatical year was 2006/7 and I was fortunate enough to purchase plenty of the 2005 before it was fully



1 International sunspot number S_n , as a monthly mean and smoothed post. (Royal Observatory of Belgium, <http://sidc.be/silso>)

appreciated to be the great vintage that it is now known to be.

Comparison of these dates with figure 1 shows that these years all have something in common with regard to the sunspot cycle. They all occur after solar maximum, during the declining phase of the cycle. 1971 and 1982 are not long after maximum, but 1961 and 2005 (the truly great vintages) occur well after maximum, and almost towards the minimum.

Some combination of solar

output and atmospheric conditions clearly combine to produce great vintages, and I was wondering whether any other readers of A&G had noted this apparent correlation, or had any theories to explain it. As a final tip for your readers, I can say that 2016 is currently looking extremely promising, and definitely one that I am busy tracking down.

Derek Ward-Thompson, University of Central Lancashire

<http://www.thewinecellarinsider.com>