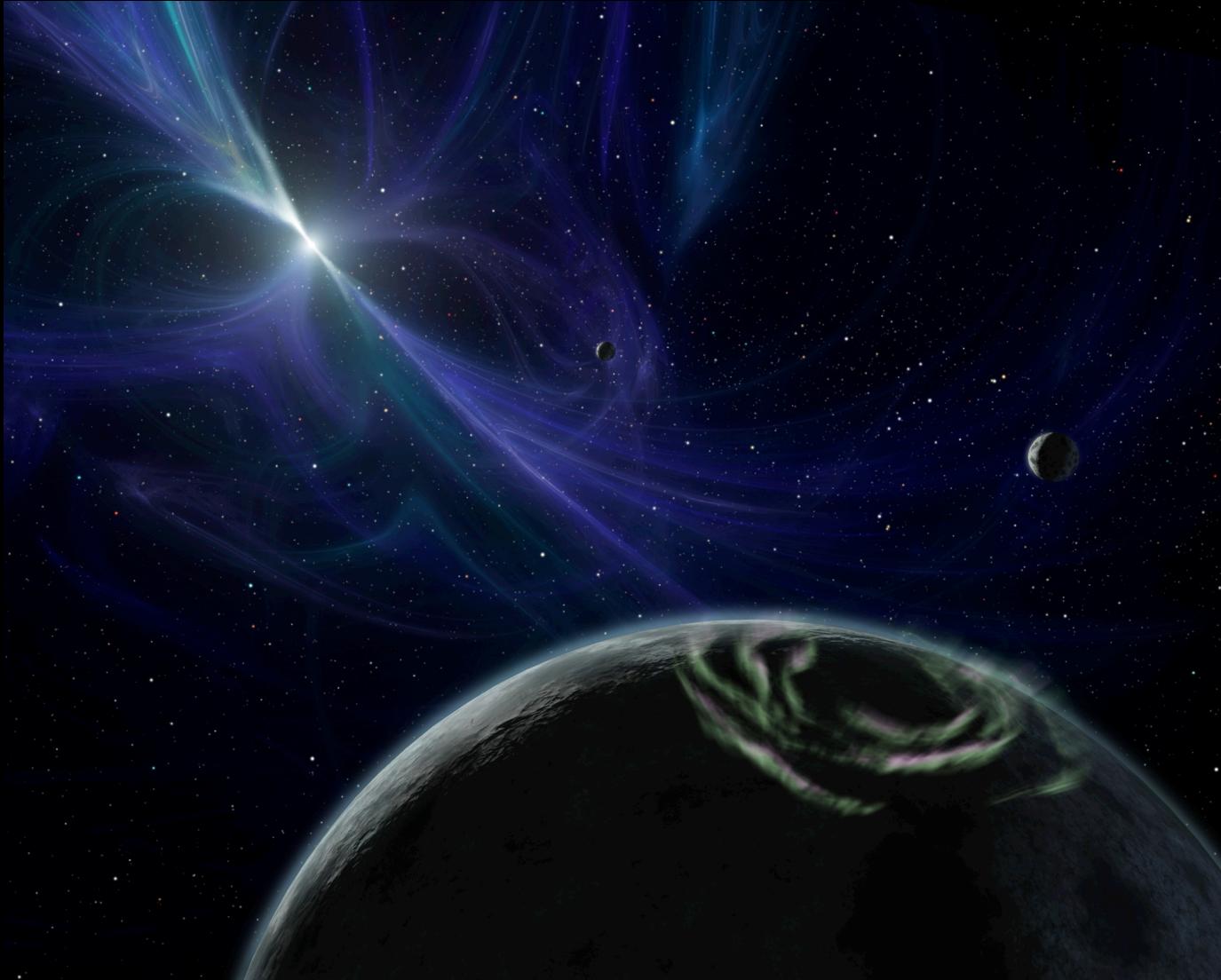
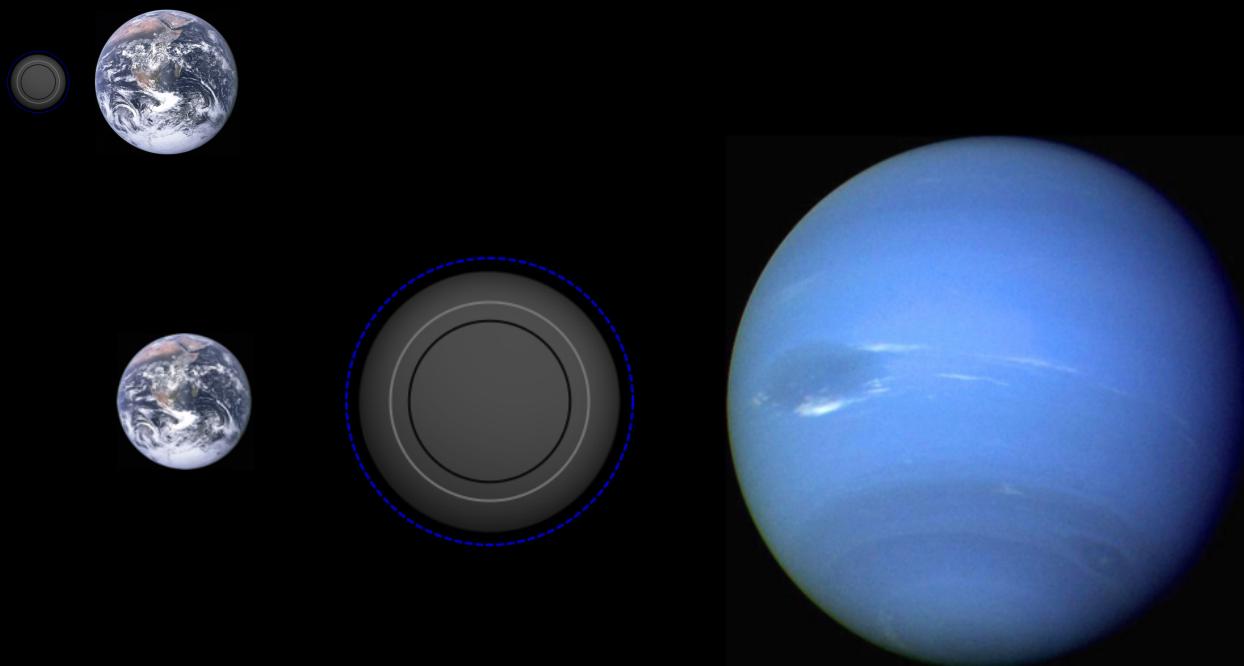


Week 7: Exoplanet Discoveries Today and Beyond

The First Exoplanet(s): PSR B1257+12



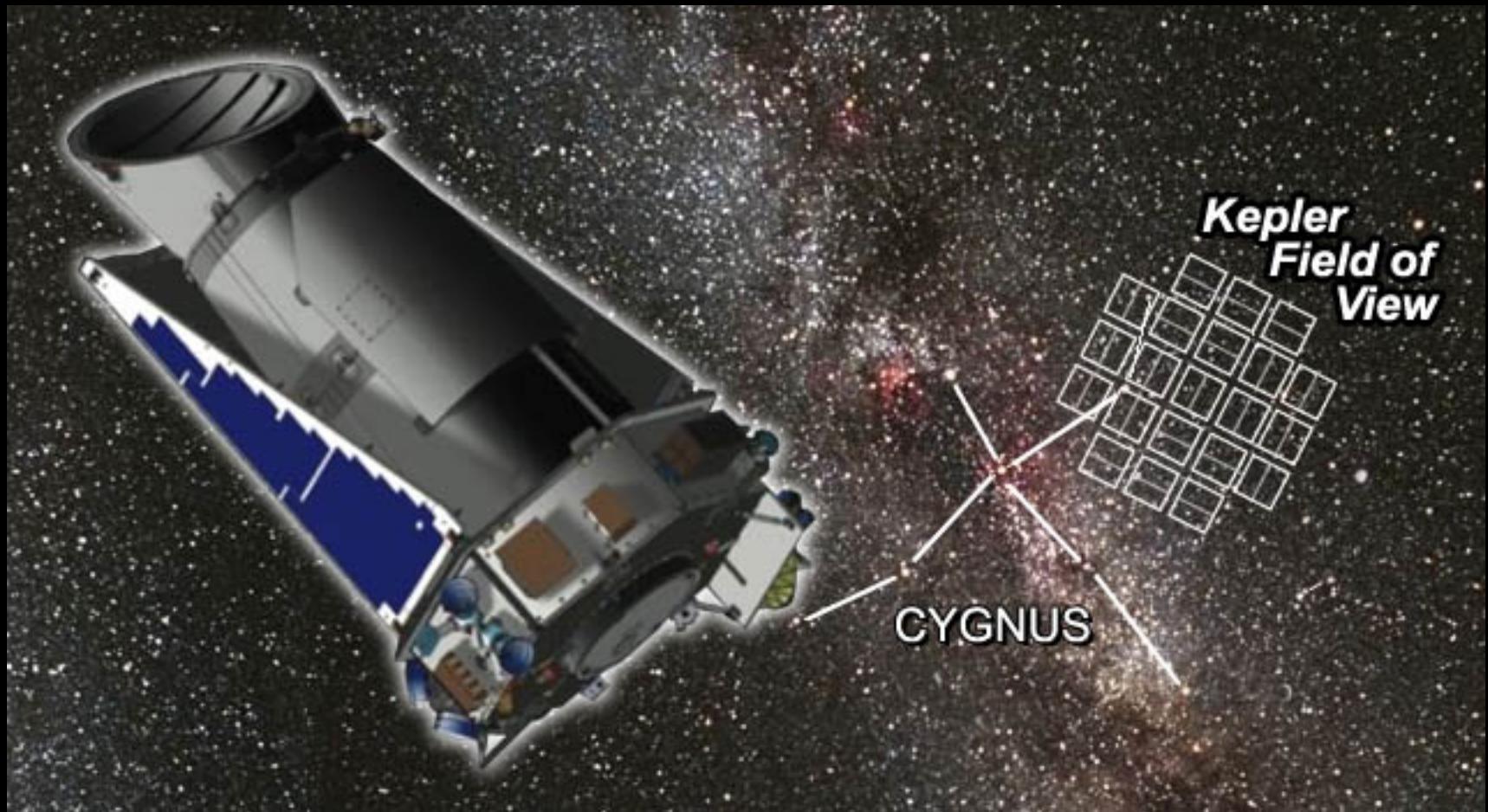
Draugr, Poltergeist and Phobetor



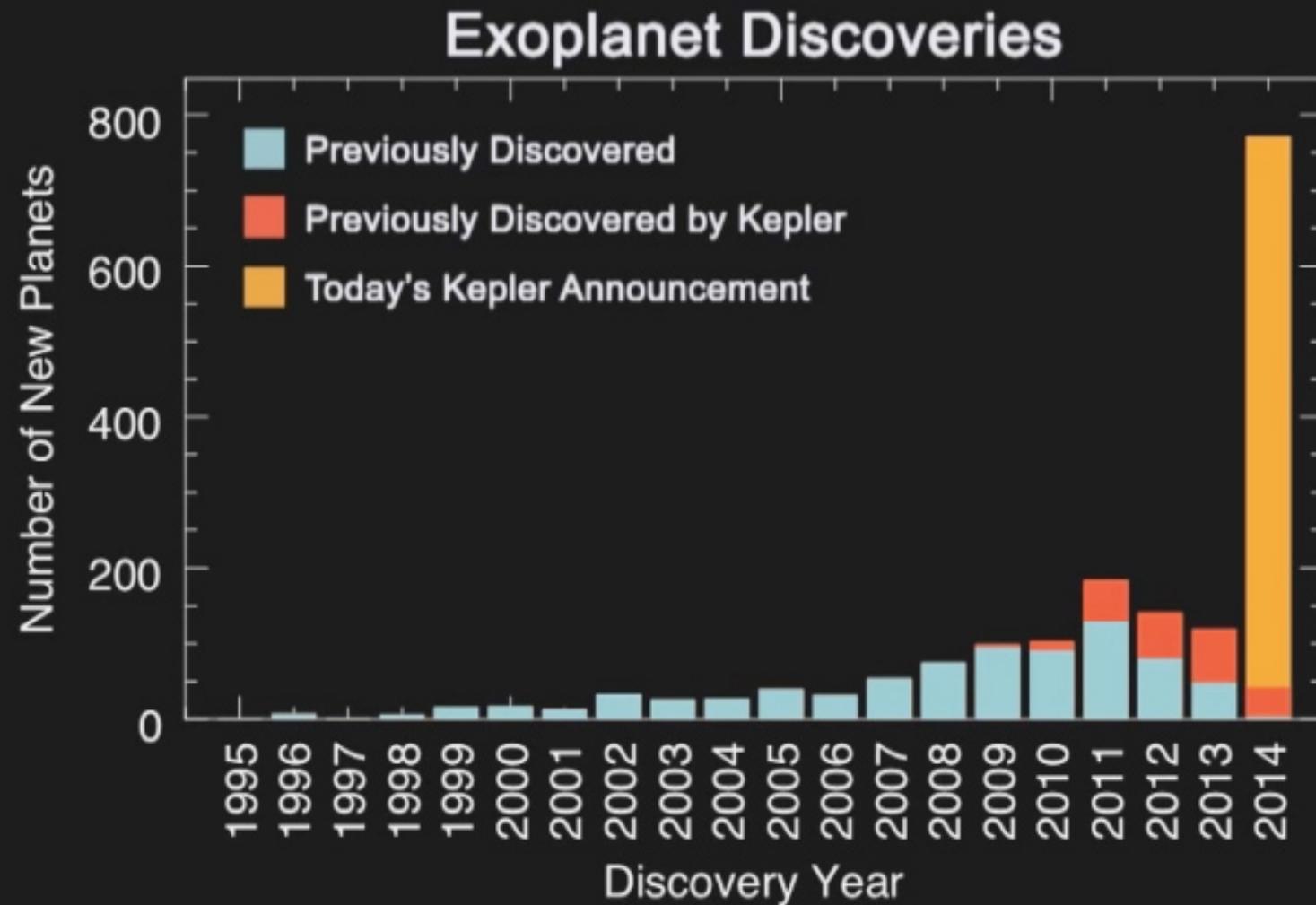
51 Pegasi b



Kepler Space Telescope

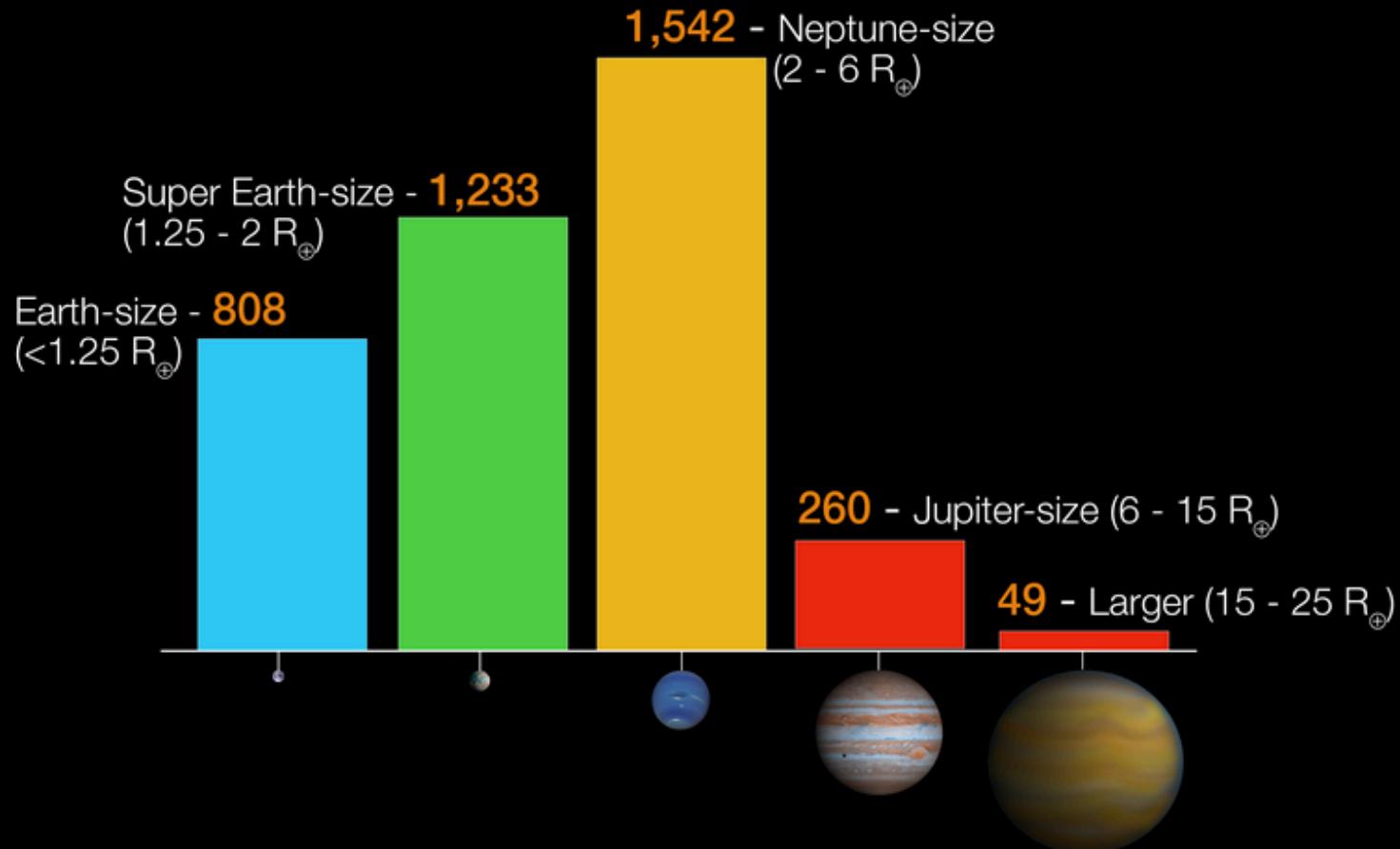


Exoplanet Discovery Timeline



Sizes of Kepler Planet Candidates

Totals as of January 6, 2015



What have we found?

Habitable planets: ~30

**Planets that could host
habitable exomoons: ~30**

What are we missing?

~20% of **Sun-like** stars might
host **habitable** “**Earth-like**” planets

Petigura 2013

Transiting **Earth-size** planet in Hz
of **M dwarf** within 30 yrs

Dressing 2013

Potentially Habitable Exoplanets

Ranked by Distance from Earth (light years)



[12 ly]
tau Cet e*



[13 ly]
Kapteyn b*



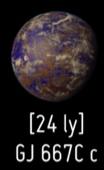
[14 ly]
Wolf 1061 c



[16 ly]
GJ 832 c



[17 ly]
GJ 682 c*



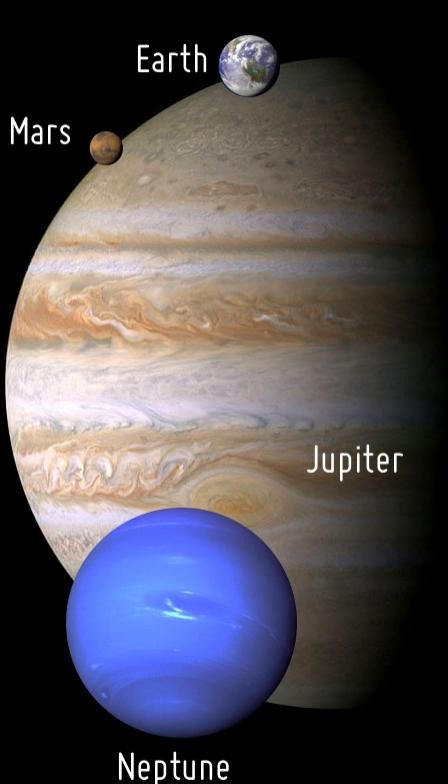
[24 ly]
GJ 667C c



[24 ly]
GJ 667C e*



[24 ly]
GJ 667C f*



Earth

Mars

Jupiter

Neptune



[38 ly]
GJ 180 b*



[38 ly]
GJ 180 c*



[41 ly]
GJ 422 b*



[42 ly]
HD 40307 g*



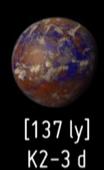
[49 ly]
GJ 163 c



[59 ly]
GJ 3293 c*



[111 ly]
K2-18 b



[137 ly]
K2-3 d



[473 ly]
Kepler-438 b



[561 ly]
Kepler-186 f



[620 ly]
Kepler-22 b



[737 ly]
Kepler-296 e



[737 ly]
Kepler-296 f



[783 ly]
KOI-4427 b*



[851 ly]
Kepler-440 b



[1063 ly]
Kepler-61 b



[1115 ly]
Kepler-442 b



[1174 ly]
Kepler-174 d



[1200 ly]
Kepler-62 e



[1200 ly]
Kepler-62 f



[1402 ly]
Kepler-452 b



[1546 ly]
Kepler-298 d



[1742 ly]
Kepler-283 c



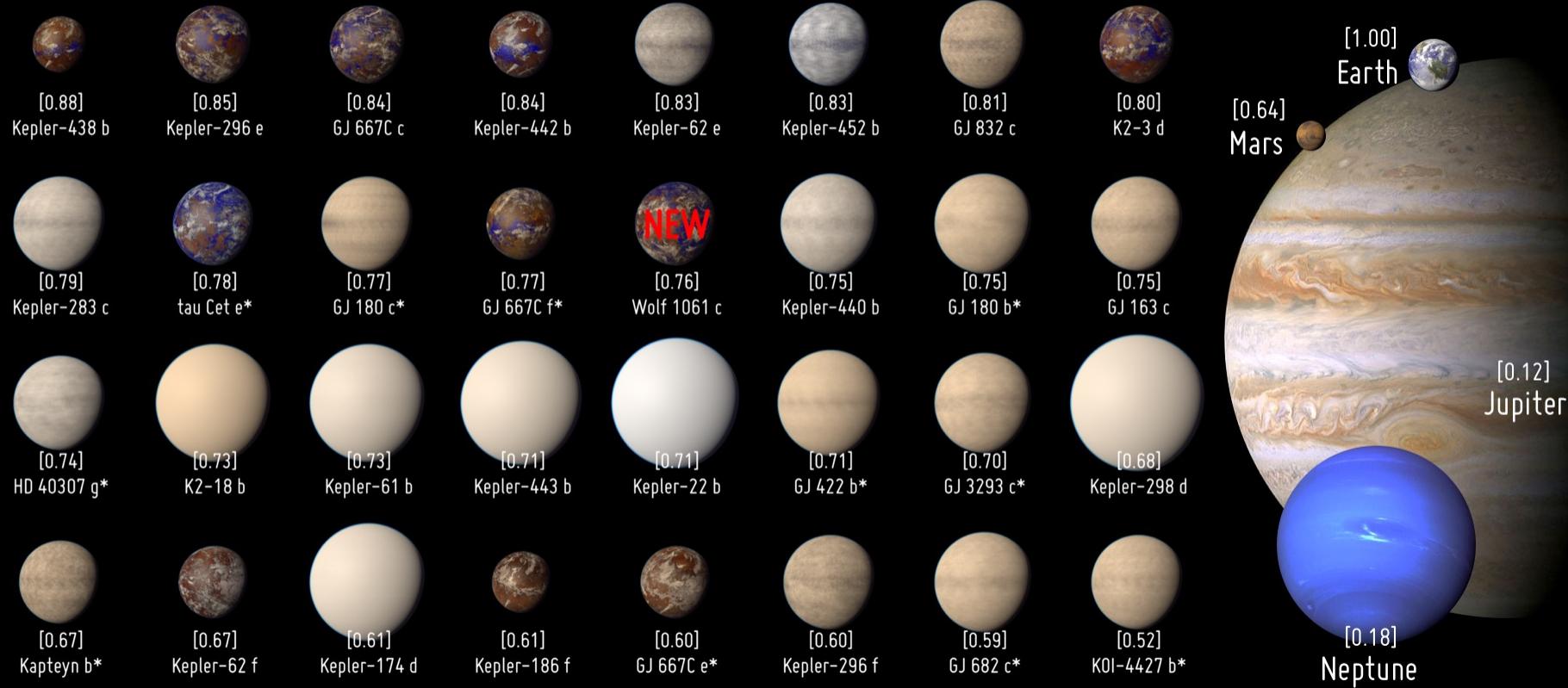
[2541 ly]
Kepler-443 b

Artistic representations. Earth, Mars, Jupiter, and Neptune for scale. Distance is between brackets. Planet candidates indicated with asterisks.

CREDIT: PHL @ UPR Arecibo (phl.upr.edu) January 8, 2016

Potentially Habitable Exoplanets

Ranked by the Earth Similarity Index (ESI)

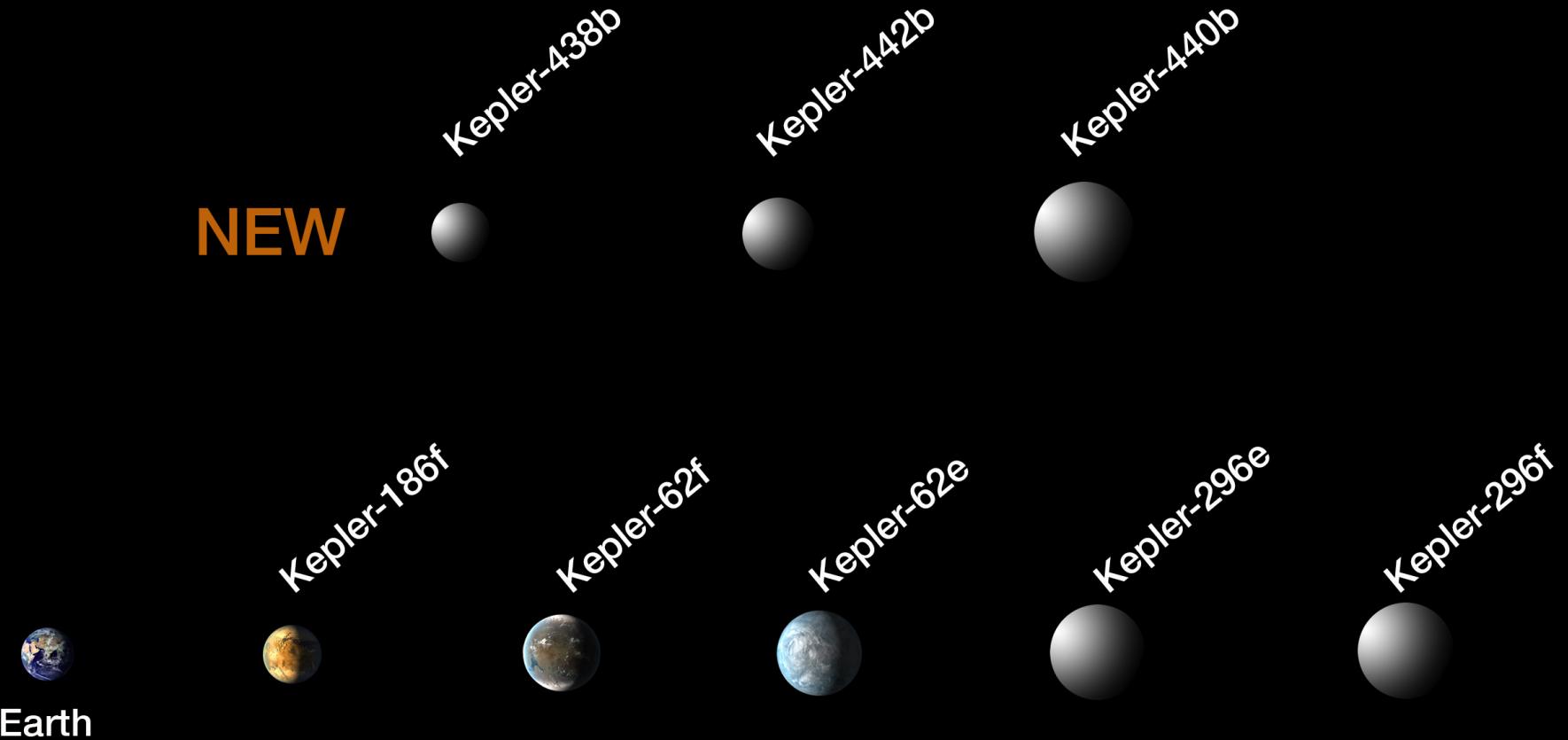


Artistic representations. Earth, Mars, Jupiter, and Neptune for scale. ESI value is between brackets. Planet candidates indicated with asterisks.

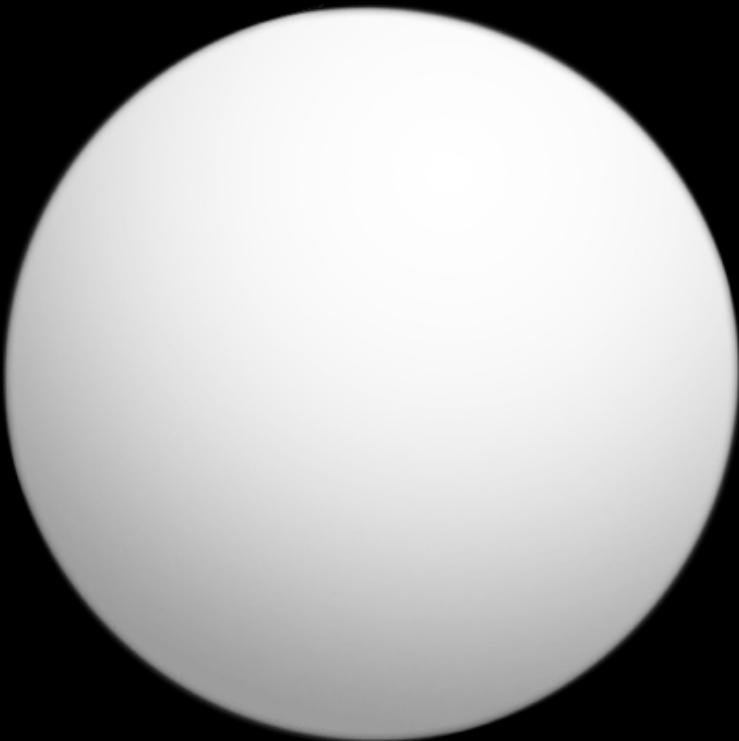
CREDIT: PHL @ UPR Arecibo (phl.upr.edu) January 8, 2016

NASA Kepler's Hall of Fame: Small Habitable Zone Planets

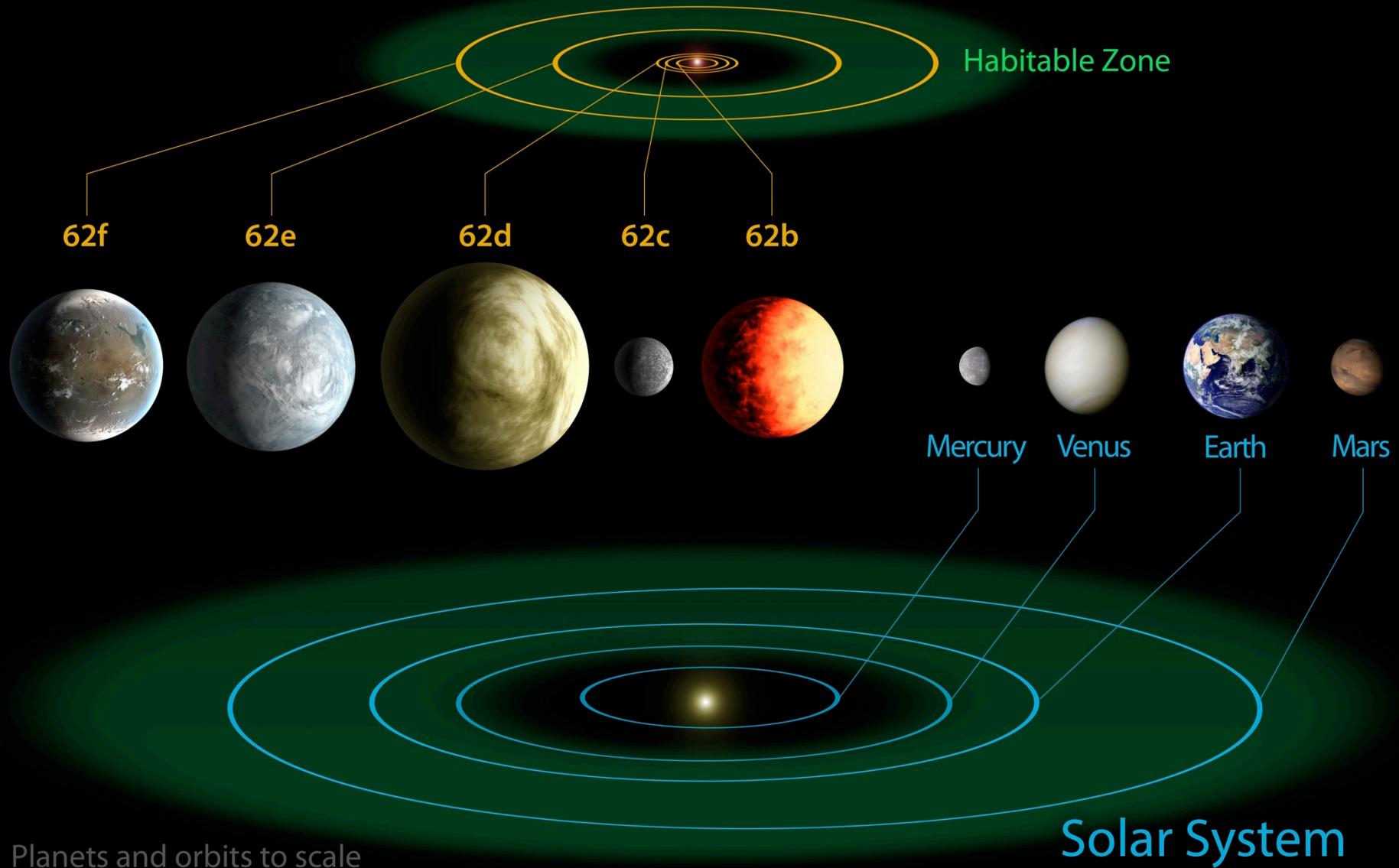
As of January 2015



Kepler-62f



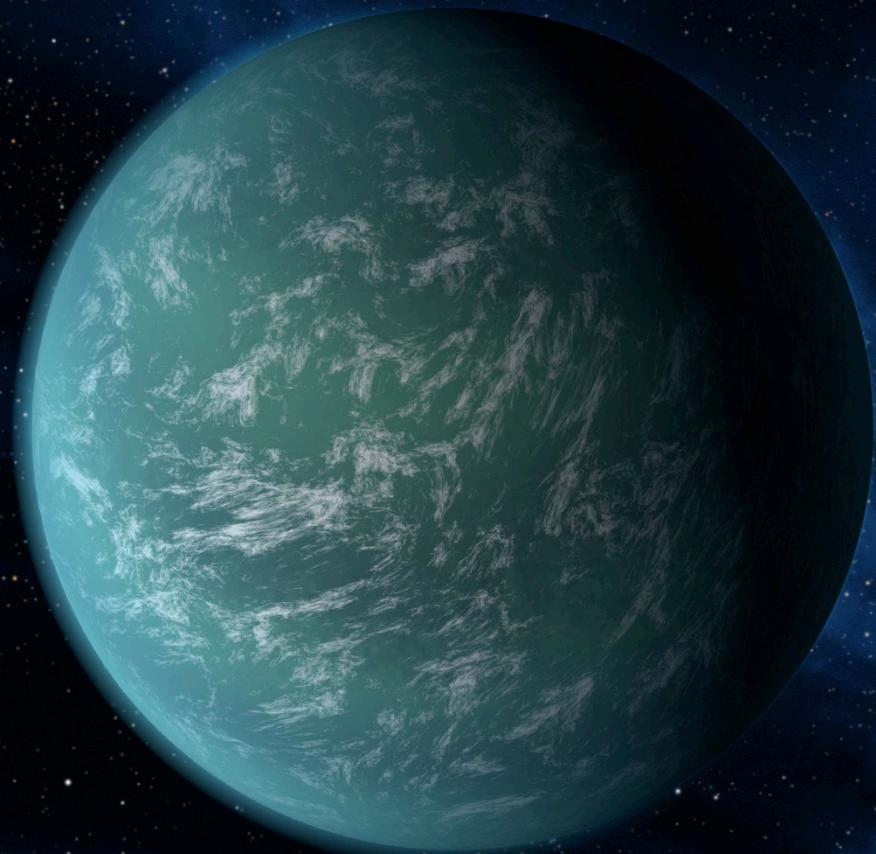
Kepler-62 System



Kepler-62f



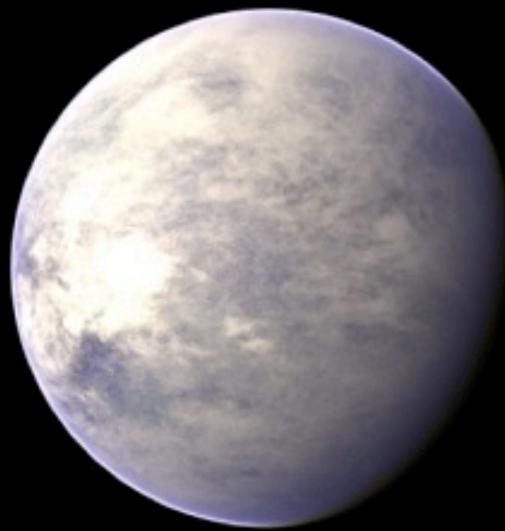
Kepler-22b



Tau Ceti e



Earth



Tau Ceti e



Tau Ceti f

Future Missions: TESS



Future Missions: JWST

