



Pete Worden

Center Director, Ames Research Center



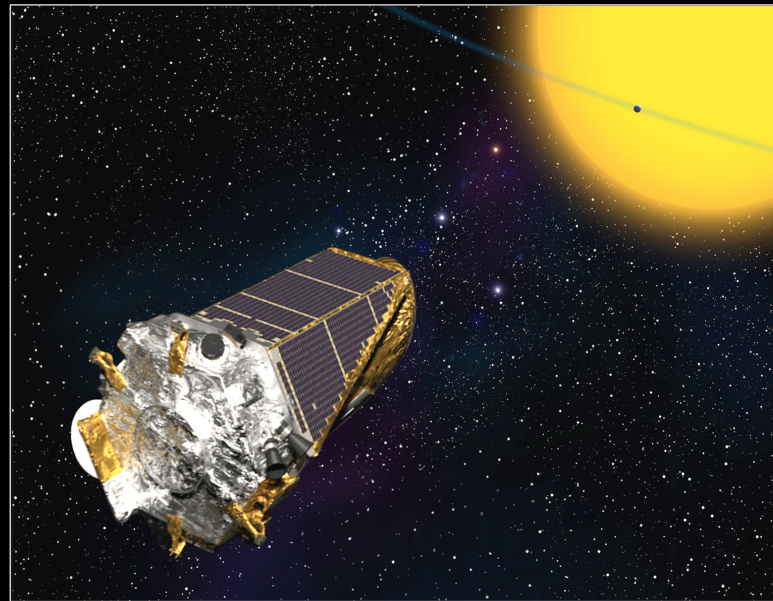
# Natalie Batalha

Kepler Deputy Science Team Lead, San Jose State University

*Kepler*

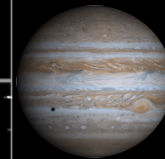
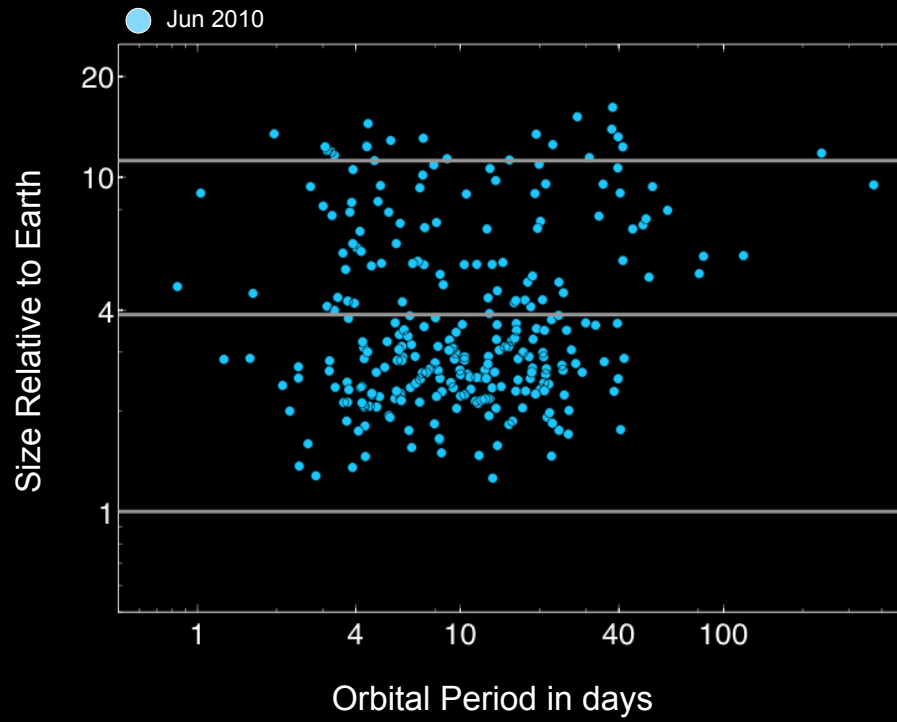


What fraction of stars in our galaxy harbor potentially habitable, Earth-size planets?





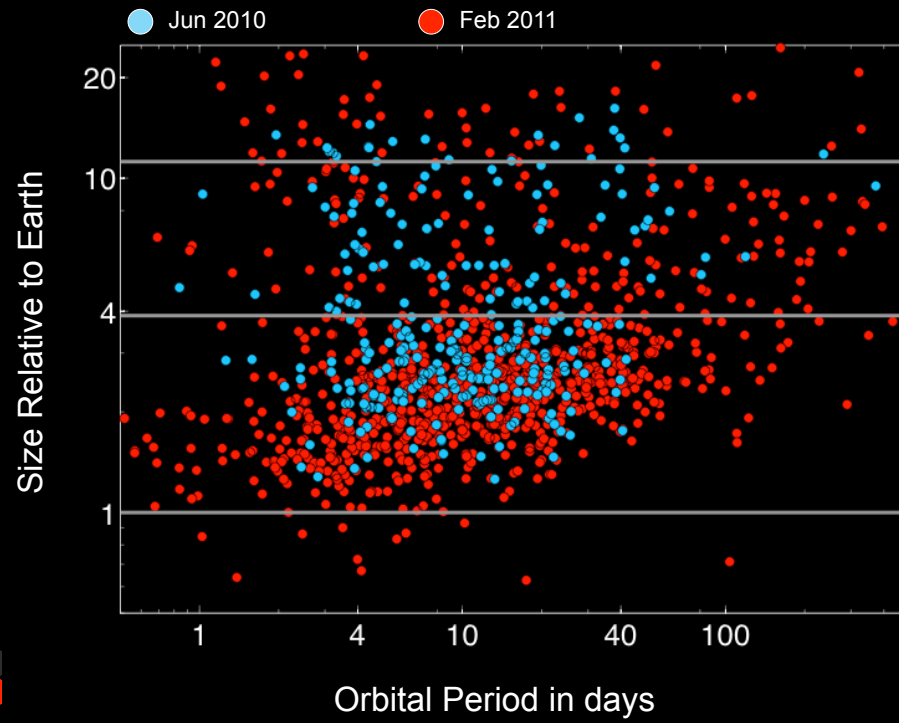
# Planet Candidates as of June 2010



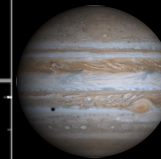
8312



# Planet Candidates as of Feb 2011

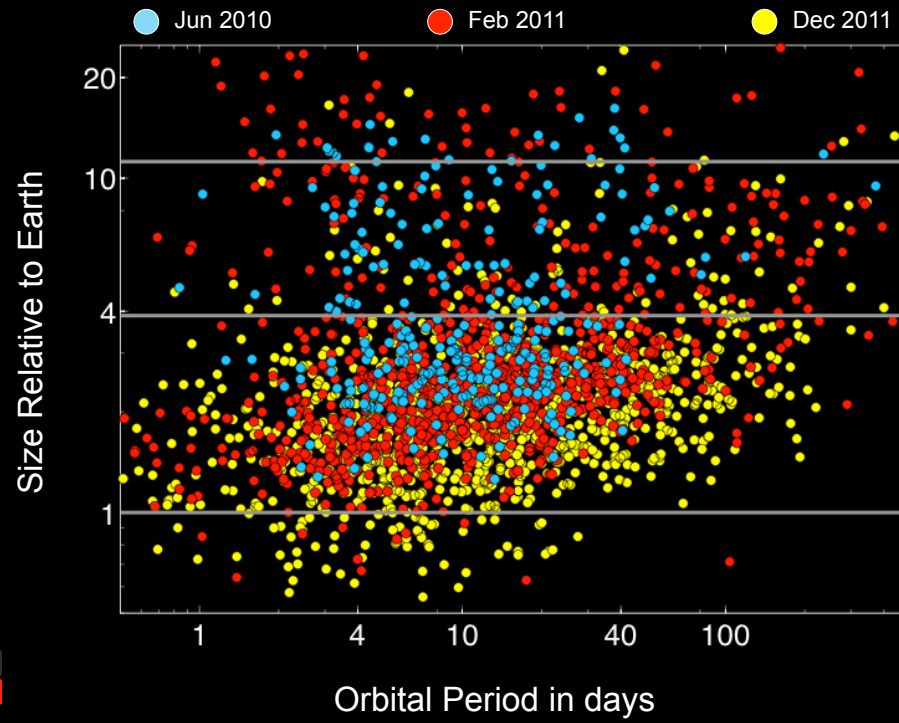


8235





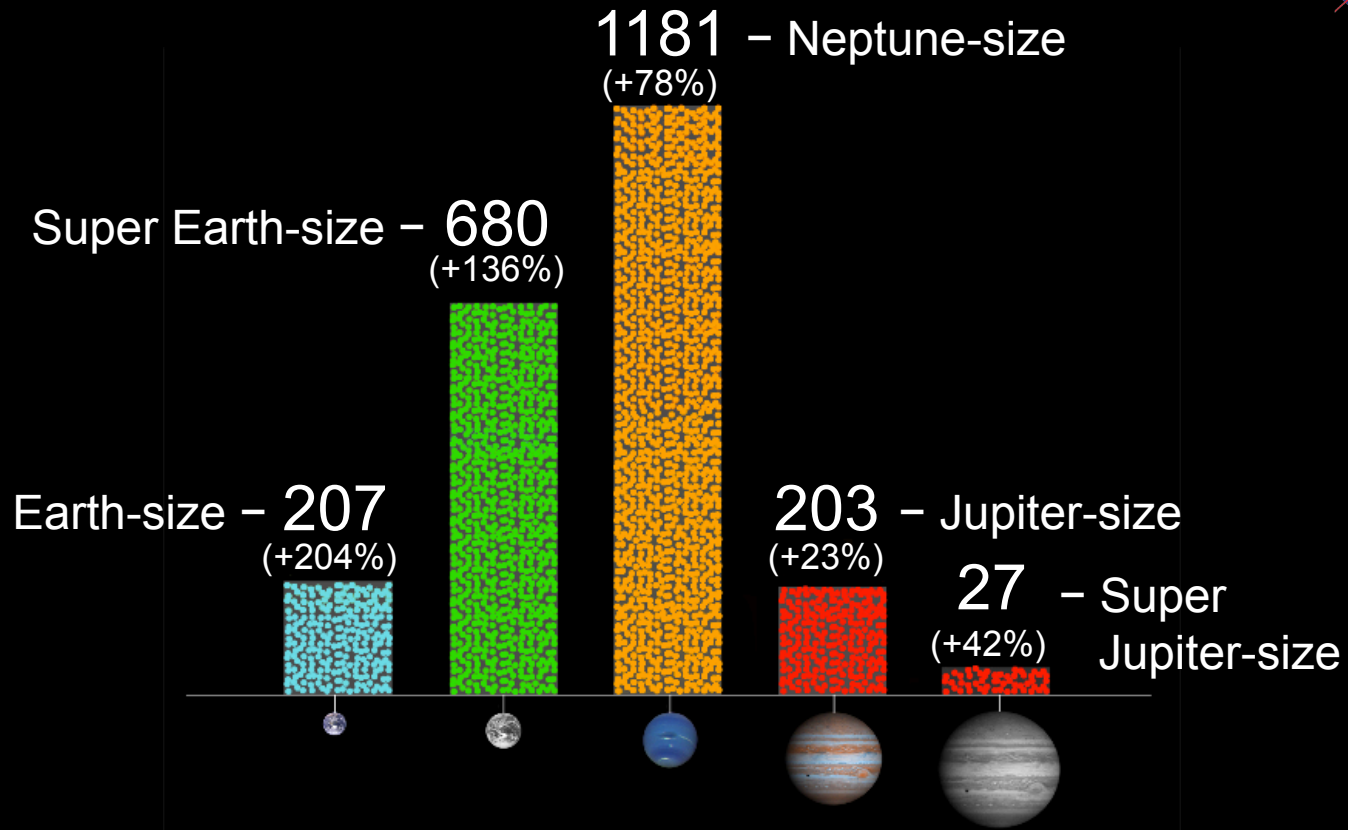
# Planet Candidates as of Dec 2011



2326

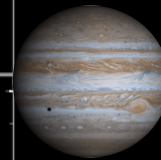
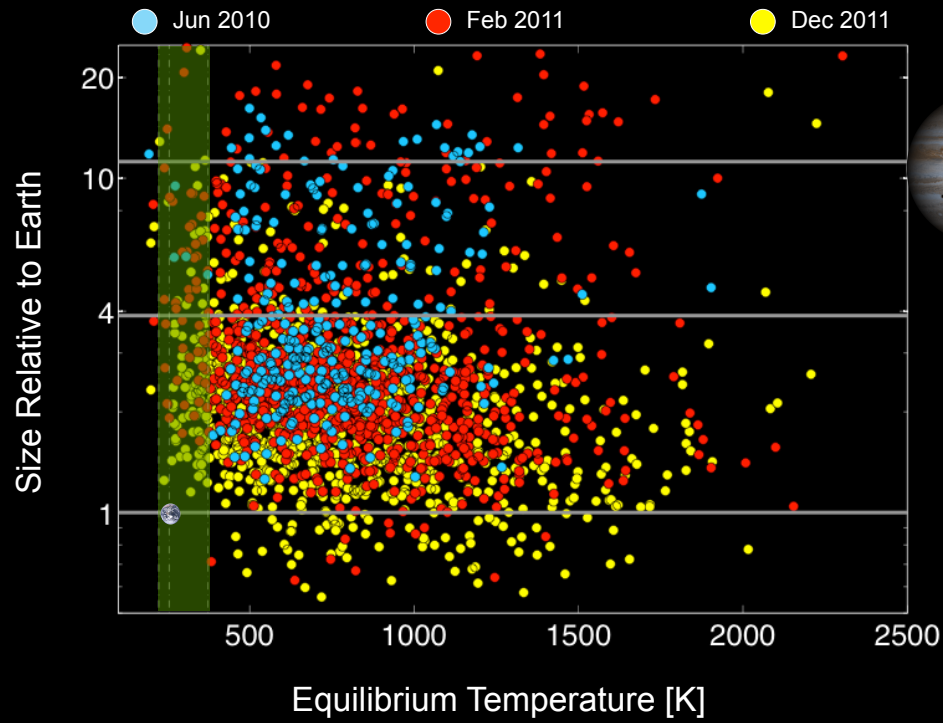


# Sizes of Planet Candidates





# Candidates in the Habitable Zone



223K - 373K



Dec: 139

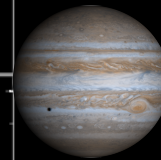
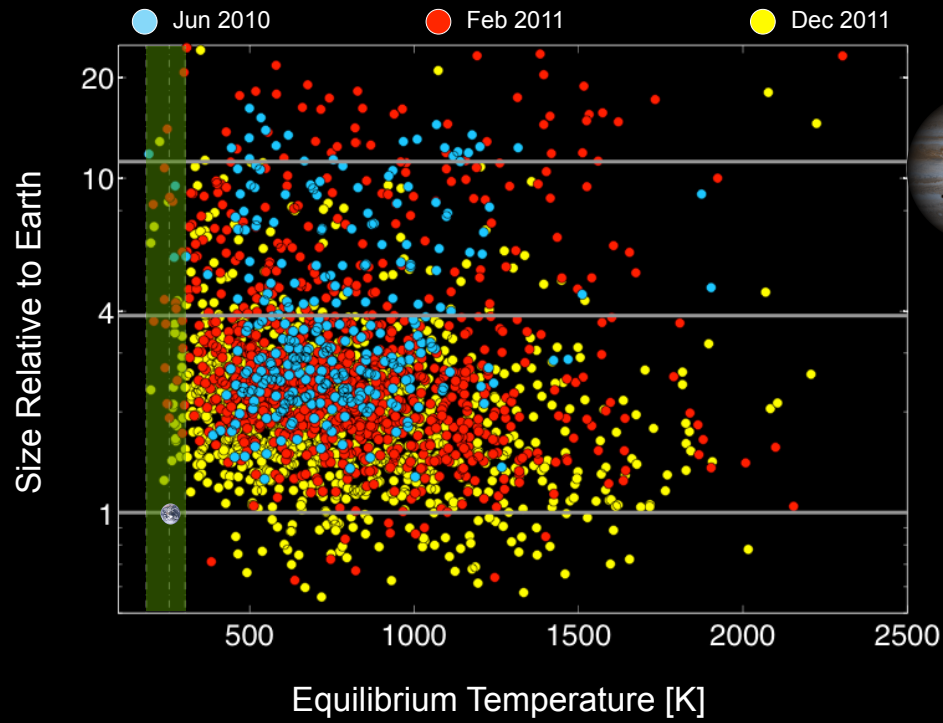
Feb: 54







# Candidates in the Habitable Zone



185K - 303K



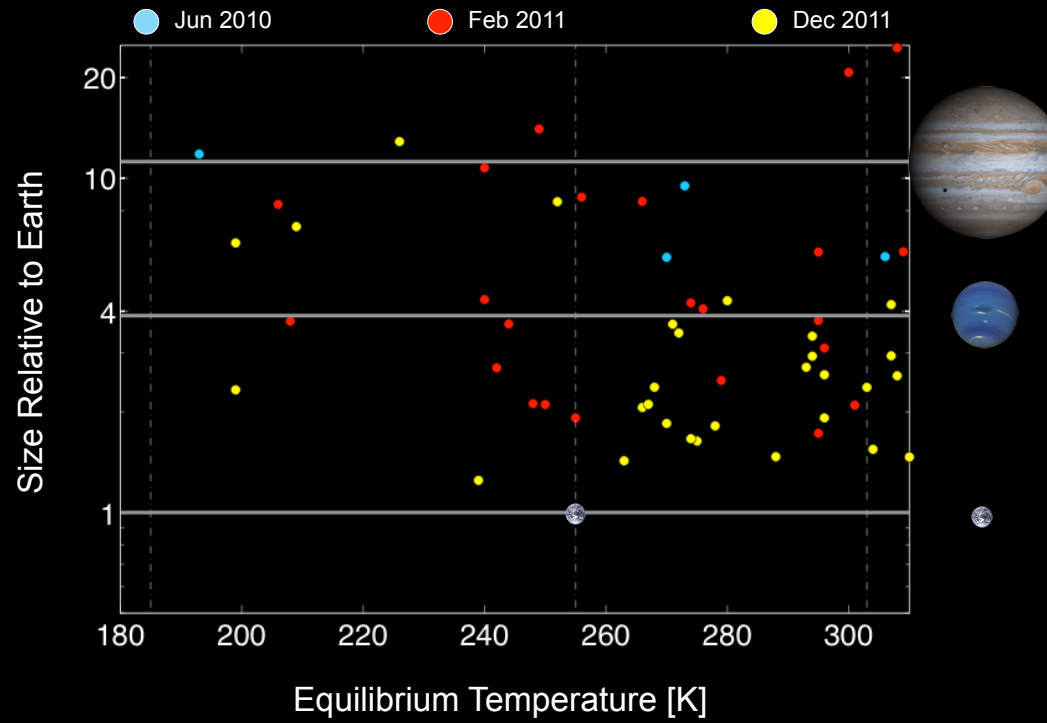
Dec: 48

Feb: 25



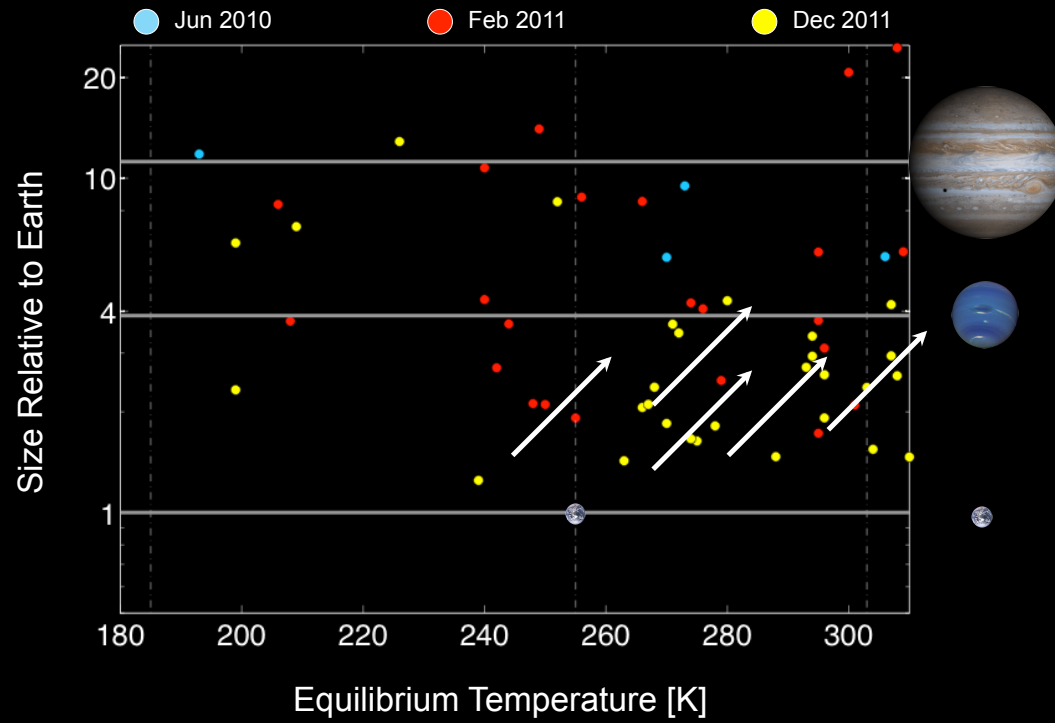


# Ten Near-Earth-Size Candidates in the Habitable Zone (185-303 K)





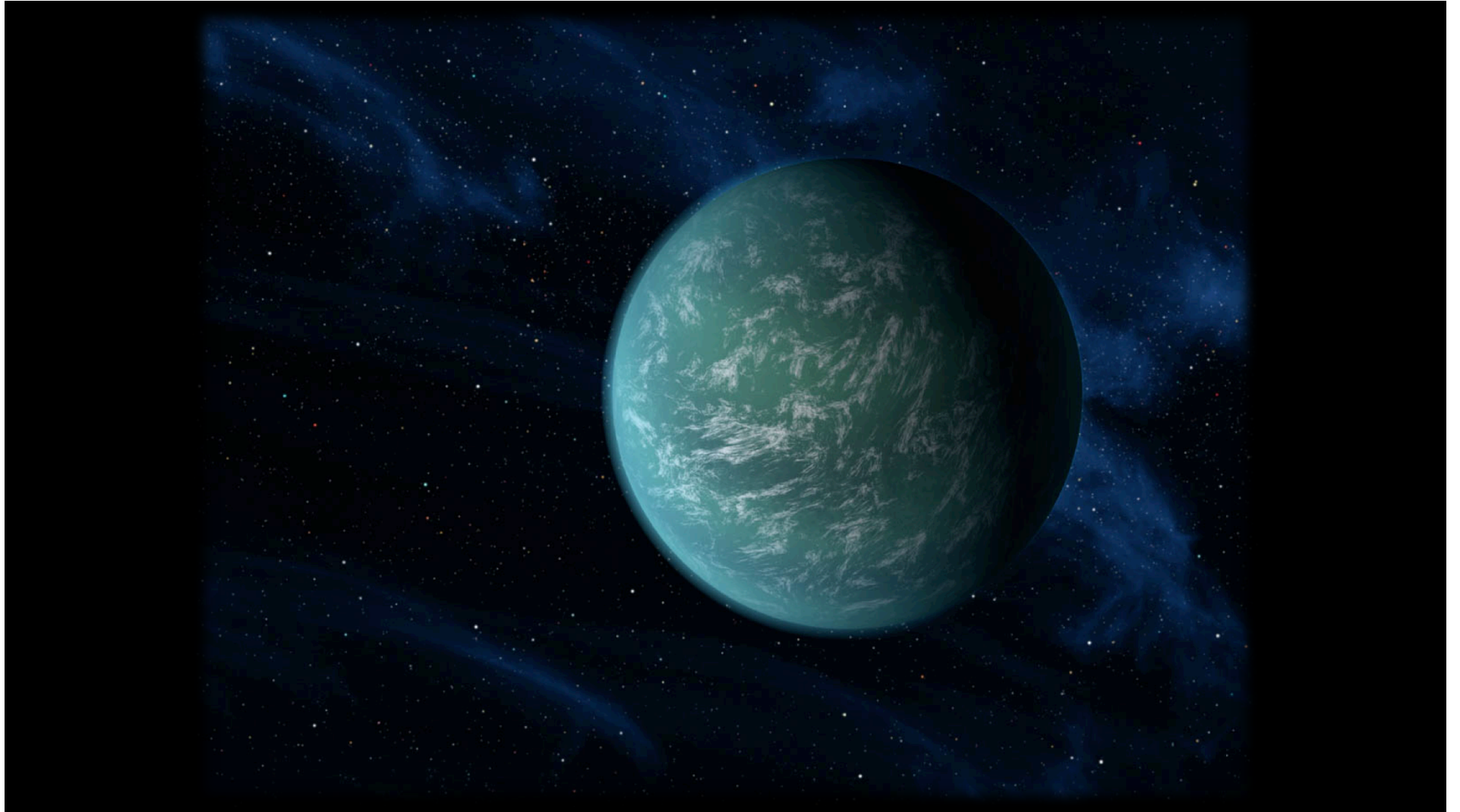
# Ten Near-Earth-Size Candidates in the Habitable Zone (185-303 K)





William Borucki

Kepler Principal Investigator at Ames



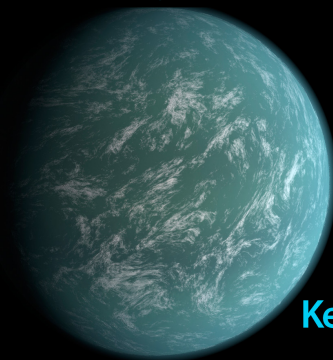
*Kepler*

Kepler-22 System

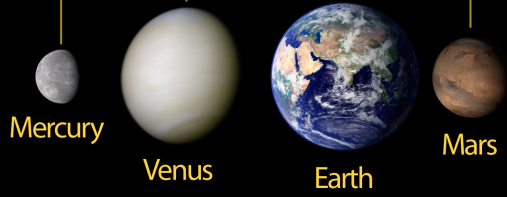


Solar System

Habitable Zone



Kepler-22b



Mercury

Venus

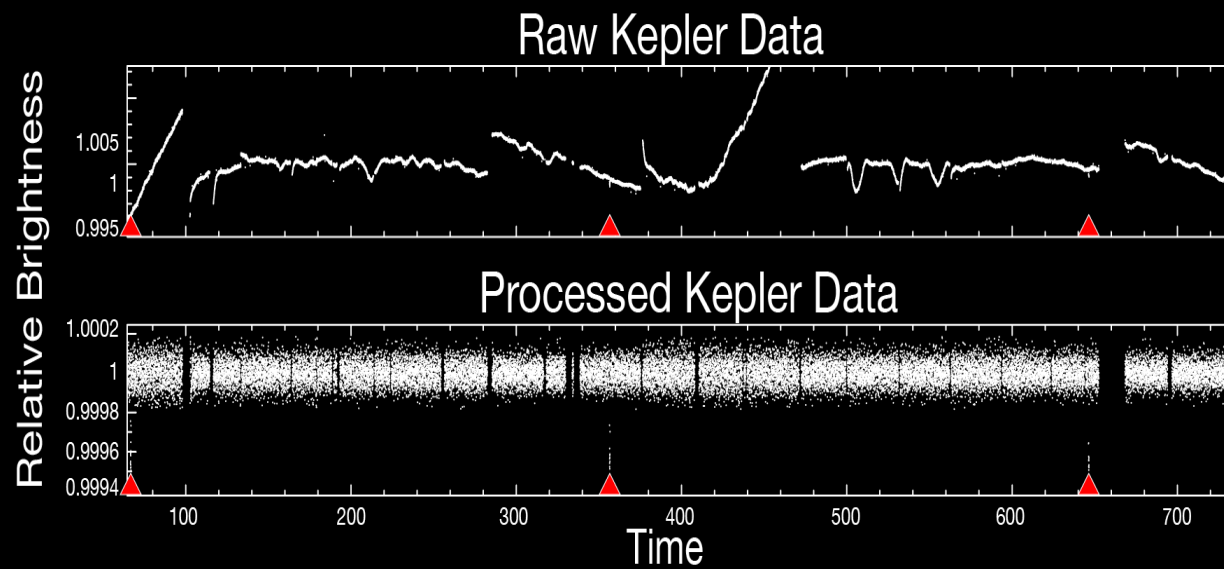
Earth

Mars

Planets and orbits to scale



# Data Confirmation

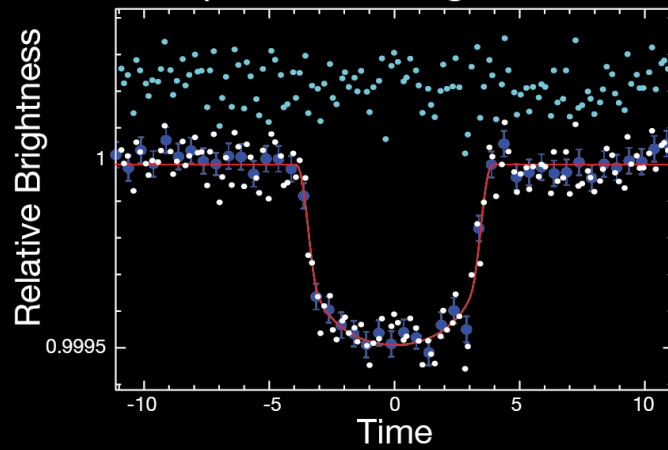




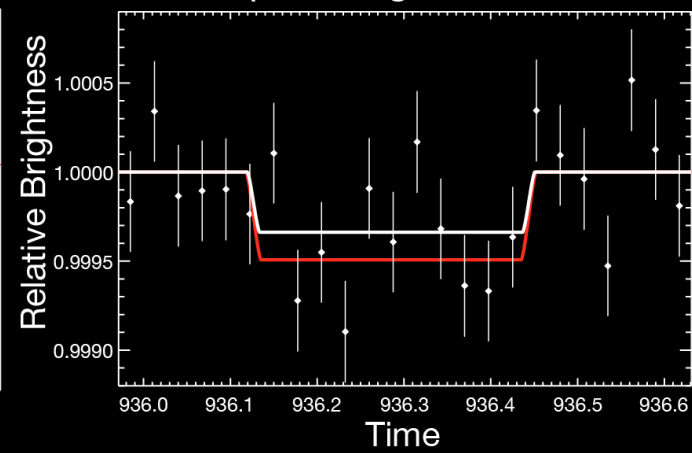
# Data Confirmation



### Kepler Folded Light Curve



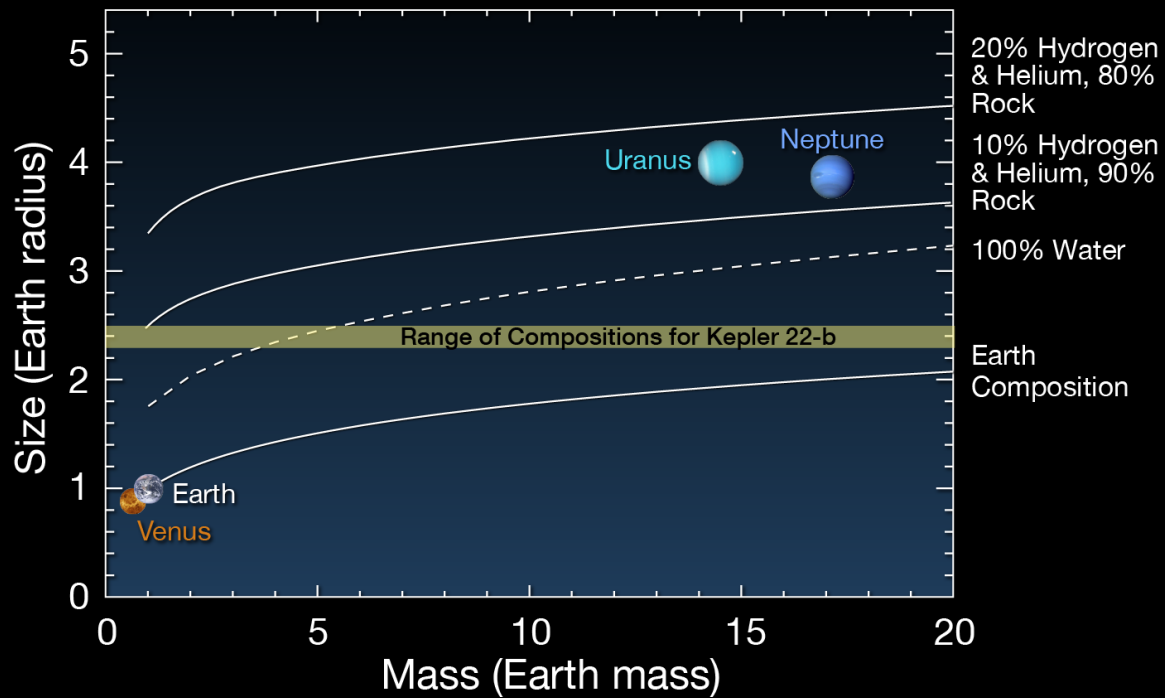
### Spitzer Light Curve





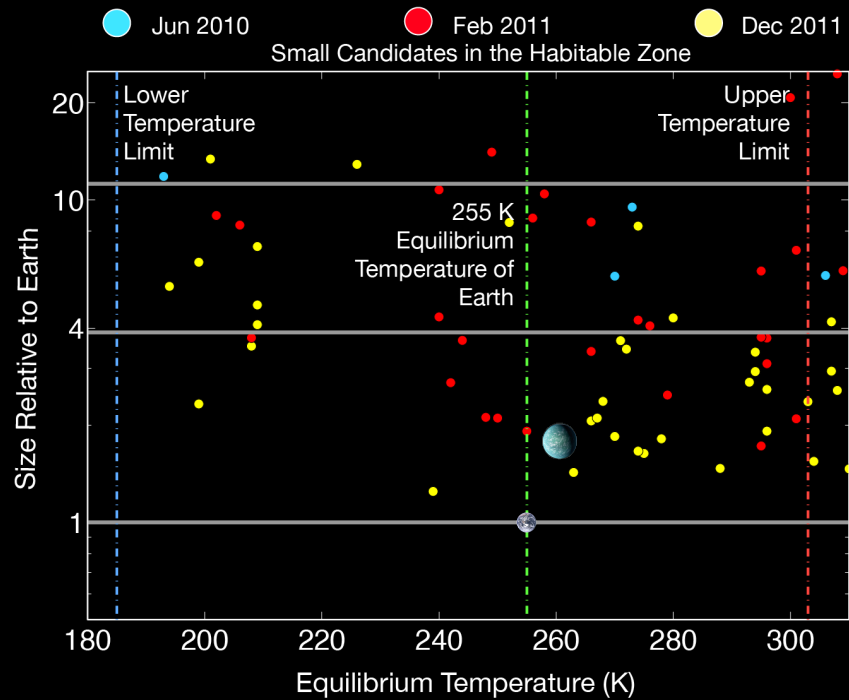
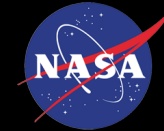


# Composition Dependence on the Radius and Mass of a Planet





# First Confirmed Kepler Planet In the Habitable Zone





# When Is an Earth-Analog Really an Earth-Analog?

Jill Tarter, Director, Center for SETI Research



# The Allen Telescope Array



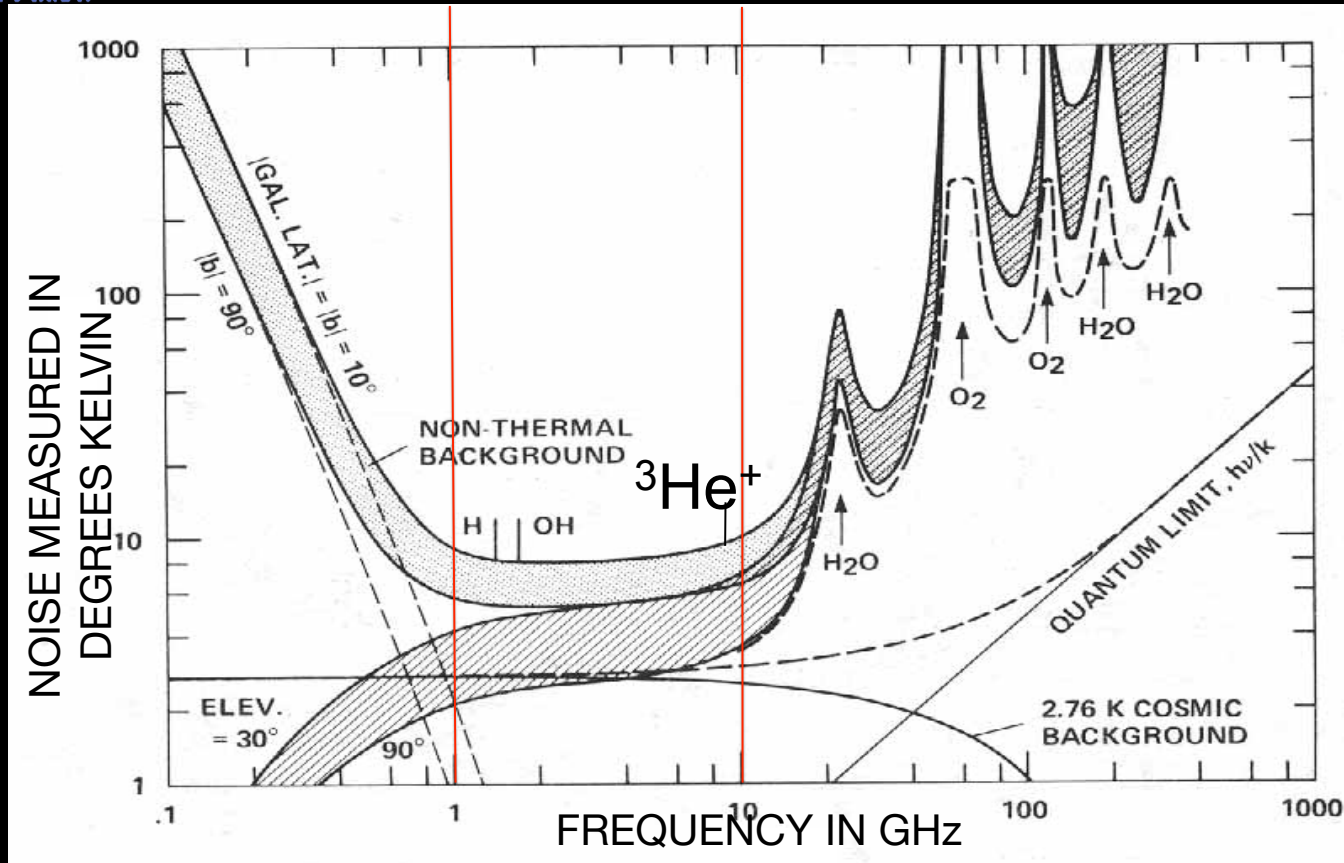
ATA-42



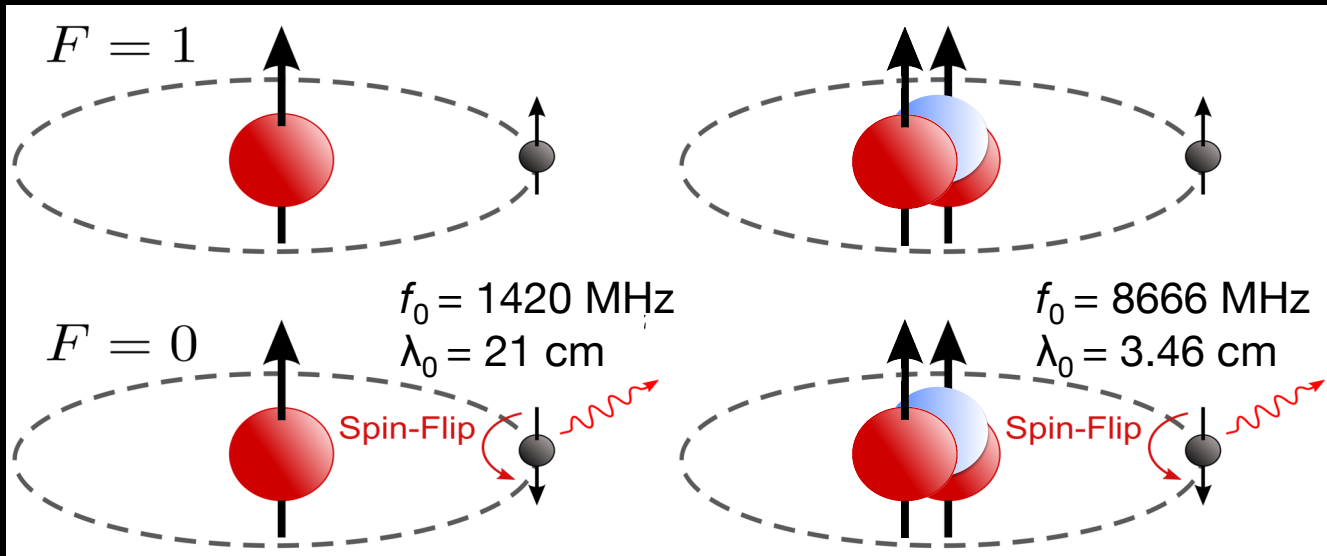
# Hat Creek Radio Observatory



# Terrestrial Microwave Window



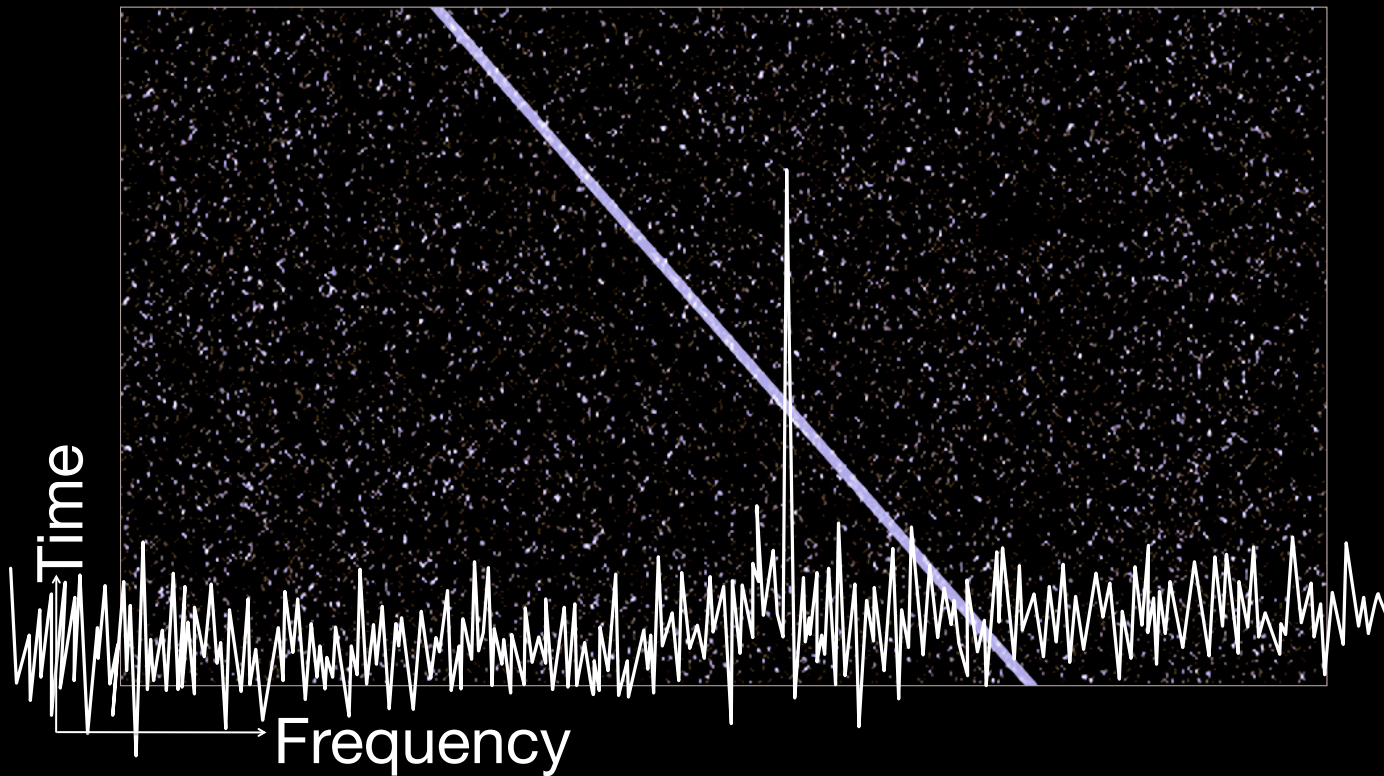
# Hyperfine Spin-Flip Transition



Hydrogen

$^3\text{He}^+$

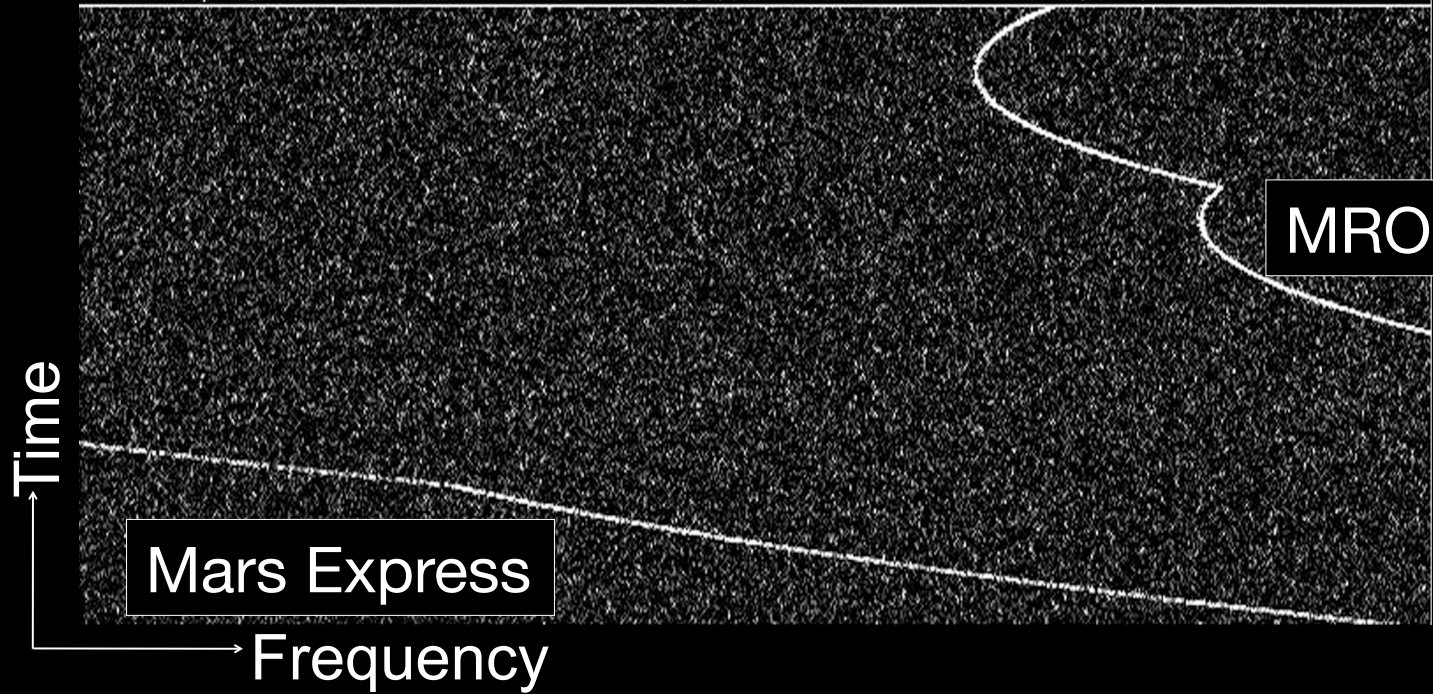
# Voyager 1 Signal from 106 AU Away





# Last Month Looking at Mars

Waterfall: File: 2011-11-15\_19-19-12.UTC.act3151.dx3017.id-2.R.archive-compamp  
Center Freq: 8439.757867 MHz Subband: 0659 BW: 533.3 Hz #Half Frames: 0256 ActId: 3151



# Locations of Kepler Planet Candidates

- Earth-size
- Super-Earth size  
1.25 - 2.0 Earth-size
- Neptune-size  
2.0 - 6.0 Earth-size
- Giant-planet size  
6.0 - 22 Earth-size

