## Abstract

As a new kind of state of the materials, topological insulators have been intensively studied by researchers very recently. The name is a little confusing. It does not have anything to do with the shape or with some abstract topology, and the interesting feature is not the insulating. The main feature of topological insulators is that they carry current along the surface but do not conduct current through the bulk of the material. We know the electrons spin in a quantum mechanical manner and encounter random collisions with other atoms and electrons, and produce magnetic field but spinning electrons on the surface of a topological insulator are protected from disruption by any quantum effects that's why we call them topologically protected. This exciting feature can make materials beneficial for spin related electronics, which would use the orientation of the electron spin to encode information. Topological Insulators bring a great opportunity to expand our understanding of solid state physics. Their applicability could also span the area of quantum computation. In my thesis work, I would try to deliver the basic understanding of these materials and their behavior with the help of some models. I would try to search for the non-trivial topology in double-exchange models via interaction of conduction electrons with localized moments. I would also like to extend this work ahead as there is so much to discover in this area and also it is the most interesting field for researchers in the condensed matter physics.