Abstract: In the simplest case, topological insulators are two-dimensional materials which support robust, one-way, edge currents. Despite recent progress on rigorously understanding edge currents through the "bulk-boundary correspondence" principle, basic practical questions about 2d materials, which are important for understanding topological insulators, remain to be answered. In this talk I will present (1) a new numerical method for computing edge states of 2d materials in the presence of edge defects, and (2) a new numerical method for computing Wannier functions of 2d materials which suggests a generalization of the "localization-topology" dichotomy to general disordered (without periodic structure) 2d materials.

Monday, October 7 at 4:00 PM in 636 SEO