Suvankar Dutta

Research Summary:

1. My main research interest is AdS/CFT correspondence. In my last work with R. Gopakumar we examined the Euclidean action approach, as well as that of Wald, to the entropy of black holes in asymptotically AdS spaces. From the point of view of holography these two approaches are somewhat complementary in spirit and it is not obvious why they should give the same answer in the presence of arbitrary higher derivative gravity corrections. For the case of the AdS_5 Schwarzschild black hole, we explicitly study the leading correction to the Bekenstein-Hawking entropy in the presence of a variety of higher derivative corrections studied in the literature, including the Type IIB R^4 term. We find a non-trivial agreement between the two approaches in every case. Finally, we give a general way of understanding the equivalence of these two approaches.
2. Currently we are interested in the R charged black holes in five dimensions which are conjectured to be dual to the gauge theory defined on four dimensions with chemical potential turned on. We are interested in the near-supersymmetric region in the phase diagramme of these R charged black holes and studying the thermodynamics of these black holes and their dual gauge theory in this particular limit.
3. In a different project with N. Banerjee, we studied phase transition between electrically charged Ricci-flat black holes and AdS soliton spacetime of Horowitz and Myers in five dimensions. Boundary topology for both of them is $\mathbf{S^1 \times S^1 \times R^2}$. We also performed the stability analysis for these black holes.
4. I am also working on AdS black holes and attractor mechanism in presence of higher derivative correction with D. Astefanesei, N. Banerjee, E. Radu.

Publications:

1. Suvankar Dutta, Rajesh Gopakumar, *Euclidean and Noetherian Entropies in AdS space* Physical Review D**volume-number74:044007,2006**

Preprints:

1. Nabamita Banerjee, Suvankar Dutta: *Phase Transition of Electrically Charged Ricci-flat Black Holes* (in preparation)

2. Suvankar Dutta, Rajesh Gopakumar: *Supersymmetric limit of R charged black hole* (in preparation)

Conference/Workshops Attended:

1. *Strings 2006*, China, June, 2006,
2. *Advanced Strings School*, India, September, 2006,
3. *Informal Workshop, on String Field Theory*, India, HRI, 2006,
4. *ISM,Puri*, India, December, 2006.

Visits to other Institutes:

1. SINP, Kolkata. May, 2006

Invited Lectures/Seminars:

1. *Euclidean and Noetherian Entropies in AdS space / talk*, , SINP, Kolkata, May, 2006.
2. *Euclidean and Noetherian Entropies in AdS space Poster presentation*, STRINGS 2006, Beijing, 2006.
3. *Holography on Horizon and on Asymptotic Infinity / talk*, ISM 06, Puri, December, 2006.