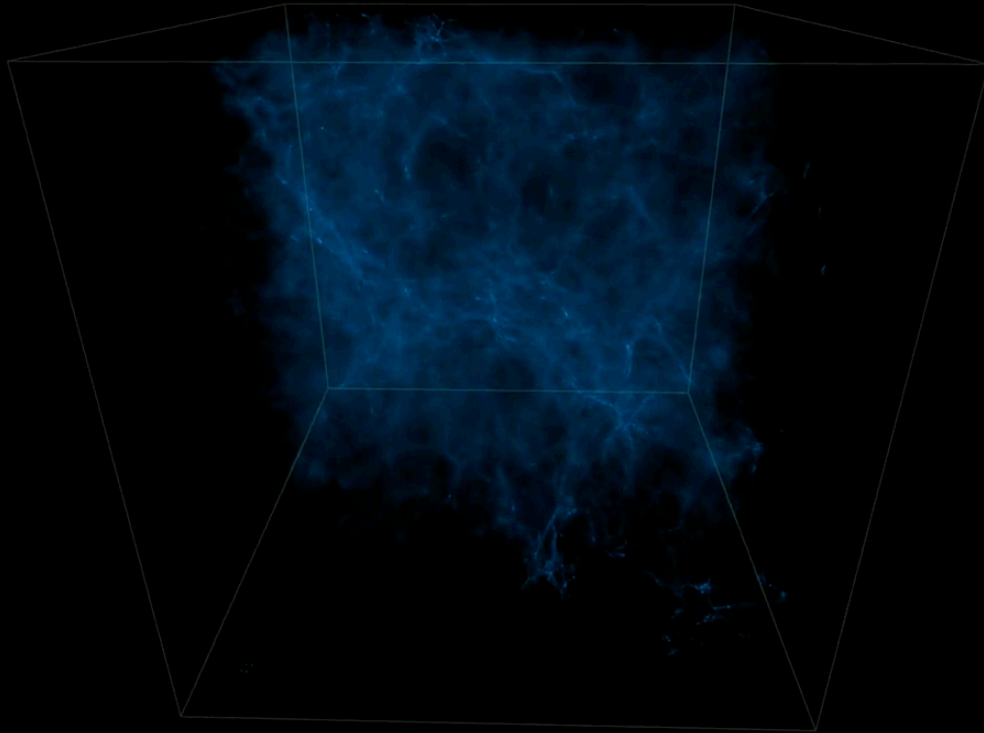


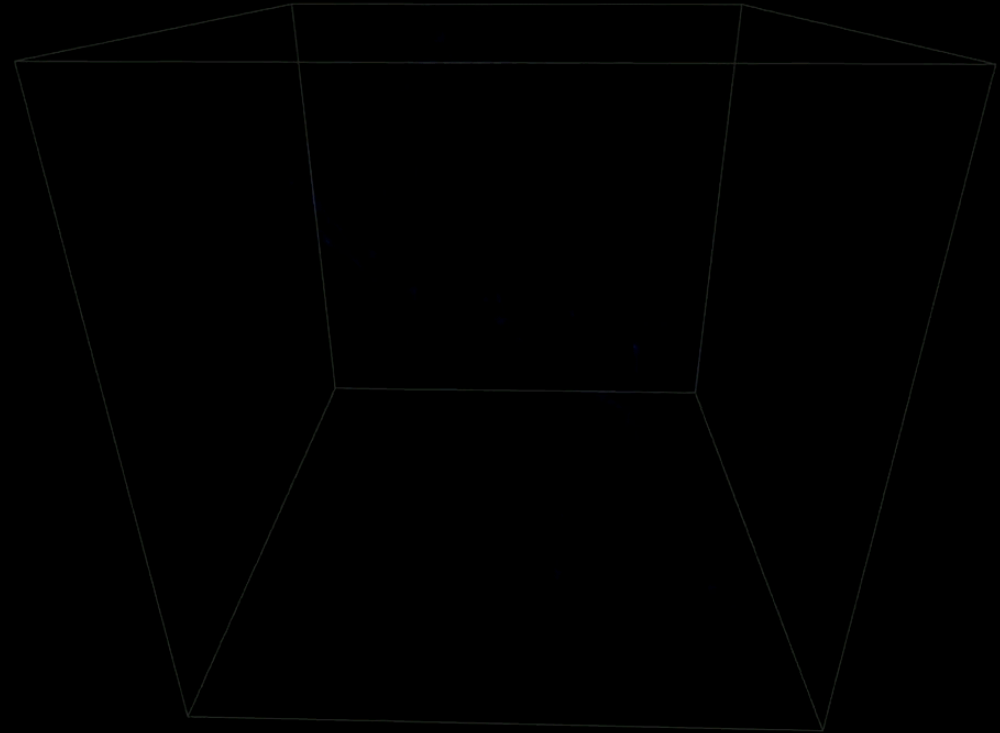
# The solar system: planets, moons and minor planets

Ay 20, Fall 2019, Lecture 2  
*Vikram Ravi*

## Dark matter density



## Temperature of normal matter

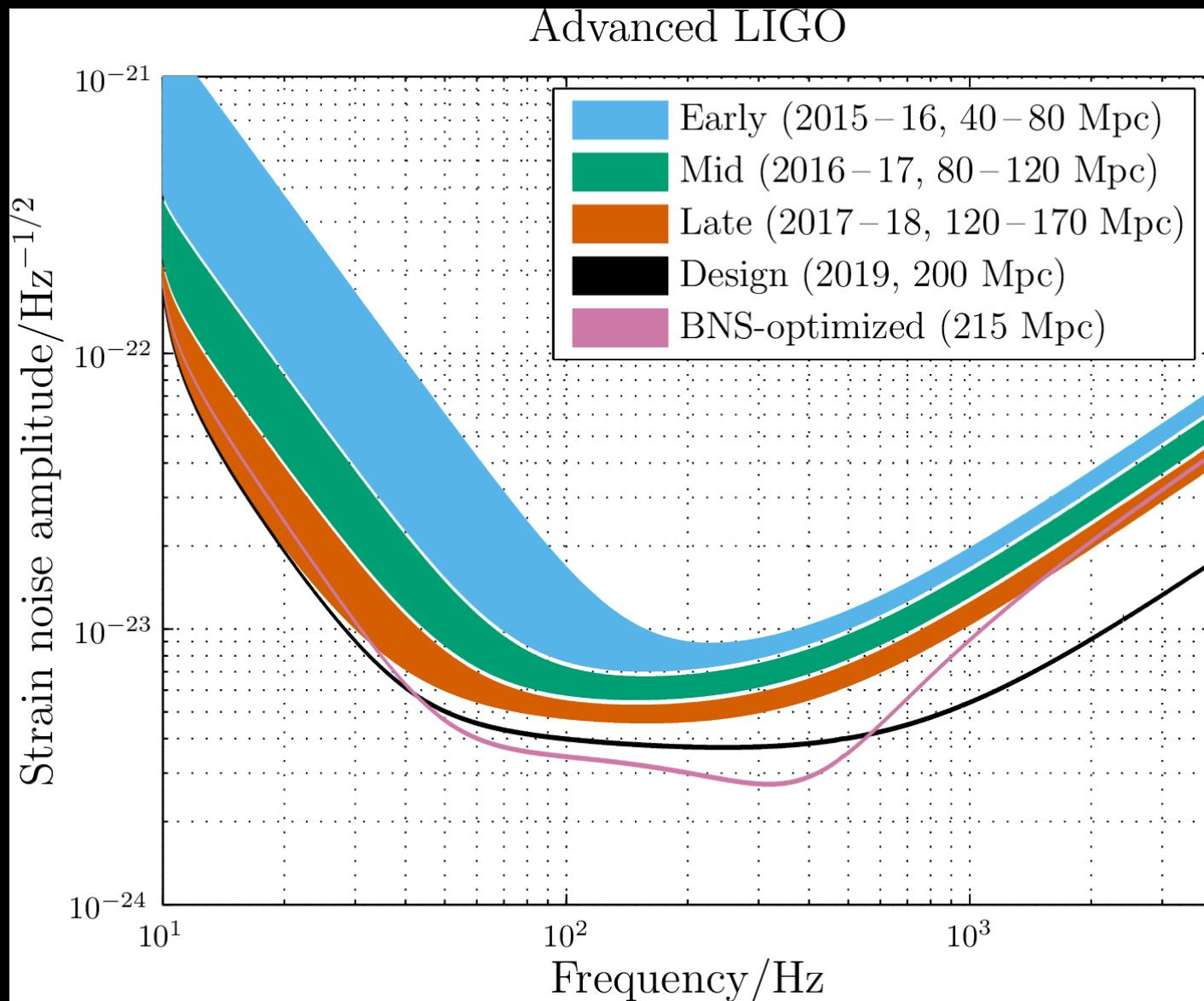


redshift : 10.89  
Time since the Big Bang: 0.4 billion years

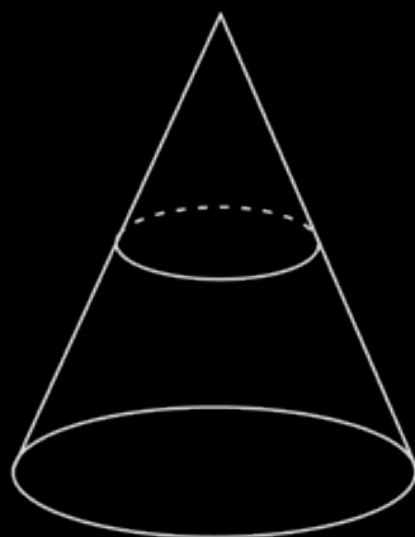
stellar mass : 0.0 billion solar masses

**ILLUSTRIS**

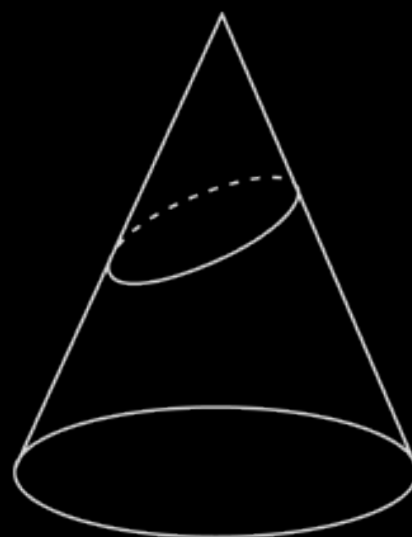
M. Vogelsberger, et al., *Nature*, **509**, 177 (2014)



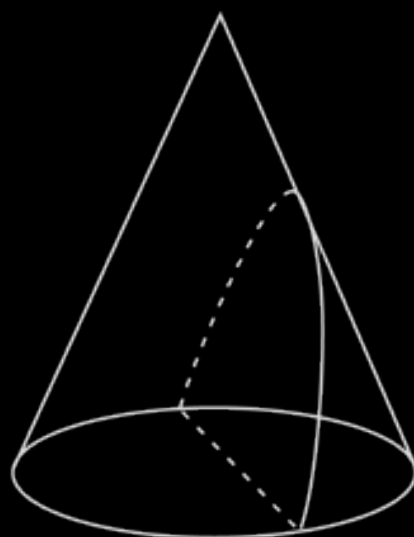
LIGO collaboration



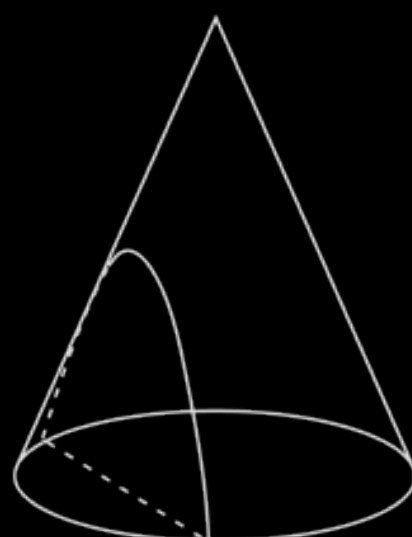
Circle



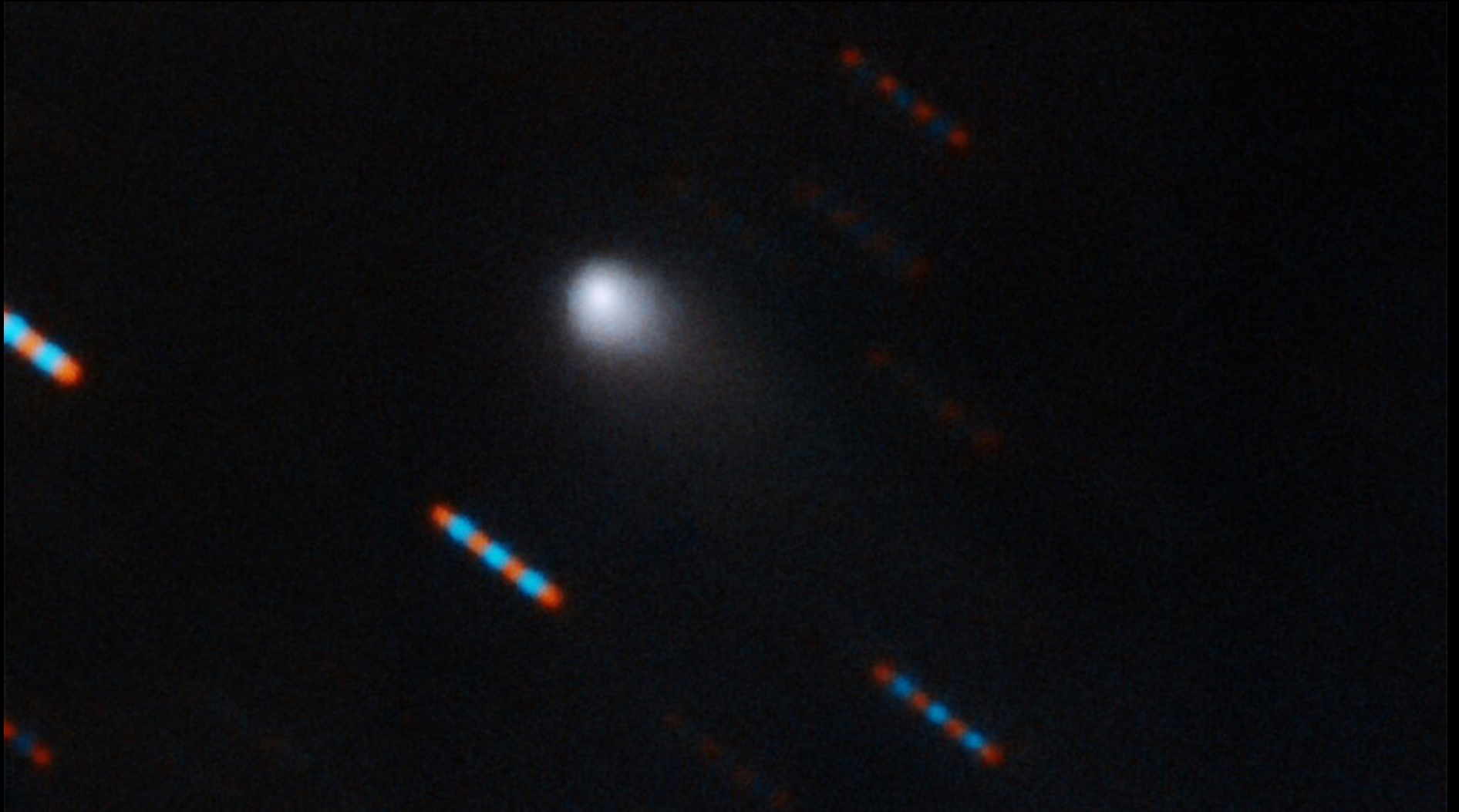
Ellipse



Parabola

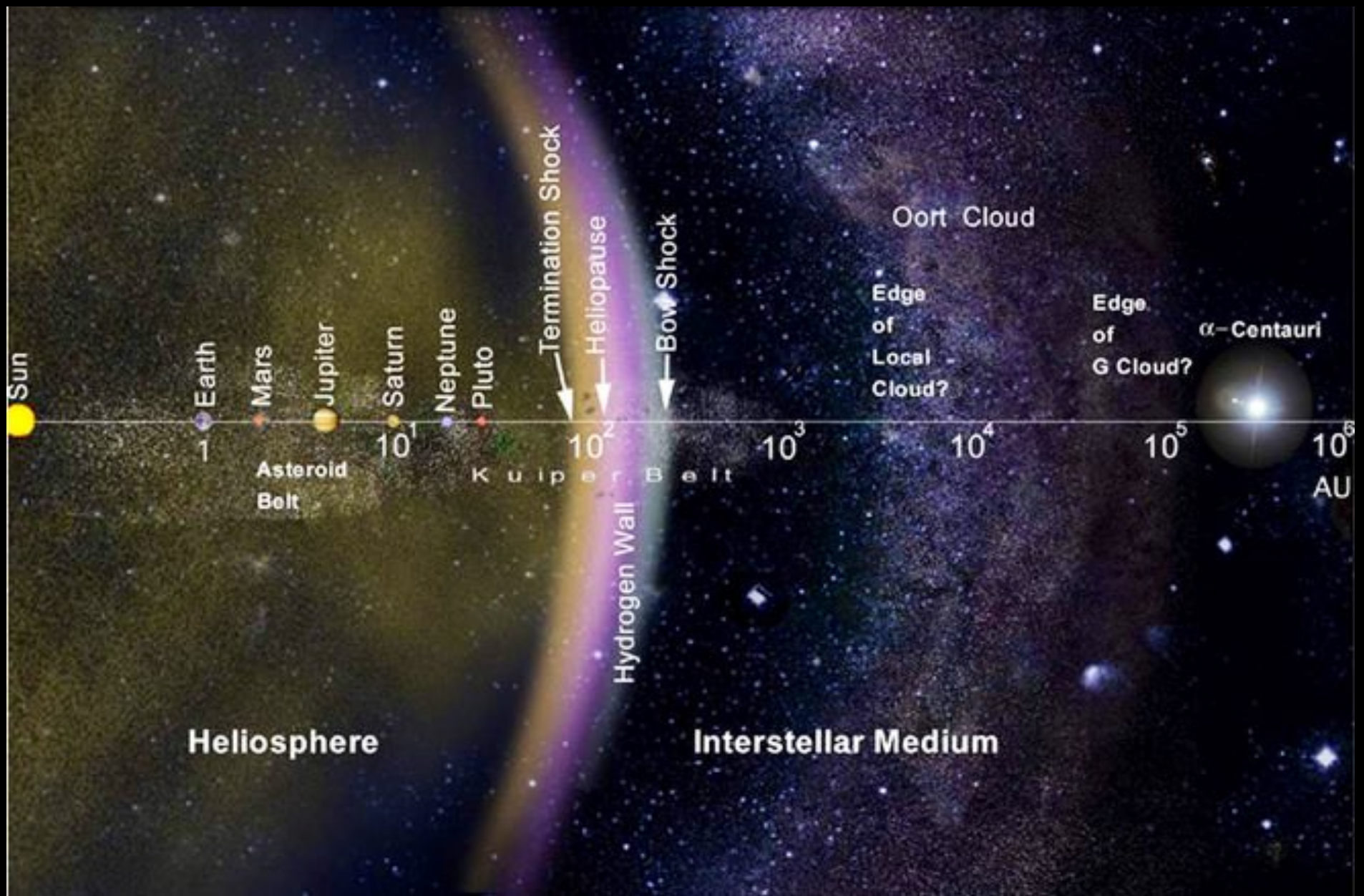


Hyperbola

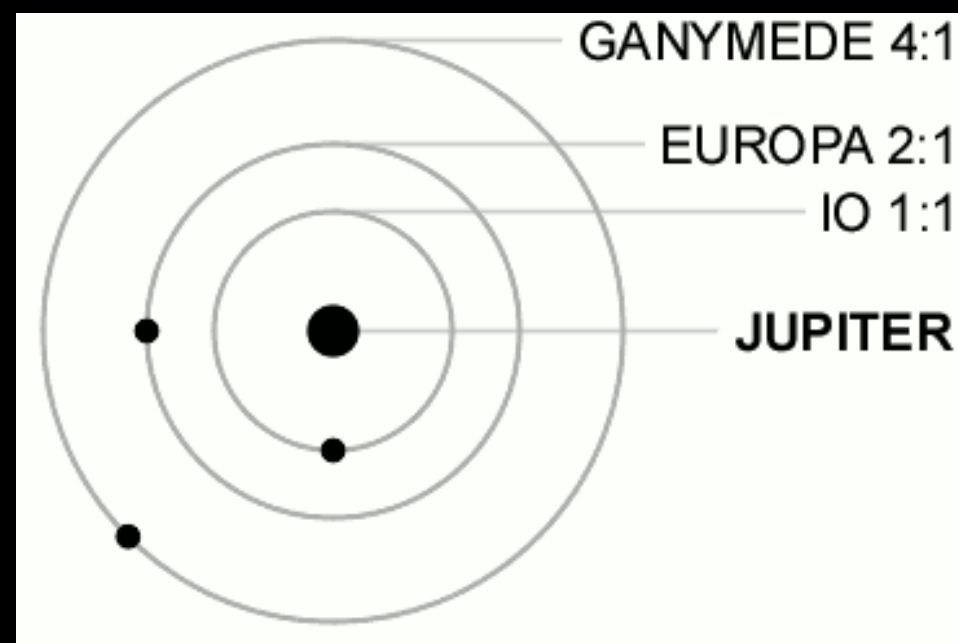
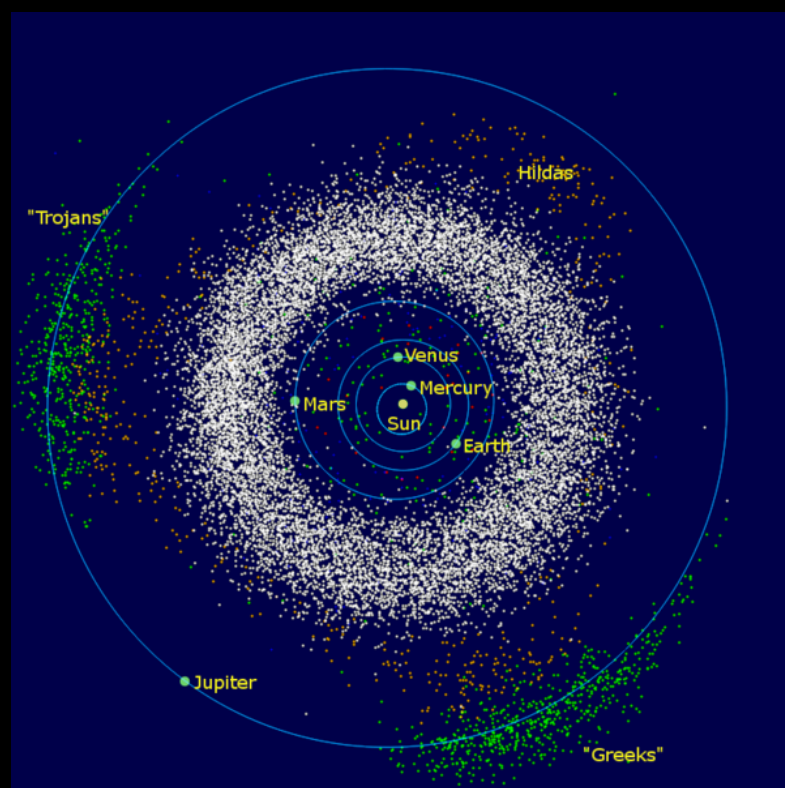


Gemini Observatory



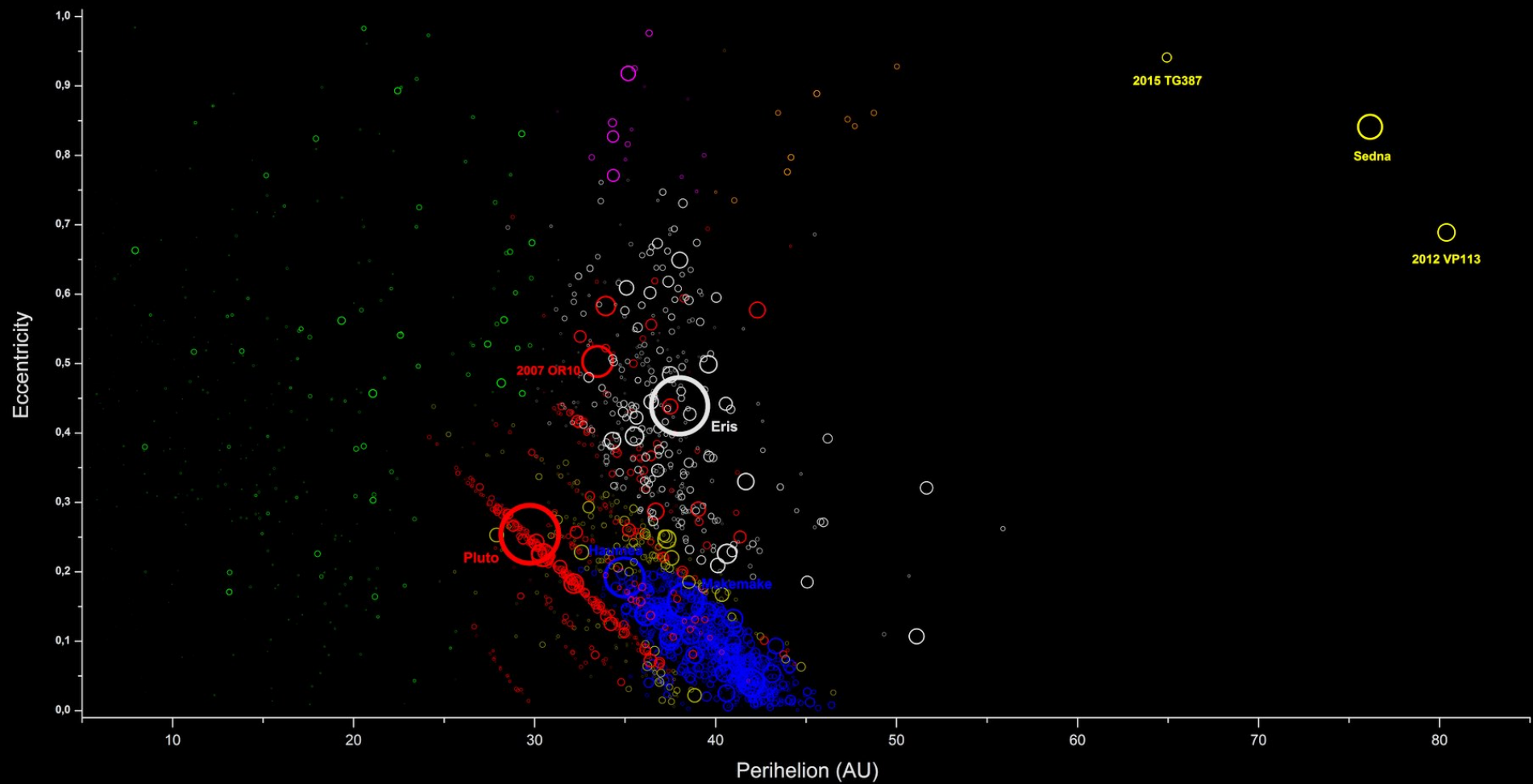


Universe Today



NASA/JPL, Wikipedia





# Trans-Neptunian Objects

