DIFFERENTIAL GEOMETRY/PDE SEMINAR

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Uniqueness of static vacuum black holes

Piotr Chrusciel
(Université de Tours, France)

A classical question in general relativity, first raised and partially answered by Werner Israel, is that of classification of black hole solutions of the vacuum Einstein equations satisfying some global regularity conditions. The most complete result existing in the literature is that of Bunting and Masood–ul–Alam who show, roughly speaking, that all such black holes which *do not contain degenerate horizons* belong to the Schwarzschild family.

In this talk I will recall some basic facts about black holes, outline the history of the problem, and present a new theorem where the hypothesis of non–degeneracy is removed, obtaining thus a complete classification result in this class of black holes. A key element of the proof is a new positive energy theorem, proved in collaboration with Robert