# Introduction to Exoplanets!

Exoplanets orbit stars other than our sun. One way of detecting them is by measuring periodic dips in the amount of light received from the host star as the planet 'transits,' or passes in front of it. These measurements are directly and immediately valuable to the scientific community, not only because they give insight into the astrophysics of extrasolar planetary systems, but also because they help NASA astronomers optimize telescope time allocation on coming missions such as the James Webb Space Telescope, Ariel, and Astro 2020 missions.

Dr. Rob Zellem leads Exoplanet Watch, a NASA initiative to collect and analyze exoplanet transit data. He describes the project in this video.

Answer these questions as you watch the video. Turn in your responses on this template.

1) What are some ways of detecting exoplanets? What is the name of the method employed by Exoplanet Watch?

2) Approximately what percent of its host star's light might be blocked by a large exoplanet? What can we deduce from the amount of starlight a planet blocks?

3) What is a "transit midpoint", and what is "normalized flux"? How will the graph below be affected by repeated citizen scientist transit midpoint measurements?
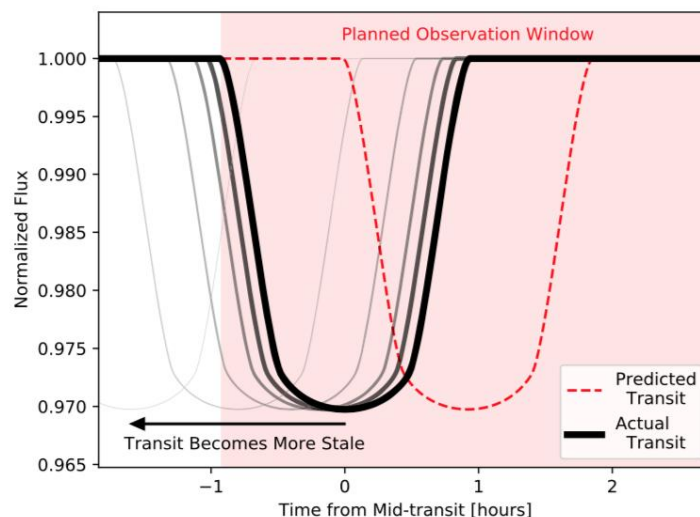

4) What is EXOTIC?

5) Once an exoplanet has been detected and confirmed, what planetary features would NASA be interested in studying?

6) What is Beer's Law and how does it pertain to exoplanet spectroscopy?

7) What factor makes the detection of water in exoplanet atmospheres particularly difficult from the ground versus from space?

8) Is the image below an exoplanet or an eclipsing binary? How can you tell? What are the dips on the far left and right sides?
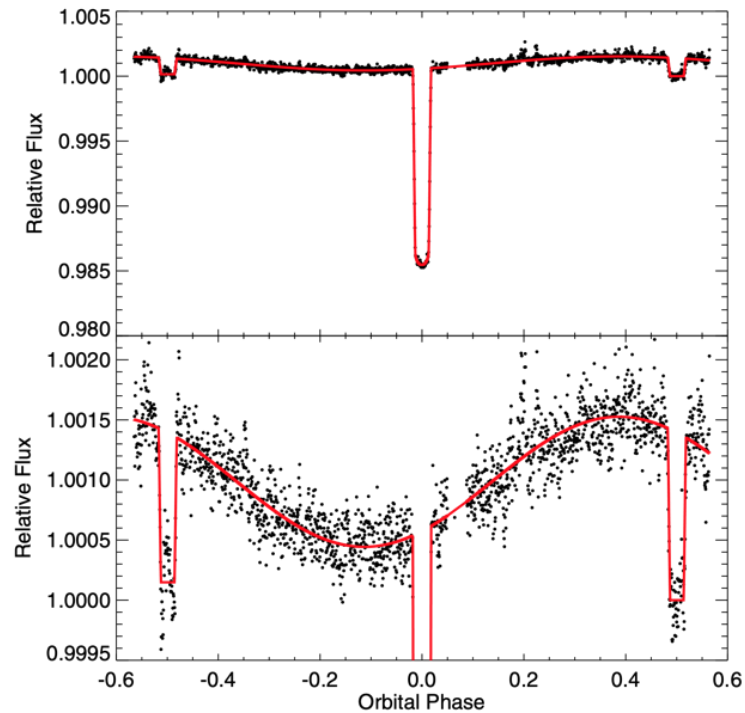
9) What are some advantages of ground-based telescopes for observing exoplanet transits?

10) What planetary atmosphere biosignatures will be the focus of upcoming space telescope missions? What are the names of some of these missions?

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Having watched the video and answered the questions, you are now ready to reduce an exoplanet transit! To "reduce" means to "extract the data of interest" from a large set of images.