

# Exploring the Solar System IV – Exoplanets



## Exploring the Solar System IV

## Exoplanets

Why Look For Exoplanets?

Finding Exoplanets

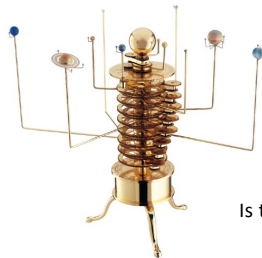
Looking For Life

What Next?



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## Why Look For Exoplanets?



Is our solar system typical?

Are there other planets like the Earth?

Is there life elsewhere in the galaxy?

Studying other solar systems will help us understand our own



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## Finding Exoplanets

Planets orbiting other stars can be found by various methods

### Discovery Method

Radial Velocity

Transits

Direct Imaging

Microlensing

Astrometry

### Method Looks For ...

Wobble

Shadows

Dots in images

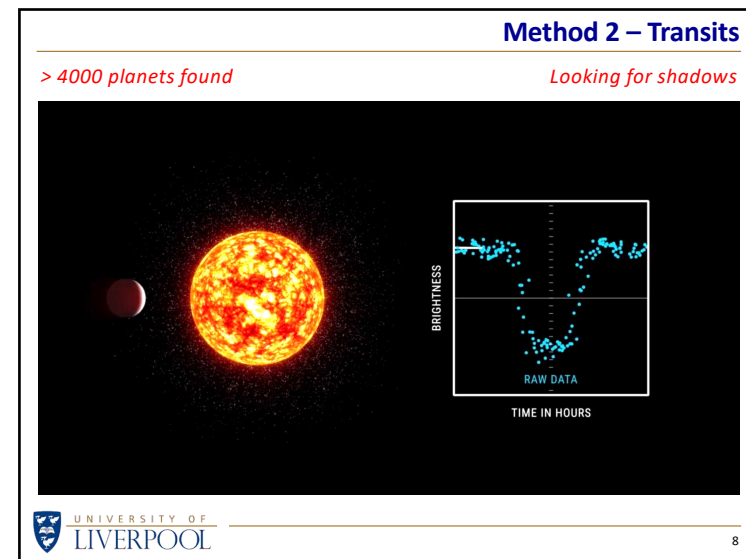
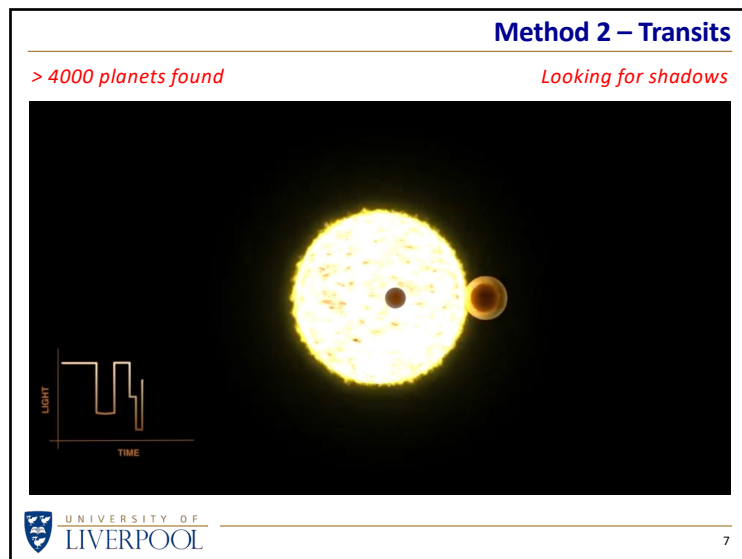
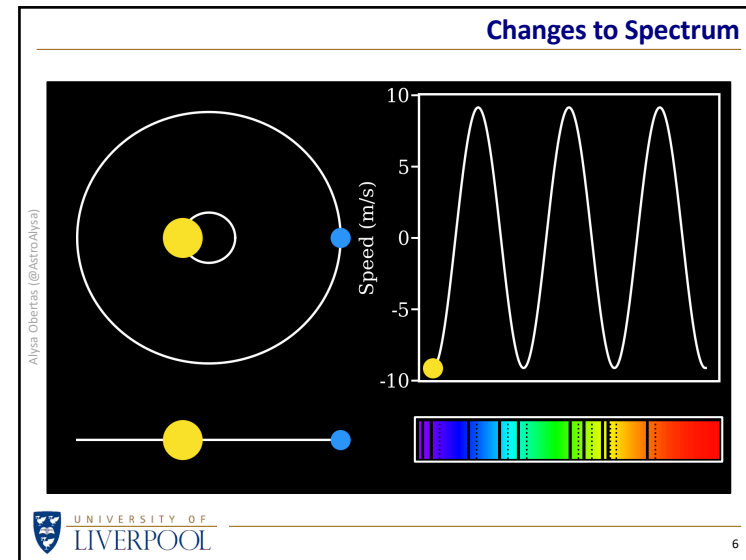
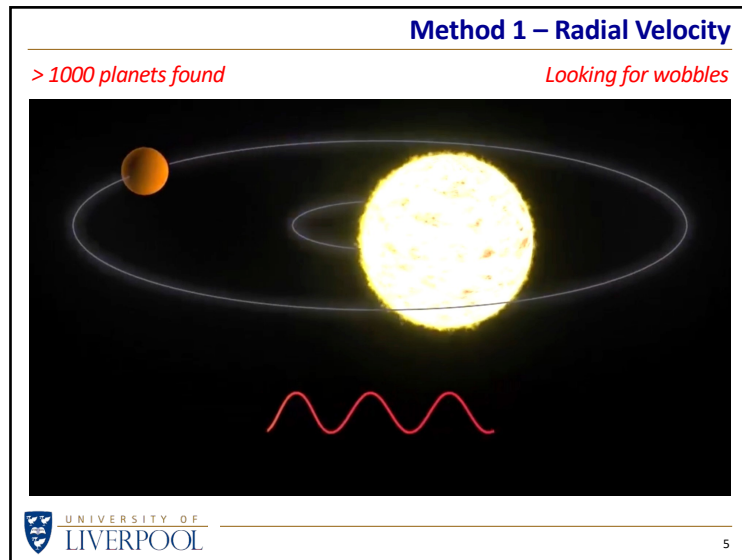
Bending of light

Motion of stars

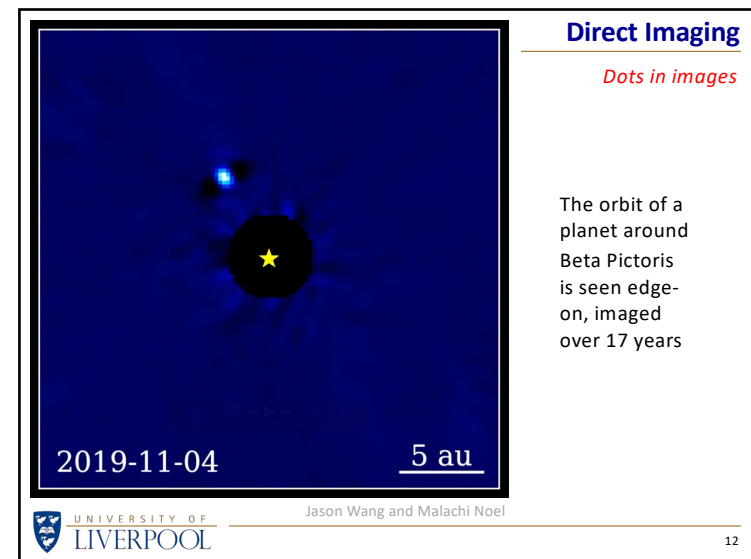
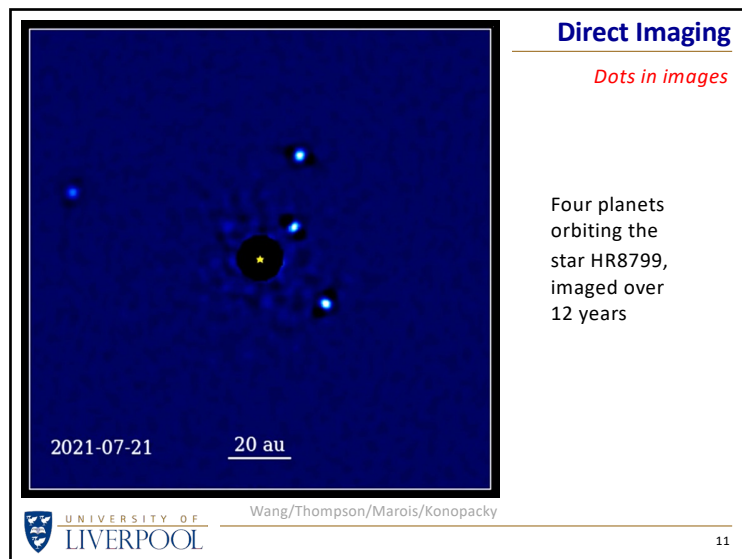
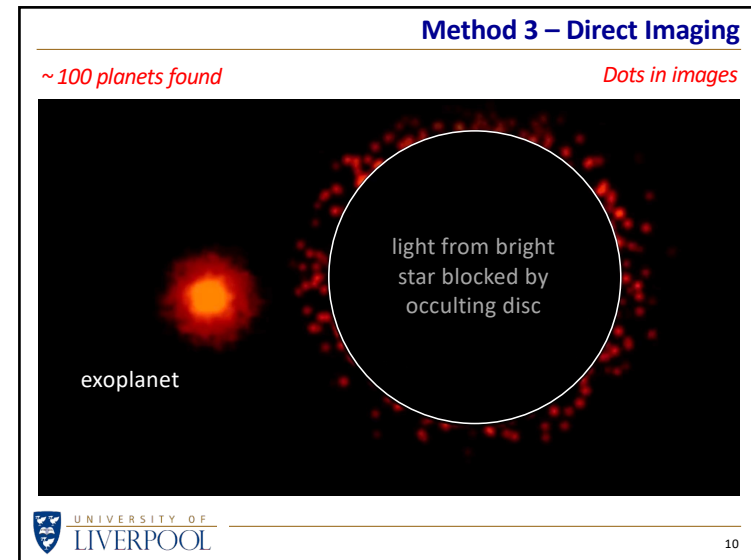
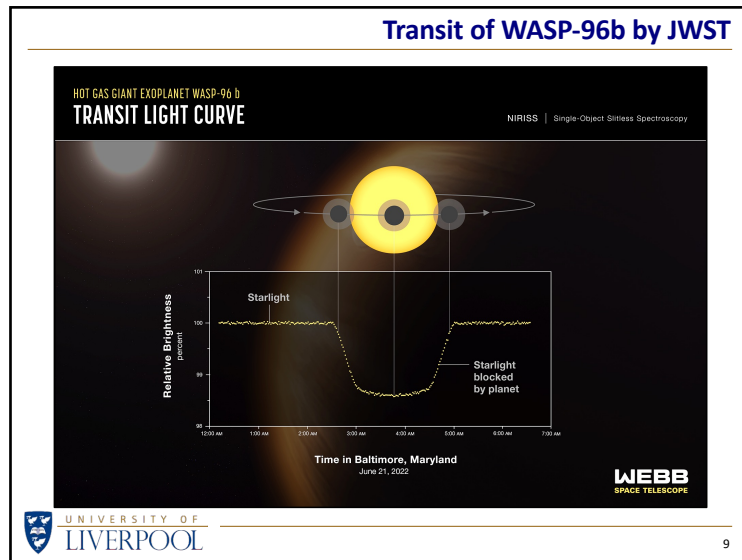


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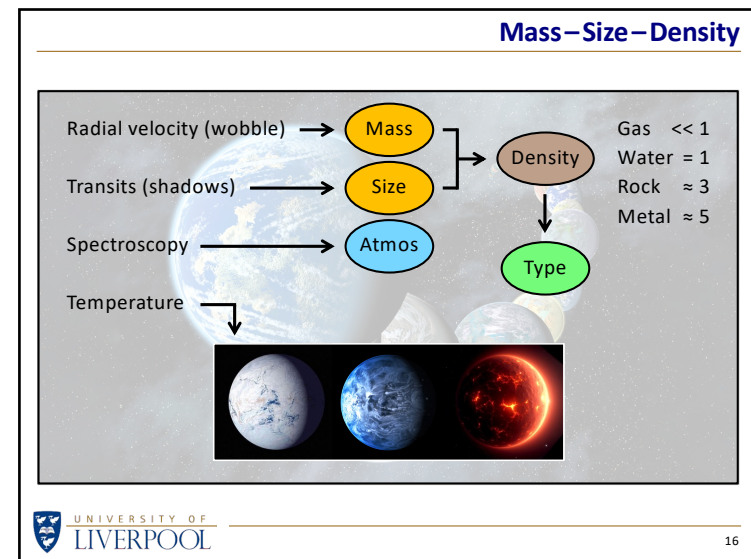
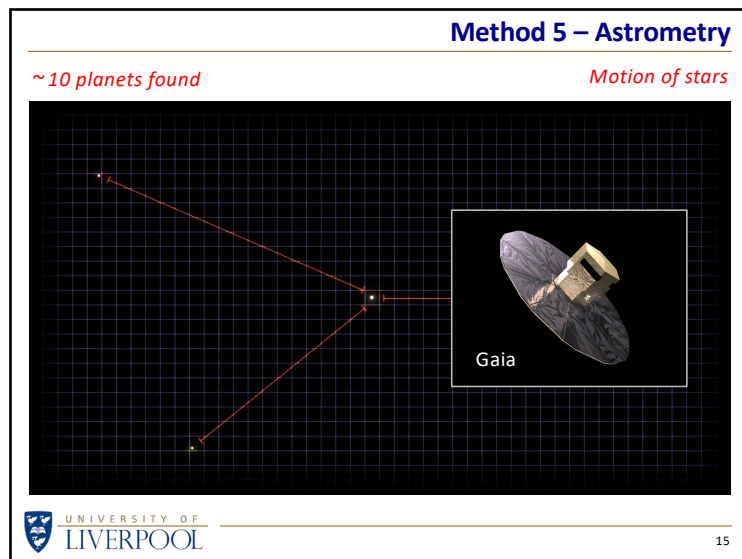
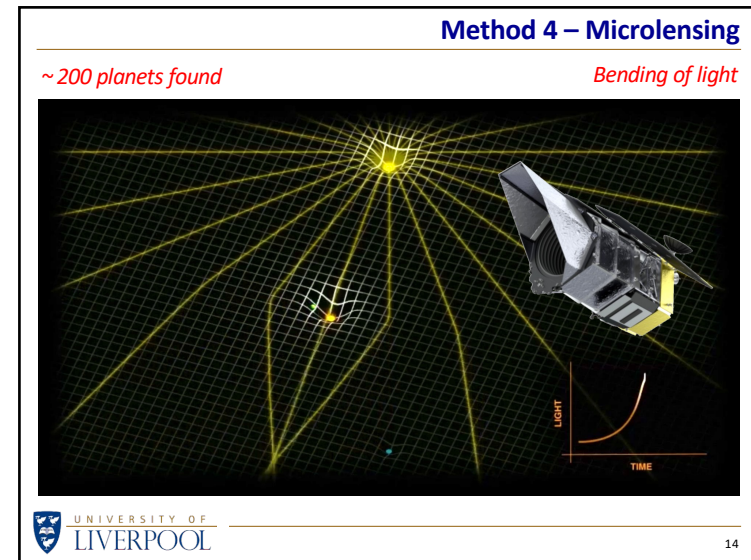
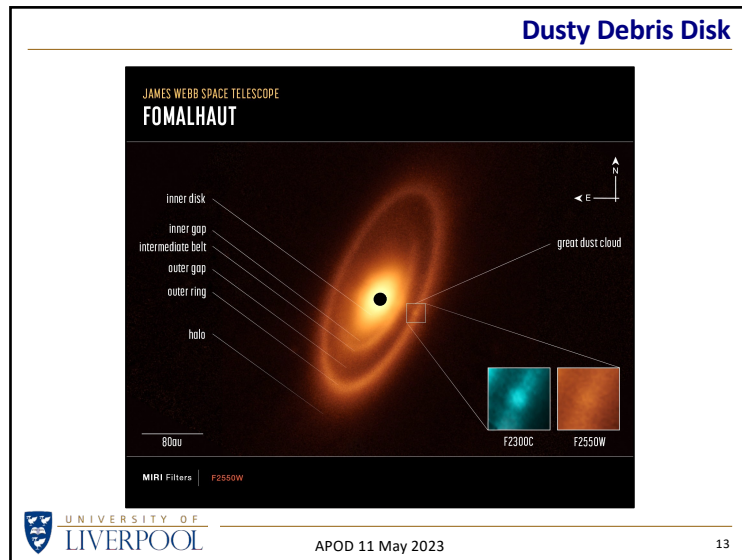
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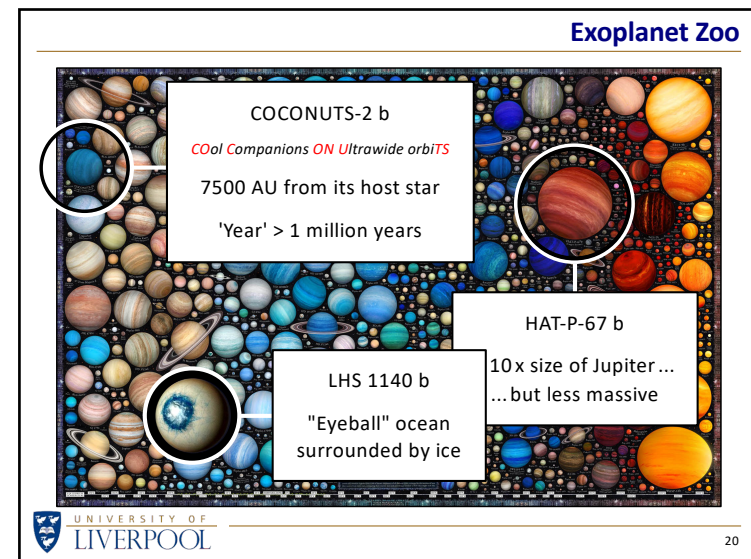
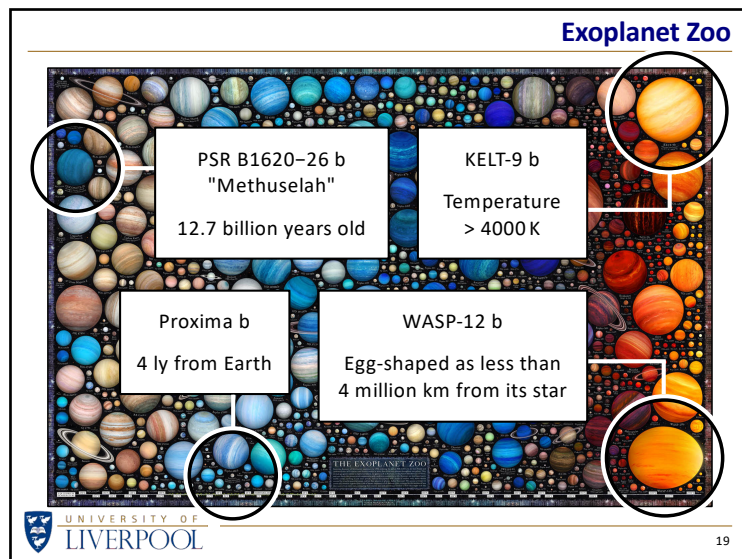
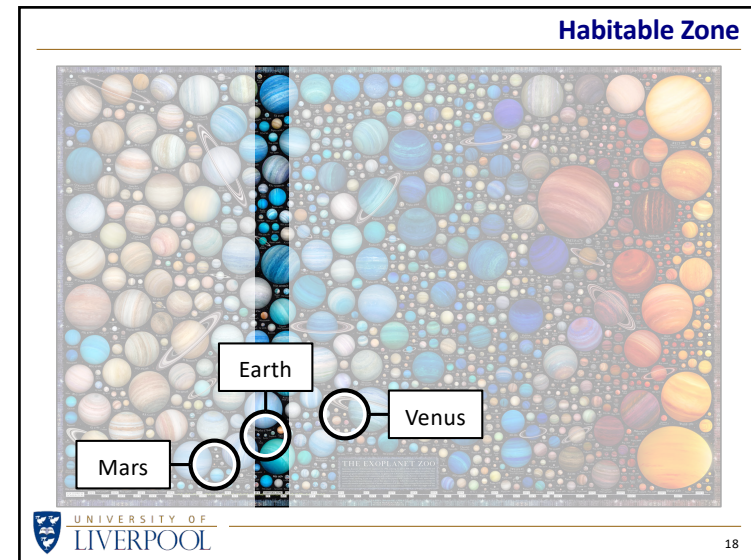
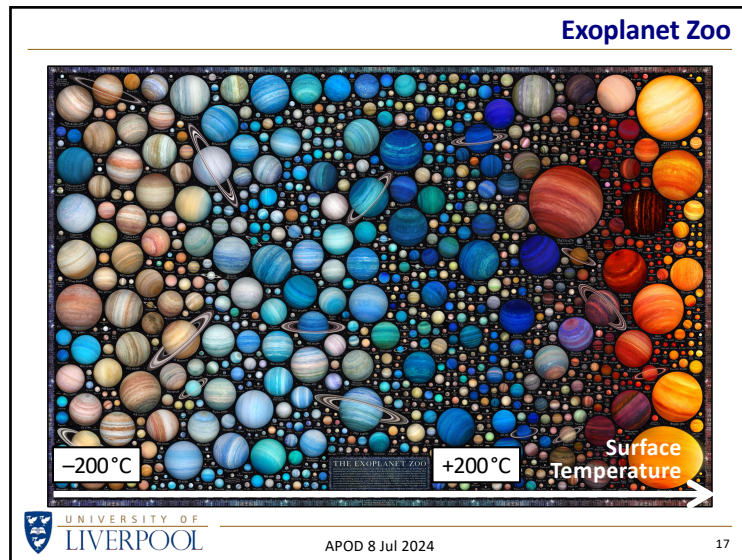


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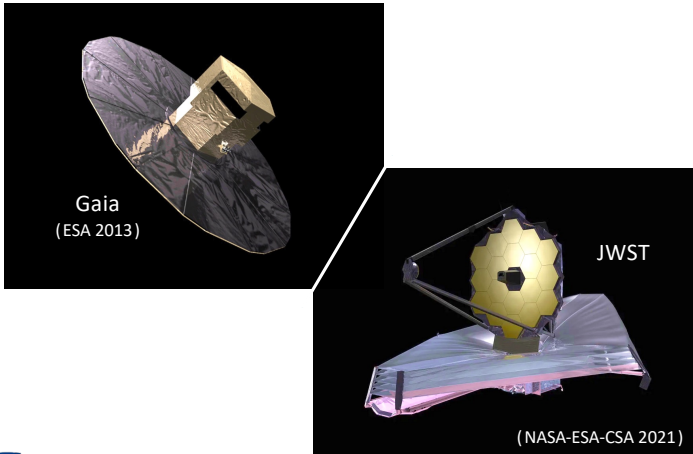


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# Exploring the Solar System IV – Exoplanets

## Exoplanet Missions



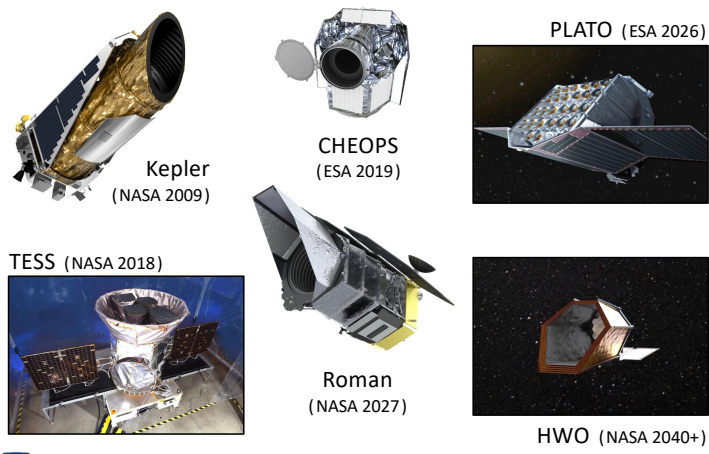
Gaia (ESA 2013)

JWST (NASA-ESA-CSA 2021)

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## Exoplanet Missions



Kepler (NASA 2009)

CHEOPS (ESA 2019)

PLATO (ESA 2026)

TESS (NASA 2018)

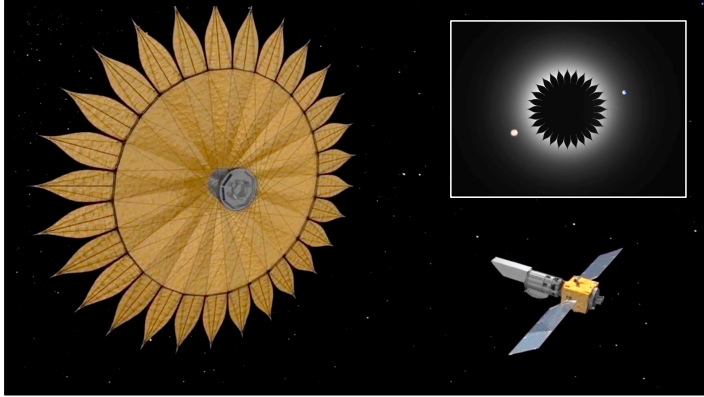
Roman (NASA 2027)

HWO (NASA 2040+)

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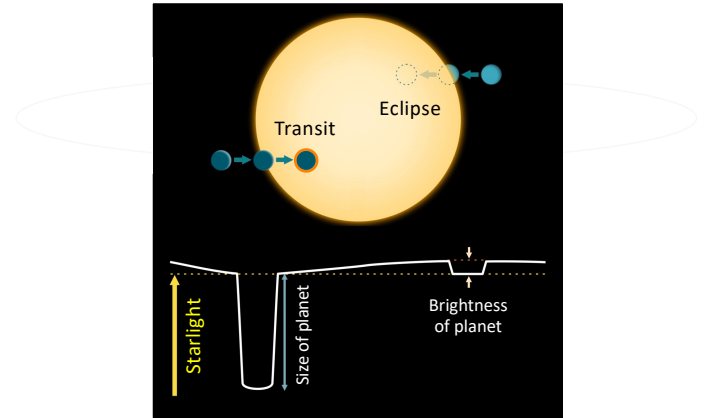
## Star Shade Concept



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## Looking For Life



Starlight

Size of planet

Brightness of planet

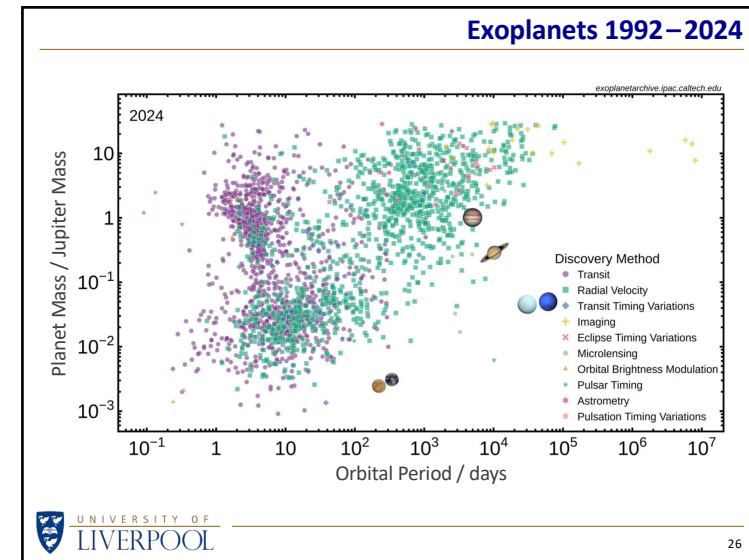
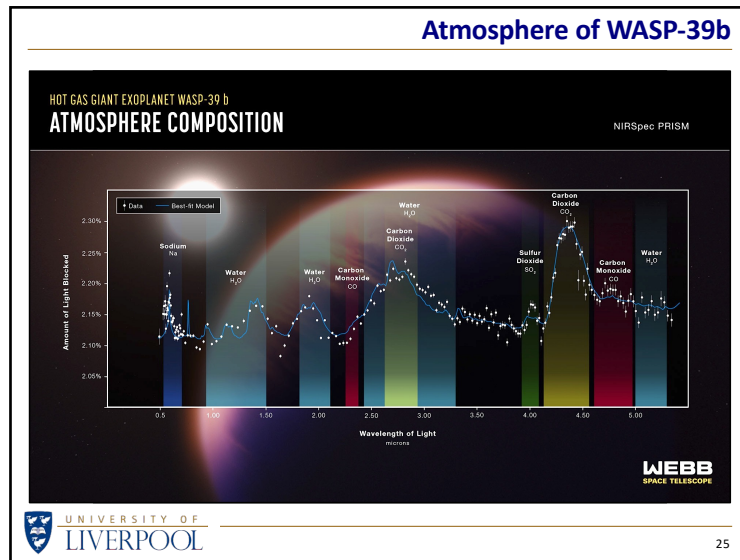
Transit

Eclipse

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## Want To Know More?

NASA Discovery Dashboard:  
[science.nasa.gov/exoplanets/discoveries-dashboard](https://science.nasa.gov/exoplanets/discoveries-dashboard)

NASA Exoplanet Archive:  
[exoplanetarchive.ipac.caltech.edu](https://exoplanetarchive.ipac.caltech.edu)



**PLATO 2026**  
[sci.esa.int/web/plato](https://sci.esa.int/web/plato)



**Roman 2027**  
[roman.gsfc.nasa.gov](https://roman.gsfc.nasa.gov)



**HWO 2040+**  
[habitableworldsobservatory.org](https://habitableworldsobservatory.org)

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# EXOPLANETS

[www.liverpool.ac.uk/~sdb/Talks](https://www.liverpool.ac.uk/~sdb/Talks)



Dr Steve Barrett  
CWCL 7 Aug 2025