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### **General Theory of interacting Topological insulators**

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In this talk, I shall first briefly review the theory of topological insulators and the experimental status. I will then discuss the general theory of an interacting topological insulator, whose topological order parameter is expressed in terms of the full interacting Green function. This topological order parameter is also experimentally measurable in terms of the quantized magneto-electric effect. I shall discuss various applications of this theory to realistic materials which could realize the topological Mott insulator state.

“Topological Field Theory of Time-Reversal Invariant Insulators,” *Phys. Rev. B.* **78**, 195424, (2008).

“General theory of interacting topological insulators,” arXiv:1004.4229.

“Dynamical Axion Field in Topological Magnetic Insulators,” *Nature Physics* **6**, 284 (2010).

“Quantum Spin Hall Effect in a Transition Metal Oxide Na<sub>2</sub>IrO<sub>3</sub>,” *Phys. Rev. Lett.* **102**, 256403 (2009).

“Topological Mott Insulators,” *Phys. Rev. Lett.* **100**, 156401, (2008).