

Special Issue on
The Black Hole, the Big Bang, and Modern Physics

Call for Papers

A black hole is a region of spacetime from which gravity prevents anything, including light, from escaping. The theory of general relativity predicts that a sufficiently compact mass will deform spacetime to form a black hole. Around a black hole there is a mathematically defined surface called an event horizon that marks the point of no return. It is called "black" because it absorbs all the light that hits the horizon, reflecting nothing, just like a perfect black body in thermodynamics. Quantum field theory in curved spacetime predicts that event horizons emit radiation like a black body with a finite temperature. This temperature is inversely proportional to the mass of the black hole, making it difficult to observe this radiation for black holes of stellar mass or greater.

Black holes of stellar mass are expected to form when very massive stars collapse at the end of their life cycle. After a black hole has formed it can continue to grow by absorbing mass from its surroundings. By absorbing other stars and merging with other black holes, supermassive black holes of millions of solar masses may form. There is general consensus that supermassive black holes exist in the centers of most galaxies.

Gravitational collapse requires great density. In the current epoch of the universe these high densities are only found in stars, but in the early universe shortly after the big bang densities were much greater, possibly allowing for the creation of black holes. The high density alone is not enough to allow the formation of black holes since a uniform mass distribution will not allow the mass to bunch up. In order for primordial black holes to form in such a dense medium, there must be initial density perturbations that can then grow under their own gravity. Different models for the early universe vary widely in their predictions of the size of these perturbations. Various models predict the creation of black holes, ranging from a Planck mass to hundreds of thousands of solar masses. Primordial black holes could thus account for the creation of any type of black hole.

In this special issue, we intend to invite front-line researchers and authors to submit original research and review articles on exploring **The Black Hole, the Big Bang, and Modern Physics**.

Authors should read over the journal's [Authors' Guidelines](#) carefully before submission, Prospective authors should submit an electronic copy of their complete manuscript through the journal [Paper Submission System](#).

Please kindly notice that the "**Special Issue**" under your manuscript title is supposed to be specified and the research field "**Special Issue — The Black Hole, the Big Bang, and Modern Physics**" should be chosen during your submission.

According to the following timetable:

Manuscript Due	May 31st, 2013
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Special Issue Editor

Guest Editor:

For further questions or inquiries

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