# CMP Seminar
# Michigan State University


## Alex Levchenko
**University of Wisconsin - Madison**


## *Multi-Terminal Josephsonics – Topological Phases and Qubits*


In this talk, we will discuss the emergent band topologies of the subgap Andreev states in the multi-terminal Josephson junctions. In particular, we will look at an analog of the quantum spin Hall state in a three-terminal Josephson device as can be revealed by a quantized conductance, and a Weyl/Dirac semi-metallic phases in a four-terminal device. The classification of the band topologies will be presented based on the symmetry analysis of the Wigner-Dyson classes of random scattering matrices. We will discuss how these devices can realize novel qubit systems, higher classes of Chern topologies, and novel many-body models such as SYK Hamiltonian of interacting Majoranas on a superconducting chip.


**Monday, December 11, 2017**
**4:10 p.m.**
**BPS 1400**
**Prof. Stuart Tessmer - Host**