



istanbul matematiksel bilimler merkezi
istanbul center for mathematical sciences

MATHEMATICAL AND THEORETICAL PHYSICS AFTERNOONS

Tuesday, February 27, 2018

13:30 - 14:30: Umut Gürsoy (Utrecht University, Netherlands)

An instability in asymptotically AdS black branes

I will introduce a new type of instability in the asymptotically AdS black brane solutions to Einstein scalar gravity which provides a counter-example to the Correlated Stability Conjecture of Gubser and Mitra that relates dynamical and thermodynamical stability of blackhole backgrounds with planar horizon. In particular I will discuss a large class of asymptotically AdS solutions that are thermodynamically stable but dynamically unstable against small perturbations. Such perturbations are contained in the quasi-normal mode spectra of the background that will be the main focus of the talk. Then I will go beyond the perturbative regime and follow the time evolution of the background in an entirely non-equilibrium setting. This GR story has an interesting counterpart in the corresponding strongly coupled quantum field theory where the instability is related to spontaneous breaking of conformal symmetry through the VeV of an operator dual to the scalar in the Einstein-scalar theory which will be discussed as well.

14:30 - 15:00: *Coffee Break*

15:00 - 16:00: Blagoje Oblak (ETH Zurich, Switzerland)

Berry Phases of Boundary Gravitons

This talk is devoted to Berry phases that appear in unitary representations of asymptotic symmetry groups in general relativity. These phases arise when a coherent state is acted upon by symmetry transformations that trace a closed path in the group manifold, and they can be evaluated exactly even when the group is infinite-dimensional. We apply these ideas to the Virasoro and BMS groups; seeing their representations as particles dressed with boundary gravitons, the associated Berry phases generalize Thomas precession and provide, in principle, observable signatures of asymptotic symmetries.

Place: IMBM Seminar Room, Boğaziçi University South Campus