

## The black hole that helps baby stars grow instead of destroying them



By **Ashley Strickland**, CNN

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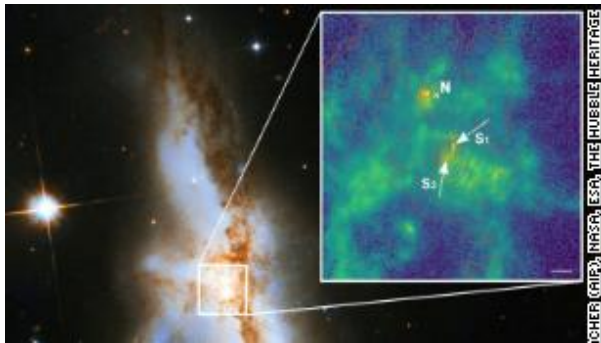


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This [image](#), which combines observations from the Chandra X-ray Observatory and the Karl Large Array, shows a black hole that is triggering star formation nearly one million light-year: The large red bubble on the left is a hot gas bubble and the dots of light to the right of it are

**(CNN)** — Black holes are known as destructive forces in the universe, shredding stars and using immense gravity to pull in gas, dust and light. But astronomers have witnessed a black hole that is actually helping to nurture and spark the birth of baby stars across multiple galaxies more than one million light-years from its origin.

Astronomers made the discovery using NASA's Chandra X-ray Observatory, along with other telescopes. They found the black hole at the center of a galaxy located 9.9 billion light-years from Earth, and the galaxy itself has seven galactic neighbors.



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Previously, scientists using another telescope detected an impressive radiowave emission that originated from a jet of highly energized particles and stretched for a million light-years. Follow-up observations with Chandra revealed the black hole to be the source of the jet. Chandra can detect the X-rays created by hot gas that swirls around black holes.

While black holes are known to devour everything caught within their gravitational pull, they also release highly energized jets of material that spit out particles at the speed of light.

Chandra also detected a cloud of X-rays near one end of the jet -- the remains from when a hot gas bubble was heated up by particles in the jet, when they mixed with other matter. The researchers determined that the gigantic gas bubble expanded and actually moved across four of the neighboring galaxies.

When this shockwave of hot gas moved through the galaxies, it would squeeze the cool gas within them. This interaction would cause more stars, which feed off of the cool gas, to form. The researchers believe star formation is two to five times higher in these galaxies.

Their findings published this week in the journal [Astronomy and Astrophysics](#).



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said [Roberto Gilli](#), study author at the National Institute of Astrophysics in Bologna, Italy. "It's amazing to think one galaxy's black hole can have a say in what happens in other galaxies millions of trillions of miles away."

Black holes are usually associated with what astronomers call negative feedback, which actually keeps stars from forming. The energy released by black hole jets can keep gas from cooling down, which is necessary for bursts of star formation.


But this was an instance of positive feedback, which is more rare. Previous examples of this have only shown that star formation increased by 30% or less, and only between 20,000 and 50,000 light-years from the black hole. This new observation is extreme in the rate of star formation and distance.


"The story of King Midas talks of his magic touch that can turn metal into gold," said Marco Mignoli, study co-author at the National Institute of Astrophysics. "Here we have a case of a black hole that helped turn gas into stars, and its reach is intergalactic."

"This is a prime example that they sometimes defy that stereotype and can be nurturing instead," added Alessandro Peca, co-author and Ph.D. student at the University of Miami.


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