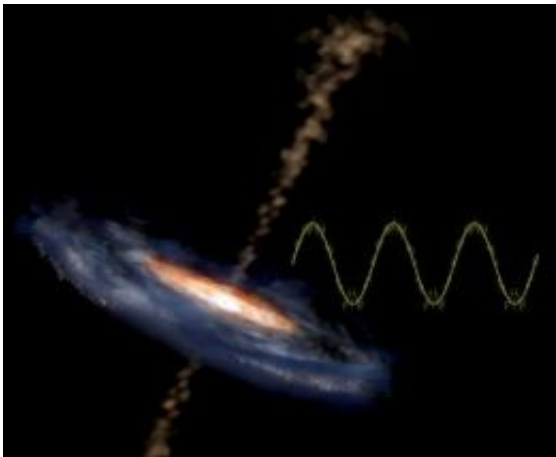


Scientists find black hole 'missing link'

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Artist's impression of material falling into a super-massive black hole together with the average shape of the periodic X-ray signal from REJ1034+396. Credit: Aurore Simonnet, Sonoma State University

Scientists at Durham University have found the "missing link" between small and super-massive black holes.

For the first time the researchers have discovered that a strong X-ray pulse is emitting from a giant black hole in a galaxy 500 million light years from Earth.

The pulse has been created by gas being sucked by gravity on to the black hole at the centre of the REJ1034+396 galaxy.

X-ray pulses are common among smaller black holes, but the Durham

research is the first to identify this activity in a super-massive black hole. Most galaxies, including the Milky Way, are believed to contain super-massive black holes at their centres.

The researchers, who publish their findings in the prestigious scientific journal *Nature* today (Thursday, September 18), say their discovery will increase the understanding of how gas behaves before falling on to a black hole as it feeds and develops.

Astronomers have been studying black holes for decades and are able to "see" them due to the fact that gas gets extremely hot and emits X-rays before it is swallowed completely and is lost forever.

Using Europe's powerful X-ray satellite, XMM-Newton, they found that X-rays are being emitted as a regular signal from the super-massive black hole. The frequency of the pulse is related to the size of the black hole.

Dr Marek Gierlinski, in the Department of Physics, at Durham University, said: "Such signals are a well known feature of smaller black holes in our Galaxy when gas is pulled from a companion star.

"The really interesting thing is that we have now established a link between these light-weight black holes and those millions of times as heavy as our Sun.

"Scientists have been looking for such behaviour for the past 20 years and our discovery helps us begin to understand more about the activity around such black holes as they grow."

Durham's scientists hope future research will tell them why some super-massive black holes show this behaviour while others do not.

Source: Durham University

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