

## **WK2 CNM: Topological Quantum Information Science: From Concepts to Practical Realizations**

*Organizers: Yue Cao (MSD), Pierre Darancet (CNM), Nathan Guisinger (CNM), Jessica McChesney (APS), Subramanian Sankaranarayanan (CNM), and Hua Zhou (APS)*

9:00 Yue Cao (Argonne National Laboratory)  
*Opening Remarks*

9:15 John Mitchell (Argonne National Laboratory)  
*Welcome*

### **Session 1: Topological Materials: Where Do We Find Them?** (Pierre Darancet)

9:30 Ivar Martin (Argonne National Laboratory)  
*Hamiltonian Engineering with Majorana Modes*

10:05 Aash Clerk (University of Chicago)  
*Photonic and Bosonic Analogues of Topological Superconductors*

10:40 Break

### **Session 2: Topological States in the Bulk** (Nathan Guisinger)

11:00 John Mitchell (Argonne National Laboratory)  
*Putative Topological Features in  $Co_{1/3}NbS_2$  and  $Pd_3Pb$*

11:35 Ni Ni (University of California, Los Angeles)  
*Experimental Exploration of Topological Materials*

12:10 Lunch

### **Session 3: Artificial Topological States on the Surface and Interface** (Hua Zhou)

1:30 Seongshik Oh (Rutgers, the State University of New Jersey)  
*Tunable Proximity-coupled Topological Superconductor Heterostructures for Quantum Computation*

2:05 Tai Chiang (University of Illinois, Urbana-Champaign)  
*Playing with Topological Insulators: Superconductivity and Strain Effects*

2:40 Break

### **Session 4: Identifying Fermionic and Bosonic Topological States** (Jessica McChesney)

3:00 Liuyan Zhao (University of Michigan)  
*Magnetic Excitations in a Honeycomb Ferromagnet*

3:35 Mark Dean (Brookhaven National Laboratory)  
*Observation of Double Weyl Phonons in Parity-breaking  $FeSi$*

4:10 Yong P. Chen (Purdue University)  
*Topological Insulator-based Quantum Devices: From Spin Batteries to Josephson Junctions*

4:45 Subramanian Sankaranarayanan (Argonne National Laboratory)  
*General Discussion*

5:30 Adjourn