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### Citation

Kesseli, A., & Snellen, I. A. G. (2022). Mapping weather on WASP-76b with high-resolution transmission spectroscopy. *Bulletin Of The American Astronomical Society*, (5), 102.184. Retrieved from <https://hdl.handle.net/1887/3561964>

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**Note:** To cite this publication please use the final published version (if applicable).

**Bulletin of the AAS • Vol. 54, Issue 5**

# **Mapping weather on WASP-76b with high- resolution transmission spectroscopy**

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**Published on:** Jun 20, 2022

**URL:** <https://baas.aas.org/pub/2022n5i102p184>

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Ultra-hot Jupiters (UHJs) are gas giant planets like Jupiter that orbit so close to their host star that they are tidally locked, causing a permanent hot dayside and a cooler cloudy nightside. The atmospheres of UHJs can be uniquely probed using high-resolution transit transmission spectroscopy by resolving time dependent velocity shifts as the planet rotates and varying areas of the evening and morning terminator are probed. These velocity shifts were seen for the first time in iron absorption from WASP-76b. In this talk I will present our comprehensive search for other atoms and ions in WASP-76b's transmission spectrum and how we can use these detections to probe condensation and cloud formation across the surface of the planet. Finally, I will discuss a novel method to resolve the atmospheric wind structure as a function of altitude, and our subsequent application to the high-resolution observations of WASP-76b. Together, the results presented here are a step towards a complete picture of weather on this exotic class of exoplanet.