THE EXOPLANET ZOO: A CATALOGUE OF MODELED AND OBSERVED SPECTRAL DATA FOR UPCOMING EXOPLANET CHARACTERIZATIONS. Shayna A. Hume[1, 2], Victoria S. Meadows[3,4], Aki Roberge[5], Tyler D. Robinson[3,6], and Shawn D. Domagal-Goldman[3,5], [1]University of Miami, Miami, FL 33124, USA, [2]Center for Research and Exploration in Space Science & Technology, University of Maryland, College Park, MD 20742, USA, [3]Virtual Planetary Laboratory, University of Washington, Seattle, WA, 98195-1580, USA, [4]Astronomy Department, University of Washington, Seattle, WA 98195-1580, USA, [5]NASA Goddard Space Flight Center, 8800 Greenbelt Road, Greenbelt, MD 20771, USA, [6]NASA Ames Research Center, MS N245-3, Moffett Field, CA 94035, USA

Abstract: A series of exoplanet characterization missions have either recently been or are about to be studied. Examples of such missions include ATLAST, Exo-C, Exo-S, JWST, WFIRST-C, and a future direct imaging flagship mission [1-4]. Yield simulators are in place to compare the number of observations enabled by each of these various missions [6]. However, in order to compare the quality of those observations, there is a need for a library containing a variety of planetary spectra. Additionally, such a catalogue, or "Exoplanet Zoo," could be useful for future exoplanet modeling and other theoretical studies that will attempt to compare spectral characteristics.

We will show the preliminary data available in the Exoplanet Zoo in this presentation. Many of the spectra are already available, from either past observations or through published simulated spectra. We will utilize the spectra to demonstrate the types of observations expected from different exoplanet missions, including ATLAST, Exo-C, Exo-S, and, WFIRST.

Observational spectra in the the first version of the catalogue will include modern Earth, Jupiter, Neptune, Saturn, Mars, and Venus. It will also include simulated spectra of alternate or past versions of planets, including pre-anthropogenic, Proterozoic, snowball, and Archean Earth. Finally, it will include generalized simulations of planets such as abiotic planets with abiotic photochemical sources O_3 and O_2. These spectra will all come from papers in the peer-reviewed literature. When available, these spectra will be shown for both direct imaging and transit observations.

Finally, we will discuss our plans for publishing the zoo on the Virtual Planetary Laboratory's website (http://depts.washington.edu/naivpl). This website already has a suite of community tools, including a library of spectra of stars (including the Sun through time), and observationally-validated high-resolution model spectra of modern-day Earth. We will be expanding these libraries in this work to include a wider variety of planets. We also have intentions to expand the capabilities of the library so that users can better search, sort, and bin the data through the web interface. We will be seeking feedback from the astrobiology community on the best formats and features for this online repository.

Figures:

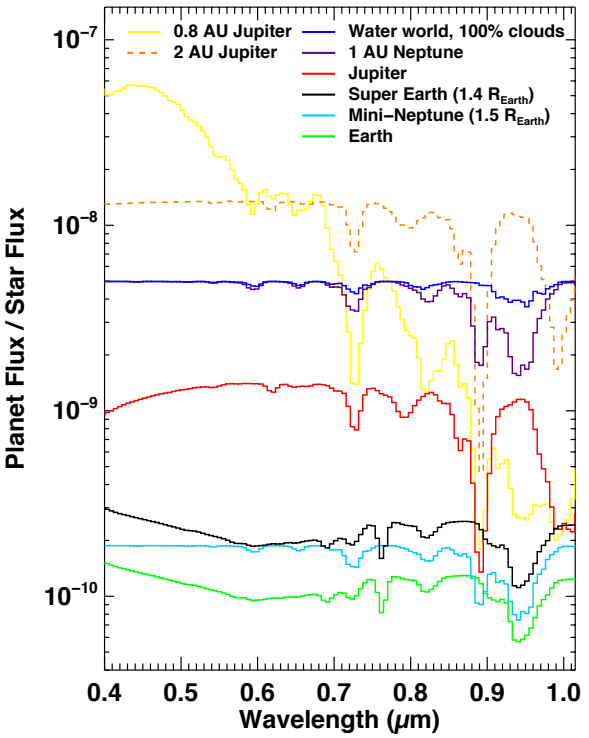

Fig. 1: Preliminary version of the exoplanet zoo, prepared by Aki Roberge for the Exo-S science and technology definition team [3].

References:

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