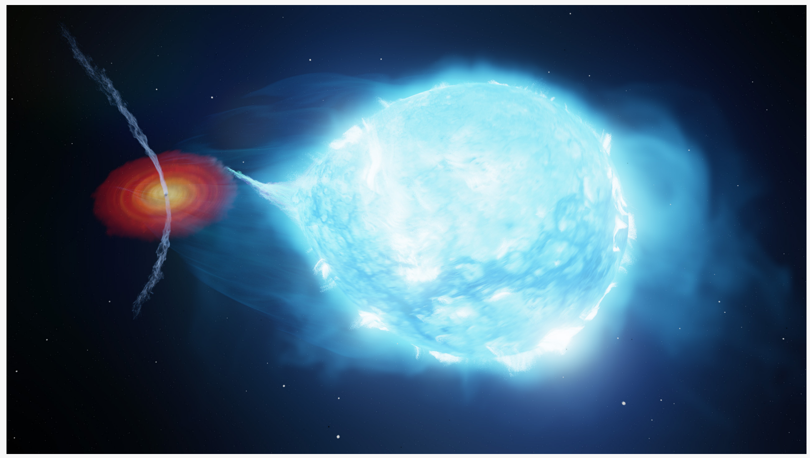
# ‘Dancing jets’ from black hole reveal their immense power

*Researchers have measured Cygnus X‑1's black hole jets, confirming they produce power equivalent to 10,000 Suns and travel at about half the speed of light.*



The strong stellar wind from the supergiant star pushes the jets launched by the black hole away from the star. This causes the jet direction to vary as the black hole and the supergiant star move around their orbit.

PERTH, WESTERN AUSTRALIA, AUSTRALIA, April 16, 2026 /EINPresswire.com/ -- New Curtin University-led research has used a radio telescope that spans the Earth to snap images that measure the immense power of jets from black holes, confirming scientists’ theories of how black holes help shape the structure of the Universe.

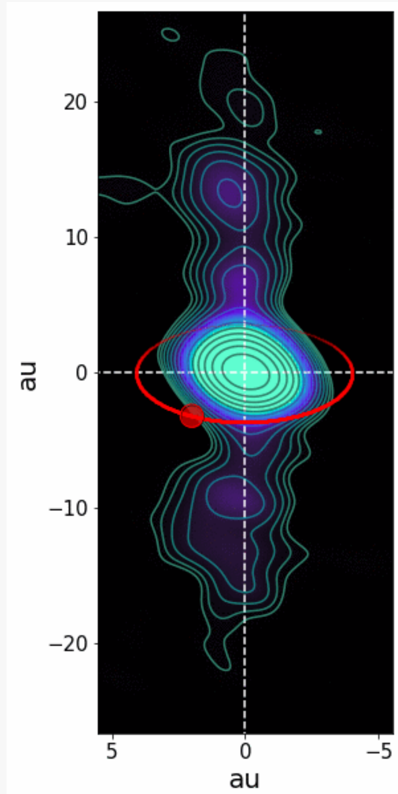
In a paper published in Nature Astronomy, researchers found the power of the jets in Cygnus X-1 – a system comprised of the first confirmed black hole and a supergiant star – was equivalent to the power output of 10,000 Suns.

To record the measurement, researchers used an array of linked up telescopes separated by large distances to observe the black hole jets being buffeted by the winds of the star as the black hole moved around its orbit – much like how strong winds on Earth can push around water in a fountain.

By knowing the power of the wind and measuring how much the jets were bent, the researchers could determine the instantaneous power of the jets for the first time.

In addition, they were able to determine the speed of the black hole’s jets – about half the speed of light, or 150,000 km per second – another measurement that has challenged scientists for decades.

The research was led from the Curtin Institute of Radio Astronomy (CIRA) and the Curtin node of the [International Centre for Radio Astronomy Research](#) (ICRAR), in collaboration with the University of Oxford.



The direction of the radio jet changes as the black hole and the star move around their orbit (shown in red). Credit ICRAR

Lead author Dr Steve Prabu, who worked at CIRA at the time of the research and who is now based at the University of Oxford, said researchers were able to make the measurement using a sequence of images of the "dancing jets" – a term he used to describe the jets' movement pattern as they were repeatedly deflected in different directions by the supergiant star's powerful winds as the star and black hole moved around their orbits.

Dr Prabu said the measurement allowed scientists to understand what fraction of the energy released around black holes could be deposited into the surrounding environment, thereby changing the environment.

"A key finding from this research is that about 10 per cent of the energy released as matter falls in towards the black hole is carried away by the jets," Dr Prabu said.

"This is what scientists usually assume in large-scale simulated models of the Universe, but it has been hard to confirm by observation until now."

Co-author Professor James Miller-Jones, from CIRA and the Curtin node of ICRAR, said previous methods could only measure the average jet power over thousands or even millions of years, preventing accurate comparisons with the X-ray energy released instantaneously from the infalling matter.

"And because our theories suggest that the physics around black holes is very similar, we can now use this measurement to anchor our understanding of jets, whether they are from black holes 10 or 10 million times the mass of the Sun," Professor Miller-Jones said.

"With radio telescope projects such as the Square Kilometre Array Observatory currently under construction in Western Australia and South Africa, we expect to detect jets from black holes in millions of distant galaxies, and the anchor point provided by this new measurement will help calibrate their overall power output.

"Black hole jets provide an important source of feedback to the surrounding environment and are critical to understanding the evolution of galaxies."

Other collaborating institutions included the University of Barcelona, the University of Wisconsin-Madison, the University of Lethbridge and the Institute of Space Science.

The paper, ‘A jet bent by a stellar wind in the black hole X-ray binary Cygnus X-1’, published in journal Nature Astronomy, can be found here.

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