. Course Title--Condensed Matter Physics II

Instructors: Prof. Krishnendu Sengupta & Dr. Arnab Sen

Day and time: Every Tuesday & Thursday from 4:30 pm - 5:30 pm

Venue: Seminar Room No. C406, Centenary Building

Course starting date: August 1, 2017

P.S. This course is not compatible with JU registration

Outline---

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1. Topology in non-interacting systems

a) Superconductors/vortices/introduction to topological excitations
b) Dirac materials
c) (Integer) Quantum Hall effect

2. Phase transition

a) Landau- theory
b) Quantum phases transition
c) Beyond Landau paradigm

3. Out of equilibrium systems:

a) Two level problem with linear drive
b) Kibble Zureck scaling
c) Periodic drive and Floquet theory
d) Steady states (if time permits)

4. Strongly correlated states:

a) Classical spin liquids (Macroscopic degeneracy, order by disorder, effective field theories etc)
b) Classical spin ice
c) Z_2 quantum spin liquids through the Kitaev Model
d) U(1) quantum spin liquids
e) Long-range entanglement structure in such states
f) Symmetry fractionalization in spin liquids