

Observing exoplanet atmospheres in the coming decade

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Observations of exoplanets to date have used the Hubble and Spitzer Space Telescopes to reveal exotic exoplanet atmospheres.

Substantial resources have been dedicated to characterizing the handful of planets with radii between Earth's and Neptune's—for which we have no counterparts in the solar system—that are accessible to current telescopes. Observations of their transmission spectra reveal a diversity of worlds, some shrouded in clouds and others with molecular features. I will discuss the types of clouds and hazes that can obscure transmission spectra, and show the effect that these thick hazes have on the thermal emission of small exoplanets. I will discuss some of my plans for new observations during the first cycle of JWST to measure the thermal emission of these planets. The new frontier of exoplanet atmosphere studies is characterizing the atmospheres of planets more familiar to Earthlings: cold gas giants and temperate Earths. I will discuss my current work to reveal the atmosphere of a cold free-floating giant planet, and my plans for detecting a host of interesting molecules in its atmosphere with JWST. Furthermore, we will soon be able to access Earth-sized, temperate worlds for the most favorable 3 systems orbiting the small stars. I will discuss the recent discoveries of Earth-sized planets around bright M dwarfs and how we might use JWST to detect their atmospheres.



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4:00 P.M.

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