

**October 9, 2025****4:10 – 5:00 PM****Roberts 113****Known Unknowns: Boundaries and interfaces in Topological Matter****Ilya Vekhter**  
**Louisiana State University****Abstract:**

We are used to the idea that modern technology relies on the physics of interfaces between different materials, and design of such interfaces provides control over functionalities. This is even more relevant for topological matter since the main manifestation of topological properties is the appearance of robust states at the surfaces and interfaces. Yet the question of what properties of these systems are and are not influenced by the details of the interface has, surprisingly, not been fully addressed.

I will start by reviewing the role of boundary conditions in simple undergraduate quantum mechanics problems, and extend that understanding to topological insulators and Dirac and Weyl semimetals. I will contrast the properties that are “topologically protected” from those that are significantly influenced by the details of the boundaries. I will discuss how this sensitivity to boundaries affects possible applications of topological materials.

**Host: Anton Vorontsov*****\* Refreshments served in the Barnard Hall second floor atrium at 3:45 PM \****