

Suggested topics for in class presentations

1. Time-dependent Landau-Ginsburg theory and its application to ultra-fast spectroscopy.
2. Inelastic neutron scattering and its application to spin ice materials.
3. Noise spectroscopy to detect magnetic monopoles .
4. Electron-phonon coupling: how to measure experimentally with example from high temperature superconductors.
5. Flat band materials.
6. Solitons in 1D systems: polyacetylene and SSH model.
7. Anomalous and spin Hall effects in spin texture magnets.
8. Correlated electron physics on optical lattices.
9. Disorder, Anderson localization and metal-insulator transition.
10. Unconventional superconductors: FFLO states.
11. Andreev reflection and point contact spectroscopy.
12. Anyons and braiding.
13. Quantum spin liquids with an example from triangular organics.
14. Bose-Einstein condensation and superfluidity.
15. Topological defects.

Notes: Your presentation is 10 mins long plus 3 mins for Q&A - to be presented in-class followed by a brief 2 page-report which must include references. The pdf version of your report should be send via email to your instructor.