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## SCIENCE: Scientists spy cosmic waves around black hole

Black holes may actually drag the fabric of space and time around them as they spin, creating waves for cosmic material to surf on, astronomers say.

This is new evidence that some black holes spin, even as they pull in everything around them, including light. Additional research shows that black holes can twirl material at tremendous speed, as fast as 20,000 miles (33,000 km) per second.

"Gas whipping around the black hole has no choice but to ride that wave," Jon Miller of the Harvard-Smithsonian Center for Astrophysics said. "Albert Einstein predicted this over 80 years ago, and now we are starting to see evidence for it." Because black holes draw in everything, even light, they themselves are invisible. But astronomers have long studied what happens just outside the black hole, and have found what they call an accretion disk – a round pancake of material, often made up of material sucked from a nearby star that acts as a black hole's companion and food source.

One characteristic that astronomers watch at the mouth of black holes is the flickering of X-ray light. It would make sense that the flickers would come very fast, since black holes spin so rapidly.

It was more puzzling when the flickering X-rays came more slowly, at as little as one 100th the speed of the fast flickers, Miller told reporters at a meeting of the American Astronomical Society. Miller and his colleagues theorize that in one black hole system they studied, the slower flickering could be the frequency of a space-time warp. In that case, the flickers – known as quasi-periodic oscillations – could be caused by the fabric of space itself churning around the black hole in a wave.

Another team of researchers studying a different black hole detected three sun-sized blobs of gas whirling around in the hole's accretion disk.

By looking at iron atoms, which are good markers for what is occurring around a black hole, the scientists figured that these blobs made one complete trip around the black hole in a day, at speeds up to 20,000 miles (33,000 km) per second.

Since these blobs were about as far from the black hole as Jupiter is from the sun, this was remarkable, said Jane Turner of NASA's Goddard Space Flight Center. It takes Jupiter 12 years to go around the sun. The whole system that includes the black hole is relatively tiny, about the size of our solar system, Turner said. reuters

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