

# Extra-Solar Planet Measurements

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# Overview

- Introduction
- Method
- Data
- Future Goals

# Extra-Solar planets

Planets that orbit other stars besides our sun

About 150 known

Mass range: 15 Earth masses to about 1000 Earth masses

# Information

- Size of planet
- Presence of Rings
- Size and temperature of star
- Limb darkening of the star
- Dust near the star
- Moons near planet

# HD209458

- Right Ascension: 22h 03m 10.8s
- Declination 18° 53m 03s
- Magnitude 7.5
- B-V 0.6
- Star type F8

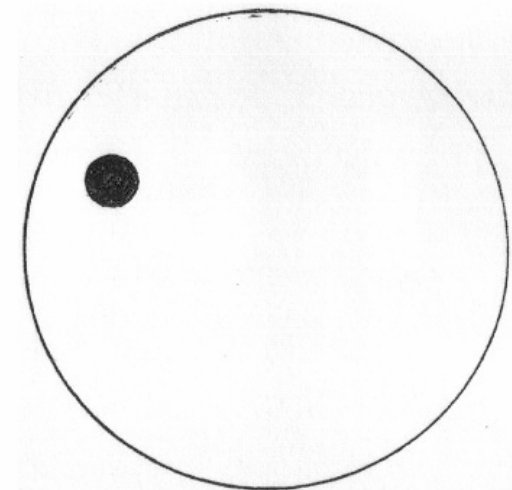
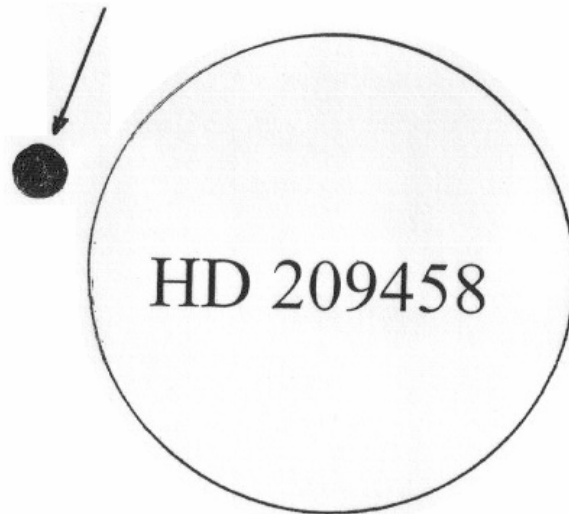
*Hirshfeld et al. (Sky Catalogue 2000.0)*

# Detection

- A planet orbits a star and the star wobbles
- A planet moves in front of the star it is orbiting (Transit)

# Transit of HD 209458 by HD 209458b

HD 209458b



# Method

- Measure comparison star
- Measure star to be transited
- Correct for sky brightness
- Record time
- Repeat top four steps before, during and after the transit

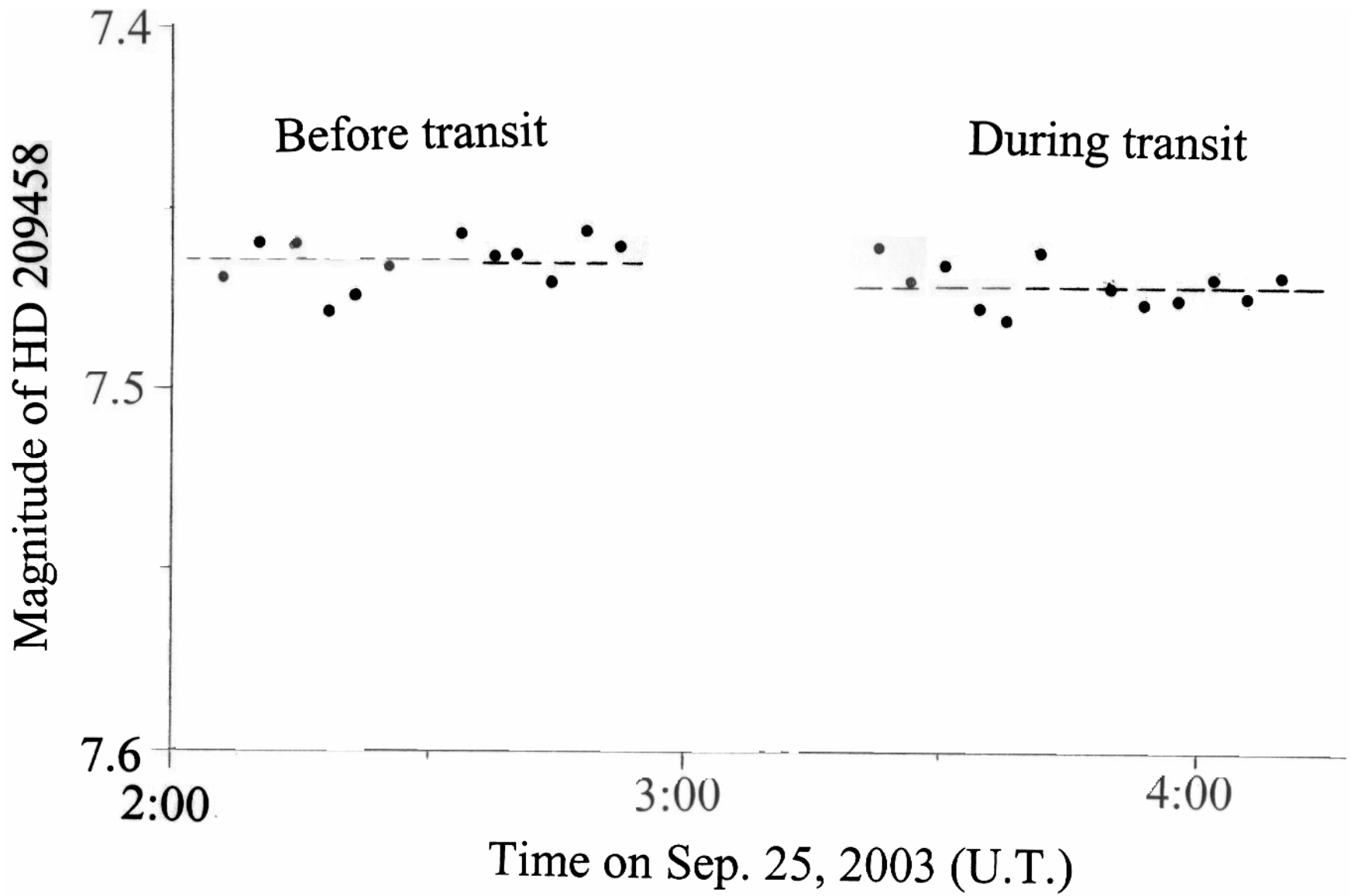


# Recommended instruments

- CCD camera and photometry software
- Photoelectric photometer
- Filters not needed but helpful

# Results

- Jim Fox measured HD 209458 before and during a transit



# Results

- Star dimmed by 0.005 magnitudes; this is lower than the literature value of 0.02 magnitudes
- Jim used a 10 inch telescope and an SSP-3 photometer to collect his data

# Future

- Continue collecting transit data
  - Rings
  - Orbital changes
  - Star/planet changes

# Conclusions

- Amateurs with modest equipment can monitor the transits of extra-solar planets
- Transit timings are useful in learning more about the planet and the star it orbits