



## Black Holes - the Harmonic Oscillators of the 21st Century

In the twentieth century, many problems across all of physics were solved by perturbative methods which reduced them to harmonic oscillators. Black holes are poised to play a similar role for the problems of twenty-first century physics. They are at once the simplest and most complex objects in the physical universe. They are maximally complex in that the number of possible microstates, or entropy, of a black hole is believed to saturate a universal bound. They are maximally simple in that, according to Einstein's theory, they are featureless holes in space characterized only by their mass, charge and angular momentum. This dual relation between simplicity and complexity, as expressed in black holes, has recently been successfully applied to problems in a disparate variety of physical systems. I will give an introduction to the subject intended for a general audience.

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September 14, 2010 (Tuesday) at 3:30pm (Refreshments at 3:15pm)

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