Contribution ID: **83** Type: **Talk/seminar**

Shadow cast by rotating black hole with a cosmological constant

Interpreting the cosmological constant (Λ) as the vacuum energy, and under a minimum amount of assumptions, leads to a deformation in the vicinity of a black hole and a new Kerr–de Sitter solution. The new Kerr–de Sitter solution is a more straightforward and has richer geometric structure than the original one. Interestingly, there exist minimum (M_{min}) and maximum (M_{min}) mass such that for $M_{min} < M < M_{min}$, we have an event horizon, two cosmological horizons and as well as the Cauchy horizon. For $M = M_{min}$, we have an extremal case where the event and cosmological horizons degenerate. Further, we investigate the black hole shadow and associated observables viz. the shadow radius R_s, area A, deformation δ_s and oblateness D. We also estimate the parameters Λ and a of the new Kerr de Sitter black hole from its astronomical shadow observables. The shadow observables of the new Kerr de Sitter black hole are found to significantly deviate from the corresponding observables of the Kerr de Sitter black hole over an appreciable range of the parameter space ($a/M - \Lambda/M^{-2}$). Also, the circularity deviation ΔC of the new Kerr de Sitter black hole is studied in the ($a/M - \Lambda/M^{-2}$) parameter space and is found to be affected by the distance of observer from the black hole.

Authors: AFRIN, MISBA (JAMIA MILLIA ISLAMIA); Prof. GHOSH, SUSHANT G. (JAMIA MILLIA ISLAMIA)

Presenter: AFRIN, MISBA (JAMIA MILLIA ISLAMIA)

Session Classification: Ph.D. Students Workshop