

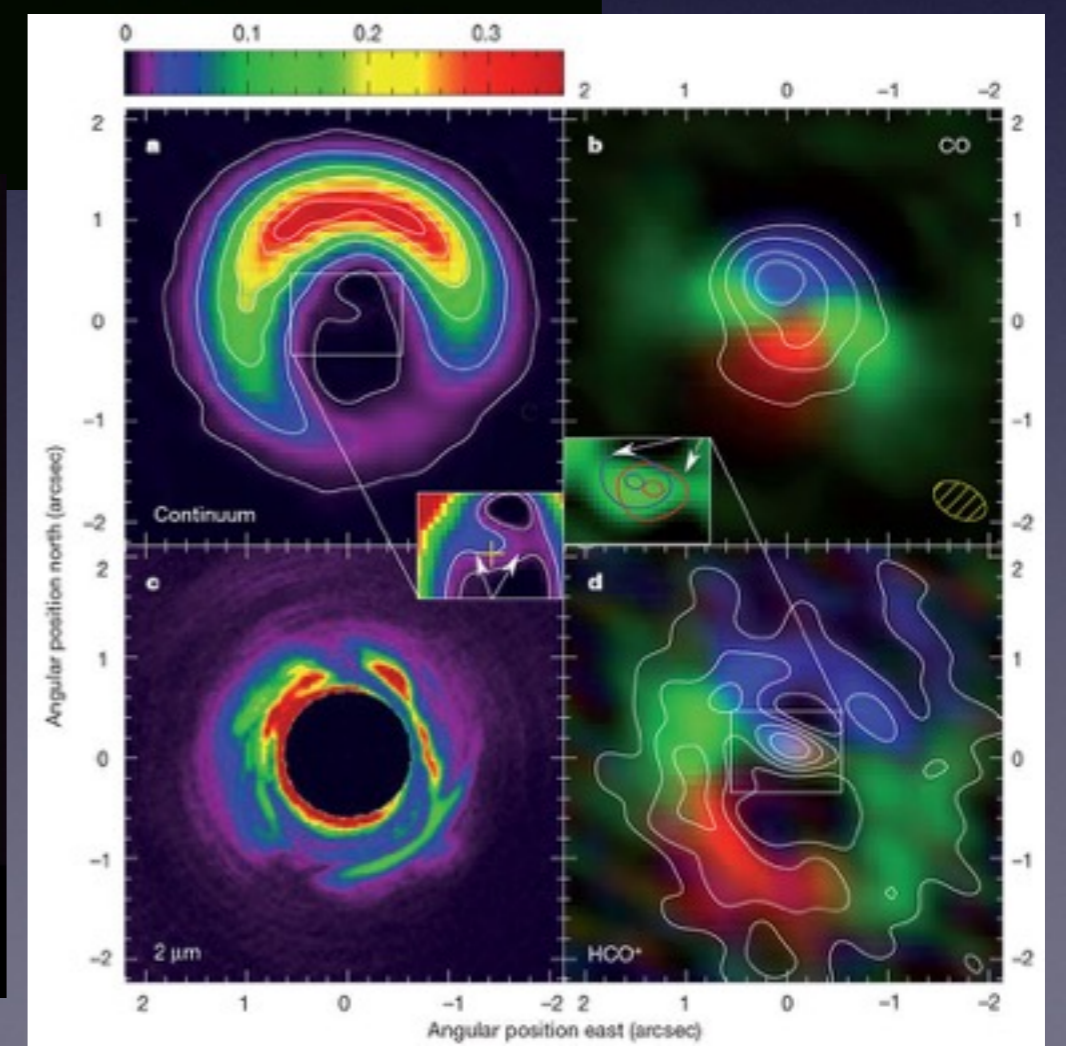
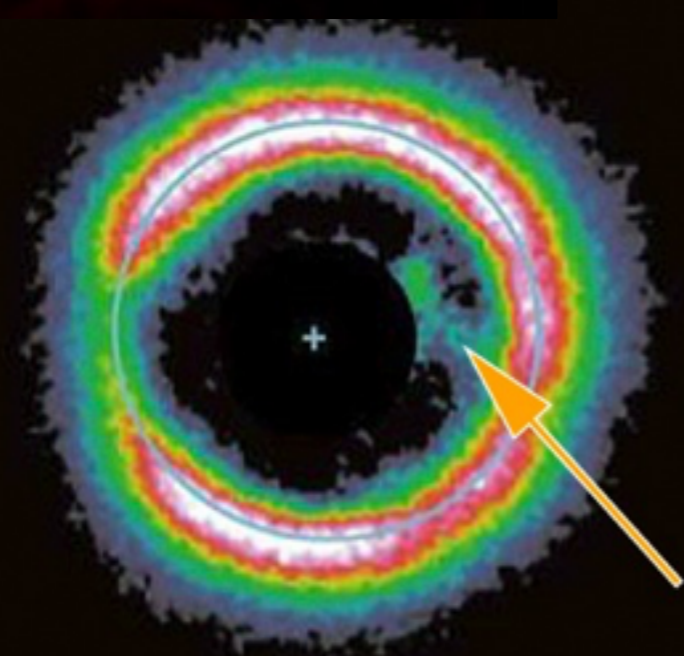
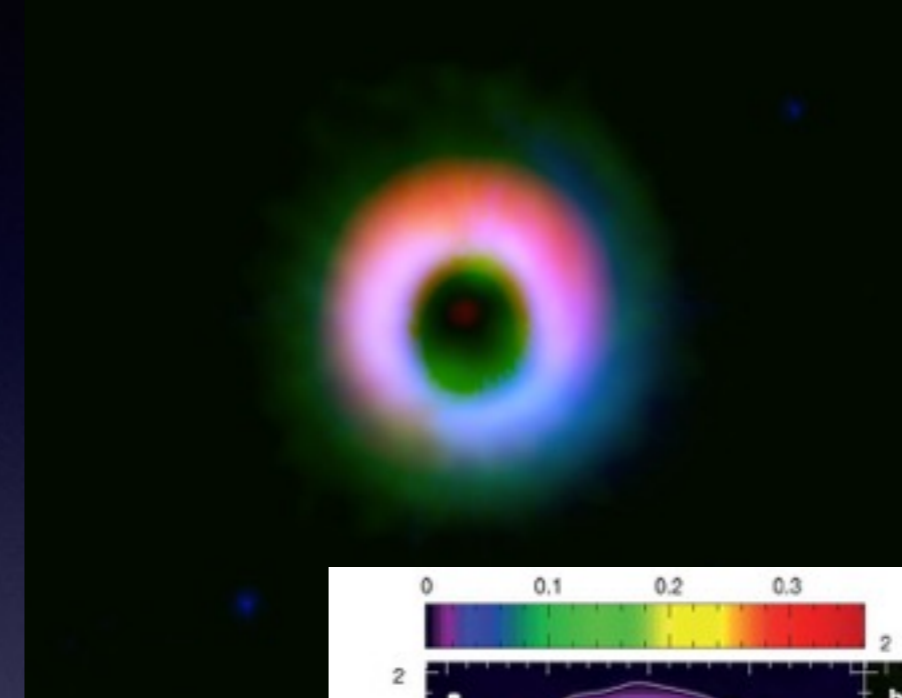
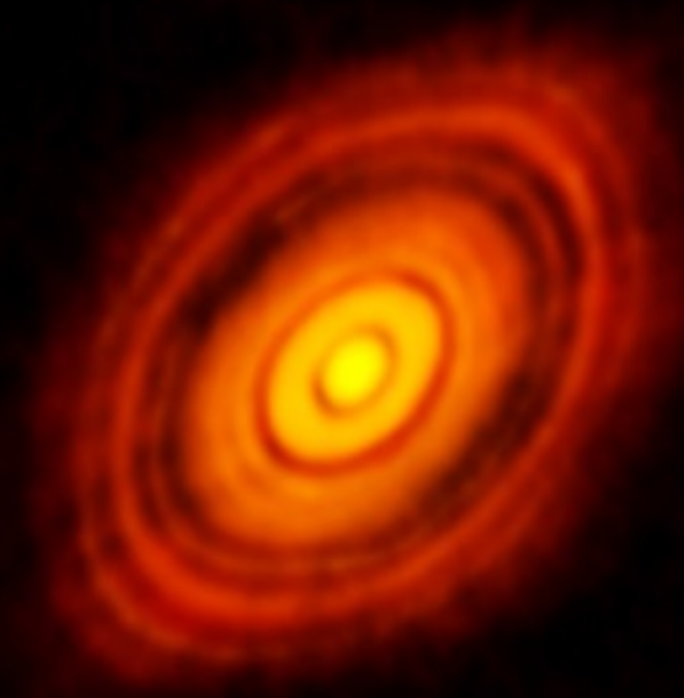
# How Do We Form the Solar System?

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# Overview



# Observations



# Observations

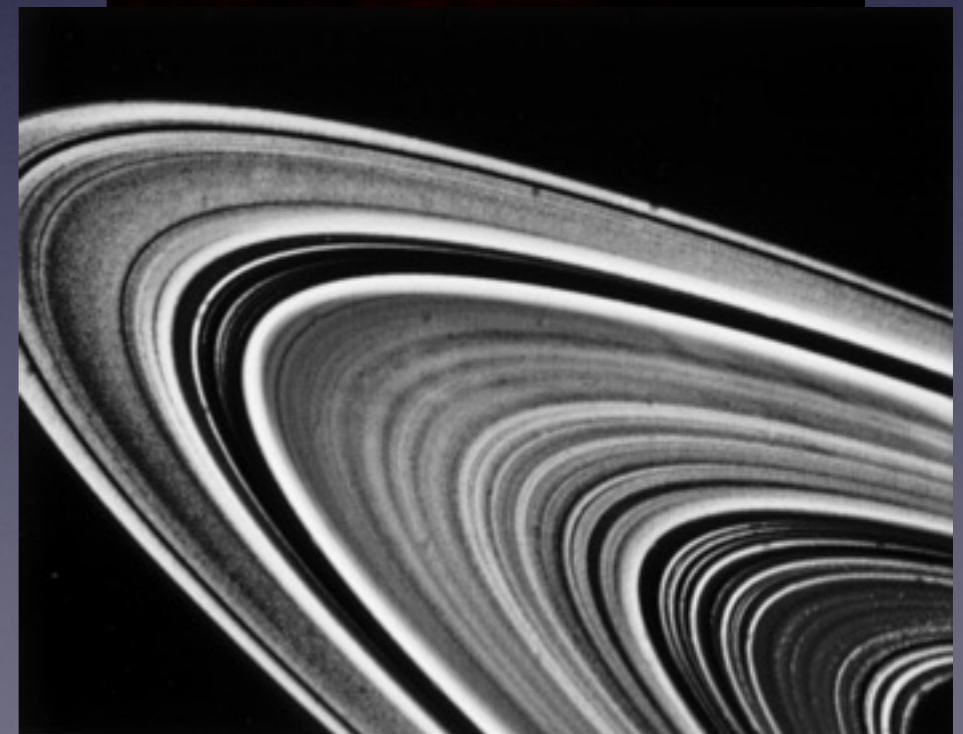
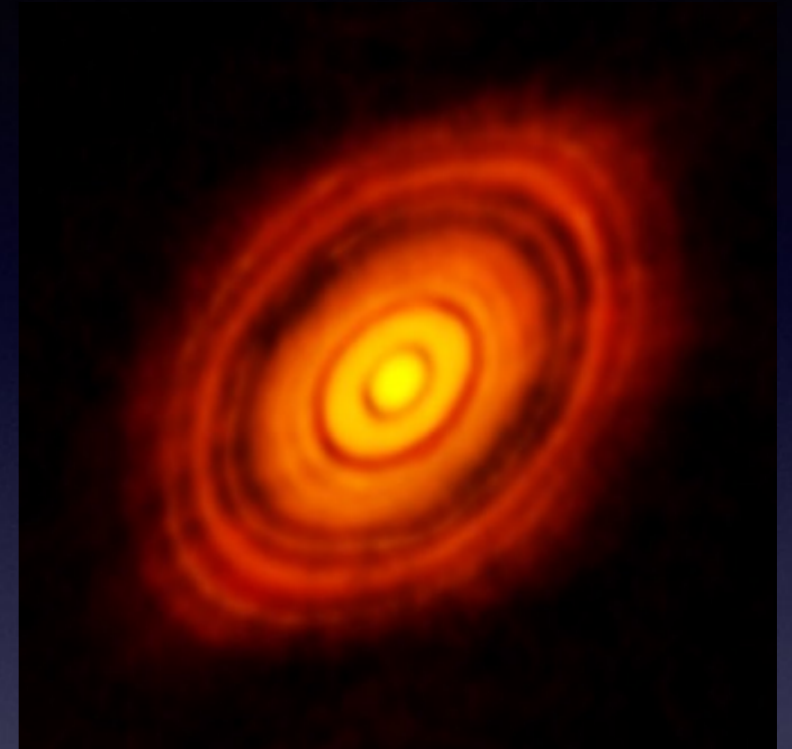
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- Rings are a sign of possible planet formation
- Asymmetries can be signs of planet formation as well, but are also signs of interactions with the star/binary star and the self gravity of the disk.

# Observations

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# Rings and Gaps

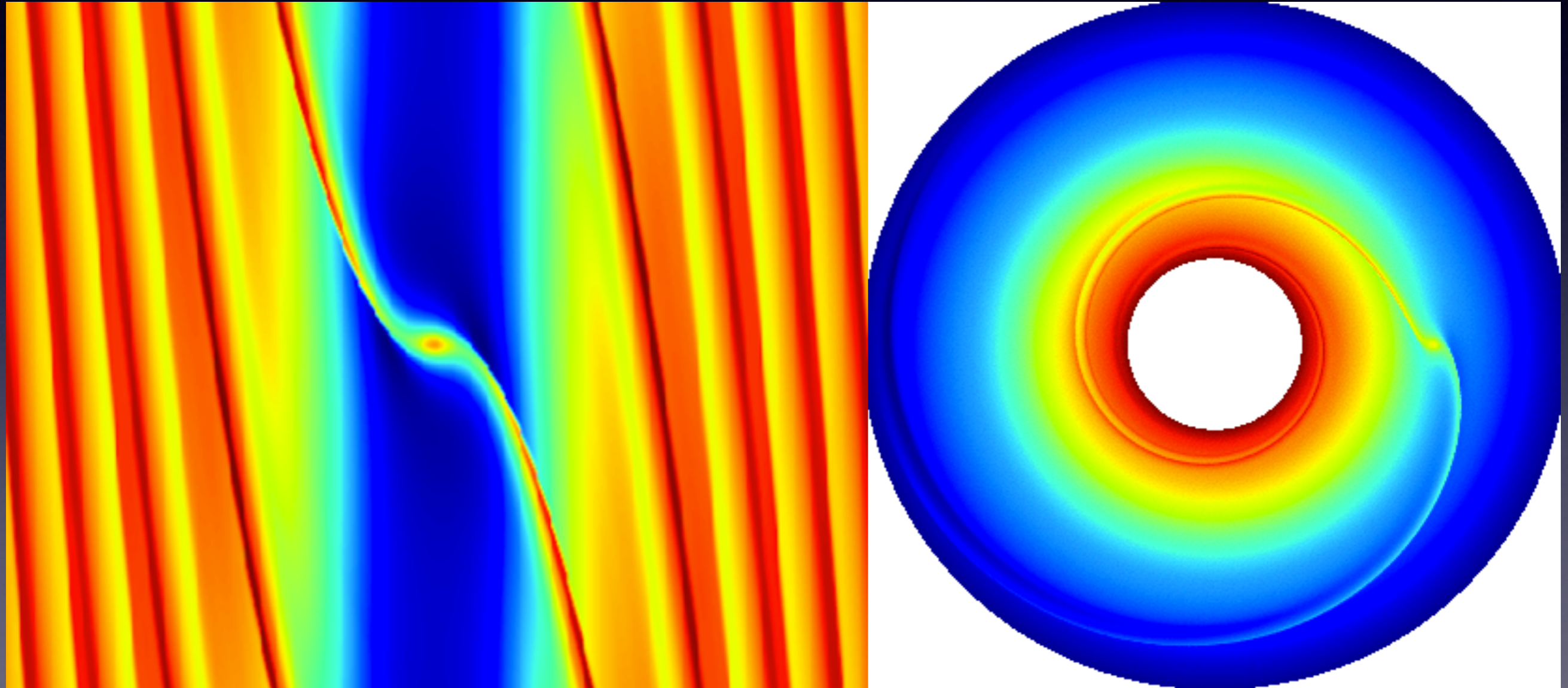
- Planets that are large enough can push enough disk material away from them to clear a *gap*.
- These gaps can be (and are) observed.
- We can simulate this process using *computational fluid dynamics* simulations.



# The Quest Supercomputer at Northwestern

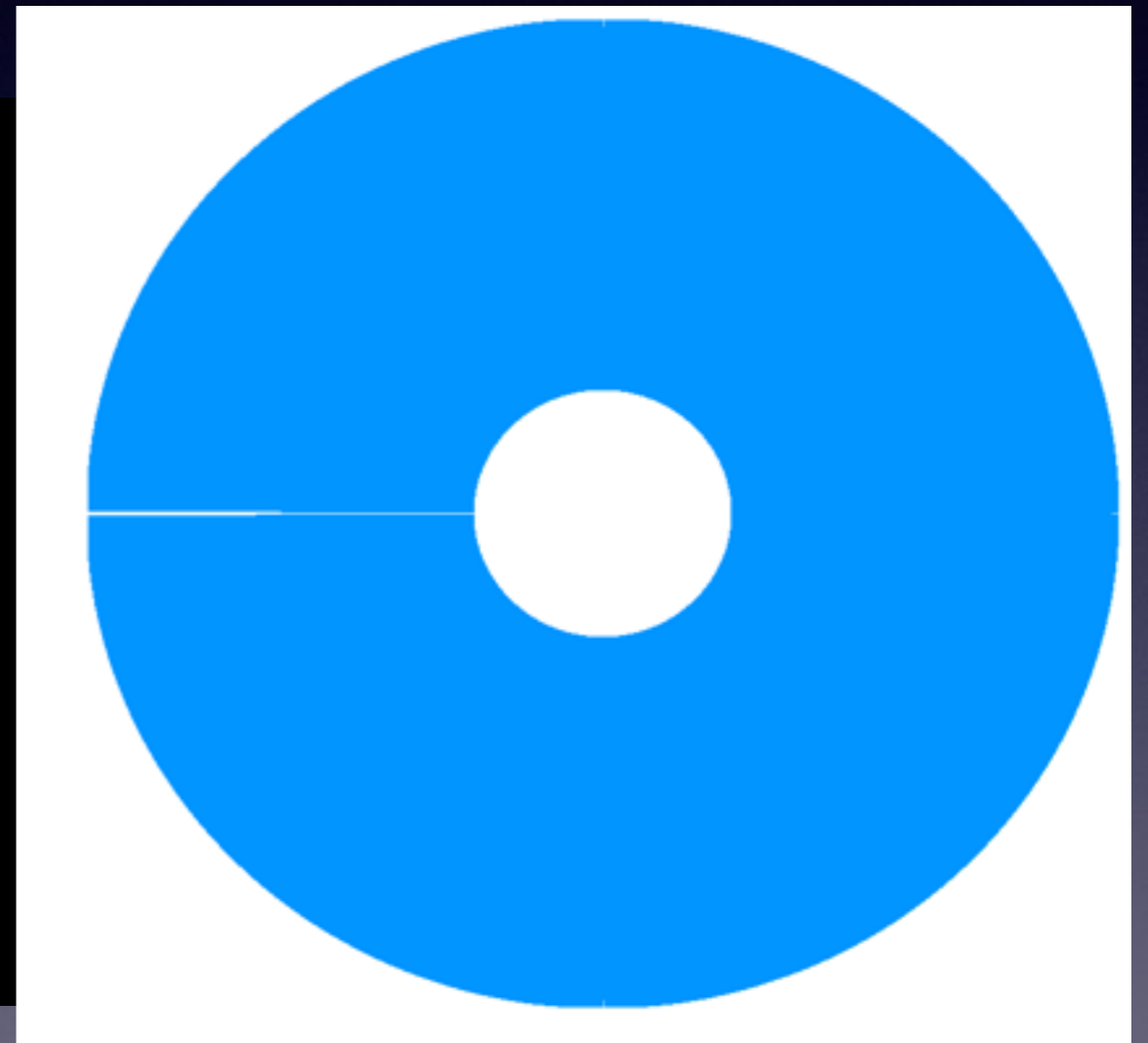
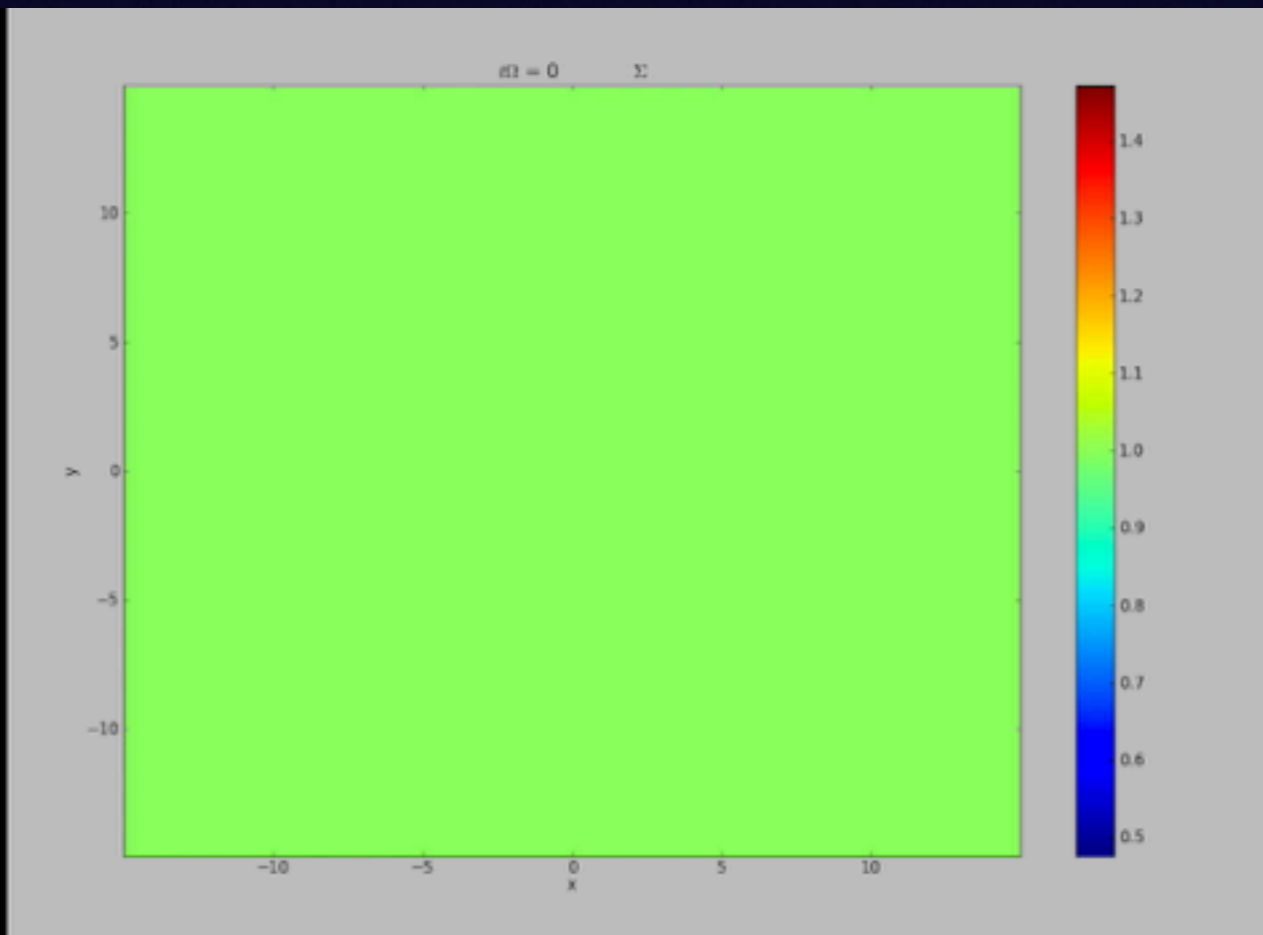


# Computer Simulations





# Computer Simulations



# Planet Formation in the Classroom

# NetLogo Model

