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