# Now scientists think you'd be 'roasted' in a black hole

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Contrary to established scientific thinking, you'd be roasted and not "spaghettified" if you stumbled into a supermassive black hole. New research being presented at the Institute of Physics conference Physics 2005 in Warwick will take a new look at the diet of the universe's most intriguing object, black holes.
Black holes stand at the very edge of scientific theory. Most scientists believe they exist, although many of their theories break down under the extreme conditions within. But Professor Andrew Hamilton of the University of Colorado says he knows what you would find inside, and challenges the traditional idea that gravity would cause you death by "spaghettification".

Most people have heard of the event horizon of a black hole, as the point of no return. But astronomically realistic black holes are more complex and should have two horizons, an outer and an inner. In the bizarre physics of black holes, time and space are exchanged when you cross an event horizon, but at a second horizon they would switch back again. Travelling into a black hole, you would therefore pass through a strange region where space is falling inward faster than light, before finally entering a zone of normal space at the core. It's this core of normal space which Professor Hamilton has been working on.

A so-called singularity sits at the centre of the core, swallowing up matter. But according to Professor Hamilton, the strange laws of general relativity temper its appetite. If the singularity ate too quickly, it would become gravitationally repulsive, so instead, matter piles up in a hot,

dense plasma filling the core of the black hole and siphoning gradually into the singularity.

Depending on the size of the black hole, this plasma could be the cause of a space traveller's demise. Most books will tell you that under the extreme gravitational conditions of a black hole, your feet would experience gravity more strongly than your head, and your body would be stretched out like spaghetti. For a small black hole with the mass of several suns, this should still be true. But for a supermassive black hole weighing millions or billions of suns, explains Professor Hamilton, the tidal forces which cause spaghettification are relatively weak. You would instead be roasted by the heat of the plasma.

Professor Andrew Hamilton is Professor of Astrophysics at the Department of Astrophysical and Planetary Sciences, University of Colorado.

Source: Institute of Physics