



**Exoplanets and  
Spectrometry**

# Exoplanets

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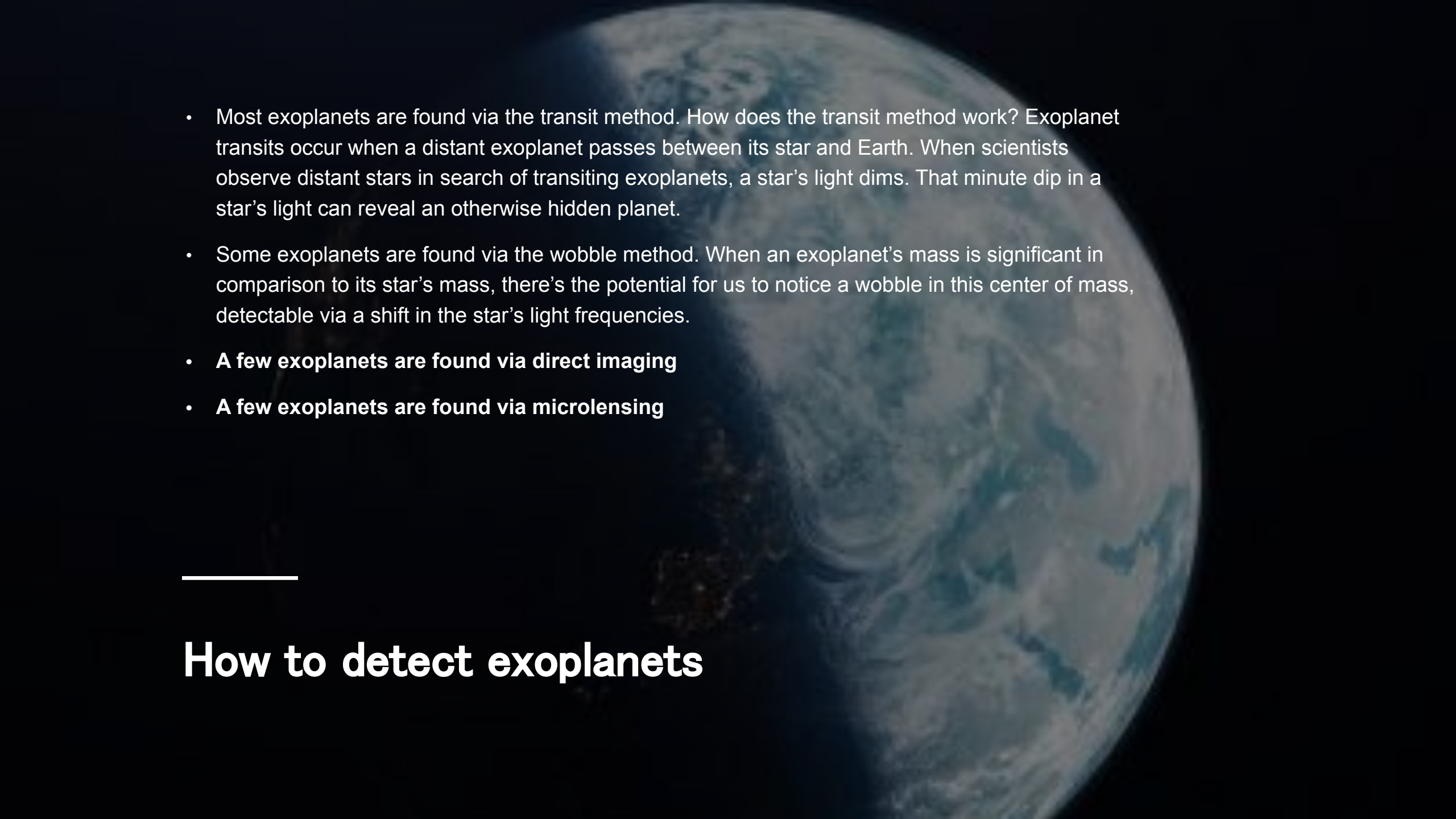
An exoplanet is any planet beyond our solar system. Most orbit other stars, but free-floating exoplanets, called rogue planets, orbit the galactic center and are untethered to any star.

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Astronomers have confirmed more than 4,000 exoplanets orbiting distant stars, with at least 1,000 more more awaiting confirmation. They found the first two exoplanets orbiting a pulsar in 1992. They confirmed the first exoplanet orbiting a sunlike star in 1995.

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Why didn't we see them before? It's because exoplanets are so far away, several light-years away at their closest. And it's because – unlike stars – exoplanets don't shine with their own light.

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- Most exoplanets are found via the transit method. How does the transit method work? Exoplanet transits occur when a distant exoplanet passes between its star and Earth. When scientists observe distant stars in search of transiting exoplanets, a star's light dims. That minute dip in a star's light can reveal an otherwise hidden planet.
  - Some exoplanets are found via the wobble method. When an exoplanet's mass is significant in comparison to its star's mass, there's the potential for us to notice a wobble in this center of mass, detectable via a shift in the star's light frequencies.
  - **A few exoplanets are found via direct imaging**
  - **A few exoplanets are found via microlensing**

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## How to detect exoplanets

- Finding an Earth-like planet, especially one where life resides, has been and remains the impetus for our searches for and explorations of these distant worlds.

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**Habitability of exoplanets**

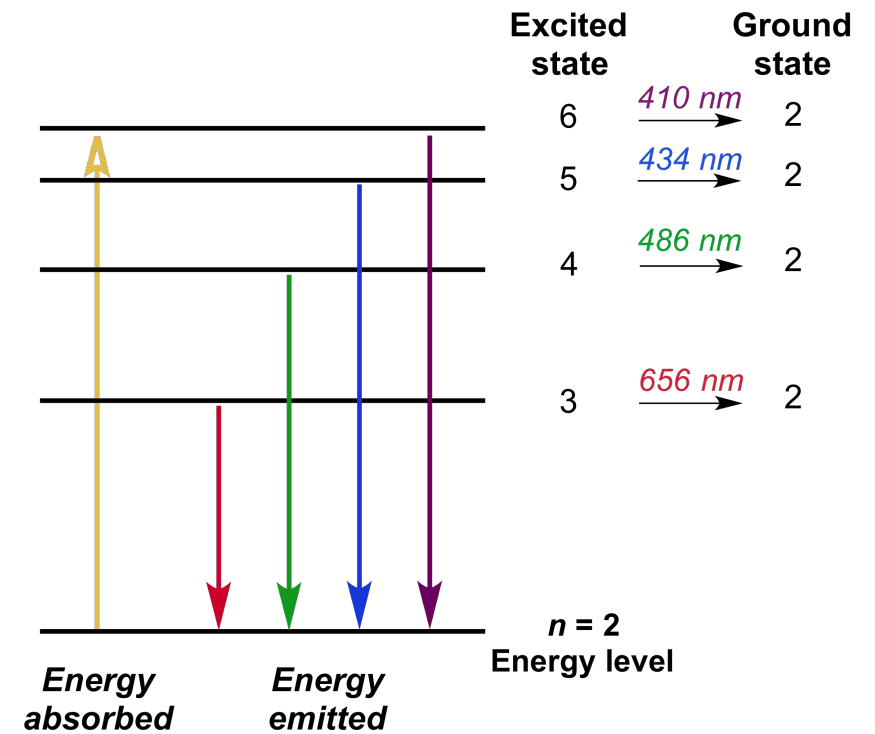
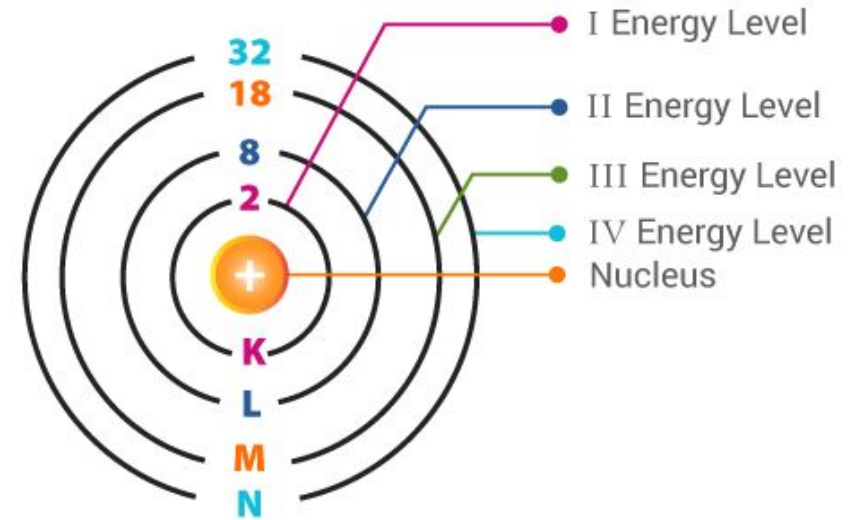


# Spectrometry

- Used to identify elements on exoplanets
- Measures wavelengths and intensities of incoming waves of light
- Carried out using a spectrophotometer
- Most of the telescopes used to carry this out are outside the atmosphere to stop the light from being absorbed by our atmosphere

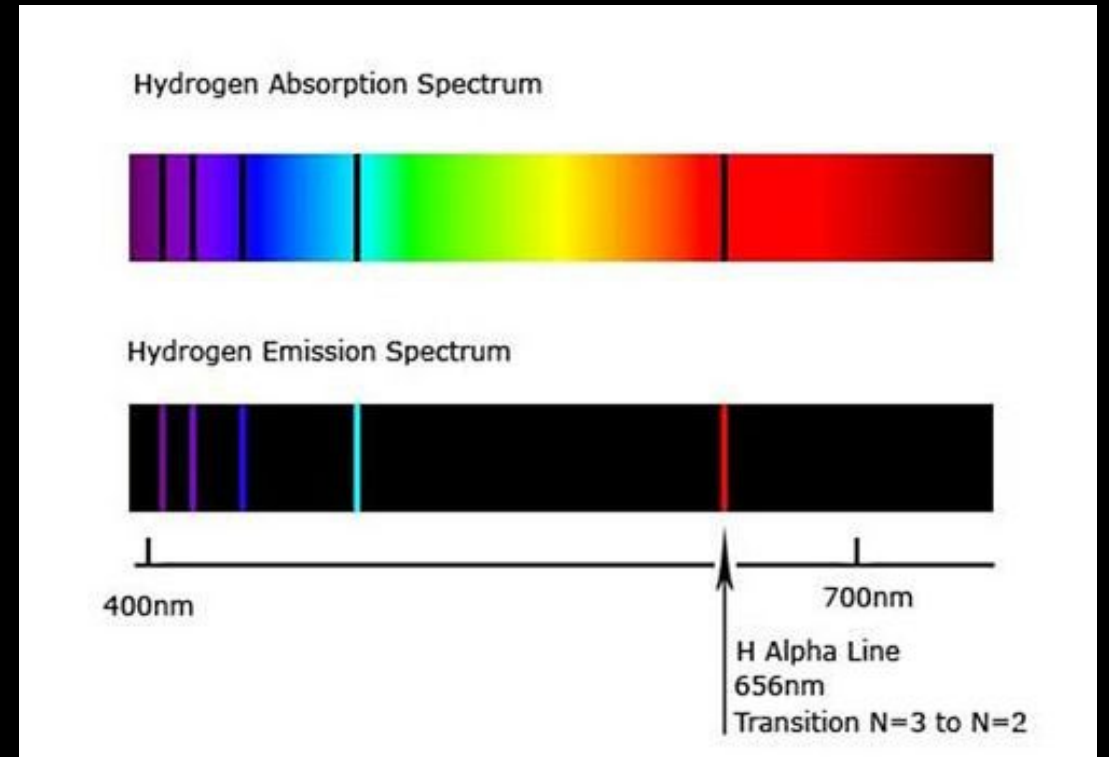
# THE STRUCTURE OF AN ATOM

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# HOW THIS HELPS US

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# Activity

Choose an exoplanet that has indicated potential for life. Come up with a short presentation on it including things like:

- Evidence for potential of life (e.g. water, oxygen, temperature)
- How far the exoplanet is from Earth
- Any other fun facts you can find about it.