

## Theory of Condensed Matter Physics

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Instructor: Prof. Aditi Mitra

### Syllabus:

1. Topological Insulators and Topological Superconductors.(SSH model, Kitaev chain, Integer Quantum Hall, Chern Insulators, p-wave superconductors, Bott periodicity).
2. Bosonic Symmetry Protected Topological Phases.
3. Fractional Quantum Hall Effect.
4. Non-chiral Topological Order (String-net models, fusion category, anyons).
5. Gauge Theories.
6. Bosonization.
7. Renormalization Group.

### Textbooks:

1. Topological Insulators and Topological Superconductors, A. Bernevig with T. Hughes. Princeton University Press, 2013.
2. Quantum Field Theory and Condensed Matter, R. Shankar. Cambridge University Press, 2017.
3. Quantum Information meets Quantum Matter, B. Zeng, X. Chen, D. Zhou, X. Wen, Springer (2019).