Some Recommended Resources for Topological Materials

May 14, 2018

General Resources:

- Schoop, L. M., Pielnhofer, F., and Lotsch, B. V. Chemical Principles of Topological Semimetals. Chem. Mater., Article ASAP. DOI: 10.1021/acs.chemmater.7b05133
- Donostia Topological Matter School 2017 Lecture Videos. Playlist [link]. Particularly recommended:
  - Ivo Souza, "Introduction to the Zak and Berry Phase"
  - Leslie Schoop, "Prediction, growth, and characterization of topological materials"
  - Claudia Felser, "Search of new topological matter"
- Moore, J. E. The birth of topological insulators. Nature **464**, 194 (2010). DOI: 10.1038/nature08916
- N. P. Armitage, E. J. Mele, and Vishwanath, A. Weyl and Dirac semimetals in three-dimensional solids. Rev. Mod. Phys. **90,** 015001 (2018). DOI: 10.1103/RevModPhys.90.015001
- Bernevig, B. A., and Hughes, T. Topological Insulators and Topological Superconductors. Princeton University Press (Princeton, N.J.), 2013. Available through the UCSB Library: [link]

Related References:

- **Quantum Hall Effect:** Avron, J., Osadchy, D., and Seiler, R. A Topological look at the Quantum Hall Effect. Physics Today, August 2003, 38-42. DOI: 10.1063/1.1611351
- **Berry Phase:** Berry, M. V. Quantal phase factors accompanying adiabatic changes. Proc. R. Soc. Lond. A 392, 45-57 (1984). DOI: 10.1098/rspa.1984.0023
- **Magnetoelectric polarization as a topological invariant**: Essin, A. Electric and Magnetic Response Properties of Topological Insulators in Two and Three Dimensions. Dissertation. Berkeley (CA): Spring 2010. `http://digitalassets.lib.berkeley.edu/etd/ucb/text/Essin_berkeley_0028E_10512.pdf`
- **Topological Heuslers:**
  - Chadov, S., Qi, X., Kubler, J., Fecher, G. H., Felser, C., and Zheng, S. C. Tunable multifunctional topological insulators in ternary Heusler compounds. Nature Materials **9**, 541–545 (2010). DOI: 10.1038/nmat2770
  - Manna, K., Sun, Y., Muchler, L., Kubler, J., and Felser, C. Heusler, Weyl, and Berry. Available on the arXiv: `https://arxiv.org/abs/1802.03771`
- **SSH toy-model framework for topological materials:** Asboth, J. K., Oroszlany, L., and Palyi, A. A Short Course on Topological Insulators: Band Structure and Edge States in One and Two Dimensions. Springer (Heidelberg), 2016. Available online at: `https://arxiv.org/pdf/1509.02295.pdf`