HISTORICAL DEVELOPMENT OF EXOPLANET DISCOVERIES

Since the discovery of the first planets outside our solar system in 1992 (around a pulsar) and in 1995 (around a main sequence star), this field has become one of the fastest growing in astronomy. (Schneider, 2011). A planet is an object orbiting a star that is massive enough to have rasumed a nearly spherical shape and also to have cleared the protoplanetary disk in which it formed of dust and debris. These characteristics distinguish planets from dwarf planets, which do not have enough mass to clear the protoplanetary disk area. In 2001 (and modified in 2003), the International Astronomical Union (IAU) provisionally defined the term exoplanet.

According to its definition, planets outside the Solar System must orbit a star or stelar remnant (white dwarf or neutron star) and have a mass less than 14 times that of Jupiter. Because of their reduced mass, they do not reach temperatures and densities high enough in their interiors to fuse deuterium or any other chemical element. Therefore, they do not produce energy by nuclear fusio.

The first historical reference to exoplanets dates back to the 4th century BC, where Epicurus wrote a letter to Herodotus in which one of his paragraphs mentions: "There is an infinite number of worlds, some like ours, others different". As early as the 16th century AD, Giordano Bruno (1548-1600), an astronomer who supported the Copernican idea that the Earth and the other planets revolved around the Sunargued that the fixed stars were similar to the Sun and that they were also accompanied by their own planets. Unfortunately, this claim was burned at the stake, and his death significantly delayed the scientific revolution.

SSir Isaac Newton (1643-1727) also considered the existence of other worlds. Cohen and Whitman in 1999 set out in their work entitled "The Principia: A New Translation and Guide" (modern translation of the masterpiece "Philosophiae Naturalis Principia Mathematica"), that Newton believed that stars must be suns with systems planetariums similar to ours. Quotes about exoplanet detections and astrometry of the same have been going on since the 19th century. An outstanding quote cocerns the binary star 70 Ophiuchi. In 1855, Captain W.S. Jacob at the Madras Observatory of the British East India Company, reported that orbital anomalies made.

It is very likely that a planetary body existed in this binary system. In the 1890s, this hypothesis was strengthened at the University of Chicago and the United States Naval Observatory. In 1896 Thomas See declared that anomalies in the orbits of the stars proved the existence of a dark body in system 70 Ophiuchi, with an orbital period of 36 years around one of the stars in the binary system. However, all these conjectures and speculations about this exoplanet ended when it was shown in 1889 that a three-body system with these orbital parameters would be highly unstable.

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In the middle of the 20th century, using astrometry again, dynamic analysis studies of Barnard's star, it was proposed that the star had two companions or Jupiter--type exoplanets orbiting it(Van de Kamp, 1969).

Currently, astronomers generally report that all initial reports of detection were inconclusive (Boss, 2009). This was the cause until the early 1990s, when it was claimed that a planet orbiting a neutron star, also known as pulsar PSR 1829-10, had been discovered using the radio pulse time measurement method. This fact immediately received a intense attention. However, in January 1992, they themselves found errors in their calculations, which caused him to retract his discovery and publish it in the journal Nature.

On January 9, 1992, a planetary system orbiting the pulsar PSR B1257+12 (now called Lich, UAI, 2015) was discovered; such a system consisted of three low-mass objects orbiting the pulsar. These objects were the PSR exoplanets B1257+12b, PSR B1257+12c and PSR B1257+12d (Draug, Poltergeist and Phobetor respectively). In 1995, the first exoplanet orbiting a main sequence star was discovered at the Geneva Observatory, the star was 51 Pegasi (Mayor and Queloz, 1995) (Nobel Prize 2019). The planet was named 51 Pegasi b, has about half the mass of Jupiter, orbits its star in 4 Earth days, and is eight times closer to its star than Mercury is from the Sun. According to Rodríguez, L. F. (2015), most of the first exoplanets discovered have a mass similar to that of Jupiter (6 times greater), but they orbit very close to their stars; therefore, they are very hot. These planets are called "hot Jupiters".

Astronomers were surprised by these "hot Jupiters," because according to the models, the giant planets should only form at great distances from the stars. Other types of planets have been found over types, and it is now clear that "hot Jupiters" are a minority of extrasolar planets (this was an observational bias, since they are easier detect). In 1999, Upsilon Andromedae (Titawin, UAI, 2015) became the first main-sequence star known to have multiple planets (more than three planets).

Later in 2011, a group of Mexican astronomers, including Dr. Carlos Pech, discovered a fourth planet for this star. After the launch of NASA's Kepler Satellite in 2009, the discovery of exoplanets increased significantly. 95% of the exoplanets discovered were more smaller than Neptune, and four, including Kepler-296f, were less than two and a half times the size of the Earth, in addition to being located in the habitable zones of their parent stars. The first extrasolar planet found around a binary system, Kepler-16, which consists of two main-sequence stars, which it orbits the two stars with an orbital period of 228 days and its size is approximately that of Saturn.

Currently, at the moment of writing these lines (February 8, 2024), the number of confirmed exoplanets is 5618, this is according to the Extrasolar Planet Database Encyclopaedia.