1154-81-1839 **Michael Hermele***, Department of Physics, University of Colorado Boulder, Boulder, CO 80309-0390. *Gapped phases of quantum matter and topological quantum field theories.*

In condensed matter physics, one often considers physical systems of quantum mechanical degrees of freedom on a spatial lattice. Such systems are considered to belong to equivalence classes referred to as phases of matter, and the simplest such phases are those possessing a gap in the energy spectrum. It has often been assumed that the low-energy properties of any such gapped phase of quantum matter can be approximated by a suitable topological quantum field theory (TQFT). Indeed, there are many examples of gapped phases where such a TQFT description is known. However, there also exist gapped phases, known as fracton phases, that are incompatible with a low-energy TQFT description. This talk will introduce the notion of gapped phases of quantum matter and discuss what is known about how and to what extent gapped phases are related to TQFTs. (Received September 16, 2019)