DEPARTMENT OF PHYSICAL SCIENCES

THEORETICAL HIGH ENERGY PHYSICS SEMINAR

Hairy Schwarzschild

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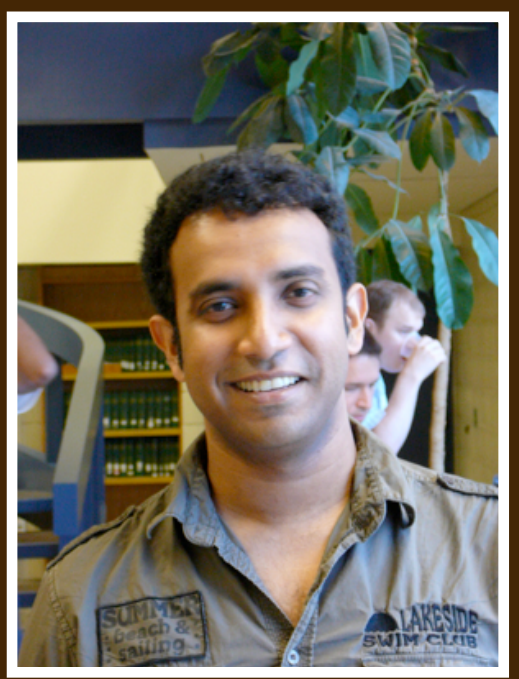
(IISc Bangalore)

Date: June 28, 2022 (Tue)

Time: 4PM - 5PM

Venue: AB1-1B



Birkhoff's theorem says that Einstein's equations in vacuum, without a cosmological constant, have a unique one parameter family of solutions if you demand spherical symmetry. This is the famous Schwarzschild metric. I present an apparent violation of this theorem, where spherically symmetric Einstein solutions arise automatically, with an infinite number of parameters -- the mass being just one of them. The resolution will turn out to be that most of these are trivial gauge parameters which do not contribute to the charges of the black hole, except for two integration constants whose status is a bit unclear for reasons I will explain. Along the way, we find a class of new coordinate systems for Schwarzschild which have power law fall-offs along null coordinates at Scri, and are prove-ably asymptotically flat.