INVESTIGATORS

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<thead>
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<tbody>
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</tr>
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OBSERVATIONS

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<tr>
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<th>Observation</th>
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<th>Observing Template</th>
<th>Science Target</th>
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<tr>
<td>1</td>
<td>HD80606b</td>
<td>NIRSpec Bright Object Time Series</td>
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ABSTRACT

Clouds are found on all Solar System planets with substantial atmospheres and are likely prevalent amongst most exoplanets as well. Although it is clear that clouds have a significant impact on observations of exoplanetary atmospheres, our understanding of the fundamental cloud physics that dictate their compositions, particle sizes, and formation/dissipation timescales is relatively poor. We are proposing to use NIRSpec to observe the eclipse and periapse passage (~18 hrs) of HD80606 b, a hot Jupiter characterized by one of the highest eccentricities (e=0.93) of any known
exoplanet, in order to study cloud dynamics. The planet's atmosphere undergoes dramatic temperature changes as it approaches periapsis (from <500 K to ~1400 K) and, as a result, the distribution of clouds is expected to vary rapidly due to evaporation/sublimation. The observations will place important constraints on cloud composition and condensation predictions as well as formation/dissipation timescales. The high brightness and extreme eccentricity of HD80606 b makes it an ideal laboratory for studying cloud dynamics and cloud properties as a function of incident radiation; the proposed observations have the potential to provide future atmospheric characterization studies with a powerful means by which "cloud-free" targets can be accurately identified.

OBSERVING DESCRIPTION
This proposal involves using NIRSpec to observe the eclipse and periapse passage of the highly-eccentric hot Jupiter, HD80606b. The observations will use the G395H/F290LP grating-filter combination (2.87-5.18 microns) and will span a period of 18 hrs encompassing the eclipse and periapsis.
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Proposal 2488 - Observation 1 - Real Time Exoplanet Meteorology: Direct Measurement of Cloud Dynamics on the High-Eccentricity ...