

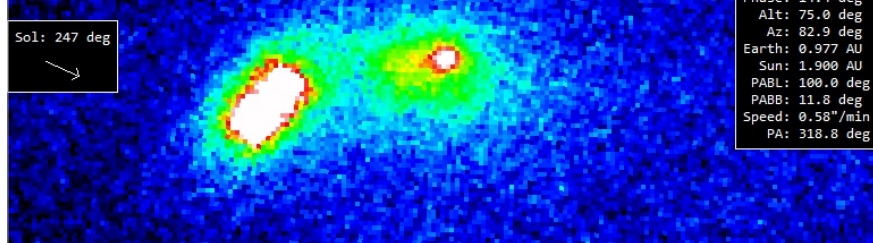


INSTITUTE OF ASTRONOMY PUBLIC OPEN EVENING

— 22 FEBRUARY 2023 —



The unusual comet and its companion blob travelling through space



In 1985 astronomers spotted an unusual comet that appeared to be followed by a huge blob of dust. Initially the blob was thought to be a separate object, possibly a part of the comet that had split off. Later, researchers thought the blob was caused by a process known as sublimation, in which sunlight heats the comet surface and causes the ice to become gas.

The comet, named 108P/Ciffreo, was recently examined by Dr Yoonyoung Kim and her colleagues at the Technical University of Braunschweig in Germany. Observations made using the Nordic Optical Telescope in Spain and NASA's Hubble Space Telescope revealed that 108P/Ciffreo is around 1km across, but the dust blob is almost 5000km across. The blob was also seen to reappear whenever comet 108P/Ciffreo passed by the Sun. This makes it unlikely that the blob is a fragment of the comet that split off, as an event like that is unlikely to happen in such a periodic way.

To further understand 108P/Ciffreo and its companion, Kim and her colleagues constructed several simulations based on different models and compared their outputs to recent observations to determine which explanation made the most sense. The position of the blob, combined with it being a single object and not spread out, led them to conclude that the dust probably comes off the comet in a jet. The researchers also suggested that the ice being heated is located at the bottom of a pit, so sublimation causes gas to be propelled up as a single jet.

In the next few years, Kim and her team plan to find and model more of these strange objects.

"There should be more strange and peculiar comets, and observation and modelling them helps us explain the life cycles of all comets," said Kim.

TONIGHT'S SPEAKER



Prakriti PalChoudhury
The Magnetic 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

JWST reveals intricate networks of gas and dust in nearby galaxies

JWST's gold plated mirrors make it extremely sensitive to infrared light, allowing researchers to observe star-formation, gas and dust in nearby galaxies with incredibly high resolution. The largest survey of nearby galaxies in JWST's first year of operations is being carried out by the Physics at High Angular resolution in Nearby Galaxies (PHANGS) collaboration, involving more than 100 researchers from around the world. The observations are led by Dr Janice Lee, Gemini Observatory chief scientist.

Images from JWST's mid-

infrared instrument (MIRI) show previously hidden networks of dust and gas that appear to be highly structured. "Areas which are completely dark in Hubble imaging light up in exquisite detail in these new infrared images, allowing us to study how the dust in the interstellar medium has absorbed the light from forming stars and emitted it back out in the infrared, illuminating an intricate network of gas and dust," said team member Dr Karin Sandstrom of the University of California.

Observing in infrared is useful as stars are surrounded by dust

which is very efficient at absorbing optical and UV wavelengths, but less efficient at absorbing infrared. Because of this, infrared light emitted during star-formation can reach our space-based observatories. All that is then required is the right equipment to view this light, which is where JWST comes in. The telescope is allowing researchers to study interactions within galaxies, providing insights into how star formation impacts the surrounding environment and how galaxies have evolved over time.

Moon mountain named after NASA mathematician Melba Mouton

Scientists recently gave the name "Mons Mouton" to a mountain located near the Moon's South Pole. The name is in honour of NASA mathematician and computer programmer Melba Mouton.

"Melba Mouton was one of our pioneering leaders at NASA," said Sandra Connelly, the acting associate administrator for science at NASA. "She not only helped NASA take the lead in exploring the unknown in air and space, but she also charted a path for other women and people of color to



pursue careers and lead cutting-edge science at NASA". Mouton began working at NASA in 1959, a year after the agency was set up. She became the head mathematician and led a group of fellow mathematicians who tracked the Echo 1 and 2 satellites. These mathematicians were referred to as "human computers" as they performed highly complex calculations - seen as tedious- entirely by hand. Being women, and many of them women of colour, meant the "computers" were much cheaper to hire than

men. Such work required endurance, one human computer - Marilyn Heyson - recalled the job as intellectually interesting, but a marathon.

The skill and dedication of Mouton and her colleagues culminated in the successful Apollo 11 Moon landing in 1969. Before her retirement in 1973, Mouton received an Apollo Achievement Award and become the assistant chief of research programs for the Trajectory and Geodynamics Division at Goddard.

Mons Mouton is one of the thirteen candidate landing sites for Artemis III, which is set to be the first crewed lunar landing since Apollo 17 in 1972 and the first mission to place a woman on the Moon.

Joke of the Week

Why did the rocket scientist abandon his project? He had no comet-ment.