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Seminaire de physique mathematique du CPHT, Ecole Polytechnique

Jeudi 25 Septembre 2014, 14 :00
CPHT, CMLS Seminar room
Domaines : hep-th

Titre : *Dynamical vs. Thermodynamical (In)stability of Black Objects in Gravity*

Orateur : **Stefan Hollands (Institute for Theoretical Physics Universitaet Leipzig)**

Résumé : *Understanding the stability properties of black objects is both a very important, but also a very complex problem in general relativity and its higher dimensional generalizations. Based on the well-known dictionary between black objects and thermodynamics, it is natural to come up with criteria for the (in)stability of black objects akin to the standard criteria involving the "specific heat" in the context of phenomenological thermodynamics. A key question is what such notions have to do with notions of instability based on the existence of "growing modes" of the corresponding perturbed Einstein equations. In this talk, I review the "canonical energy method", which, as I argue, provides a beautiful and clear link between these different concepts of stability (and also a direct connection to the recently proposed approach via a "local Penrose inequality"). I outline some applications of the canonical energy method, such as : (1) a proof of the Gubser-Mitra conjecture for black branes, and (2) a connection between the stability of rotating higher dimensional black holes and that of their associated near horizon geometries, thereby proving a recent conjecture of Durkee-Reall.*