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Transits and Exoplanets: What Can We Learn?

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Applied Physics

Transits



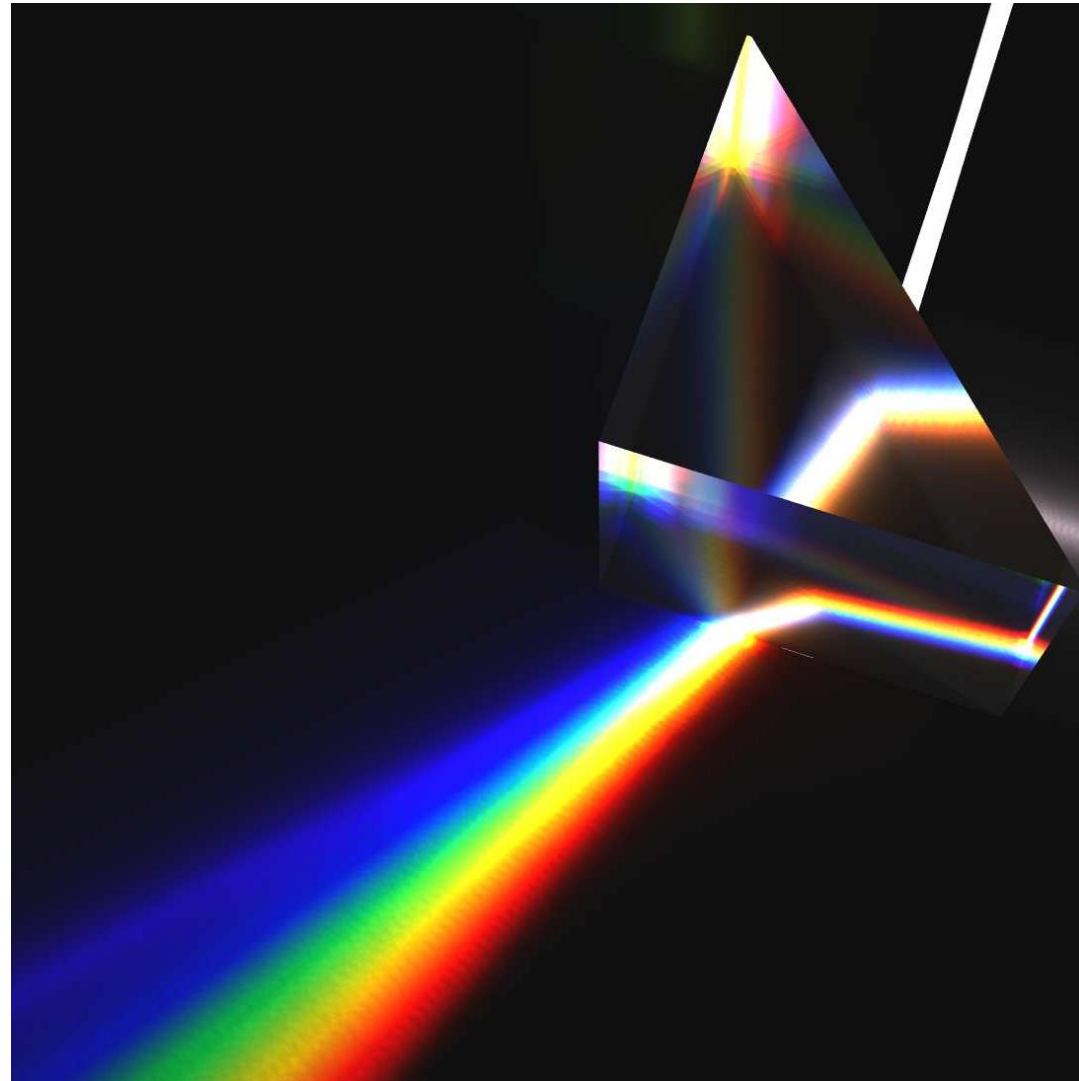
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- Can provide us with a LOT of information about other planets as they pass in front of stars/planets
- We can directly visit the nearest planets in our solar system – we cannot in more distant worlds



Looking at light...

- We can do **SPECTROSCOPY**, investigating the properties of the light produced, breaking up the white light into its constituent colours:





Mysteries of the Light

- The light **should** be a continuous rainbow,



- But in fact some lines are missing,

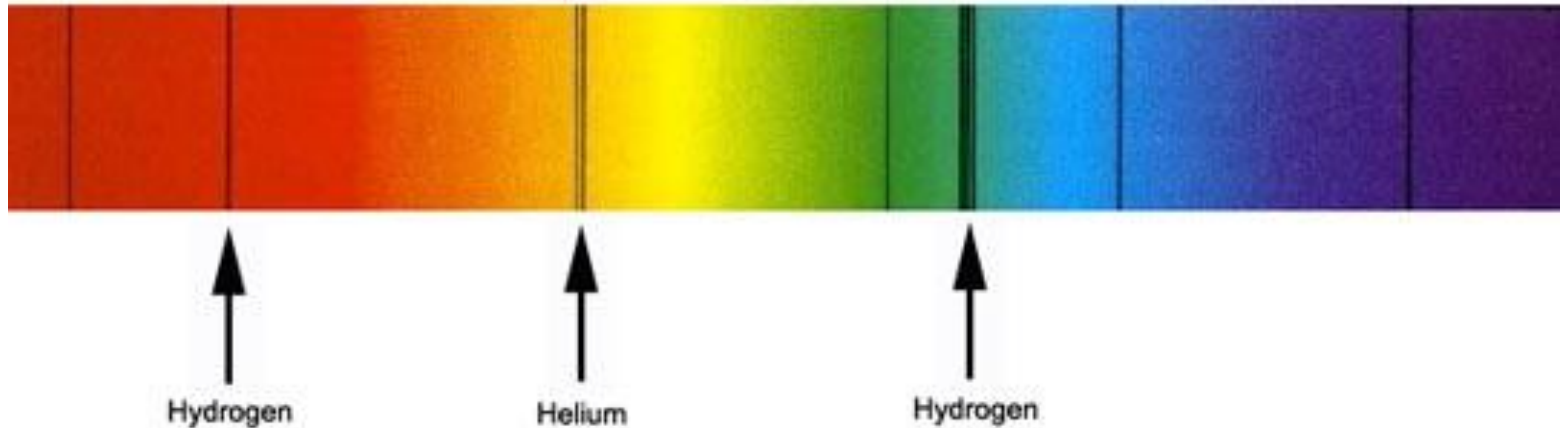


- These are due to the atoms in the star absorbing energy



The Spectra

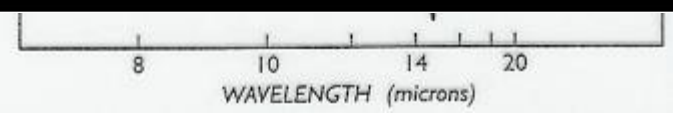
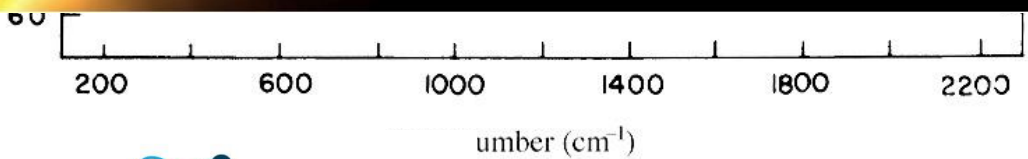
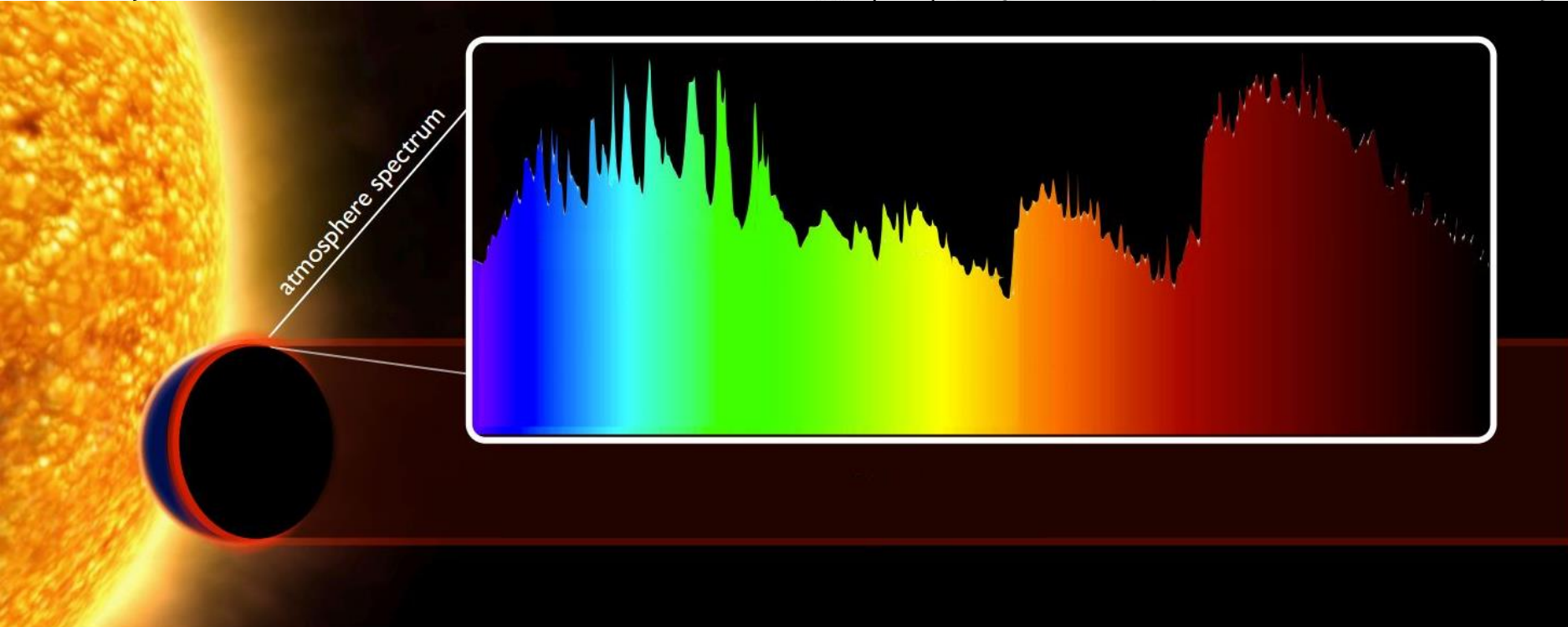
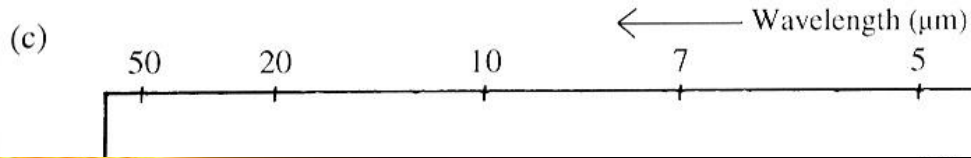
- As the light passes through the atmosphere of a planet, more lines can get removed – telling us what elements are present



The Spectra



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Can tell us about the presence of:

- Water Vapour
- Oxygen/Nitrogen/Carbon Dioxide
- Dust/sand as Silicon
- Whether the “sky is blue”
- Average temperature of the atmosphere