

Offered Title: Portrait of a Black Hole

Out of sight, out of mind. Bet you haven't thought about black holes in a while...or maybe ever, until the Event Horizon Telescope team wowed us with a portrait of one. What a sight! I think it's time to revisit that enigma called a black hole.

The concept of something so massive that it doesn't shine because light cannot escape its gravity was first proposed by Englishman John Michell, way back in 1784. He called it a "dark star". The idea didn't gain much traction however and it faded until, did you guess it?... Albert Einstein's theory of relativity was published. Relativity has equations that describe conditions for a black hole that Einstein did not solve. He thought the concept somewhat absurd. Yada, yada, yada...many physicists later (Schwarzschild, Eddington, Finkelstein, Lemaitre, Chandrasekhar, Tolman, Oppenheimer, Volkoff, Pauli, Penrose, Hawking, and many others) we have a general understanding of this phenomenon called a black hole.

While credit has been given to physicist John Wheeler for coining the term 'black hole' in 1967, it had been used by others previously, most notably in the early 1960's by physicist Robert H. Dicke. He compared the phenomenon with a prison cell in Calcutta called the Black Hole, where prisoners entered but never left...alive.

Let's look at the conditions that cause a black hole. Easy, got to have a star, but not just any star. It has to be really, really massive. The concept is simple, the star's gravity becomes stronger than the energy required to keep everything from collapsing. After a few million years or so of living large, this monster star no longer produces enough fusion energy to stop gravity from crushing itself into oblivion.

A black hole is oblivion. It is a bubble of strange space around what we call a singularity. A singularity is a point of infinite gravity and density with no known or measurable volume. The bubble is composed of space and time (spacetime) so warped by infinite gravity that anything within, including light, just follows the warped/looped spacetime. It's trapped. Oblivion. The very edge of this bubble is called its event horizon, the point of no return for anything entering, bye-bye. No known power can get you out once you enter. While black holes do not emit light, they are visible via the cloud of luminous stuff, sometimes even stars, in orbit around them.

The recent image by the Event Horizon Telescope team of M87's black hole is a technological feat. The M87 (a giant elliptical galaxy) black hole is a monster, billions of times the mass of our Sun. Our Milky Way galaxy, as with most galaxies, has a super massive black hole too. Ours is about 4 million times the mass of our Sun.

What's in the Sky?

April 22-23; after midnight; east: Lyrid Meteor Shower peaks, the Moon interferes

April 23; pre-dawn; south-southwest: Jupiter and the waning gibbous Moon are close