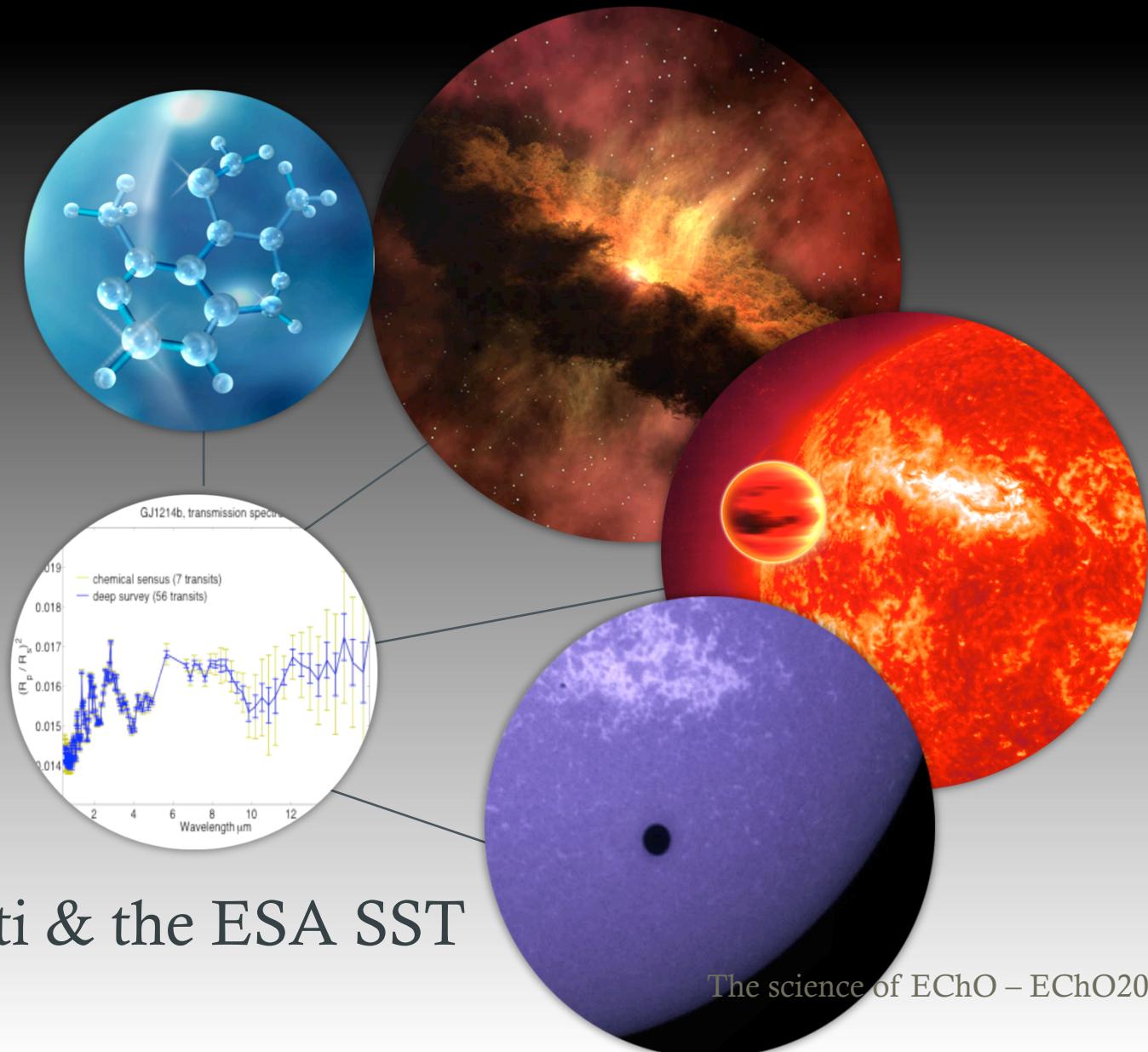


The Science of EChO

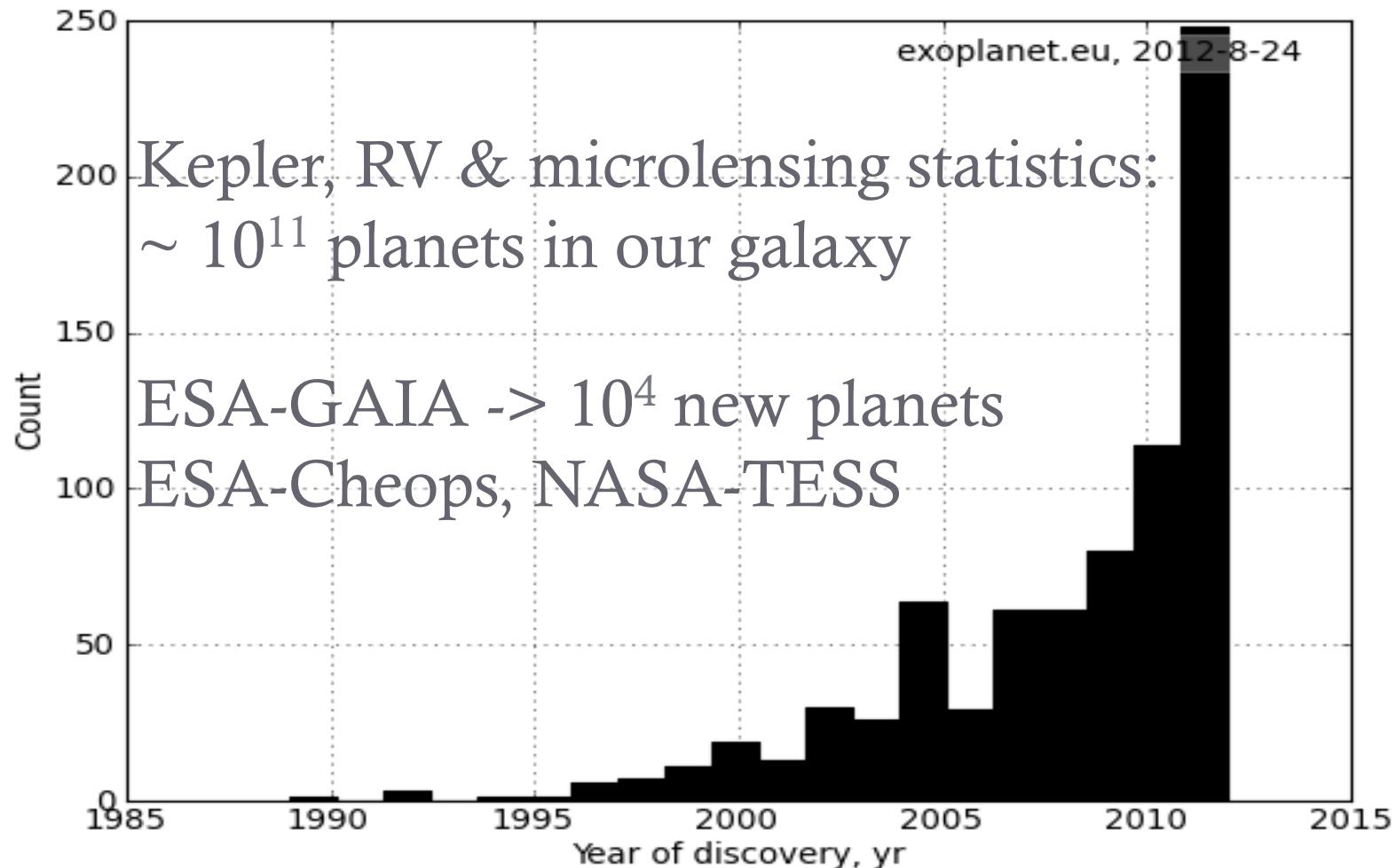


G. Tinetti & the ESA SST

7/23/13

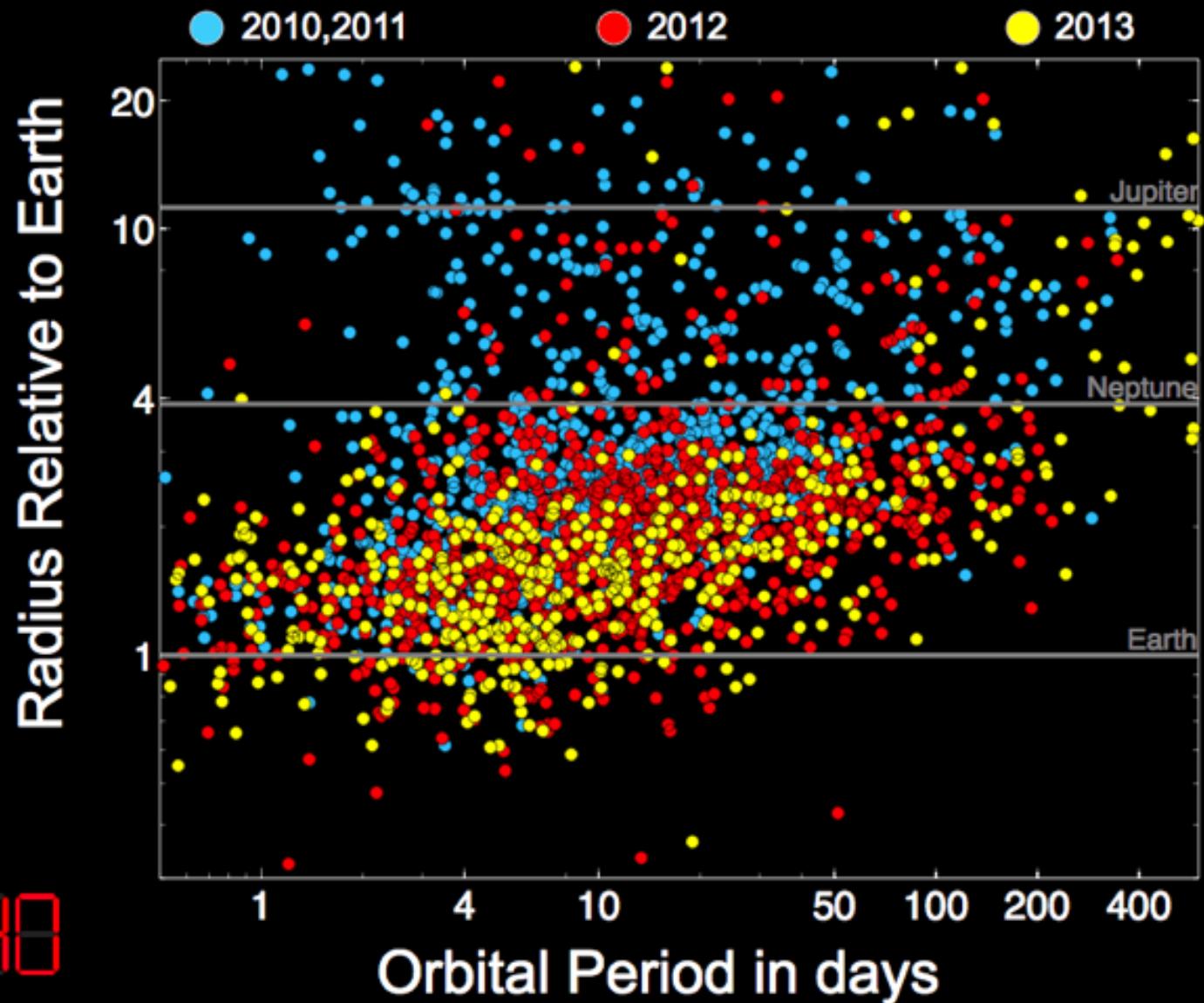
The science of EChO – EChO2013

Planets are ubiquitous...



Kepler's Planet Candidates

22 Months: May 2009 - Mar 2011

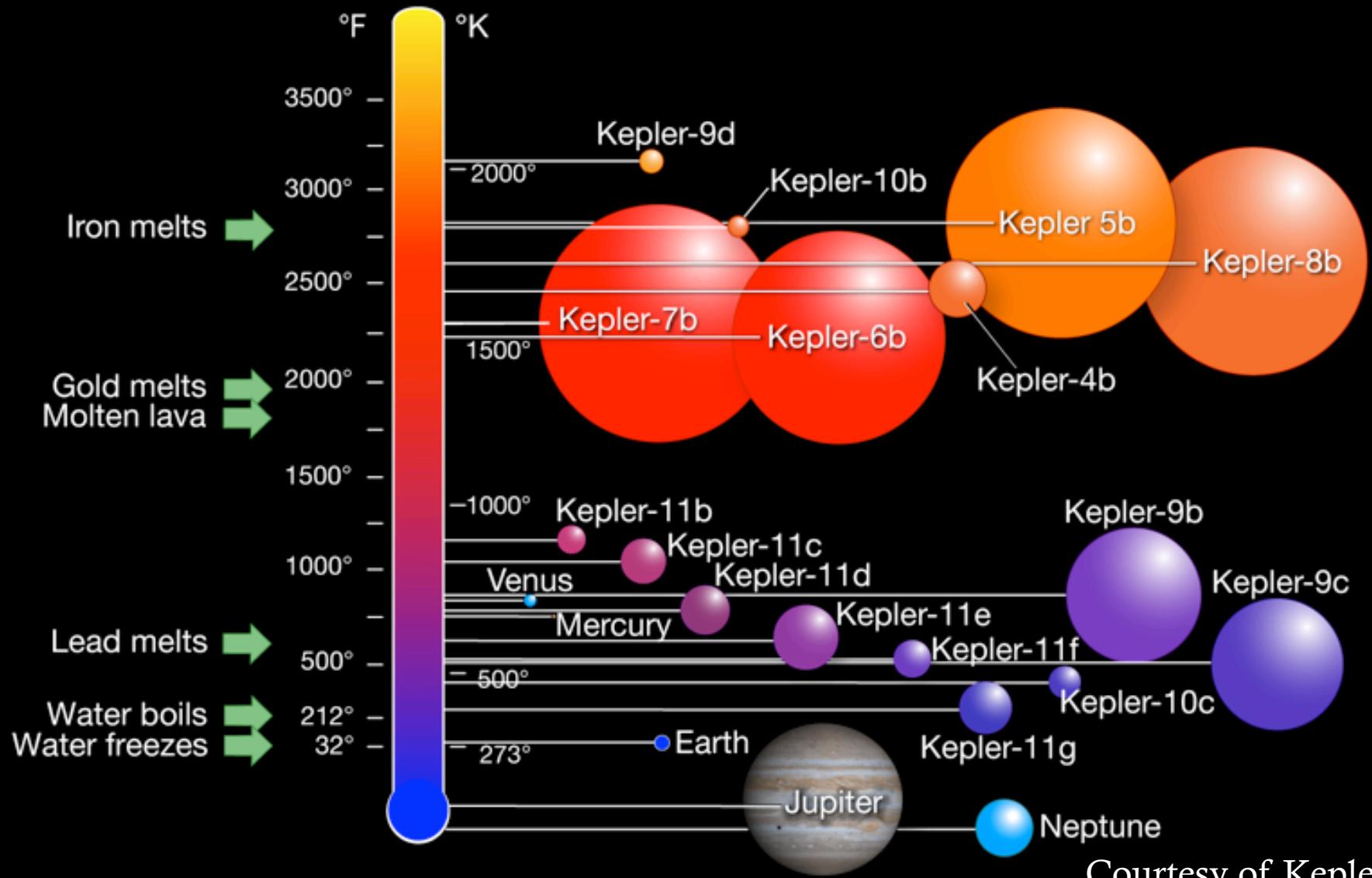


2010

AA 221ST
MEETING
American Astronomical Society
Long Beach Convention Center, CA, January 2014

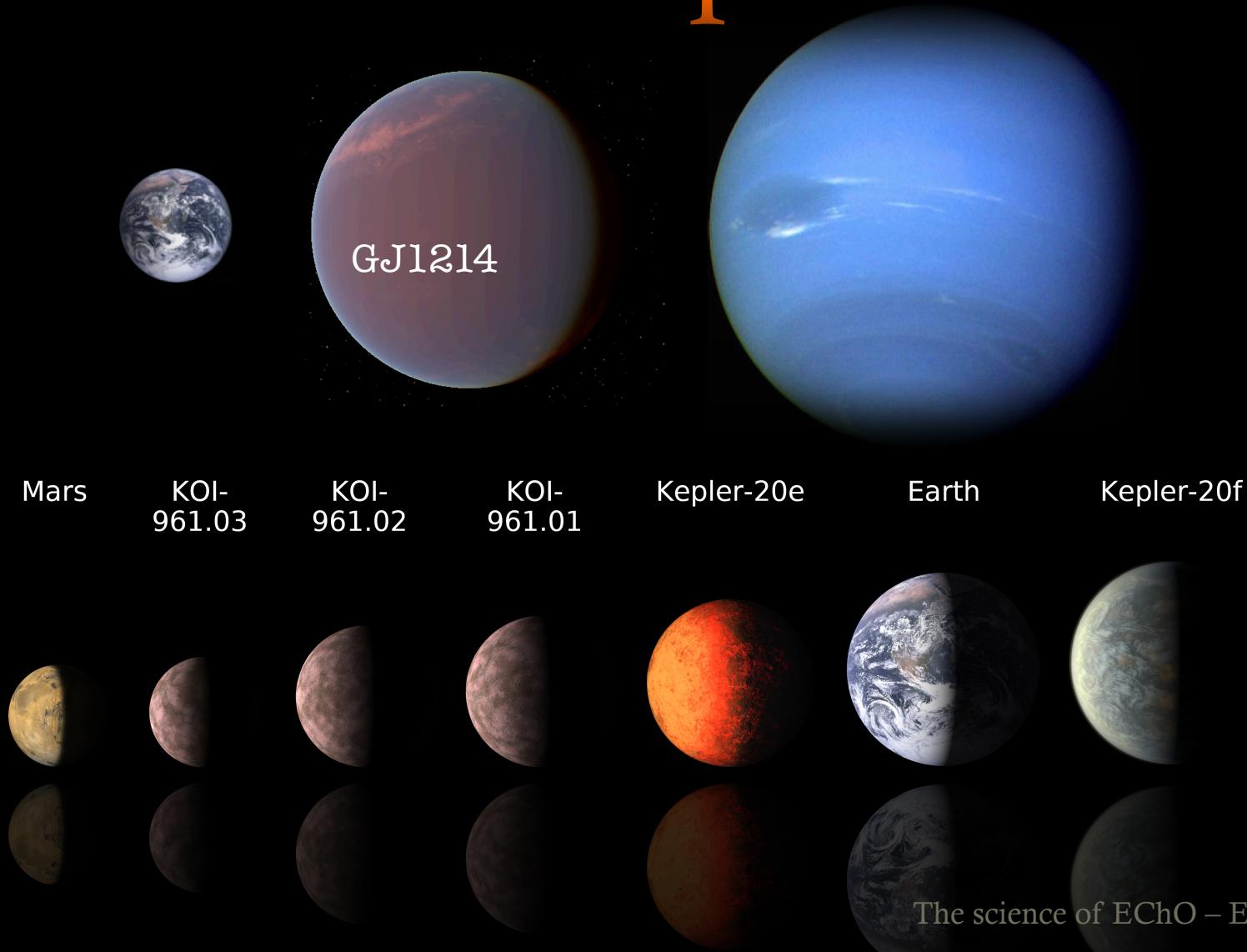
Chris Burke:
216.02

Planet Temperature & Size



Courtesy of Kepler

Sub- and Super-Earths



Planets with 2 Suns...



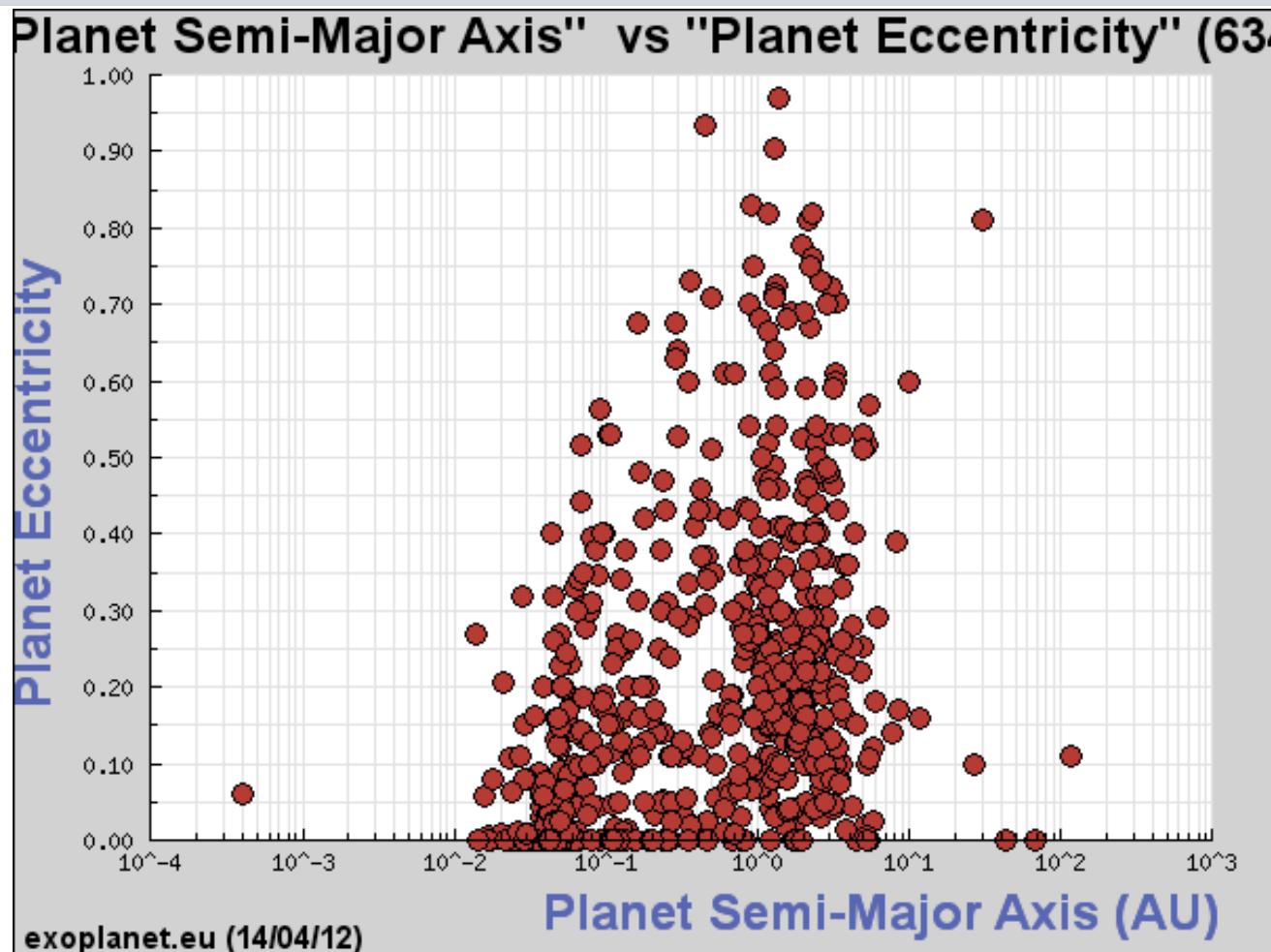
Kepler-16b

Kepler-34b

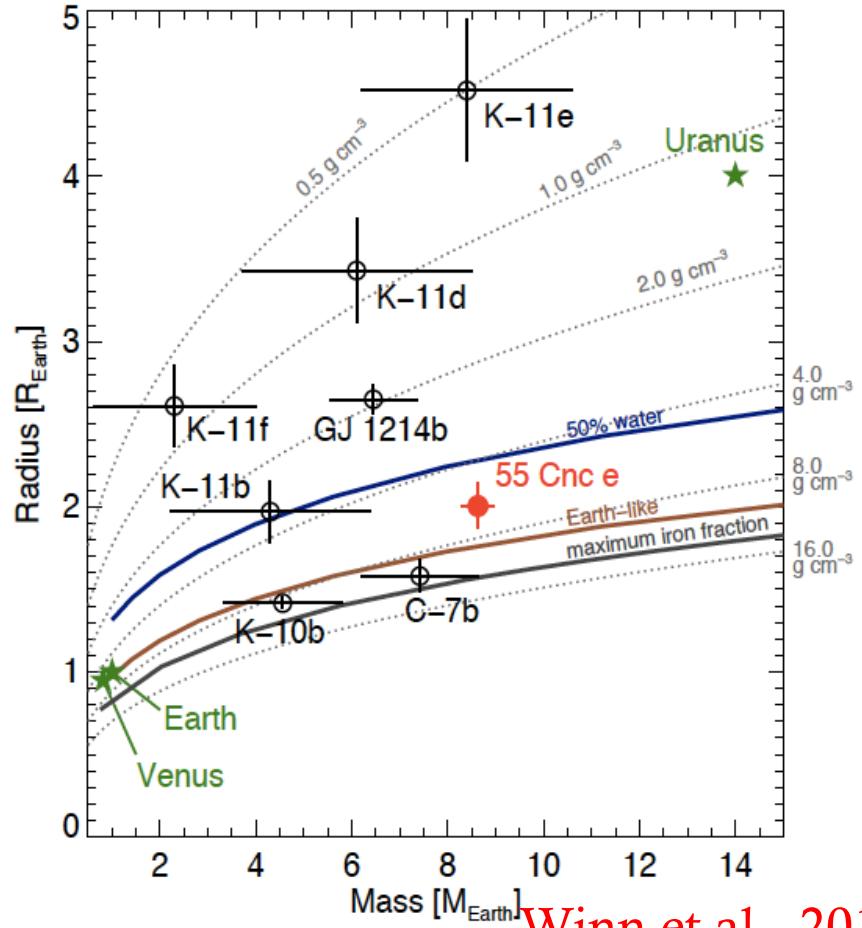
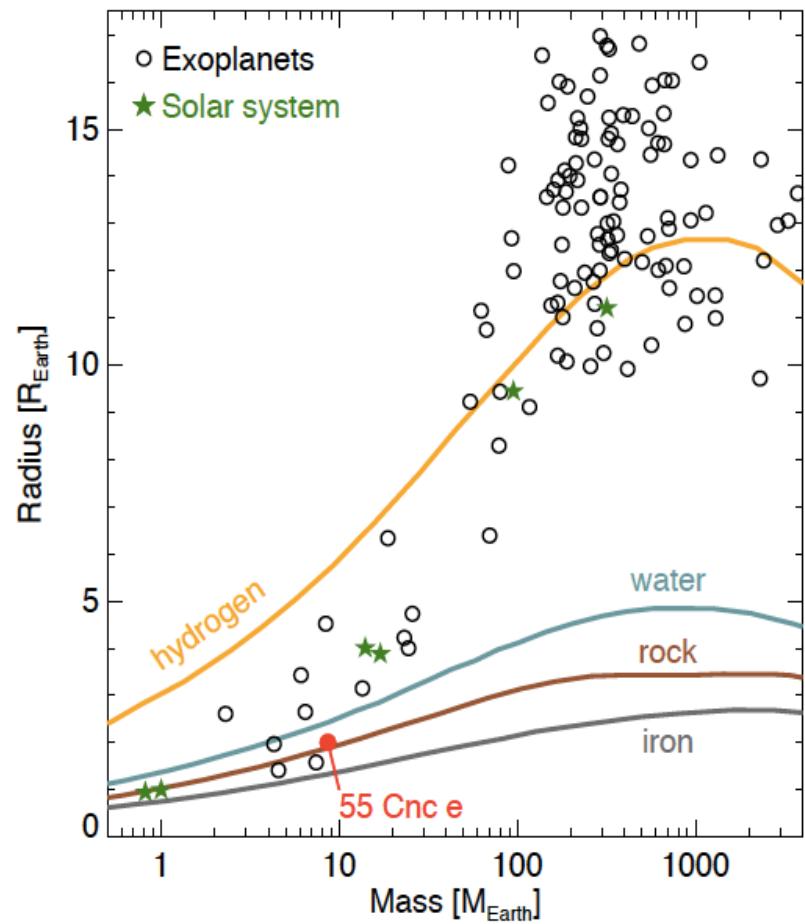
Kepler-35b

Doyle et al., *Science*, 2011
Welsh et al., *Nature*, 2012

“Eccentric” planets...



What is the origin of such diversity?

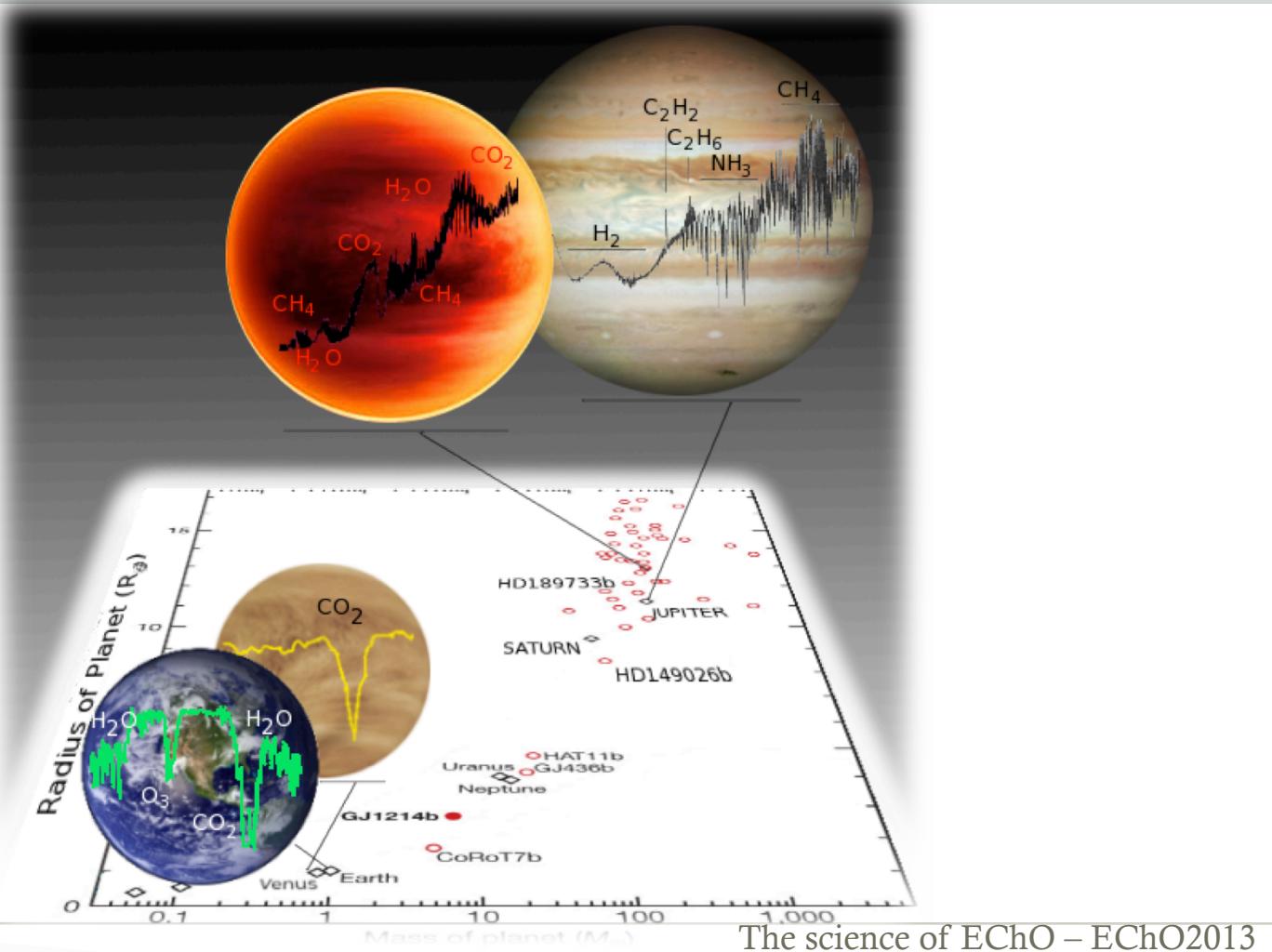


Winn et al., 2011

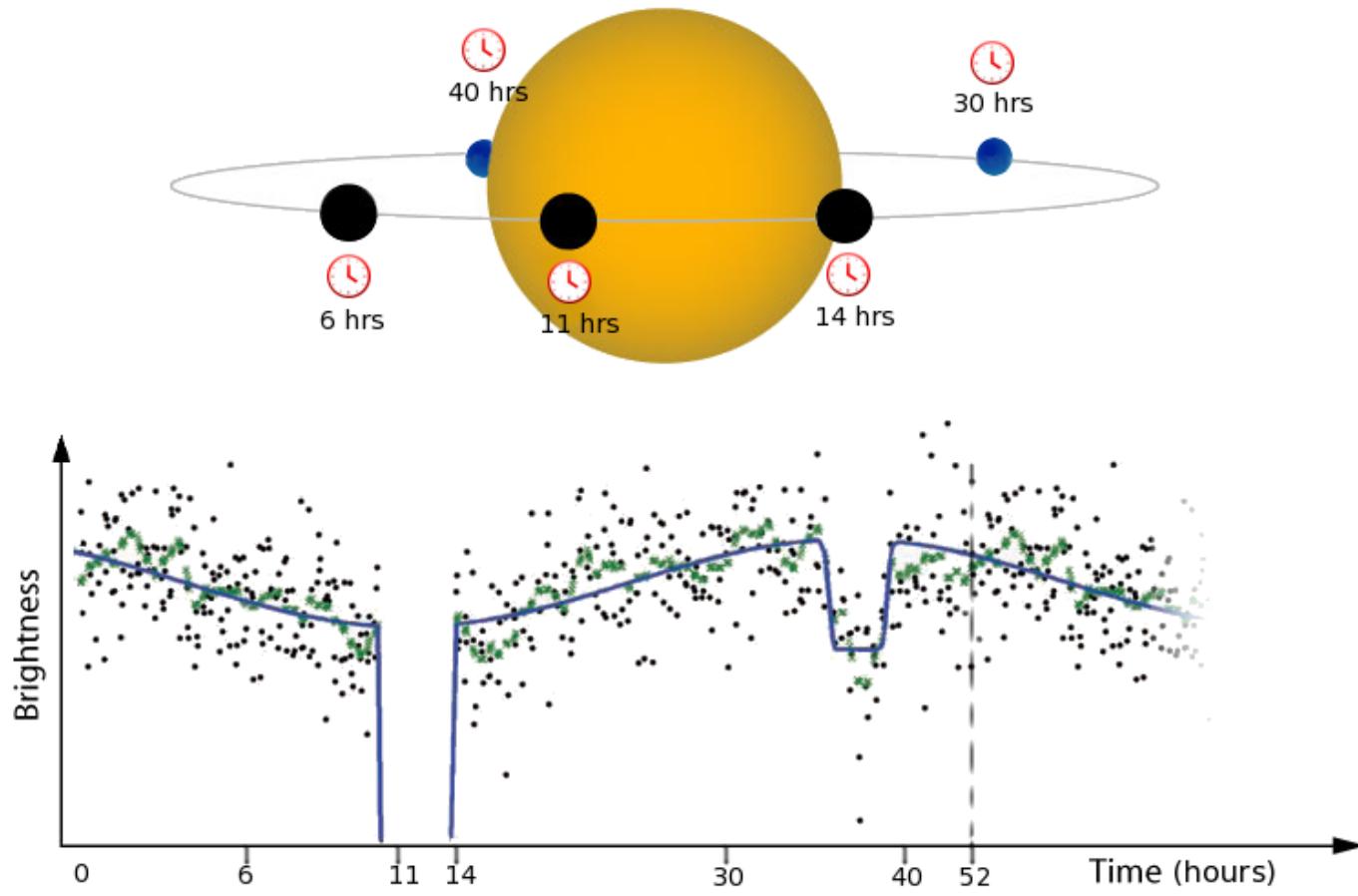
The science of EChO – EChO2013

Why are exoplanets so diverse?

Look at the atmospheres

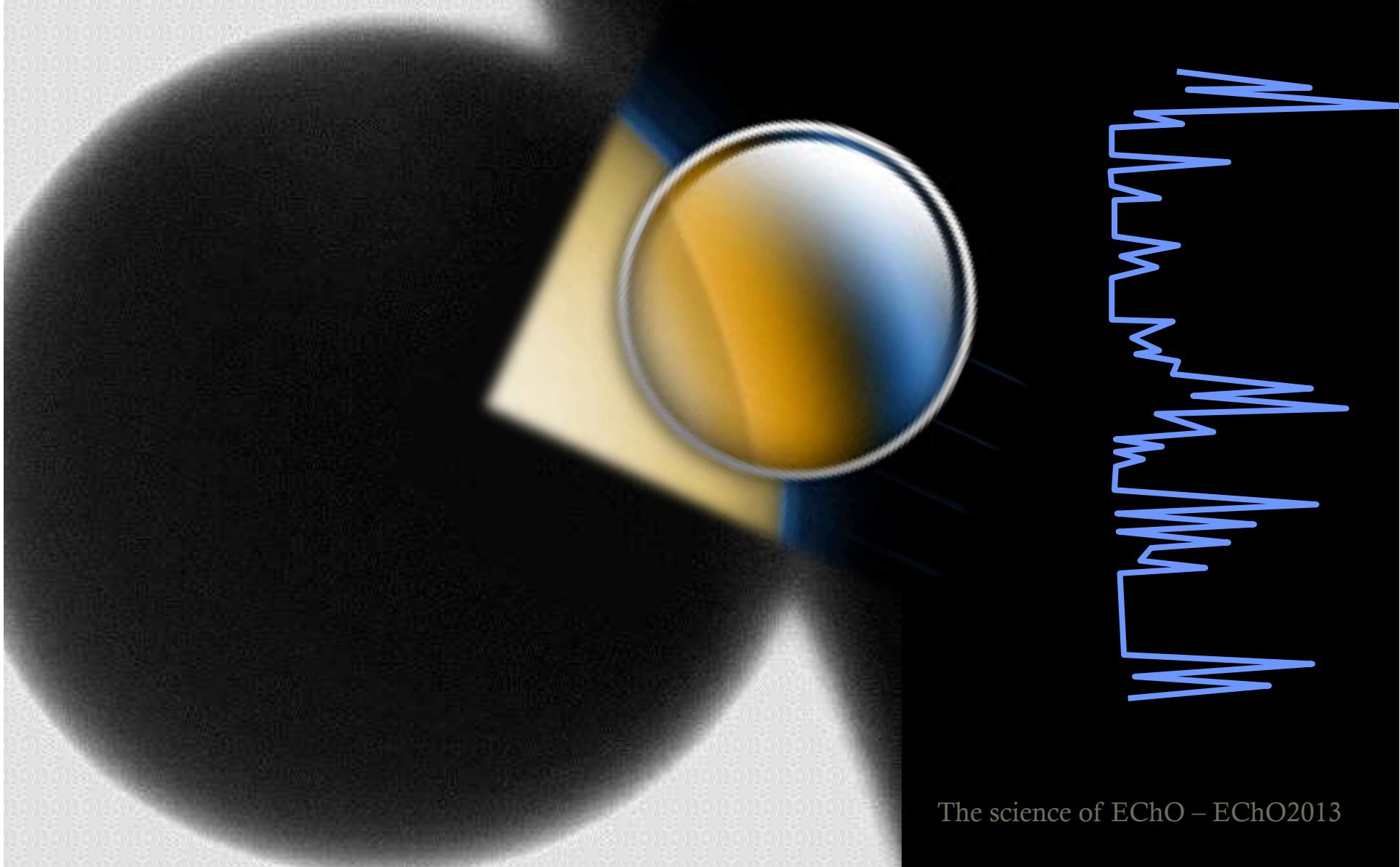


Transiting planets



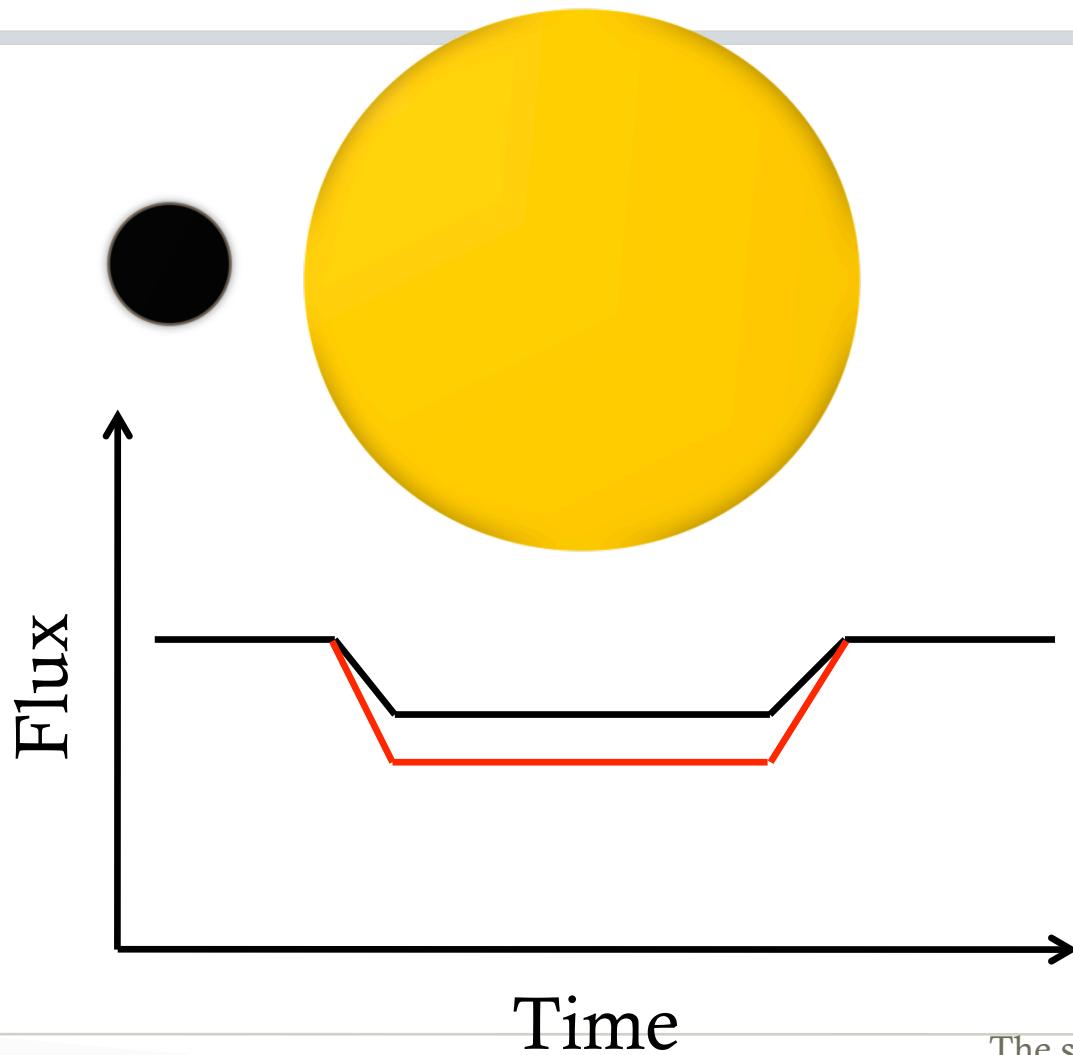
HAT-P7b observed by Kepler
(Borucki et al, 2010)

Primary transit spectra

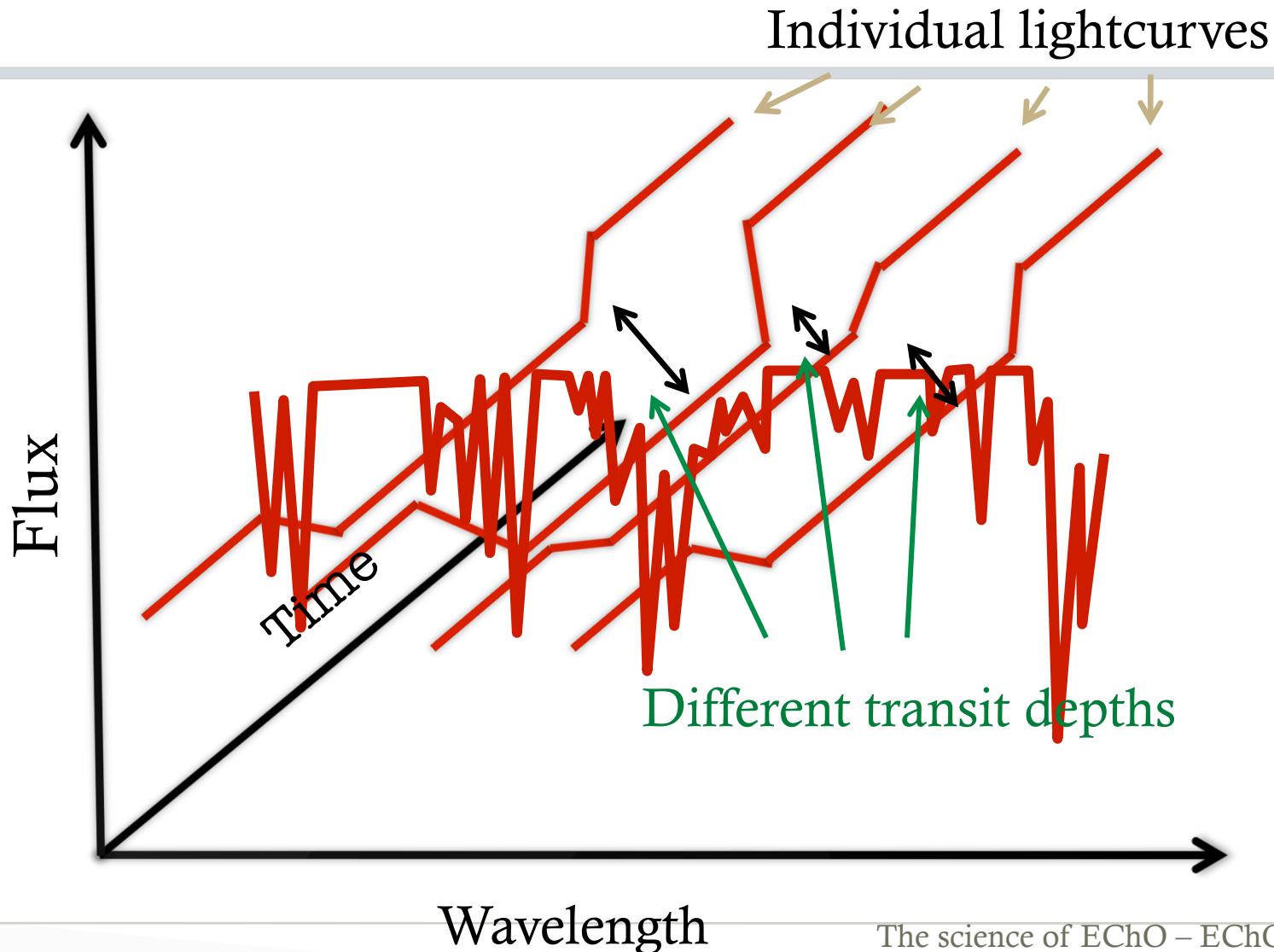


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Secondary eclipse – emission spectroscopy



Secondary eclipse – emission spectroscopy



Hubble & Spitzer + Ground Telescopes



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