

A black hole is depicted with a glowing accretion disk and a blue jet of light. The background is a dark, swirling pattern of orange and yellow, suggesting the intense heat and gravity of the black hole.

# BLACK HOLE APOCALYPSE

2 x 60 HD



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In *Black Hole Apocalypse*, NOVA investigates recent surprising discoveries about black holes that have raised deep questions and brought astrophysics to a major crossroads. Guided by astrophysicist and novelist Janna Levin, viewers journey to the weirdest places in the cosmos to explore the profound mysteries of these gravitational monsters. Where do they come from? What's inside them? What happens if you fall into one? And what can they tell us about the nature of space, time, and gravity? Through dynamic CGI animation, Janna illustrates the principles of gravity, and even takes a trip to the edge of the black hole at the center of our galaxy. What will happen if she gets too close?

Also in the special, Janna shows how bigger and ever more powerful instruments are leading to extraordinary breakthroughs in black hole research, such as the Laser Interferometer Gravitational-Wave Observatory (LIGO) Experiment. On September 14, 2015, after four decades of development, LIGO's enormous twin interferometers finally detected the existence of elusive, long-sought gravity waves, produced by the collision of two black holes some 1.3 billion years ago. This stunning result finally confirmed a prediction of Albert Einstein's 1915 General Theory of Relativity, even though Einstein himself doubted whether such extreme phenomena as gravity waves, created by the warping of space and time, could actually exist.

NOVA meets other prominent scientists in the field, contributing to the acceleration of black hole research, including UCLA's Andrea Ghez, one of the key discoverers of a supermassive black hole at the center of our own Milky Way galaxy, and Yale's Priya Natarajan, a leading expert on the mystery of black holes and early cosmic evolution. A long trail of evidence, including observations by NASA's Chandra X-ray telescope and the Hubble Space Telescope, has pointed to the probable existence of supermassives—giant black holes millions or even billions of times as massive as the sun—in nearly every galaxy. NOVA follows Ghez and Natarajan as they explore questions about the role of supermassives in the early universe, and search for answers about how they got so big—answers that could provide an understanding of how all galaxies emerged, including our own Milky Way, from their origin in the Big Bang.

A visually spectacular and accessible guide to many mysteries of black holes, the special offers a provocative look at how their extreme properties make them a crucial “lab” for testing our most important theories about how our universe works and the story of how it evolved.

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### CREDITS

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*Image:* NASA/JPL-Caltech



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