

Massachusetts Institute of Technology  
Department of Physics

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Condensed Matter Theory Seminar

"Bridging the gap between lattice models and TQFT"

**Michael Levin**, University of Chicago

**Abstract:** Every (2+1) dimensional lattice model with an energy gap is believed to be described by a topological quantum field theory (TQFT) in the low energy, long wavelength limit. What this means concretely is that every lattice model of this kind is associated with a collection of universal topological data that defines the corresponding TQFT. Physically, this data describes the statistical phases associated with braiding or fusing particle-like excitations of the model. Some of these statistical phases, however, are missing a precise definition that would allow for their computation from a microscopic Hamiltonian. In this talk, I will address this issue by giving a microscopic definition of the "F-symbol" --- one of the most poorly understood pieces of data that characterize TQFTs. I will also discuss applications of this definition to the computation of anomalies in (1+1) dimensional field theories and lattice models.

**12:00pm noon**  
**Wednesday, March 13, 2019**  
**Duboc Room (4-331)**

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Host: Senthil Todadri