Bridging the Theory Gap:
Developing a Novel Cloud Model for Exoplanets

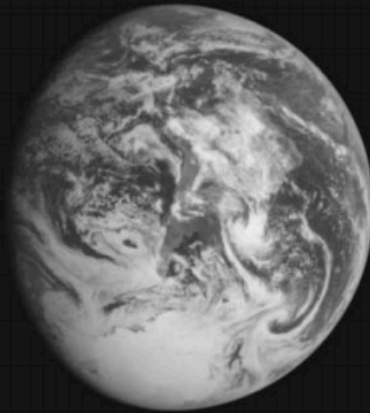## Tyler D. Robinson (Sagan Fellow)

Image credit: Penn State/NASA/JPL-Caltech
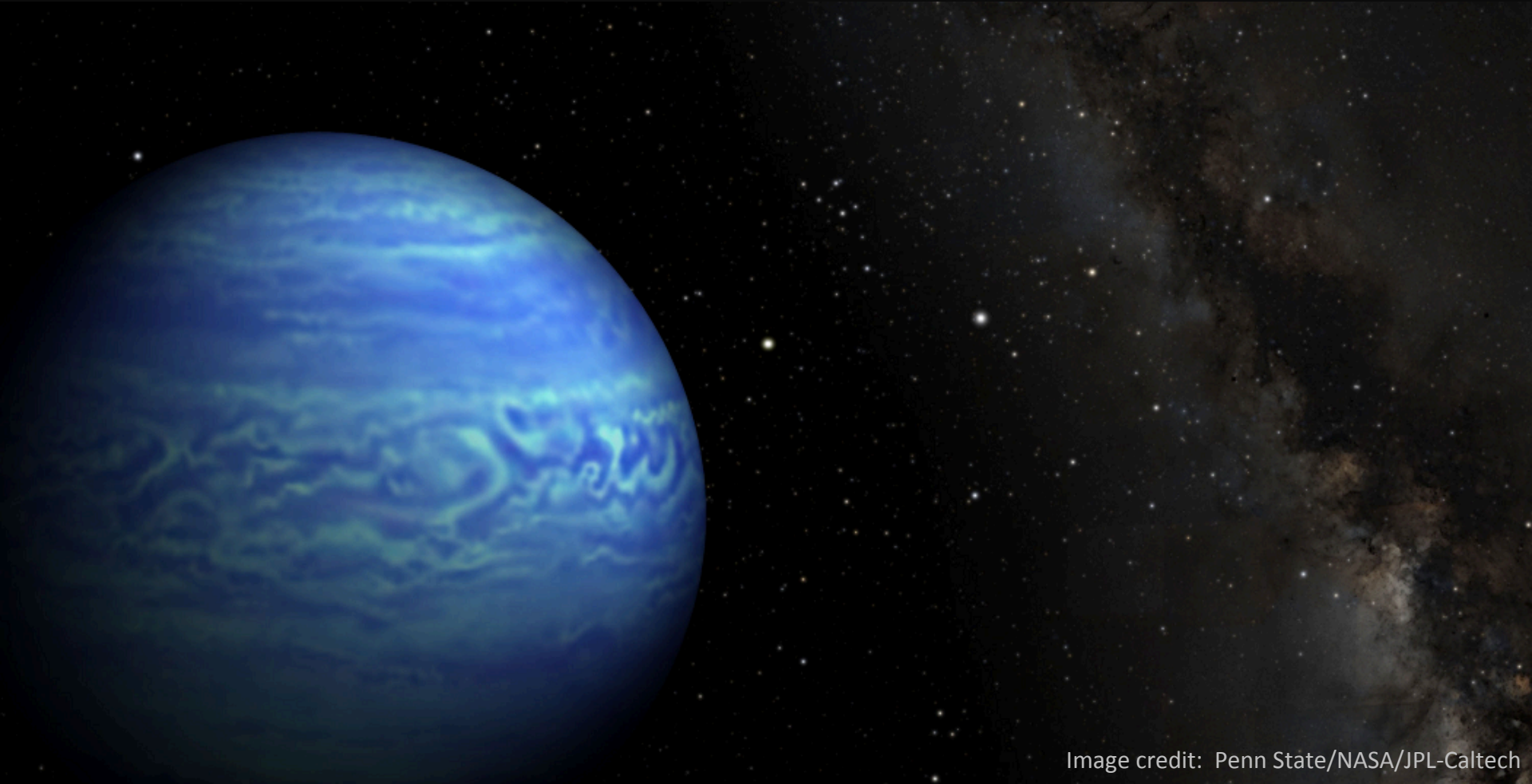
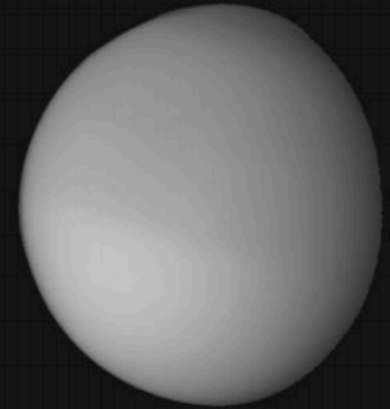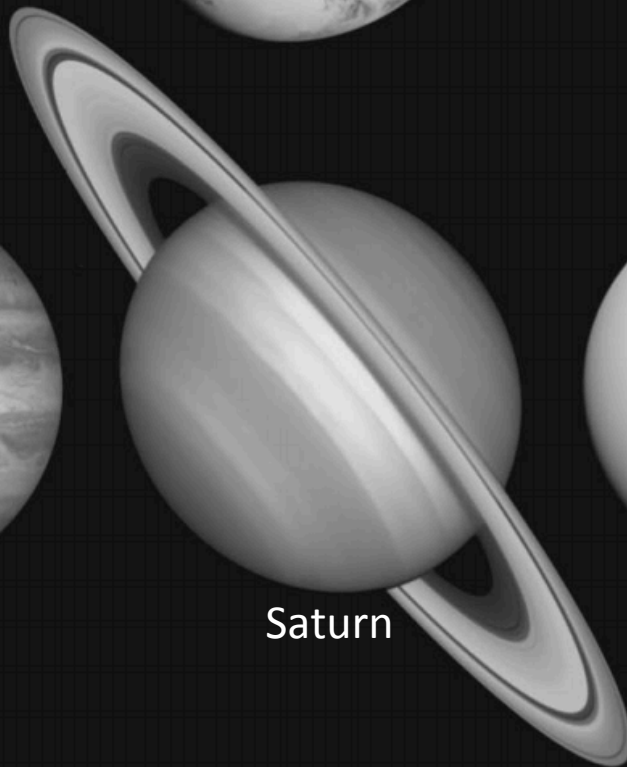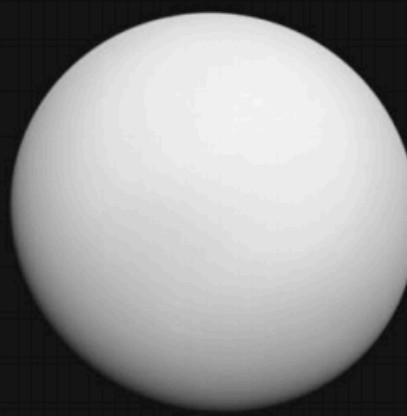# Clouds and hazes are ubiquitous in the Solar System...
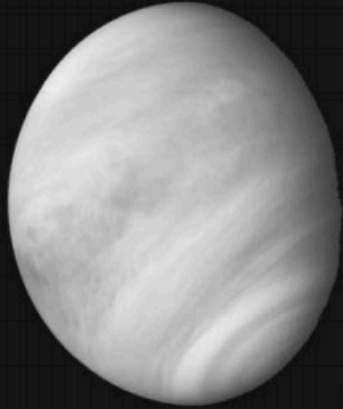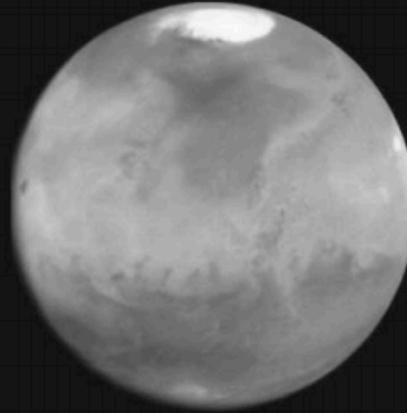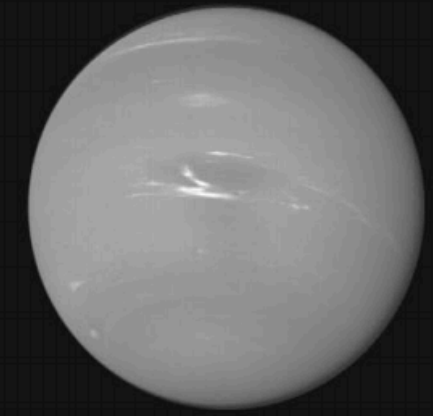

Venus   Earth   Mars   Titan
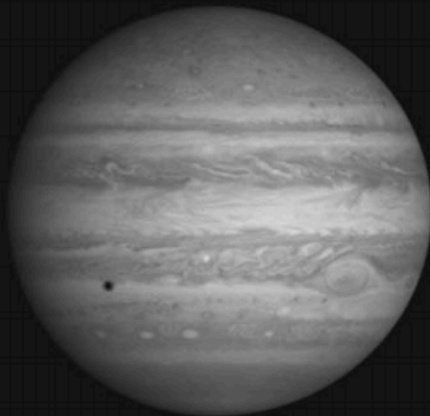
Jupiter   Saturn   Uranus   Neptune
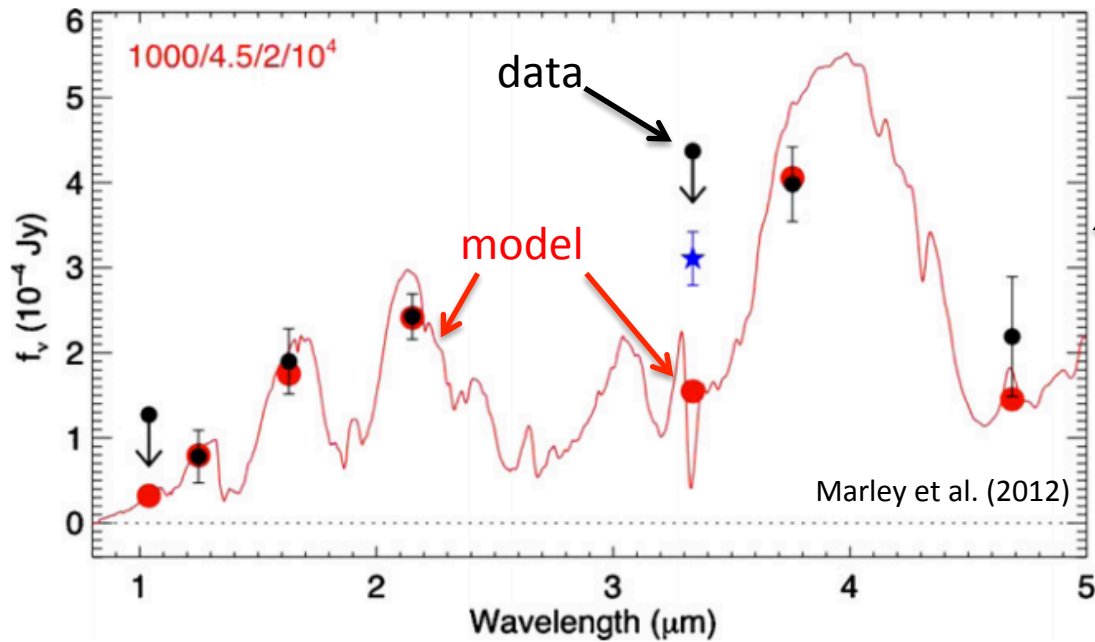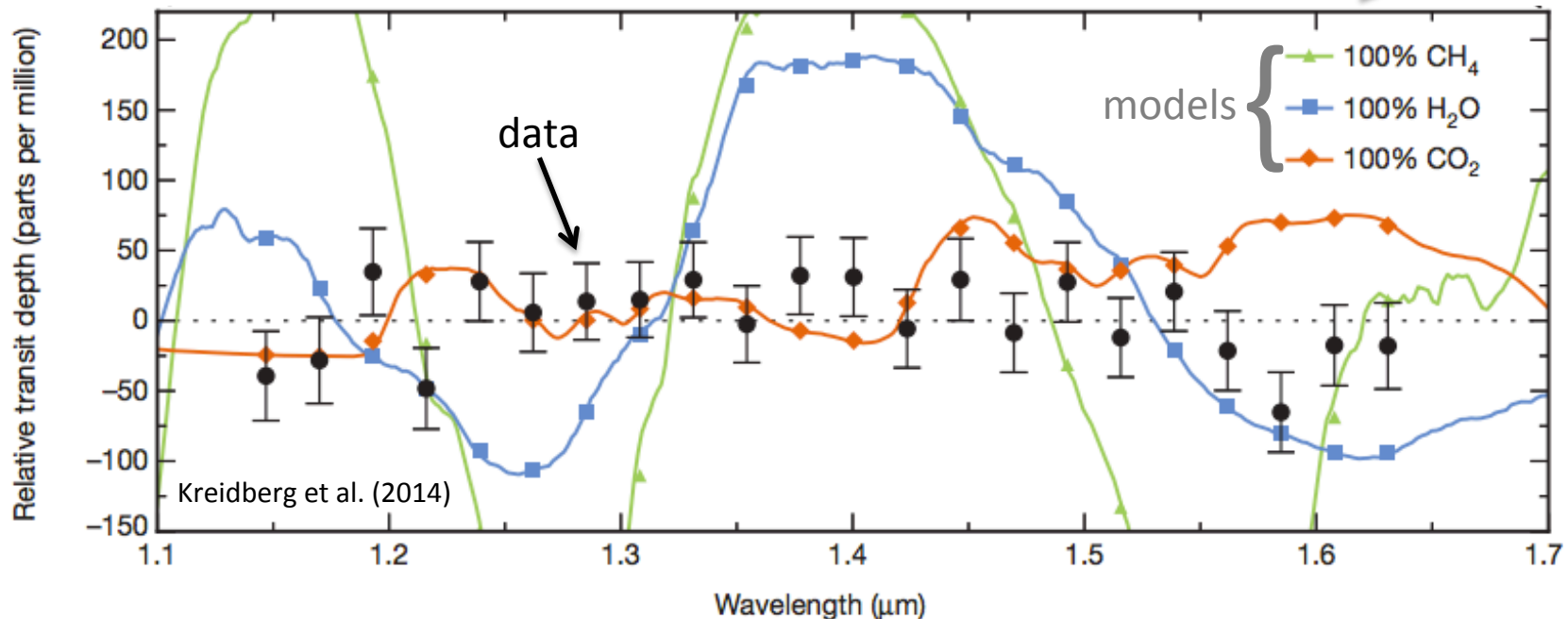
...and strongly influence many exoplanet observations.
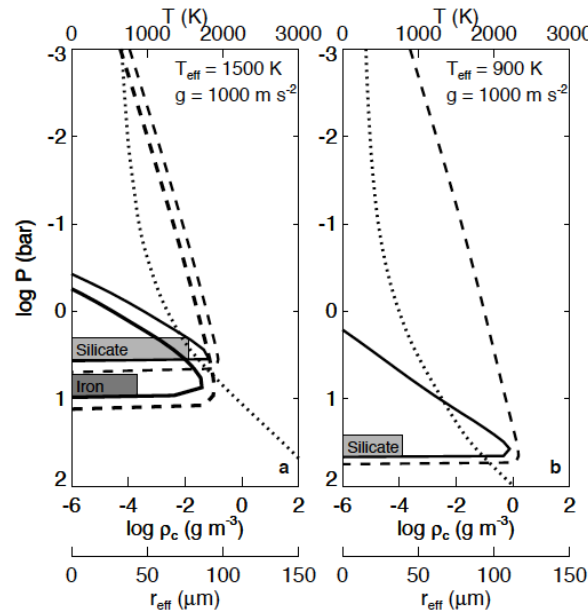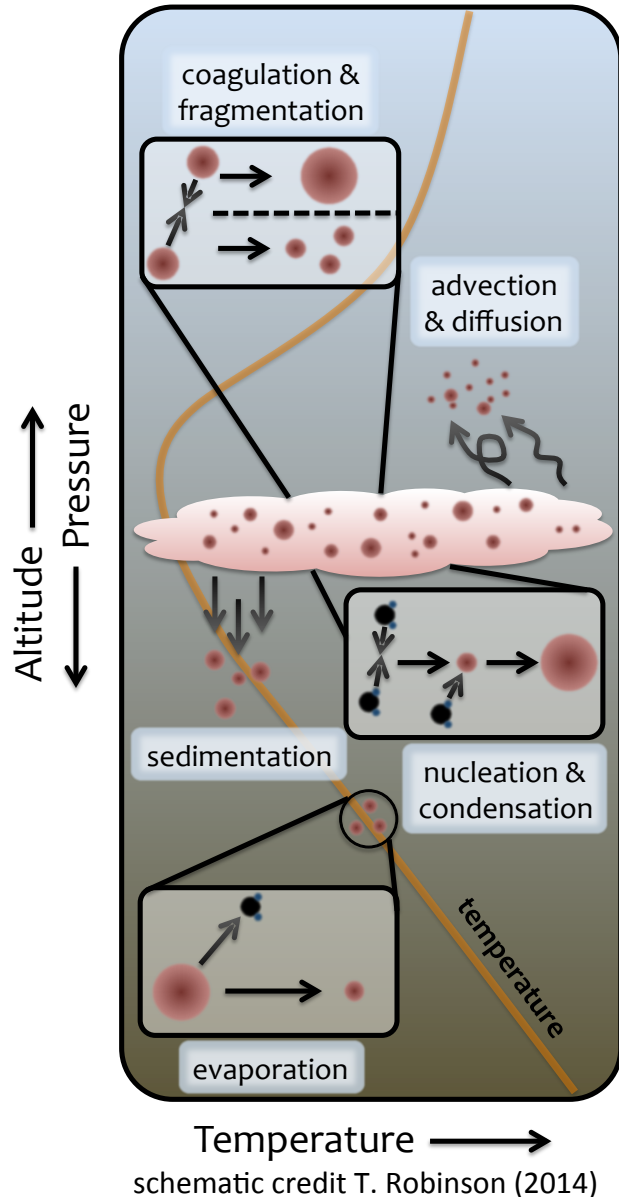

Best-fit models for HR 8799 planets require clouds.

Best explanation for flat transmission spectrum for GJ 1214b is high-altitude cloud/haze.

Marley et al. (2012)

Kreidberg et al. (2014)

Can we develop new dynamical and efficient cloud models to help better interpret exoplanet observations?

schematic credit T. Robinson (2014)

Number density and particle size profiles from the steady-state Ackerman and Marley (2001) model.

Dust particle number density contours from the complex, 3-D models of Helling et al. (2001)