THEORETICAL PHYSICS SEMINAR

Title: Principle of Least Action in General Relativity

Speaker: Sumanta Chakraborty, IUCAA, Pune

Date/Time/Venue: 3rd September (Thursday)/4:00 PM/ Room No. 469

ABSTRACT

Constructing a well-posed variational principle and characterizing the appropriate degrees of freedom that need to be fixed at the boundary are non-trivial issues in general relativity. I will discuss a few toy examples in classical mechanics and field theory before going into general relativity. For spacelike and timelike boundaries I will show that the action principle for general relativity is well posed, only when a suitable counter-term [the Gibbons-Hawking-York (GHY) counter-term] is added to the action principle. Also I will show that the degrees of freedom to be fixed on the boundary are contained in the induced 3-metric. These results, however, do not directly generalize to null boundaries on which the 3-metric becomes degenerate. In this talk I will address the following questions: (i) What is the counter-term that may be added on a null boundary to make the variational principle well-posed? (ii) How do we characterize the degrees of freedom which need to be fixed at the null boundary?

All are welcome to attend