

JOINT TUFTS/MIT COSMOLOGY SEMINAR

Allowable complex spacetimes and the no-boundary proposal

Oliver Janssen
ICTP

We will review a recent proposal by E. Witten [2111.06514] on which complex metrics to include in the gravitational path integral. We will then apply this “allowability criterion” to the semiclassical no-boundary wave function in the minisuperspace of a closed FLRW universe with homogeneous scalar matter which drives inflation. Here each point of the minisuperspace is prepared by a complex instanton, and we find that large regions are excluded by the new criterion. For example, the trajectory describing 60 e-folds of inflation in quadratic inflation exits the allowable regime well before inflation ends, pointing towards a tension between the new criterion and the no-boundary proposal in this model. We discuss how the tension may be alleviated in hilltop models, and also comment on how the new criterion affects the implementation of the tunneling wave function as a gravitational path integral.

Tuesday, November 1, 2022, 2:30 pm

574 Boston Ave, Room 310

Tufts University

Refreshments at 2:00 outside the building, at the corner of
Harvard St. and Boston Ave.