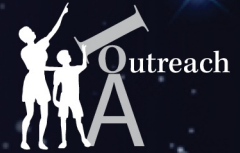




INSTITUTE OF ASTRONOMY PUBLIC OPEN EVENING

— 1 MARCH 2023 —



The mother-daughter duo discovering new worlds

Astronomers Dr Natalie Batalha and Dr Natasha Batalha collaborate on projects focussed on discovering and describing exoplanets - planets outside our Solar System - using JWST.

Both Natalie and Natasha contributed to a package of five papers analysing JWST's observations of WASP-39b that scientific journal Nature has chosen to highlight this week. The papers report the analyses of profiling the atmospheric chemistry of WASP-39b, an exoplanet known as a "hot Jupiter" due to its large mass and close proximity to its host star. The planet is notable for having water in its atmosphere, as well as being the first exoplanet in which atmospheric carbon dioxide and sulphur dioxide have been detected. It orbits the star WASP-39, which belongs to the same spectral class and is about 90% as massive as our Sun.

Natalie specialises in observations of distant light to discover such exoplanets, while Natasha uses these

observations to simulate exoplanet atmospheres. Doing so allows fellow astronomers to better understand the climate and chemical composition. For instance, the ratio of carbon to oxygen determines how carbon-rich a planet is which gives insight into how it formed and its potential to host life.

In a recent interview with Nature, Natalie and Natasha spoke about their experiences working together. "We also complement one another in our approach to science." said Natalie. "She's good at identifying bite-size pieces of a problem. To use a jigsaw-puzzle analogy, whereas I could spend hours categorizing colours without ever connecting two pieces, Natasha would complete a whole corner of the puzzle."

The two also talked about supporting each other in their work. "As an adult, one privilege of having a parent in the field is that I feel comfortable speaking out about injustices. We give each other extra support." said Natasha.

TONIGHT'S SPEAKER



Shikhar Asthana

The Hitchhiker's guide to building a universe

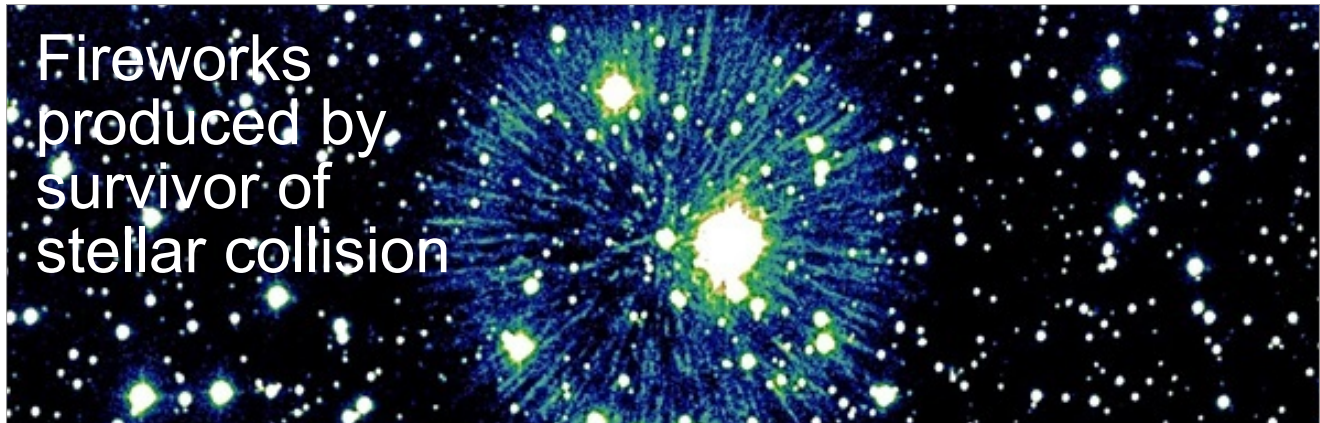
Our weekly welcome

WELCOME to our weekly public open evenings for the 2022/23 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).

News stories written by **Natasha Goodman**. 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.public.ast.cam.ac.uk



Fireworks produced by survivor of stellar collision

Normally, two white dwarfs colliding results in destruction in the form of a thermonuclear explosion that consumes both stars and scatters their remains. However, recent observations of the faint nebula Pa 30 have revealed that this isn't always the case. The nebula is surrounded by glowing sulphur gas, similar to the trails of sparks produced by an exploding firework. Astronomers suspect that this spectacle is the result of two white dwarfs colliding without destroying each other.

Instead, the two stars appear

to have merged to form a strongly magnetised object that pushes debris outwards to form a unique object with firework-like trails. "I've worked on supernova remnants for 30 years and I've never seen anything like this," said Dr Robert Fesen, of Dartmouth College in Hanover, New Hampshire. Astronomers are calling Pa 30 a Type Ia supernova, also known as a "failed" supernova. Type Ia supernovae have only ever been observed in distant galaxies; Pa 30 presents a unique opportunity to see one of these objects up

close.

Fesen and his colleagues hope to follow up these observations of Pa 30 with Hubble or JWST. This could reveal further information about Type Ia supernovae and how it is possible for a star to survive these explosions, which remains a mystery to astronomers.

"There's beauty, science, and history in the story," Fesen said. "We've never seen a Ia in our galaxy. So here we have one that's just a few thousand light years away."



Wednesday March 8th is International Women's Day! Join us in celebrating this day by coming to our special public open evening involving two talks from women in astronomy. The first speaker will be Dr Jacqueline Mitton, a British astronomer and writer who was one of the first women to be awarded a PhD from the IoA since its foundation in 1972. She was the first Public Relations and Press Officer to be appointed by the Royal Astronomical Society and for 7 years she was editor of the Journal of the British Astronomical Association.

Jacqueline has also written over 30 books on astronomy for audiences of all ages, including the biography 'Vera Rubin: A Life'.

Jacqueline will talk about the life and research of astronomer Vera Rubin, whose observations provided the first evidence of dark matter in the Universe. Rubin was also a strong advocate for the equality and representation of women in science and sets a great example for young astronomers today.

The second talk will be given by NASA astrophysicist Dr.

Nicholeen Viall. Nicholeen studies wind coming from our Sun and the 'space weather' it causes when it interacts with the Earth. She is the Project Scientist for an upcoming NASA mission to study the Sun's atmosphere using satellites. Her talk will tell us all about "Our Ordinary, Extraordinary Sun". Following the talks, there will be an 'Ask an Astronomer' session with members of the International Women's Day Committee who hope to talk to you all about their research and experiences. As always, there will be an opportunity for stargazing, clear skies permitting...

We hope to see you there!

Joke of the Week

Last night I slept like a log. Ten hours felt like 2.3.