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Junior Paper Outline
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This paper will discuss the Sachdev-Ye-Kitaev model of interacting Majorana fermions, or fermions which are their own antiparticles. It will focus on the small-N limit, looking at the application of large-N methods to the small-N limit. It will also look at applying methods used in condensed matter physics to deal with Majorana fermions to high energy theory.

- Introduction to Dirac Fermions
  - Dirac Equation
  - Quantizing the Dirac Equation
  - Particles and Antiparticles
  - Dirac Fermions and anti-commutation relations
- Introduction to Majorana Fermions
  - Constrain Dirac spinor to be real
  - Anti-commutation relations
  - Physical interpretation of Majorana fermions as its own antiparticle
- Applications of Majorana Fermions
  - High energy physics
  - Condensed matter
  - Quantum Computing
- SYK model
  - Definitions
  - Some calculations
  - Large-N limit
- Small-N limit
  - Supercharge
  - Supersymmetry