The interaction of surface albedo and star type plays a strong role in planet habitability with 1D modeling

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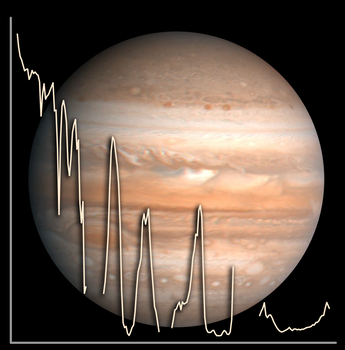
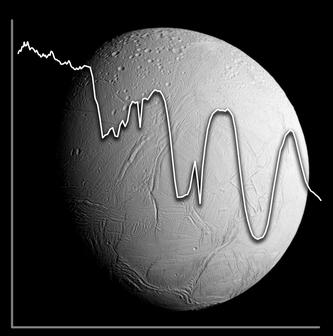
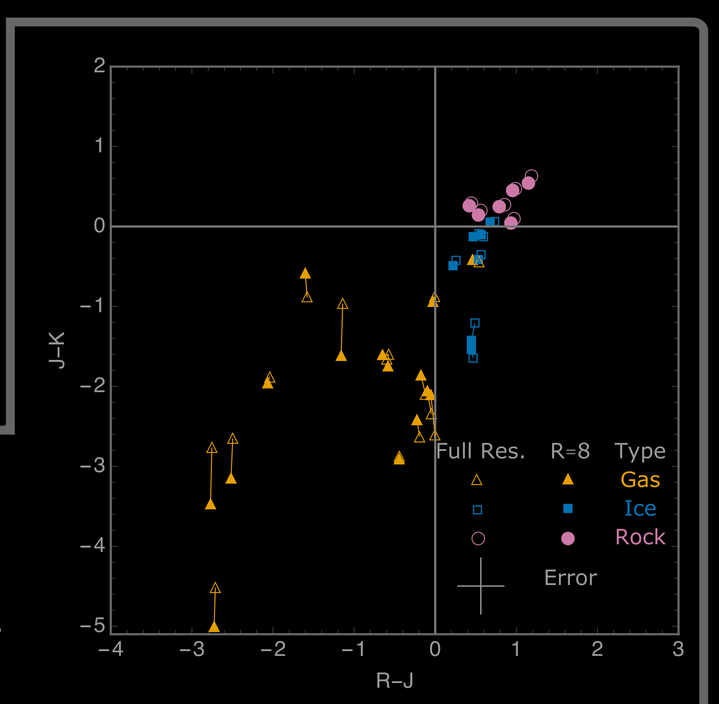


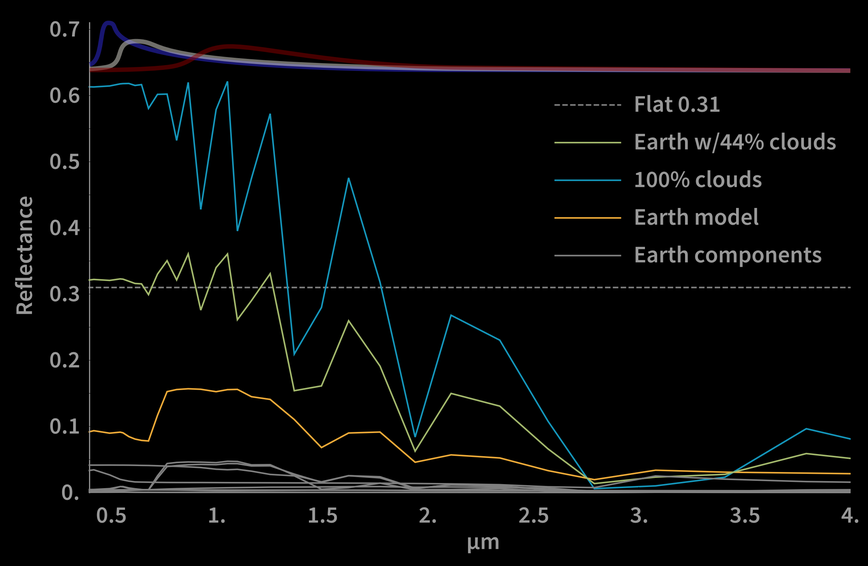
Our own Solar System contains a wide range of rocky, icy, and gaseous objects that can be used as a reference catalog for comparison against exoplanet observation. We've shown how our spectral reference catalog of 19 Solar System objects can be used to initially characterize different surface types using color filters.

Using a wavelength dependent surface albedo, we also explore the changes of a planetary environment for different surfaces around different stars and create a database of high resolution spectra for biosignature observability reference. The feedback between planetary surfaces and climate is critical to understand the possible environments on potentially habitable worlds.

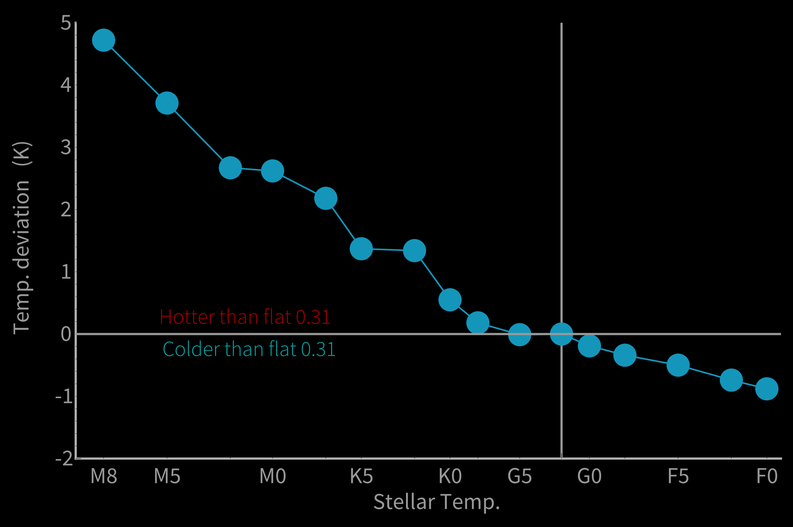


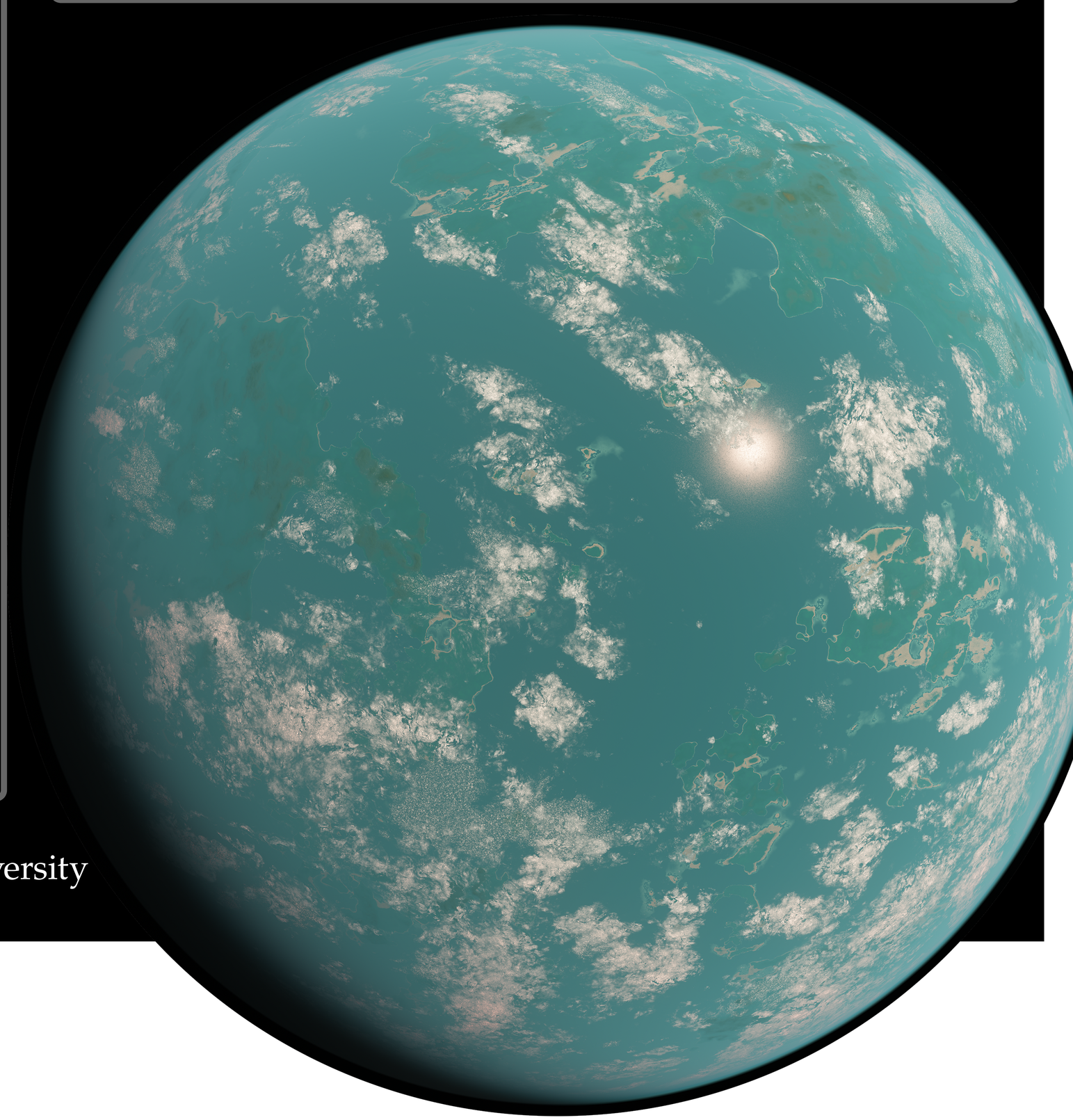


- Calculated albedos for 19 Solar System objects can distinguish surfaces between gas, ice, and rock with simple color data.
- Can be used to characterize exoplanets with future reflectance data.



- The standard method of using a single value for surface albedo doesn't hold up when modeling planets around different stars.
- Surface temperature for an Earth-like planet can differ significantly around M and F stars when using a wavelength dependent albedo vs a single vlaue.





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