
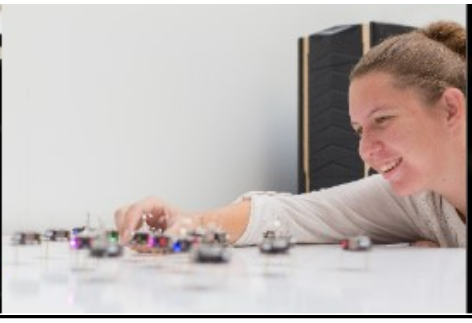


SPECIAL PHYSICS SEMINAR:

Exploiting Geometry and Disorder in Exotic Quantum States of Matter

Date: **11/22/19**

Time: **1:30 PM**

Location: **ACS 230A**

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Abstract

Quantum Hall states are a prominent example of exotic topological states of matter. The signature property of QH states, namely, the quantization of Hall conductance, is well-appreciated, and independent of sample-specific details, to the extent that it is used for precise measurements of fundamental constants. Less well understood, and at the frontier of current research, is how the geometry of these states responds to gravitational perturbations, i.e., deformations to the real space manifold they are embedded in, and what if any universal signatures characterize this response. In this talk I will discuss how remarkable new universal behaviors emerge when probing the gravitational response of quantum Hall states. By exploiting novel aspects of the quantum geometry of charged particles in a magnetic field, I will show that the these responses can be characterized not only by considering QH states in curved spaces, but equivalently, by placing them in non-uniform electric fields, thus facilitating experimental tests of these results. I will conclude by noting how the quantum geometry can be combined with the theory of coherent states to provide an analytical route, hitherto elusive, for deriving the properties of fractional quantum Hall phases from experimentally relevant microscopic Hamiltonians.

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.