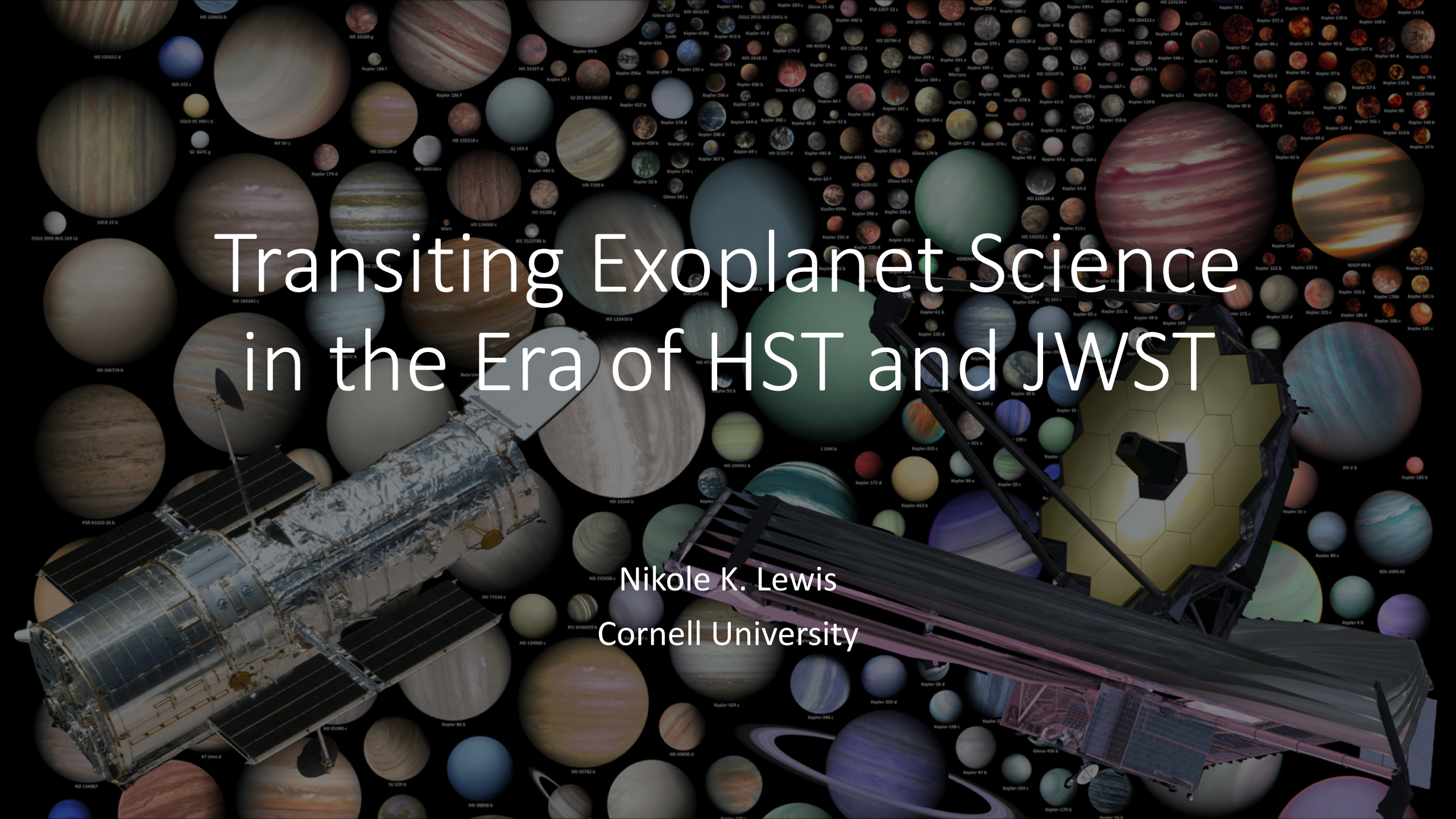
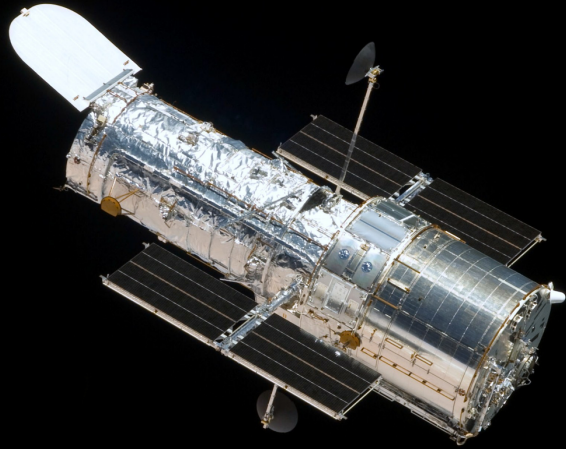


Transiting Exoplanet Science in the Era of HST and JWST

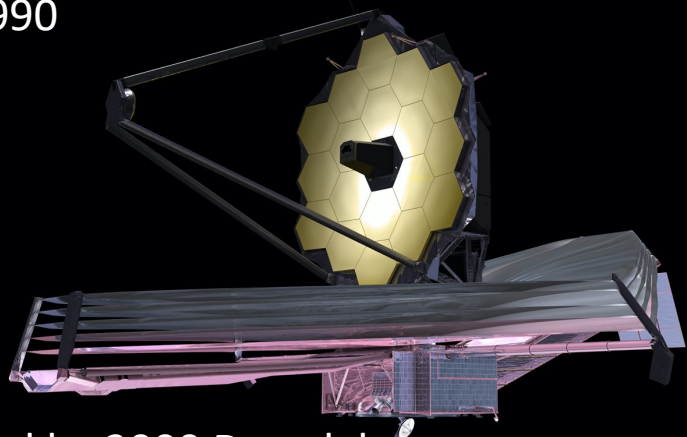
Nikole K. Lewis
Cornell University



Transiting Exoplanet Science was not originally envisioned as a core capability of *Hubble* or *Webb*...



Recommended/Approved in 1970's
Launched in 1990



Recommended by 2000 Decadal
Launch set for 2021



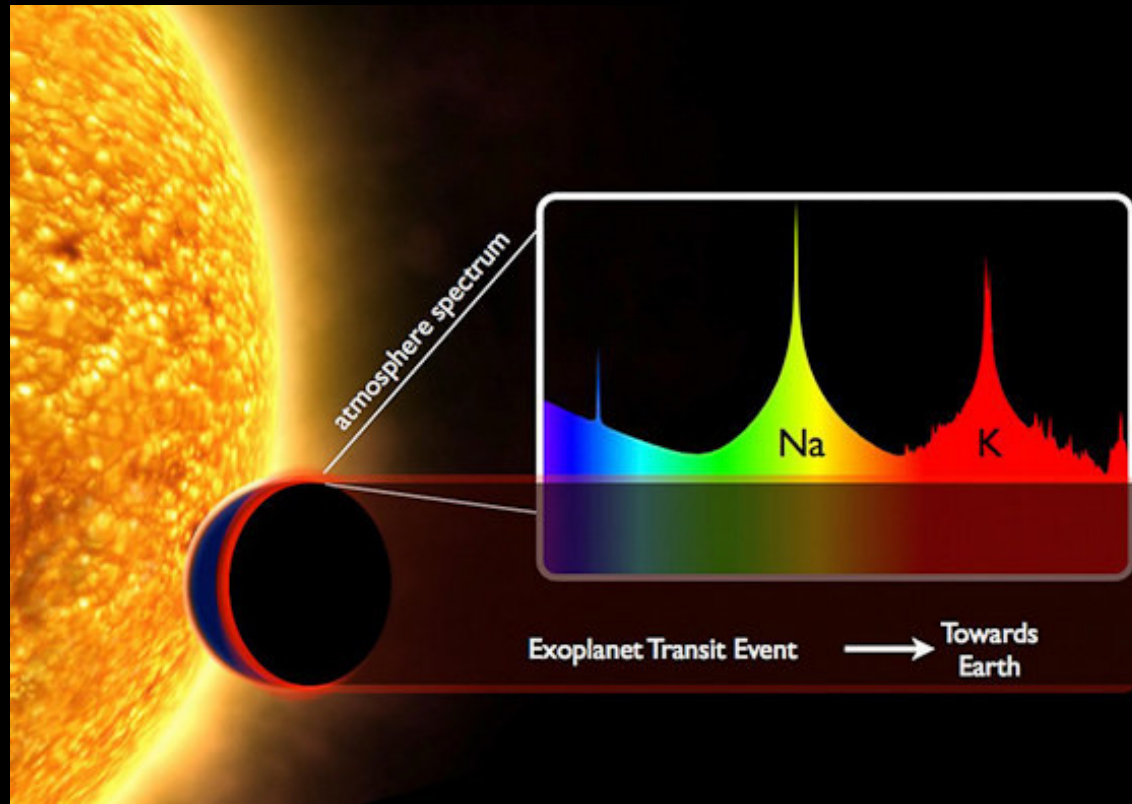
1992 - First Exoplanets
Discovered

1995 - First Exoplanet
Around Sun-like Star
Discovered

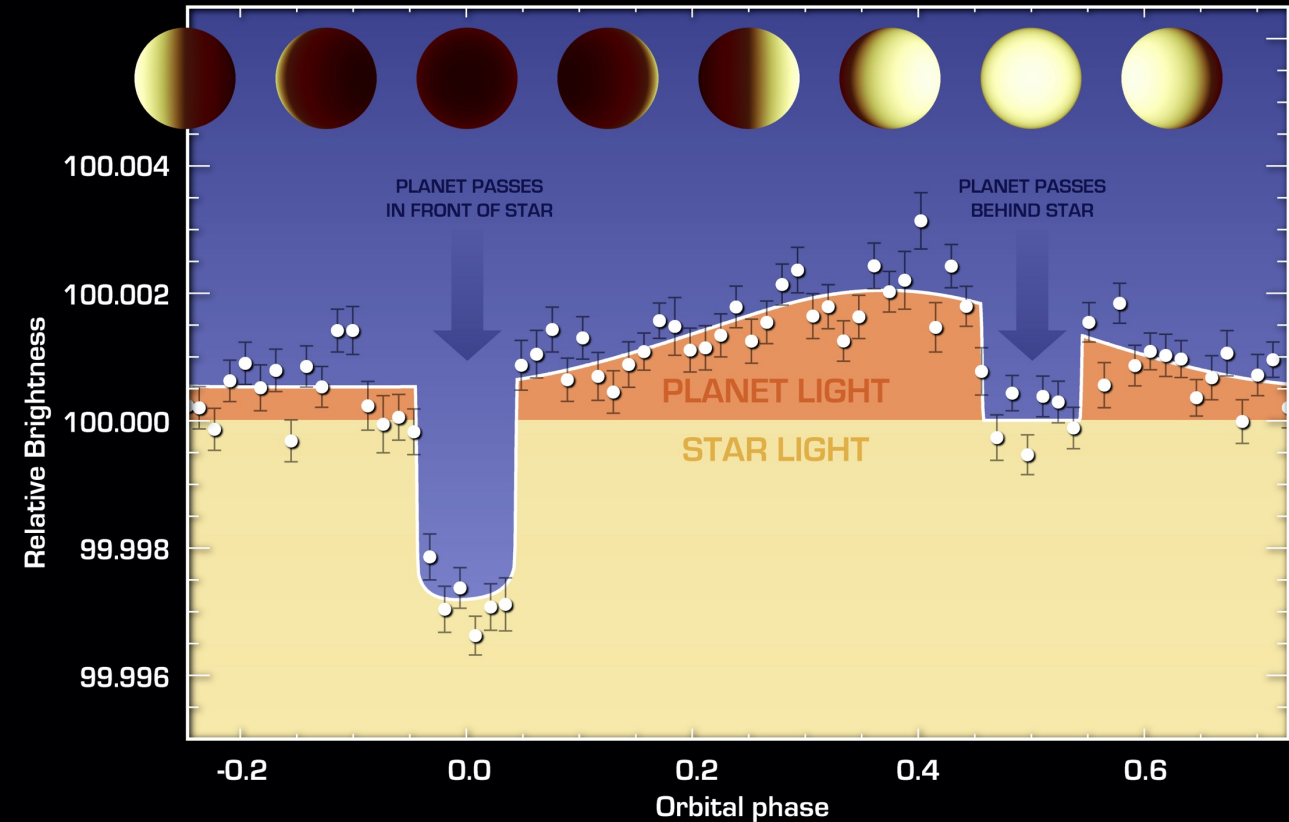


2000 – First Exoplanet
Transit Detected

Transiting exoplanets offer a wealth of opportunities for further characterization

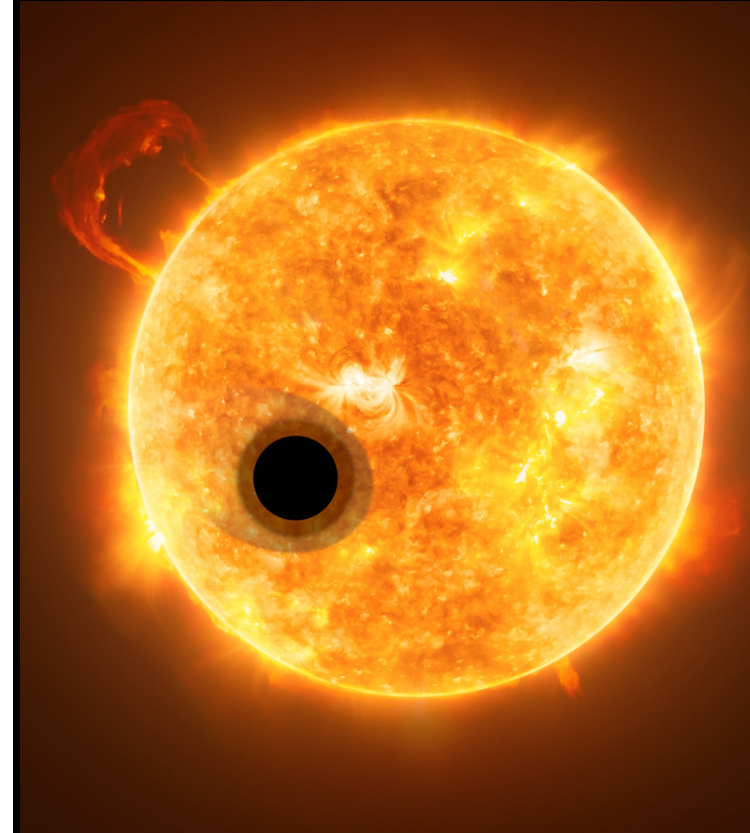
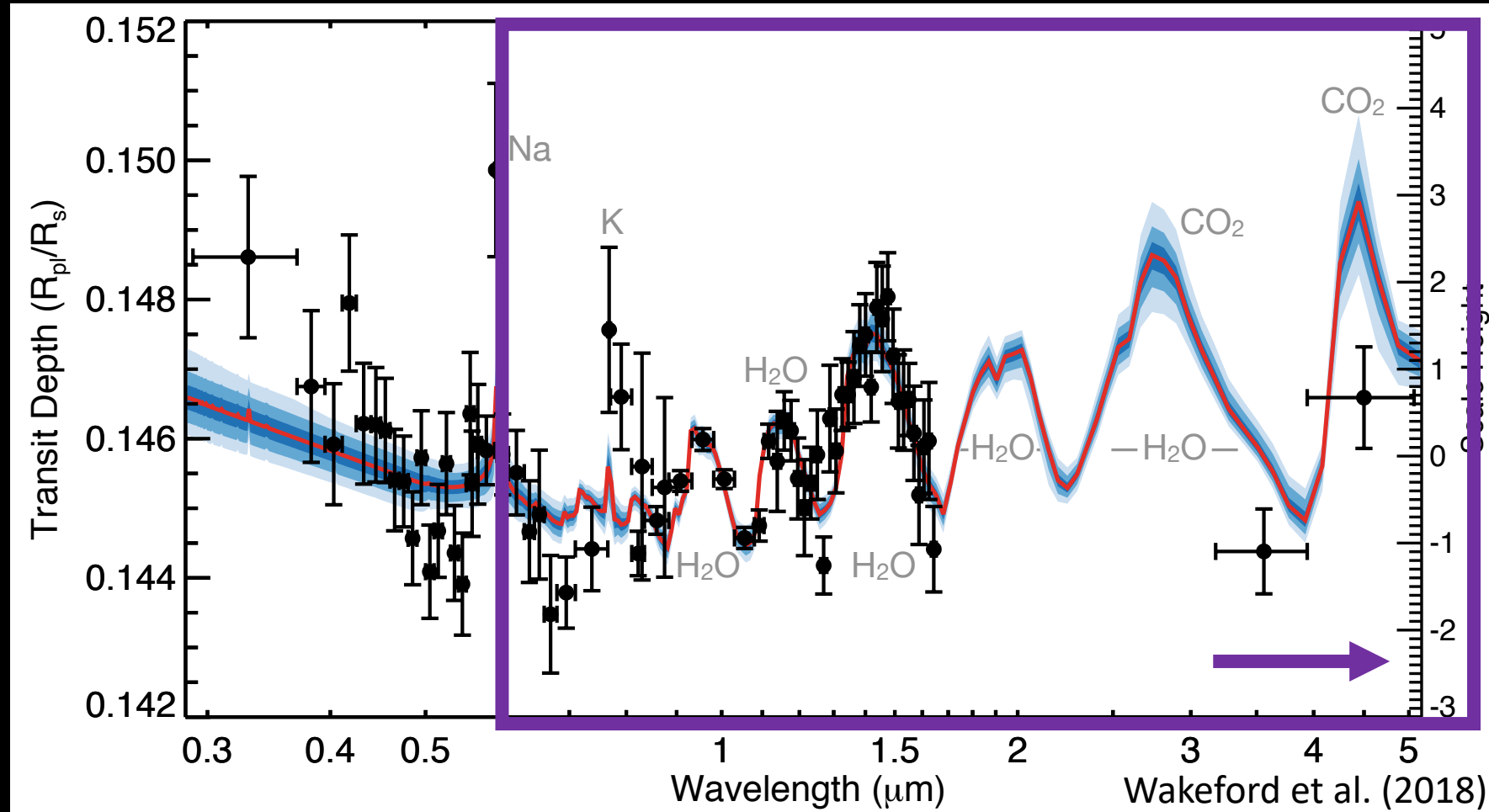


Atmospheric Transmission

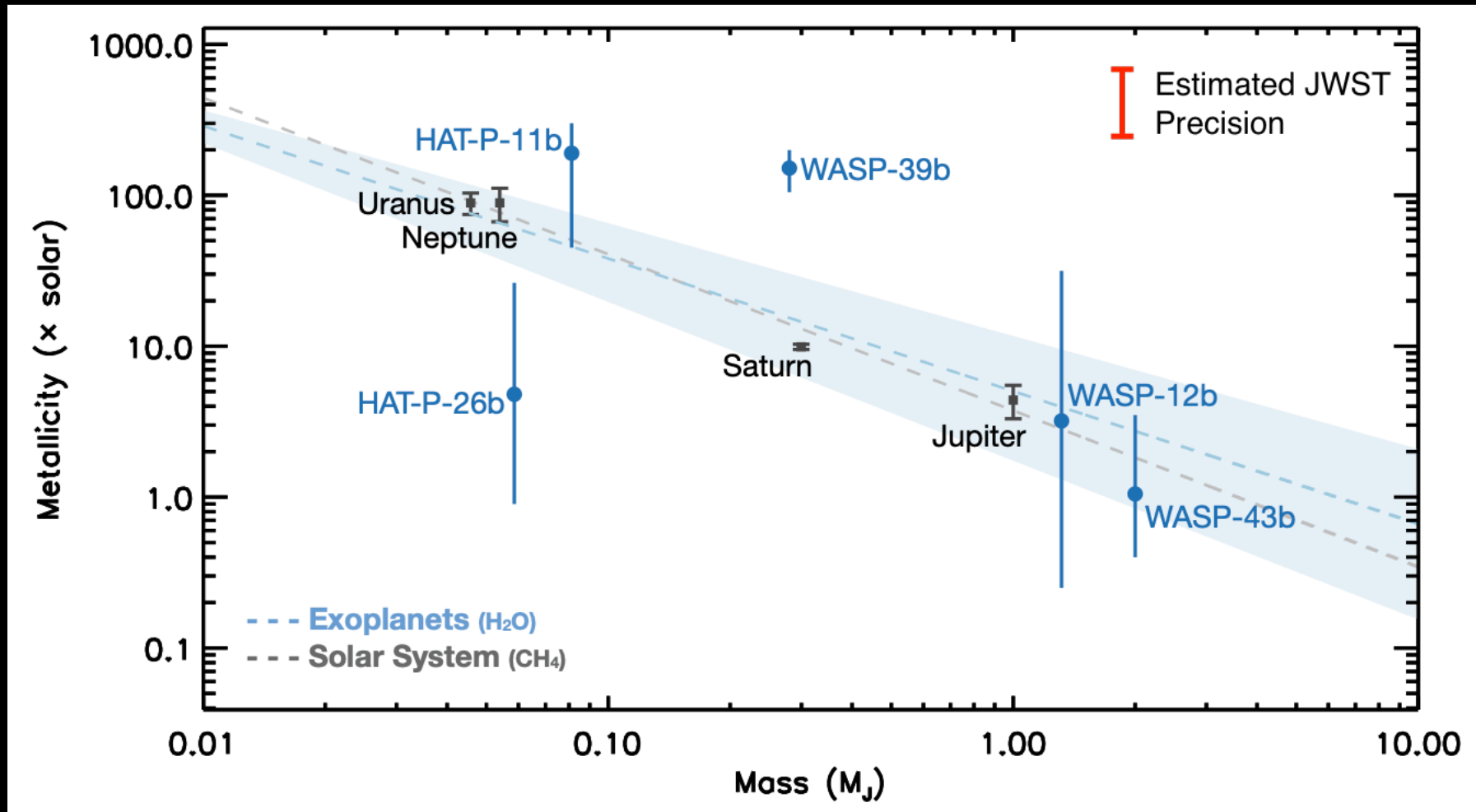


Thermal Emission and Reflected Light

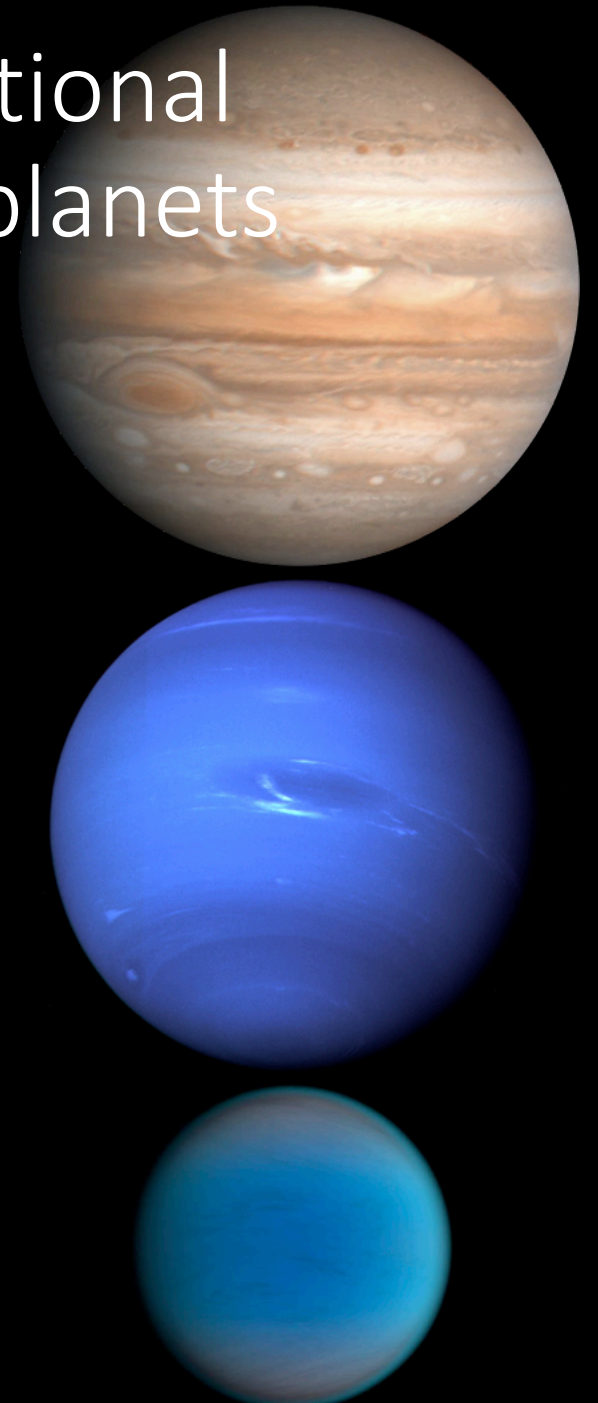
Hubble is currently the only space-based facility that provides spectroscopic capabilities for exoplanet characterization studies



Webb+Hubble will provide precise compositional information for a large sample of giant exoplanets

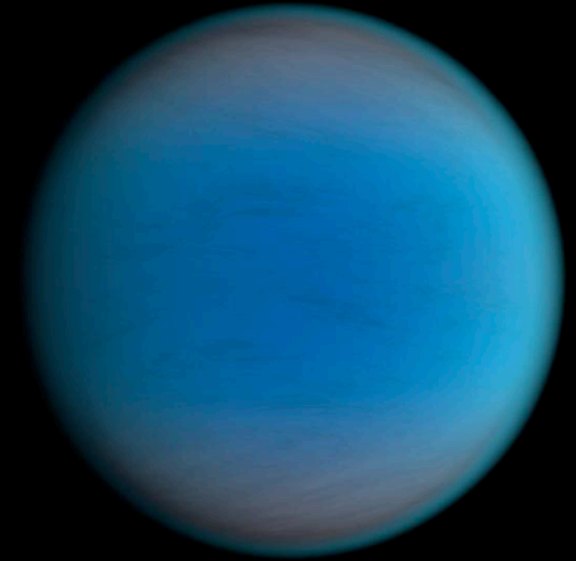
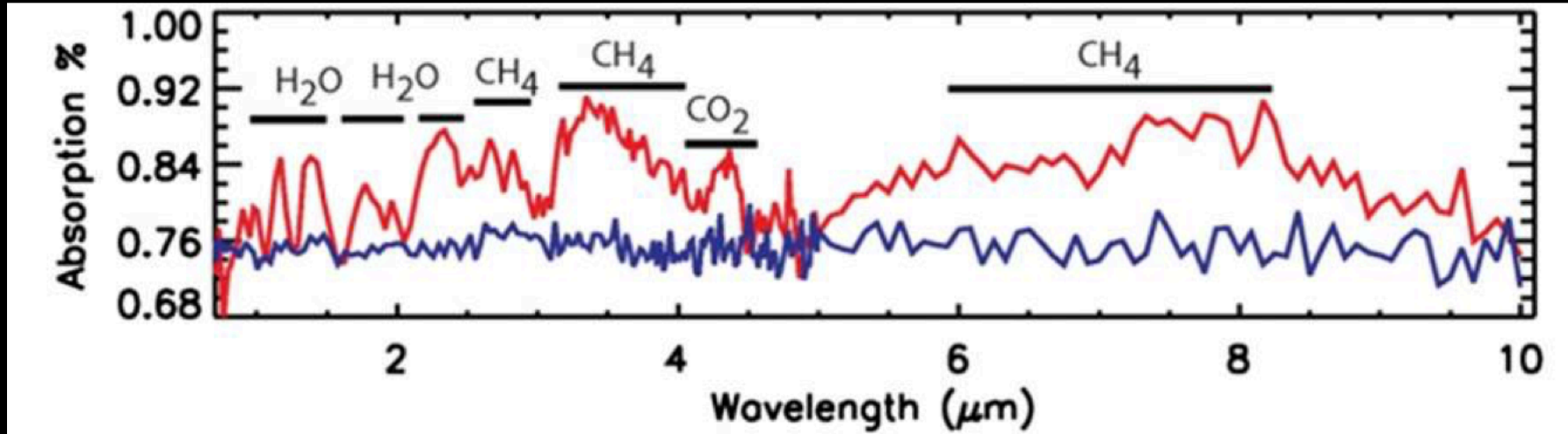


Wakeford et al. (2018)
Greene et al. (2016)



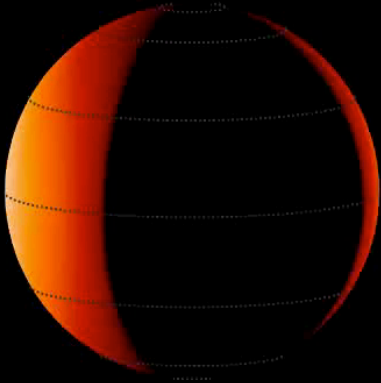
Webb will provide our (nearly) first opportunity to obtain spectra of close-in exoplanets in the IR

Beichman et al. (2014)

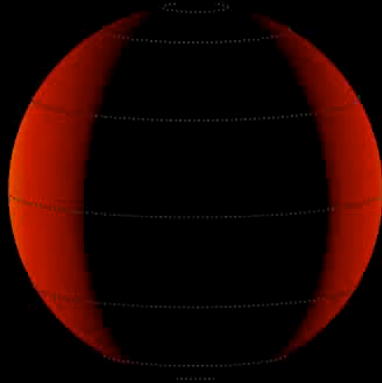


Brightness Temperature Maps

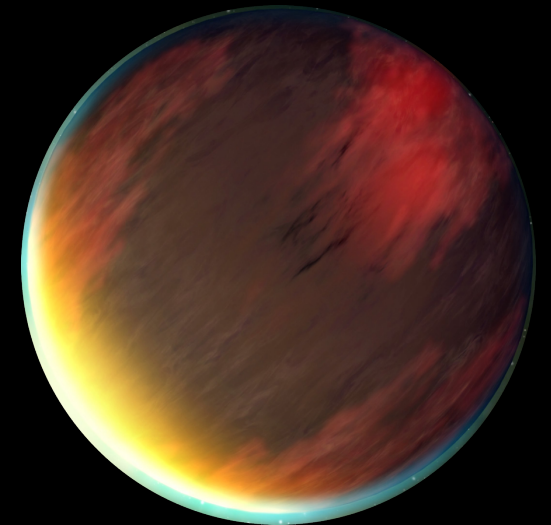
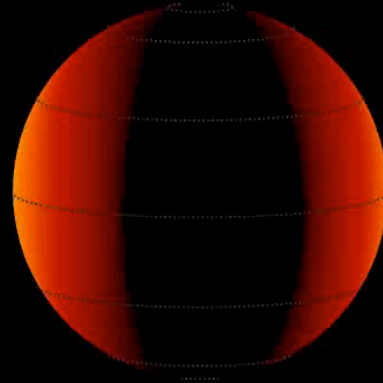
1.21 μm



1.42 μm

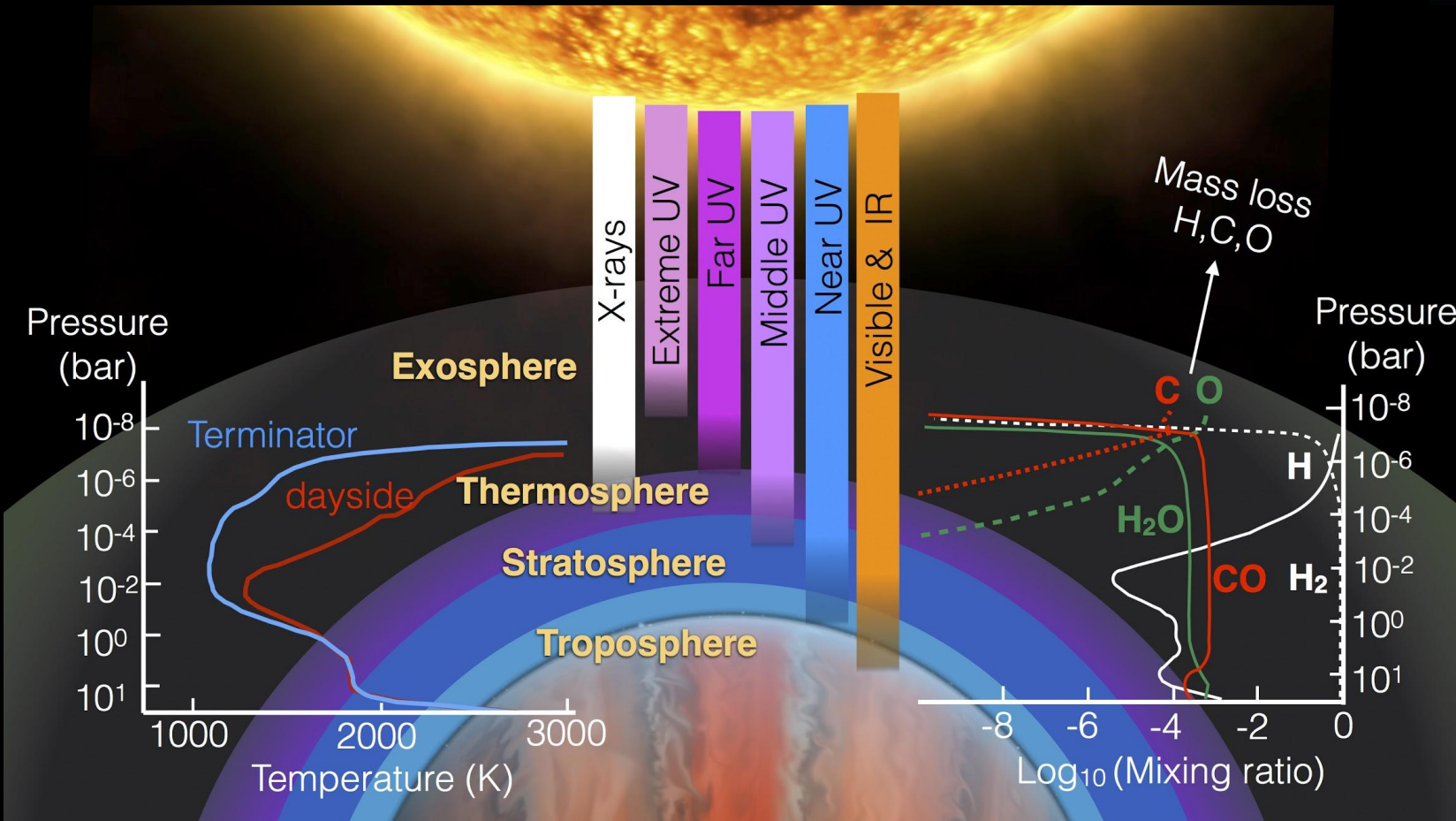


1.63 μm



K. B. Stevenson (2014)

Hubble will provide our only access to UV and NUV wavelengths critical for understanding atmospheric chemistry and evolution

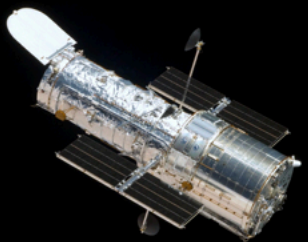
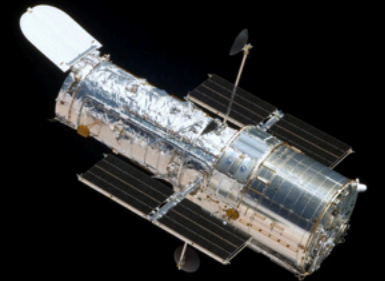
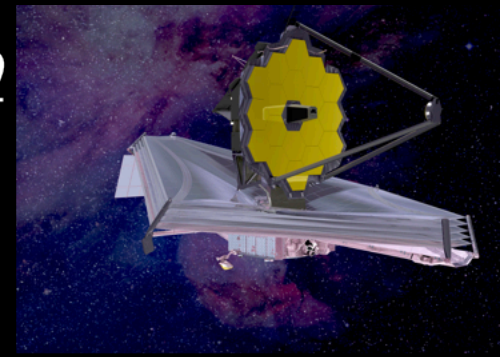


Credit: Mercedes Lopez-Morales



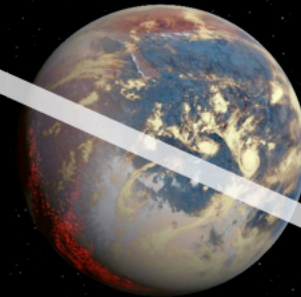
In the era of *Hubble* & *Webb*

Potential for >300 Exoplanets
with Characterization
Observations



In the era of *Hubble* & *Spitzer*

>100 Exoplanets with
Characterization Observations



Webb+Hubble will provide a holistic view into potentially habitable worlds

