



# INSTITUTE OF ASTRONOMY PUBLIC OPEN EVENING

— 7 DECEMBER 2022 —



## Tiny galaxy provides glimpse into early universe



Astronomers were able to discover a tiny galaxy using a combination of ground and space-based telescopes, including NASA's Hubble space telescope. The galaxy has been nicknamed 'Peekaboo' because from Earth it is seen to peek out from behind the glare of a bright foreground star.

Observations show that Peekaboo is almost entirely composed of hydrogen and helium, making it metal-poor (in astronomy all elements heavier than hydrogen and helium are classified as metals). Since the early universe was also metal-poor, Peekaboo likely underwent the same galaxy formation processes that took place shortly after the Big Bang.

Such metal-poor galaxies are not uncommon in the universe, however most of these galaxies have an older stellar population or are located hundreds of millions of light years from Earth. At only 20 million light years from Earth, Peekaboo is by far the closest metal-poor galaxy ever discovered.

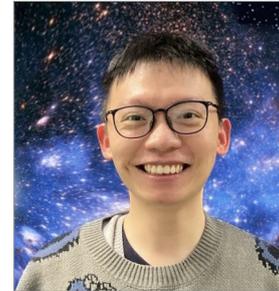
"Uncovering the Peekaboo Galaxy is like discovering a

direct window into the past, allowing us to study its extreme environment and stars at a level of detail that is inaccessible in the distant, early universe," said Dr Gagandeep Anand of the Space Telescope Science Institute in Baltimore, co-author of the new study on Peekaboo's properties.

Combined data from NASA's Hubble, the Southern African Large Telescope (SALT) and others allowed for measurements of the ages and metallicities of 60 of Peekaboo's stars. Almost all of these stars were found to be a few billion years old or younger, making them similar in age to our Sun. The stars were also found to be very blue, which is indicative of them being metal-poor.

Researchers intent to follow up on these observations using Hubble and JWST to learn more about Peekaboo's stellar populations and their metal content.

### TONIGHT'S SPEAKER



Jiachen Jiang

Run away from black holes

### Our weekly welcome

**W**ELCOME 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).

If you have any questions, suggestions or comments about the IoA Open Evenings please contact **Matt Bothwell** at [bothwell@ast.cam.ac.uk](mailto:bothwell@ast.cam.ac.uk).

The talk schedule for this term can be viewed at: [www.public.ast.cam.ac.uk](http://www.public.ast.cam.ac.uk)

## BlueWalker 3 satellite outshines most stars

Since the launch of Sputnik 1 in 1957 over 14,000 satellites have been sent to orbit Earth, corresponding to over 10400 tonnes of debris objects. At the moment satellites crossing the night sky are mostly a curiosity. But with more and more satellites being sent into space night sky pollution could become a serious problem.

The recent launch of BlueWalker 3, the largest commercial communications satellite in low Earth orbit (a few hundred kilometres above Earth), highlights this problem. Though initially faint, BlueWalker 3

unfolded a 64 square meter communications array. This surface is incredibly effective at reflecting sunlight, making it one of the brightest objects in the night sky.

Amazon's Blue Origin intends to launch at least 100 more satellites, which could be even bigger and brighter. If this were to happen there would be times where all stars would be completely obscured by bright satellites. As well as losing the experience of star gazing, astronomical images will suffer. Such satellites are bright enough to produce trails which overwrite the stars and

galaxies beneath them in images. Short-lasting phenomena, such as a brief flash from a gamma ray burst, could be lost. Many of these satellites also broadcast at radio frequencies which could interfere with radio astronomy.

Companies such as Elon Musk's SpaceX have also made plans to launch hundreds of satellites with little regard for possible environmental impacts.

The International Astronomical Union has raised concerns over satellite constellations, however it is unclear whether this will result in a lasting change.



## Megatsunami swept over Mars billions of years ago

It is thought that billions of years ago a third of Mars' surface was covered by an ocean of liquid water. A recent paper published in the journal Scientific Reports puts forward the idea that an asteroid impacting Mars around 3.4 billion years ago created a wave up to 250 meters tall, leaving behind a layer of debris tens of meters thick.

The paper suggests that the 110 km wide crater known as Pohl was the site of this impact, analogous to Chicxulub crater in Mexico

formed by the asteroid responsible for the end of the dinosaurs. Further analysis indicates that the Viking 1 lander, the first spacecraft to successfully land on Mars, landed directly on top of the deposit left by the megatsunami. Images from early Mars missions revealed massive channels that suggested ancient flowing water. Viking 1's landing site was chosen with the hope that it would spot such features that would have indicated fast flows of water. However the lander was instead

surrounded by mostly flat terrain. Initially scientists thought that Viking 1 had landed on top of a blanket of material thrown out from an impact crater, but there weren't enough craters to support this hypothesis.

For years the features of this landing site were a mystery, but a megatsunami caused by an asteroid impact could explain them – potentially reshaping the interpretation of Viking 1's mission.

## Joke of the Week

Heisenberg is speeding down a road when he's pulled over by a police officer. The officer asks "do you know how fast you were going?". Heisenberg responds "not a clue. But I'm pretty certain where I am". The officer tells Heisenberg he was going 15mph above the speed limit. "Oh great" says Heisenberg "now I'm lost!"