

Image: Black hole caught in a stellar homicide

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Image Credit: NASA, S. Gezari (The Johns Hopkins University), and J. Guillochon (University of California, Santa Cruz)

(Phys.org) -- This computer-simulated image shows gas from a star that is ripped apart by tidal forces as it falls into a black hole. Some of the gas also is being ejected at high speeds into space.

Using observations from telescopes in space and on the ground, astronomers gathered the most direct evidence yet for this violent process: a [supermassive black hole](#) shredding a star that wandered too close. NASA's orbiting [Galaxy Evolution Explorer](#) (GALEX) and the Pan-STARRS1 telescope on the summit of Haleakala in Hawaii were used to help to identify the stellar remains.

A flare in ultraviolet and [optical light](#) revealed gas falling into the black hole as well as helium-rich gas that was expelled from the system. When the star is torn apart, some of the material falls into the black hole, while the rest is ejected at high speeds. The flare and its properties provide a signature of this scenario and give unprecedented details about the stellar victim.

To completely rule out the possibility of an active nucleus flaring up in the galaxy instead of a star being torn apart, the team used NASA's Chandra X-ray Observatory to study the hot gas. Chandra showed that the characteristics of the gas didn't match those from an active [galactic nucleus](#).

The galaxy where the supermassive black hole ripped apart the passing star is known as PS1-10jh and is located about 2.7 billion light years from Earth. Astronomers estimate the black hole in PS1-10jh has a mass of several million suns, which is comparable to the supermassive black hole in our own [Milky Way galaxy](#).

Provided by NASA

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