

# *Kepler* & Planet Formation



Kavli Institute of Theoretical Physics  
University of California @ Santa Barbara  
10 February 2015

**Jack J. Lissauer**  
**NASA Ames**  
**Artwork Lynette Cook 1999**

# Planets Data from *Kepler*

Un-giant planets larger than Earth  
with  $P < 100$  days are common

# Planets Data from *Kepler*

# Planets Data from *Kepler*

Un-giant planets larger than Earth  
with  $P < 100$  days are common

Rocky planets larger than  $1.6 R_{\text{Earth}}$   
are uncommon

# Planets Data from *Kepler*

Ungiant planets larger than Earth with  $P < 100$  days are common

Rocky planets larger than  $1.6 R_{\text{Earth}}$  are uncommon

Typical densities of ungiants larger than  $1.6 R_{\text{Earth}}$  drops with increasing size, but large scatter in  $M$  for given  $R$



# Systems Data from *Kepler*

Packed flat systems are common

# Systems Data from *Kepler*

Packed flat systems are common

Most planets aren't in or near mean motion resonances



# Systems Data from *Kepler*

Packed flat systems are common

Most planets aren't in or near mean motion resonances

More resonance planets than random