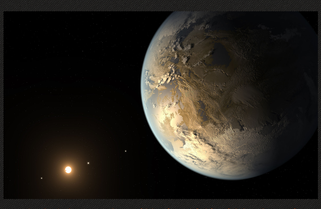
4 Exoplanets to Know About

By Telvin Benjamin

As of June 2021, we have confirmed 4,424 extrasolar planets (exoplanets). By the time you read this, the number will have gone up. Exoplanets are planets outside of our solar system orbiting other stars. In a galaxy, the Milky Way, of an estimated range of 200 billion to 400 billion stars, and assuming a 1-to-1 star to planet ratio, there would at least 200 billion planets! A majority of those exoplanets may come with their own moons, exomoons, but that is a topic for another time. In this first edition of exoplanets to know about, we will focus on four potential Earth-like worlds discovered by NASA's Kepler Space Telescope; Kepler-186f, Kepler-22b, Kepler-62f, and Kepler-452b. These are worlds located within the habitable zone (where liquid can exist on the surface making them potentially Earth-like) of their star and serve as a major interest in the quest to find life elsewhere in the universe.

Kepler-186f



Artist's impression of Kepler-186f orbiting its red dwarf star 0.35 Astronomical Units (AU) away.

> Location from Earth: 490 light years (ly) away in the Cygnus constellation

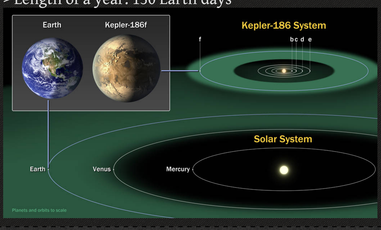
> Announcement date: April 17, 2014

> The Kepler-186 System is composed of 5 planets.

> Its star is a M-type red dwarf star (cooler than the Sun).

> Distance from parent star: 52.4 million km (0.35 AU)

> Length of a year: 130 Earth days



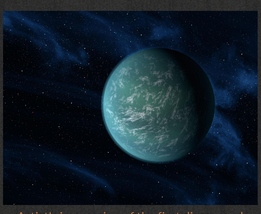
> Mass is 11% larger than Earth's mass.

> Diameter is 10% larger than Earth's diameter.

> Receives 1/3 of energy from its star compared to Earth and the Sun.

> How long to get there in ship time:
Traveling at 59,000 km/h (New Horizons) - 9 million years
Traveling at 95% speed of light (c) - 161 years
Traveling at 99% c - 70 years
Traveling at 99.9% c - 22 years

Kepler-22b



Artist's impression of the first discovered potential Earth-like planet.

> Location from Earth: 620 ly in Cygnus constellation

> Announcement date: December 5, 2011

> The Kepler-22 System is composed of at least 1 planet.

> Its star is a G-type yellow dwarf star just like our Sun.

> Difference, luminosity (brightness) is 25% less than the Sun.

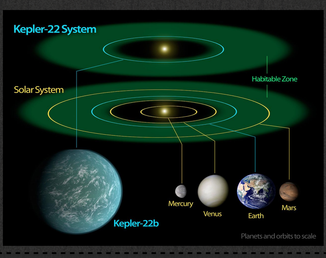
> Distance from parent star: 126.5 million km (0.85 AU)

> Length of a year: 290 Earth days

> Mass is 53 times that of Earth's.

> Diameter is 2.4 times that of Earth's.

> How long to get there in ship time:
Traveling at 59,000 km/h - 11 million years
Traveling at 95% c - 204 years
Traveling at 99% c - 88 years
Traveling at 99.9% c - 28 years



Kepler-62f

Artist's impression of Kepler-62f and its orange dwarf star 0.73 AU away.

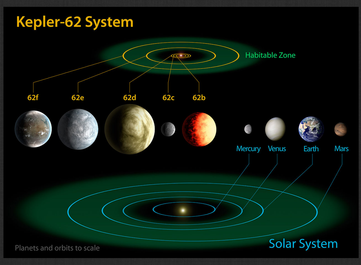
> Location from Earth: 1,200 ly in Lyra constellation

> Announcement date: April 18, 2013

> The Kepler-62 System is composed of 5 planets.

> Its star is a K-type orange dwarf star (cooler than the Sun)(7 billion years old).

> Distance from parent star: 108 million km (0.73 AU)



> Length of a year: 267 Earth days

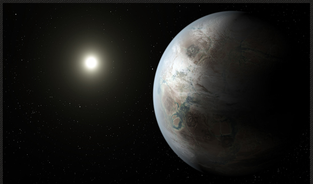
> Mass is between 2.5 to 3 times that of Earth's depending on its composition.

> Diameter is about 40% larger than Earth's.

> Receives 1/5 of energy from its star compared to Earth and the Sun.

> How long to get there in ship time:
Traveling at 59,000 km/h - 22 million years
Traveling at 95% c - 394 years
Traveling at 99% c - 171 years
Traveling at 99.9% c - 54 years

Kepler-452b



Artist's impression of nicknamed Earth 2.0 orbiting a star like our Sun at a similar Earth-Sun distance.

> Location from Earth: 1,400 ly in Cygnus constellation

> Announcement date: July 23, 2015

> The Kepler-452 System is composed of at least 1 planet.

> Its star is a G-type yellow dwarf star (6 billion years old).

> Distance from parent star: 158 million km (1.06 AU)

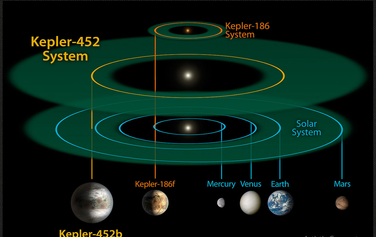
> Length of a year: 385 Earth days

> Mass is between 4 to 5 times that of Earth's depending on its composition.

> Diameter is about 60% larger than Earth's.

> Receives 10% more energy from its star than Earth and the Sun due to age of star.

> How long to get there in ship time:
Traveling at 59,000 km/h - 26 million years
Traveling at 95% c - 460 years
Traveling at 99% c - 200 years
Traveling at 99.9% c - 63 years



Sources

http://exoplanetarchive.ipac.caltech.edu/

Kelper-186f: http://www.solarsystemquick.com/universe/kepler-186f.htm

Kelper-22b: http://www.solarsystemquick.com/universe/kepler-22b.htm

Kepler-62f: http://www.solarsystemquick.com/universe/kepler-62f.htm

Kepler-452b: http://www.solarsystemquick.com/universe/kepler-452b.htm