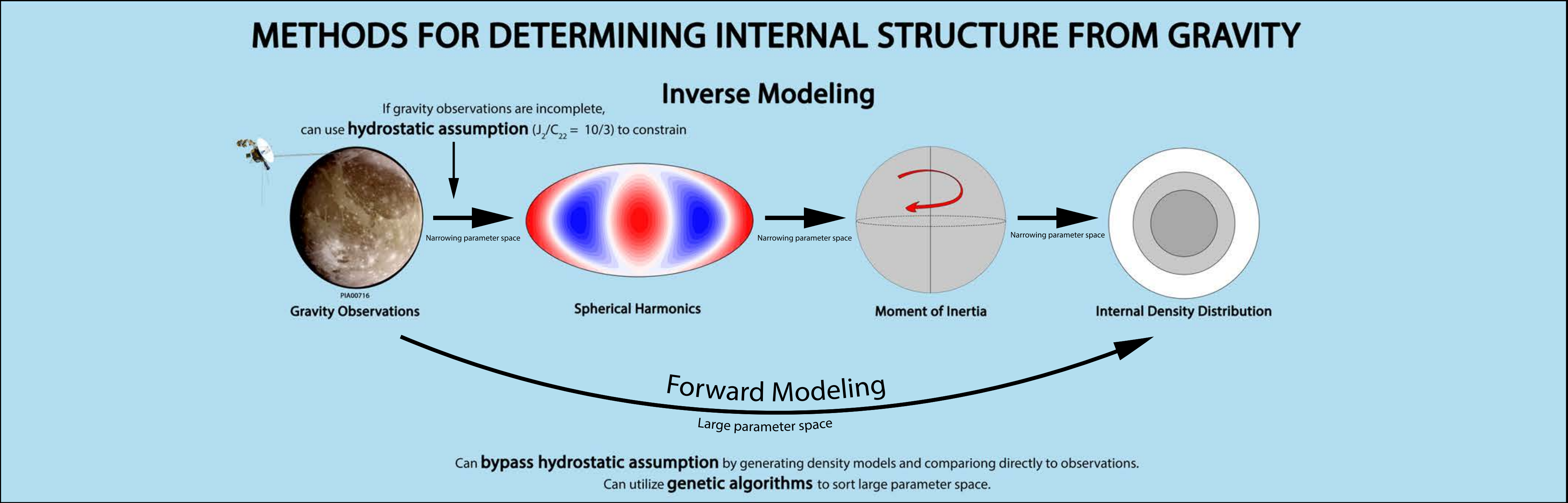


# FORWARD MODELING PLANETARY INTERIOR STRUCTURE FROM GRAVITY USING GENETIC ALGORITHMS



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**CALCULATE GRAVITATIONAL POTENTIAL**  
Kattoum and Dombard (2009) method  
Generate potential above plate centroids  
Can use potential field to generate spherical harmonics

**EVALUATE GENERATION MEMBERS**  
Reject unphysical solutions  
Compare solutions to observations via error function  
Most fit solutions continue to next generation

START

**GENERATE SHAPE MODEL**  
Overlapping triaxial ellipsoids  
Varying size and  $\Delta\sigma$  parameters  
Meshed by triangular plate model

Iterate until population is full for given generation

**ADD TO POPULATION**  
Each generation is a set of multiple possible solutions

**EXCHANGE AND MUTATE GENES**  
Physical properties are stochastically varied between population members

New generation instantiated  
Loop until runtime criteria achieved

Fit solutions from previous generation  
"sed" next generation