



# ASTEROID MASS ESTIMATION WITH MARKOV-CHAIN MONTE CARLO

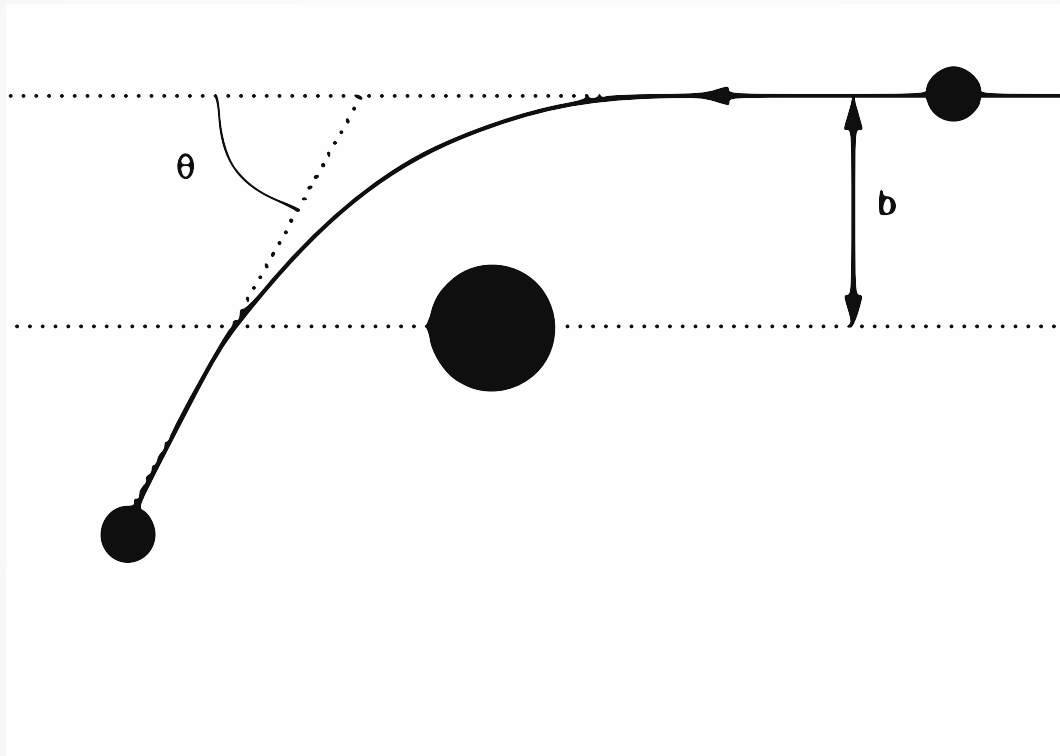


# MOTIVATION: WHY ASTEROID MASSES?

- Knowledge of an asteroid's mass is necessary to determine its density
- Density, in turn, together with surface measurements constrains an asteroid's composition and structure -> very interesting to asteroid researchers!
- Masses currently only known for a tiny fraction of all known asteroids. Actually, asteroid perturbations currently represent the greatest source of uncertainty in planetary ephemerides (Standish 2000)
- In the past mass estimation has been done with linearized (least-squares) methods. These methods need to make assumptions regarding probability distributions of the parameters. Advantage of MCMC is that we don't need to make such assumptions

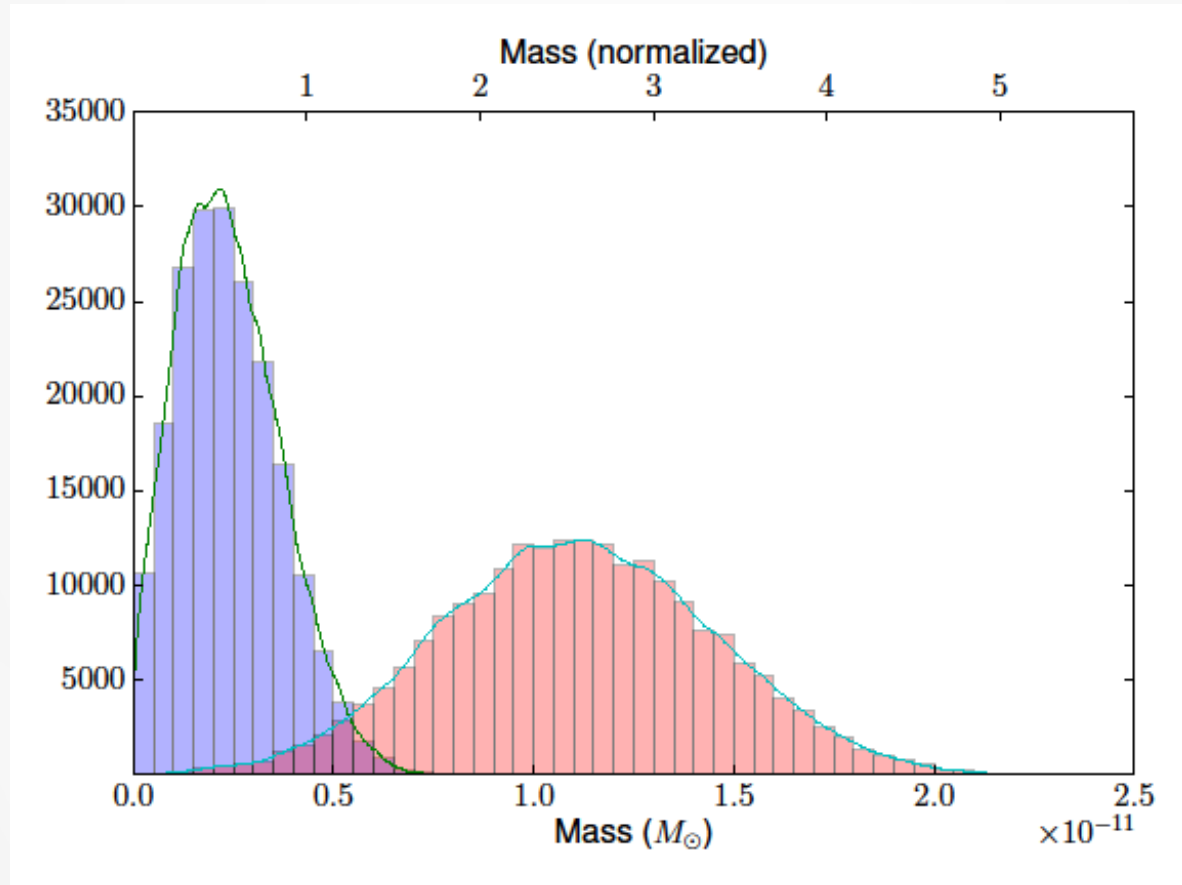


# BUT HOW IS IT DONE?





# EXAMPLE RESULTS: 19-3486 (BLUE) AND 19-





**THE END. THANK YOU!**