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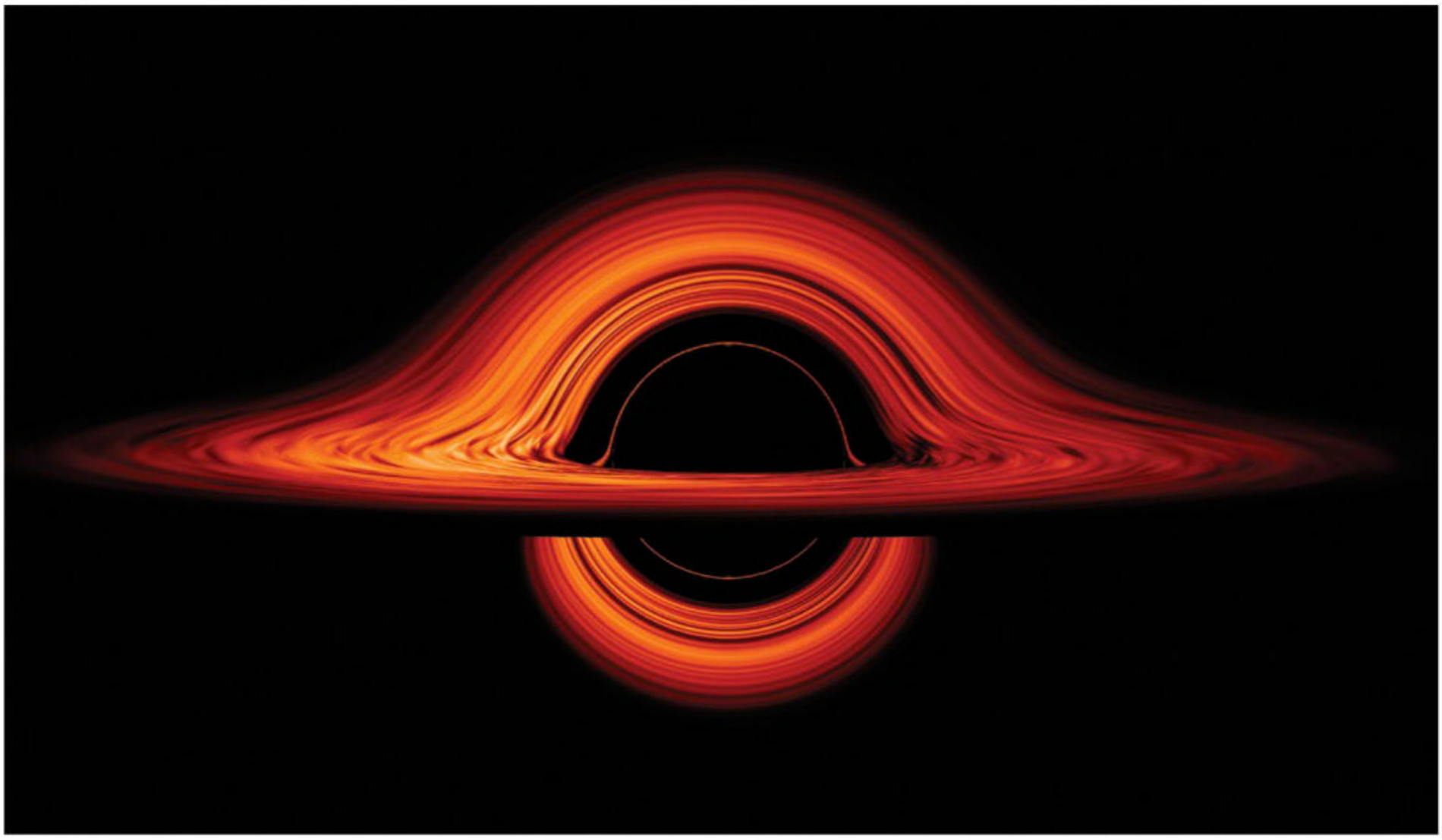

First light detected from behind a black hole

X-rays bouncing off a black hole's disc confirm Einstein's predictions.

For the first time, astrophysicists have caught sight of light reflected from behind a black hole, proving Einstein right yet again.

You may have heard that nothing – not even light – can escape a black hole, but this isn't strictly true. Anything that crosses the event horizon is forever lost, but the hot disc of matter swirling around the black hole can emit dazzlingly powerful X-rays visible from Earth.

However, not all of this light escapes easily.

While watching X-rays streaming out from a supermassive black hole at the heart of a galaxy 800 million light-years away, Stanford University astrophysicist Dan Wilkins noticed something odd – extra flashes of X-rays. They were smaller, came later and had different wavelengths to the normal, more luminous emissions, as though they were echoes.

As described in a study led by Wilkins in *Nature*, these flashes seemed to be reflected from behind the black hole – a weird place for light to be coming from.

"Any light that goes into that black hole doesn't come out, so we shouldn't be able to see anything that's behind the black hole," Wilkins explains.

"The reason we can see this is because that black hole is warping space, bending light and twisting magnetic fields around itself."

As a black hole spins, its incredibly strong magnetic field arcs high above it and become so tangled that the field lines eventually break – similar to what happens on the surface of our Sun.

"This magnetic field getting tied up and then snapping close to the black hole heats everything around it and produces these high-energy electrons that then go on to produce the X-rays," says Wilkins.

These X-rays try to escape the black hole's massive gravitational pull, but some end up being pulled back – then reflected off the back of the disc and out into space. Some of these "echoes" from behind the black hole are bent around it by extreme gravity, creating the light seen by Wilkins and his team.

This is the first time astronomers have directly spotted light from behind a black hole, building on research published last year that found "imprints" of such reflected light.

Observing these kinds of signals will enable astronomers to build a better understanding of black holes themselves.

▲ Light bending around a black hole? Einstein saw it coming.

NASA'S GODDARD SPACE FLIGHT CENTER / JEREMY SCHNITTMAN