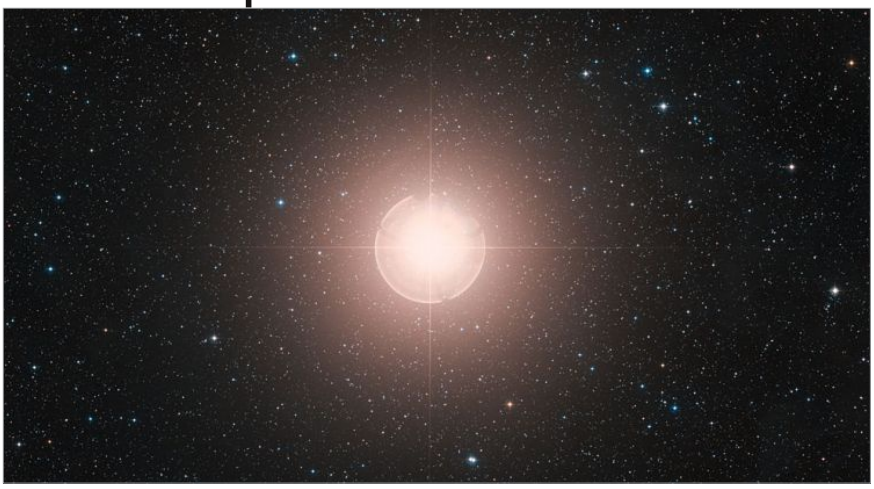
INSTITUTE OF ASTRONOMY
PUBLIC OPEN EVENING

— 8 JANUARY 2020 —

Betelgeuse is getting dimmer! Will it explode soon?



Betelgeuse, as seen by the Digitized Sky Survey. Credit: ESO

Betelgeuse is one of the most recognisable stars in the night sky. A reddish star in Orion's armpit (its name even means 'Orion's Armpit!), Betelgeuse is also known to astronomers as 'Alpha Orionis', as it is the brightest star in the constellation Orion. Or, rather, it WAS the brightest star in Orion.

Betelgeuse has been rapidly dimming over the past few months, and to date its brightness has dropped by a factor of more than two -- or by about a magnitude, in astronomical parlance. And while Betelgeuse does vary in brightness normally, this new dimming is far more than ever seen before,

The massive star is fairly young as stars go (at just 8.5 million years old), and is nearing the end of its life. This new dimming has prompted speculation that Betelgeuse may be entering a 'pre-supernova phase', with the dimming being a precursor to a full collapse and explosion.

If the star did go supernova, it would outshine the moon for several weeks. "It'd be brilliant," the star would be so bright that it would make it difficult to see other stars near it" said Edward Guinan (Villanova University) who reported the dimming.

So, can we expect a supernova soon? Unfortunately, the answer might well be 'no'. The physics of stars near the end of their lives remain fairly unknown, so astronomers can't be sure that this dimming precedes a supernova. As astronomer Sarafina Nance put it, "I do think that this is more indicative of really interesting physics that's going on with the star rather than an imminent explosion". But she added "If it does explode and we're wrong, awesome".

TONIGHT'S SPEAKER

Vivien Parmentier

Cloudy nights and sunny days in exoplanets

Our weekly welcome

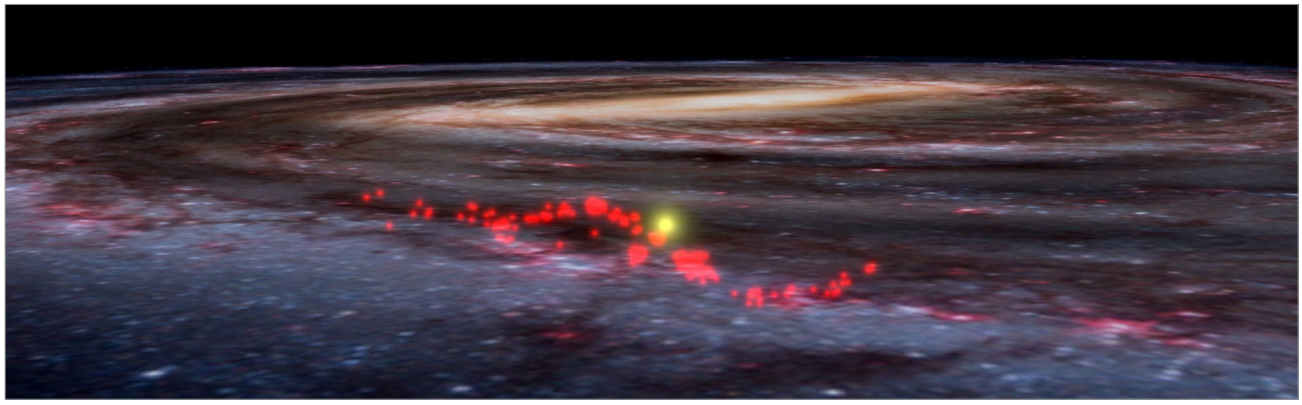
WELCOME to our weekly public open evenings for the 2019/20 season. Each night there will be a half-hour talk which begins promptly at 7.15pm. Please note that the talk will be recorded and archived for online streaming.

The talk is followed by an opportunity to observe if (and only if!) the weather is clear. The IoA's historical Northumberland and Thorrowgood telescopes, along with our modern 16-inch telescope, will be open for observations. In addition, the Cambridge Astronomical Association will provide a floorshow outdoors on the Observatory lawns, relaying live images from their telescopes and providing a commentary. If we're unlucky and it's cloudy, we'll offer you a conciliatory cup of tea after the talk (with perhaps some more astro-information in the lecture theatre for those who want to stay on).

If you have any questions, suggestions or comments about the IoA Open Evenings please contact Matt Bothwell at bothwell@ast.cam.ac.uk.

The talk schedule for this term can be viewed at: www.ast.cam.ac.uk/public

Vast stellar nursary found in our Galaxy



The Radcliffe wave (red) in our Milky Way, with the position of our Sun shown in yellow. Image credit: Harvard University

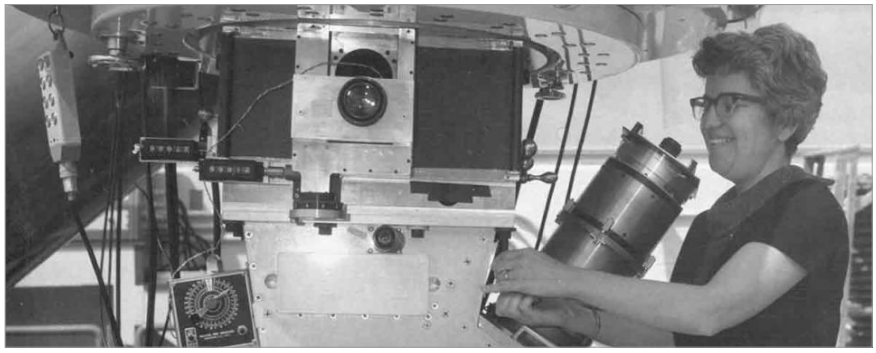
A team of astronomers have discovered a vast rippling wave of star-forming gas, nearly 10,000 light years long. As well as being the largest gaseous structure found in our galaxy (and containing around 800 million stars), the wave flows right past our own Solar neighbourhood. “It is the largest gaseous structure we know about in the Milky Way,” said Alyssa Goodman, professor of applied astronomy at Harvard University, who presented the findings. “It’s right up in our face. It’s crazy that it’s so close by.”

The gaseous filament has been dubbed the Radcliffe Wave, named for the Radcliffe Institute for Advanced Study.

The new findings revolutionises our previous knowledge of 'Gould’s Belt', a ring of stars 3000 light years across. These new results show that there is actually no ring -- just a long, straight wave of gas undulating across our galactic disk. Goodman said: "We were completely shocked when we first realised how long and straight the Radcliffe Wave is, looking down on it from above in 3D. The wave's very existence is forcing us to rethink our understanding of the Milky Way's 3D structure."

This new research was made possible by the European Space Agency's Gaia satellite, which is mapping billions of stars in our Milky Way with unprecedented accuracy, allowing astronomers to find new structures and features in our galaxy that previously eluded us.

The Vera Rubin Observatory



Trail-blazing astronomer Vera Rubin has been honoured this week, as the upcoming Large Synoptic Survey Telescope (LSST) has been officially renamed the Vera C. Rubin Observatory, or VRO.

Rubin, one of the most influential astronomers of the 20th Century, was instrumental in providing observational evidence for the existence of dark matter, by measuring how fast galaxies rotate. The fact that galaxies seemed to be rotating much faster than they should implied that there must be vast quantities of missing matter in the Universe.

Rubin, who died in 2016, made many pioneering discoveries as well as being a lifelong advocate and mentor for women in science. "It is fitting for this major new observatory, which includes the study of dark matter and dark energy as one of the major research topics, to be named for a pioneering astronomer whose observations were so critical to our understanding of this area," said Paul Dabbar, Department of Energy undersecretary for science.

The VRO, currently being constructed in Chile, will be equipped with an 8.4 metre mirror and a 3200 megapixel camera -- the largest camera ever built. It will be able to image the whole sky every few days, and is expected to provide key insights into the nature of several astrophysical phenomena, including dark energy and dark matter.

Joke of the Week

Einstein developed a theory about space. And about time too!