



PHYSICS COLLOQUIUM: Crossover Appeal of Quantum Exotica on Curved Space

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Date:

9/2/2022

Time:

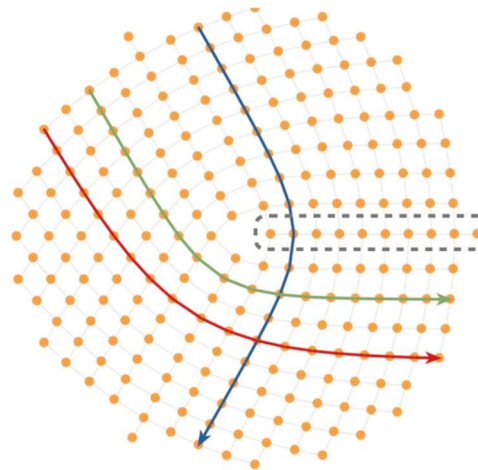
10:30 AM-11:50 AM

Location:

KOLLIG 217

About The Speaker:

Dr. Biswas received his PhD from Harvard University, working with Prof. Subir Sachdev on experimentally relevant exotic quantum states of matter. Prof. Bert Halperin served as mentor. While at Harvard Rudro held several fellowships including the James Mills Pierce Fellowship Award, the Purcell Fellowship and the Harvard Center for Energy and Environment Fellowship. Following postdoctoral research as an Institute of Condensed Matter Theory Fellow at UIUC, Rudro became an Assistant Professor of Physics at Purdue University, where he is currently.



Abstract:

What physics can one hope to learn by looking closely at exotic quantum states of matter, esoteric to begin with, but even more so on curved surfaces?! In this colloquium first I will introduce paradigmatic exotic states: quantum hall, and discuss their signature property: the quantization of Hall conductance, which is independent of sample-specific details, to the extent that it is used for precise measurements of fundamental constants. Tracing the topological origin of this remarkable property, I will motivate the interplay between the geometry of these states and their response to “gravitational” perturbations, i.e., deformations to the real space manifold they are embedded in — on a cone, for example! This then naturally leads to a discussion of what, if any, universal signatures characterize this response. Finally, the broader implications of these excursions, and connections to other branches of physics, including classical soft matter systems.

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