

BBC WHERE WE'LL FIND THE SOLAR SYSTEM'S WATER

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Sky at Night

THE UK'S BEST-SELLING ASTRONOMY MAGAZINE

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Why astronomers are so fascinated
by things that explode in space

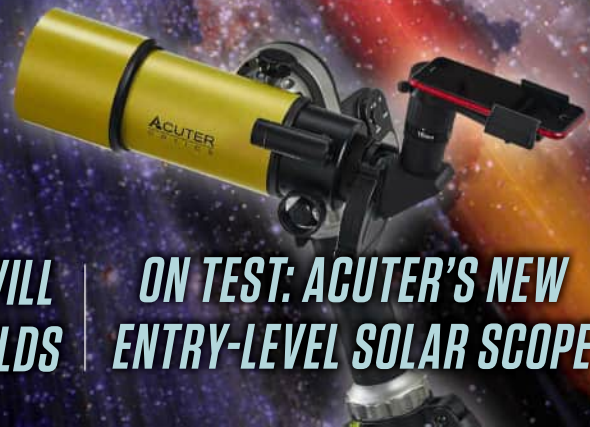
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BULLETIN

At last: an explanation for the Wow! Signal

Rather than an alien communiqué, the signal was from a cosmic cloud



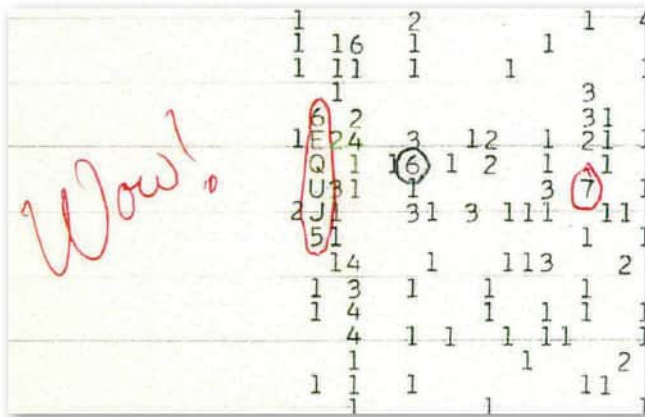
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by Chris Lintott

Why did it take nearly 50 years to work out what the Wow! Signal was? While in Hollywood, alien signals set off alarms, in reality it took days for Jerry Ehman to notice the Wow! Signal in his data. Similarly, a signal detected by the Breakthrough Listen project in 2019, seemingly coming from Proxima Centauri, was only found after observations had finished. It took two more years to track down comparable signals – it, like Wow!, turned out not to be aliens.

Things would be easier if we could spot signals as they happen. Luckily, instruments such as MeerKAT in South Africa, along with machine learning, mean that a new generation of SETI projects will do just that. We might be saying 'Wow!' more often.

Chris Lintott
co-presents
The Sky at Night



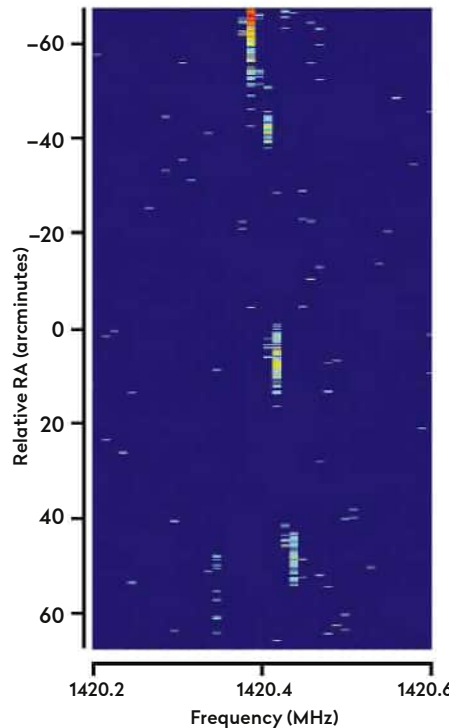
▲ The unusual and very strong signal was picked up by Ohio State University's radio observatory in 1977

After almost half a century of wondering, astronomers may have found the cause of the mysterious Wow! Signal. And no, it's not aliens.

The signal was first spotted as part of a 22-year search for extraterrestrial intelligence, the longest ever carried out. Between 1973 and 1995, Ohio State University's 'Big Ear' radio telescope monitored the sky for signs of communications from distant civilisations. The Wow! Signal was picked up on 15 August 1977, when the observatory recorded an extremely strong pulse of radio waves lasting around 72 seconds, at the frequency of neutral hydrogen. The strength of the signal inspired astronomer Jerry R Ehman to write 'Wow!' next to it on the printout. Its origin – alien civilisation or natural event – has been debated ever since.

"The Wow! Signal remains an enigmatic outlier, representing a tantalising hint of potential extraterrestrial communication, while underscoring the challenges inherent in distinguishing genuine signals from cosmic noise and terrestrial interference," says Abel Méndez from the University of Puerto Rico, in a recent paper on the signal.

The paper is a result of the Arecibo Wow! project, which searched archived data from the Arecibo Radio Telescope for similar events. The team found several signals similar to the 1977 one, albeit much less intense. These similar signals all came from the radiation of a distant, transient background source, like a flaring neutron star, when it passed through a



▲ By searching archive data, the team traced similar signals to interstellar clouds of cold hydrogen – putting ET theories to bed

cloud of neutral hydrogen, the source's radiation exciting the hydrogen gas, making it glow intensely for several minutes.

Such events are rare and rely on the cloud, the background source and Earth being correctly aligned. And while most radio observations are broadband, these rare alignments are also only detectable in narrowband searches, meaning the similarities went unnoticed until now. The researchers suggest looking for more evidence to determine whether the Wow! Signal was an exceptionally bright occurrence.

"Since these neutral hydrogen clouds are easy to recognise, it may be possible to determine the exact location of the source of the Wow! Signal," the new study states. "Identifying the trigger source, however, would prove challenging. It may be close or behind the cloud location, or far in the background."

phl.upr.edu/wow