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Mega-MUSCLES: A treasury of X-ray to IR SEDs of M-dwarfs for community use.

Cynthia Froning, Kevin France, Allison Youngblood, Girish Duvvuri and the Mega-MUSCLES Collaboration.

Mega-MUSCLES (Measurements of the Ultraviolet Spectral Characteristics of Low-mass Exoplanetary Systems) is a large HST/XMM/Chandra project producing Spectral Energy Distributions (SEDs) of a representative sample of M dwarfs, covering a wide range of stellar mass, age, and planetary system architecture.

Mega-MUSCLES combines observations with model spectra to produce SEDs covering ~5 Å-10 µm . Updates from the MUSCLES techniques include DEM modeling in the EUV, replacement of low S/N UV data with semi-empirical models and the latest PHOENIX optical-IR spectra.

Our completed SEDs will be available as a community resource, with the aim that a close MUSCLES analogue should exist for most M dwarfs of interest.

Mega-MUSCLES target list:

- ★ GJ 729 -- M3.5
- ★ TRAPPIST-1 -- M8
- ★ GJ 676 A -- M0
- ★ GJ 649 -- M1.5
- ★ GJ 674 -- M3
- ★ GJ 163 -- M3.5
- ★ GJ 699 -- M4
- ★ L 980-5 -- M4
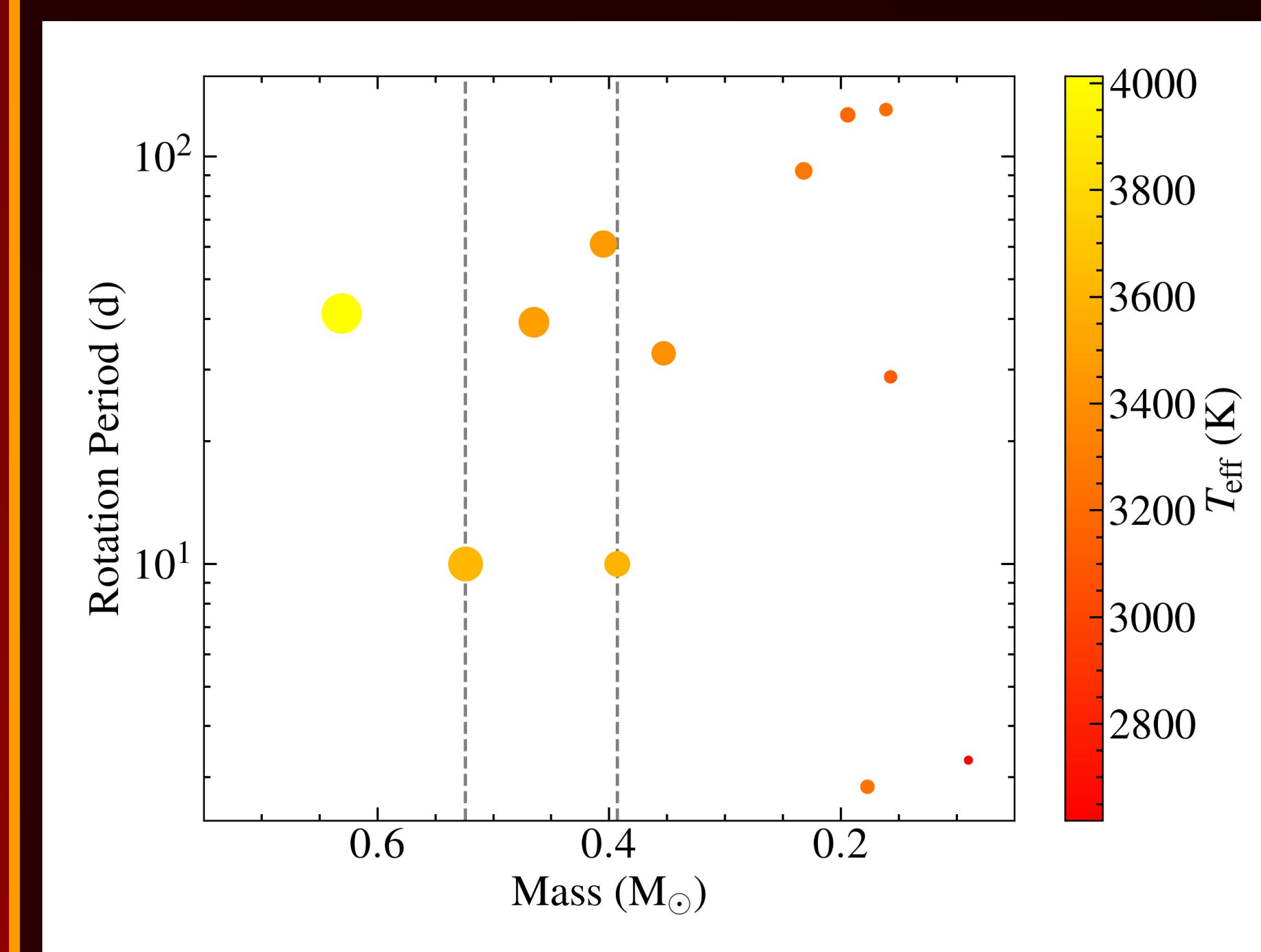- ★ LHS 2686 -- M5
- ★ GJ 1132 -- M4
- ★ GJ 15 A -- M1

SEDs will be uploaded to the MAST High Level Science Products in coming months

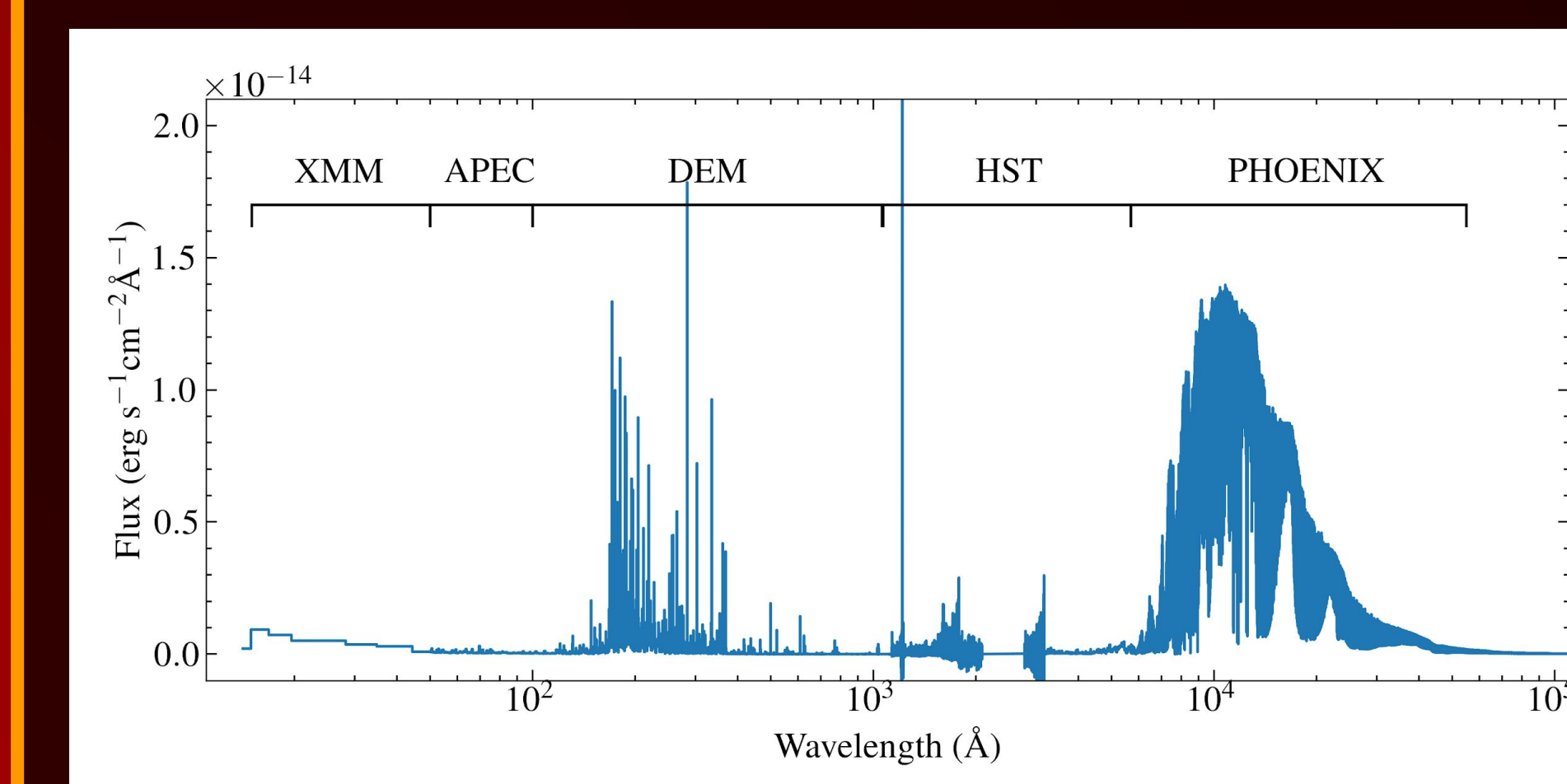If your favourite star is on the target list, let me know and we'll do that one first!
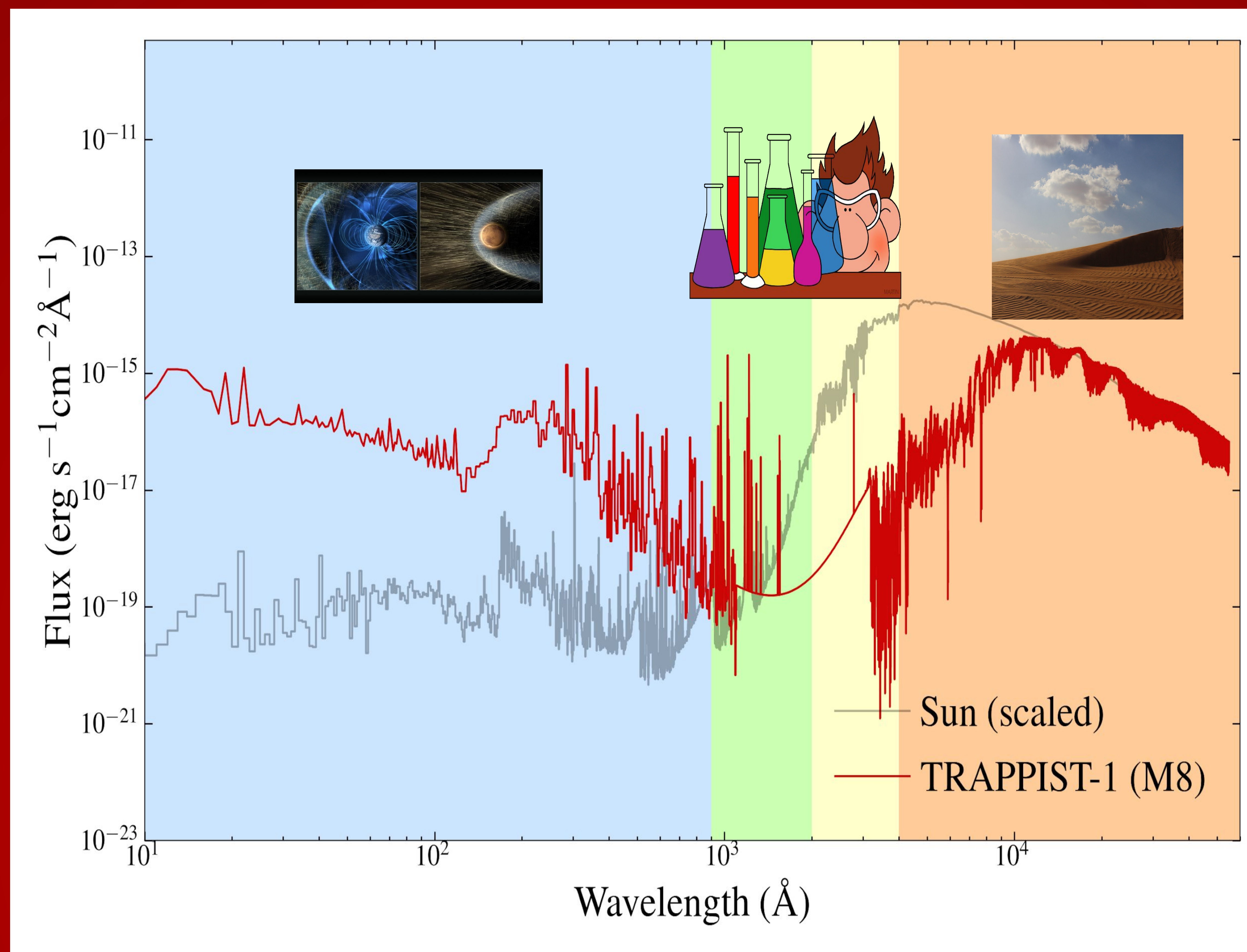
See Wilson et al. and Duvvuri et al. on arXiv! Mega-MUSCLES SED of TRAPPIST-1 available here.

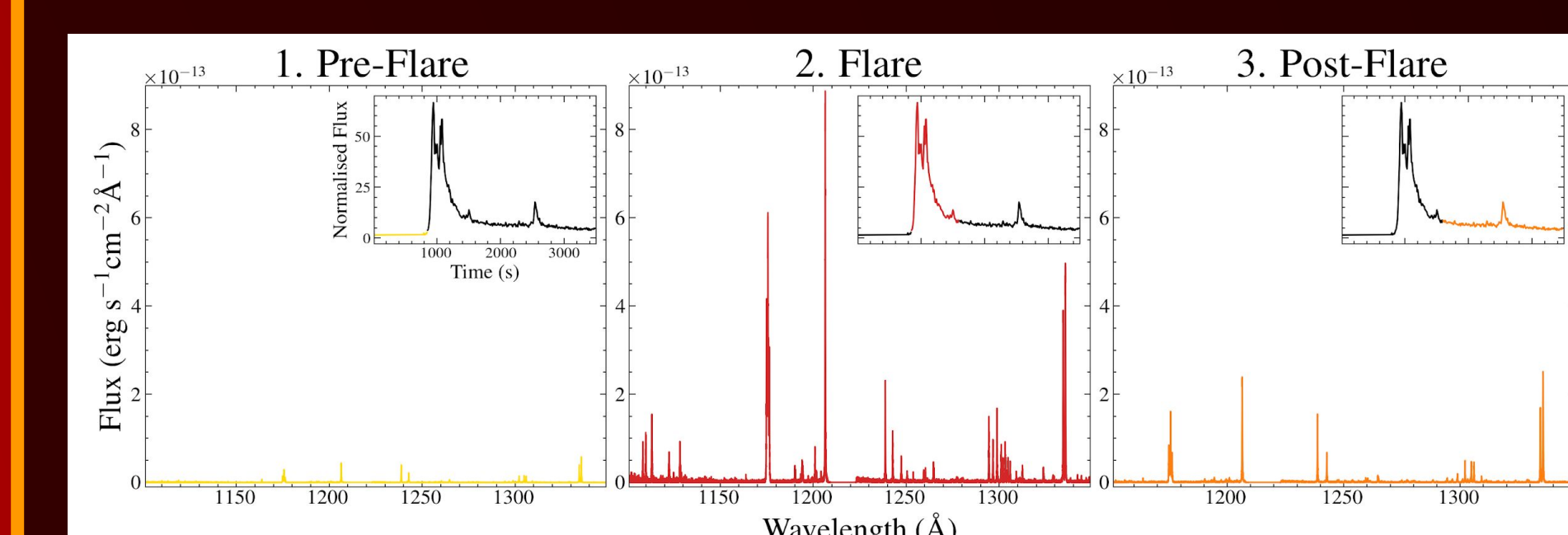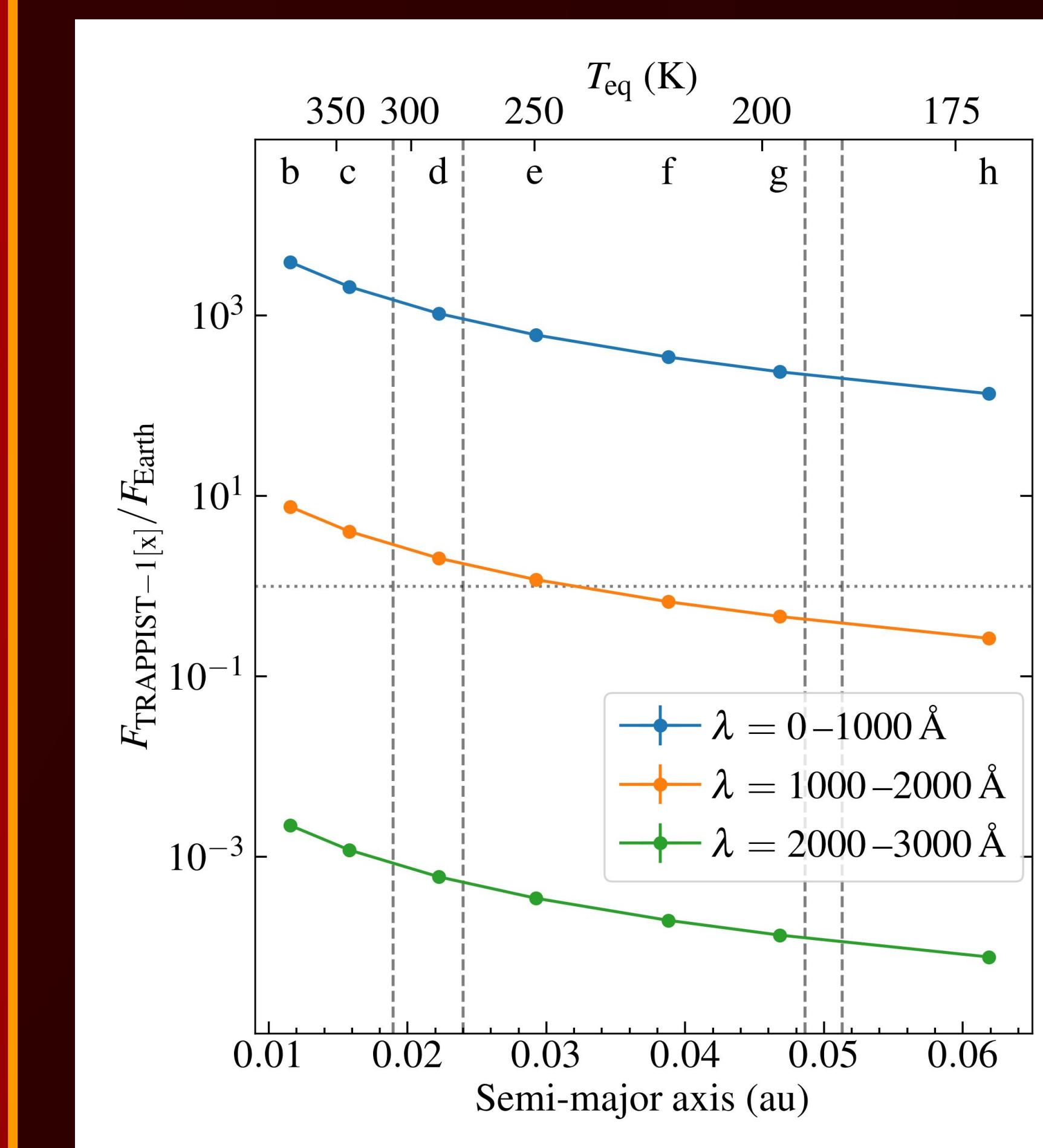Mega-MUSCLES target properties.

SED of TRAPPIST-1 showing data sources.

Photon-counting observations allow time-resolved (~100s) spectroscopy of stellar flares. Flares are detected at multiple targets and wavebands.

Integrated flux received by the TRAPPIST-1 planets compared to Earth.