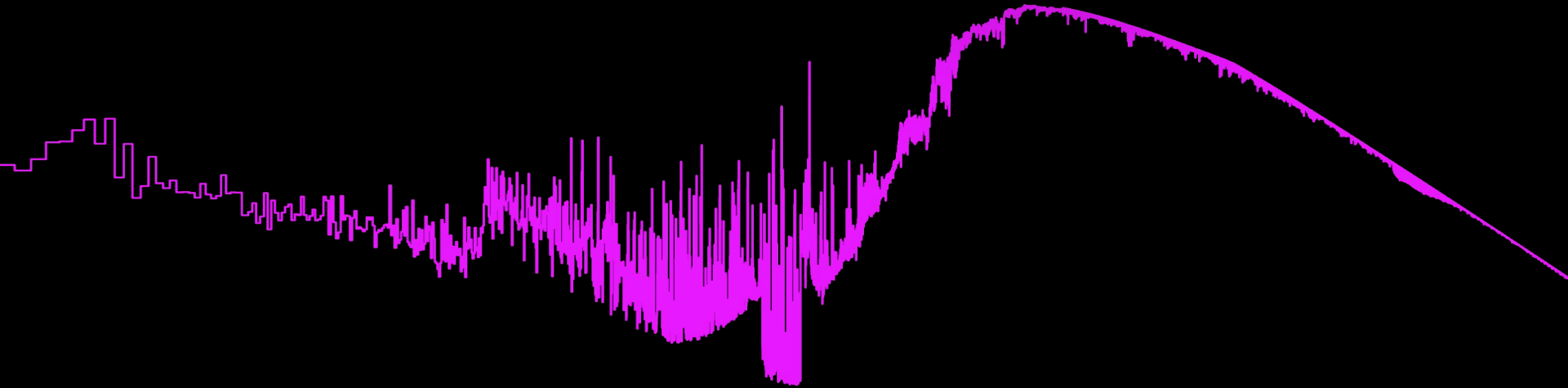


# Ultraviolet and X-ray Characterisation of Exoplanet Host Stars



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# Many people helped

## MUSCLES+

Kevin France, Cynthia Froning, Allison Youngblood, Girish Duvvuri, Christian Schneider, Alex Brown, Bella Longa, Parke Loyd, Patrick Behr, Sebastian Pineda, Yamila Miguel, Zach Berta-Thompson, Andrea Buccino, Jeffrey Linsky, Elisabeth Newton, Seth Redfield, Aki Roberge, Sarah Rugheimer, Mariela Vieytes, Jacob Bean, Eliza Kempton, Lisa Kaltenegger

## HWO task group

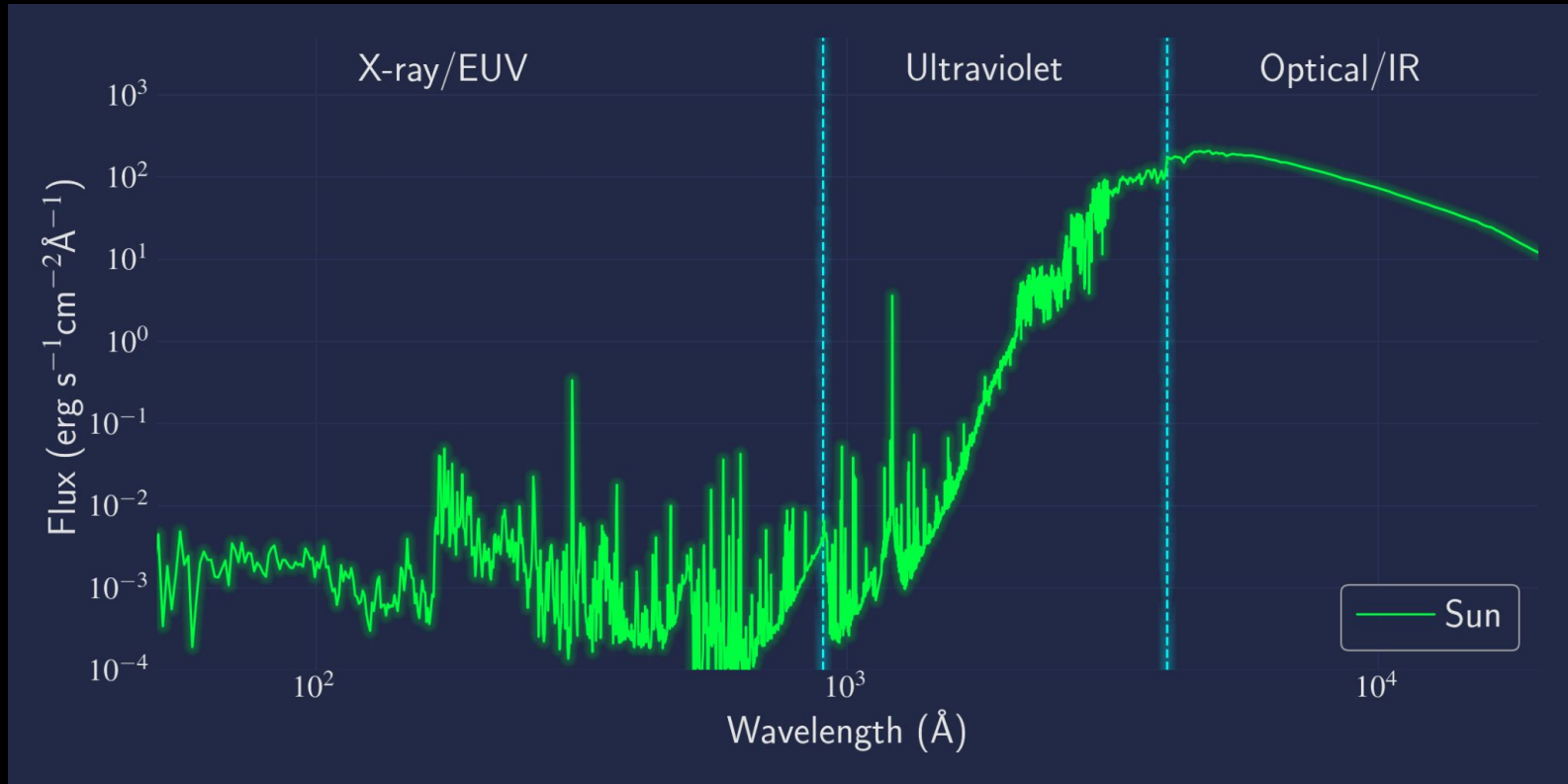
Sarah Peacock, Tyler Richey-Yowell, Noah Tuchow, José Caballero, Fallon Taylor, Riccardo Spinelli, Aiden Zelakiewicz, Lia Corrales

## MANTIS

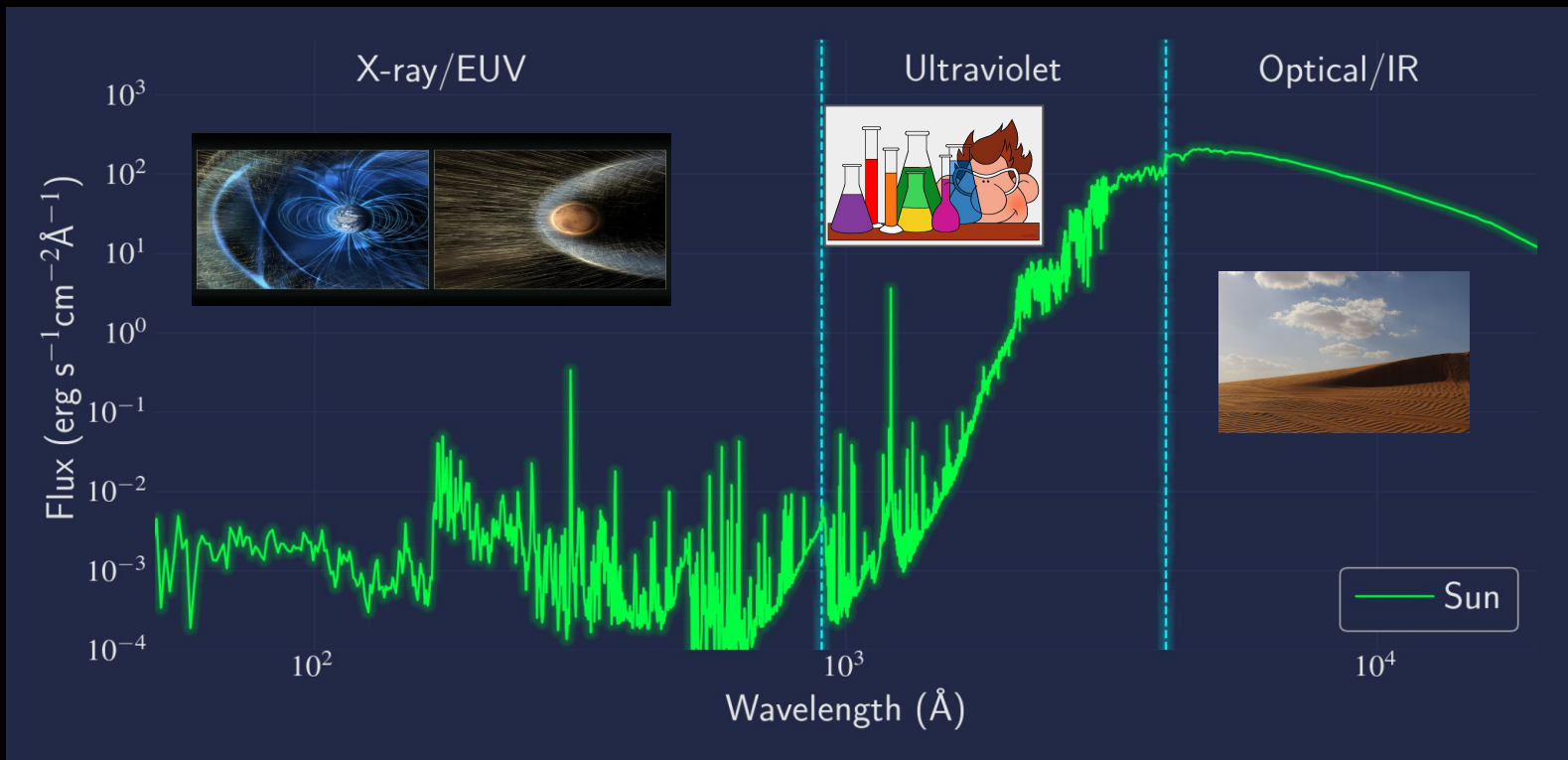
Briana Indahl, Brian Fleming, Tommi Koskinen, Nestor Espinoza, Marta Civitani, Giovanni Pareschi, Giancarlo Ghirlanda, Francesco Borsa, Davide Fedele, Brunella Nisini, Juan Manuel Alcala, Ignazio Pillitteri

I am not responsible for any of the acronyms

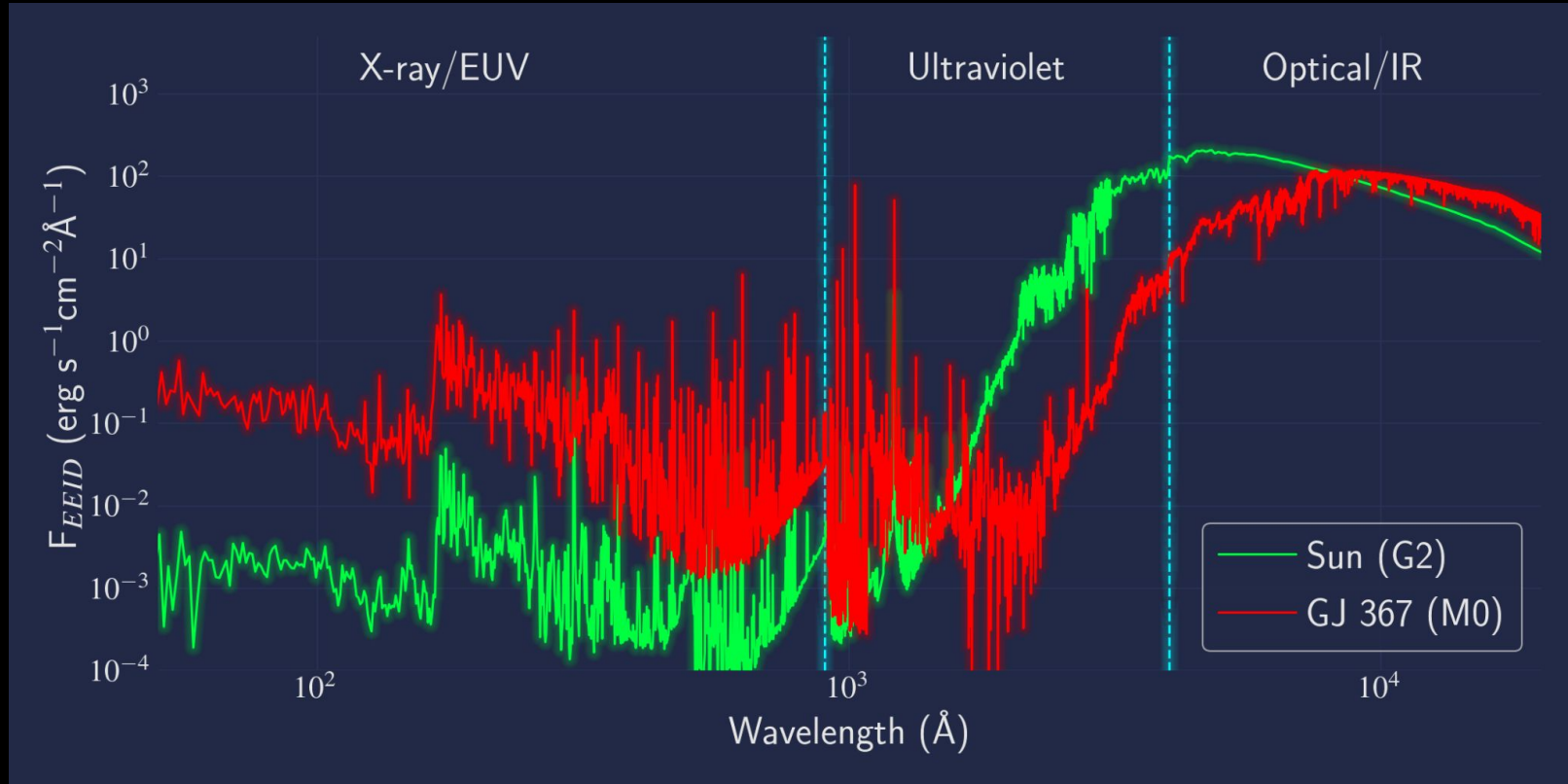
# Knowing Thy Star includes the X-ray and Ultraviolet



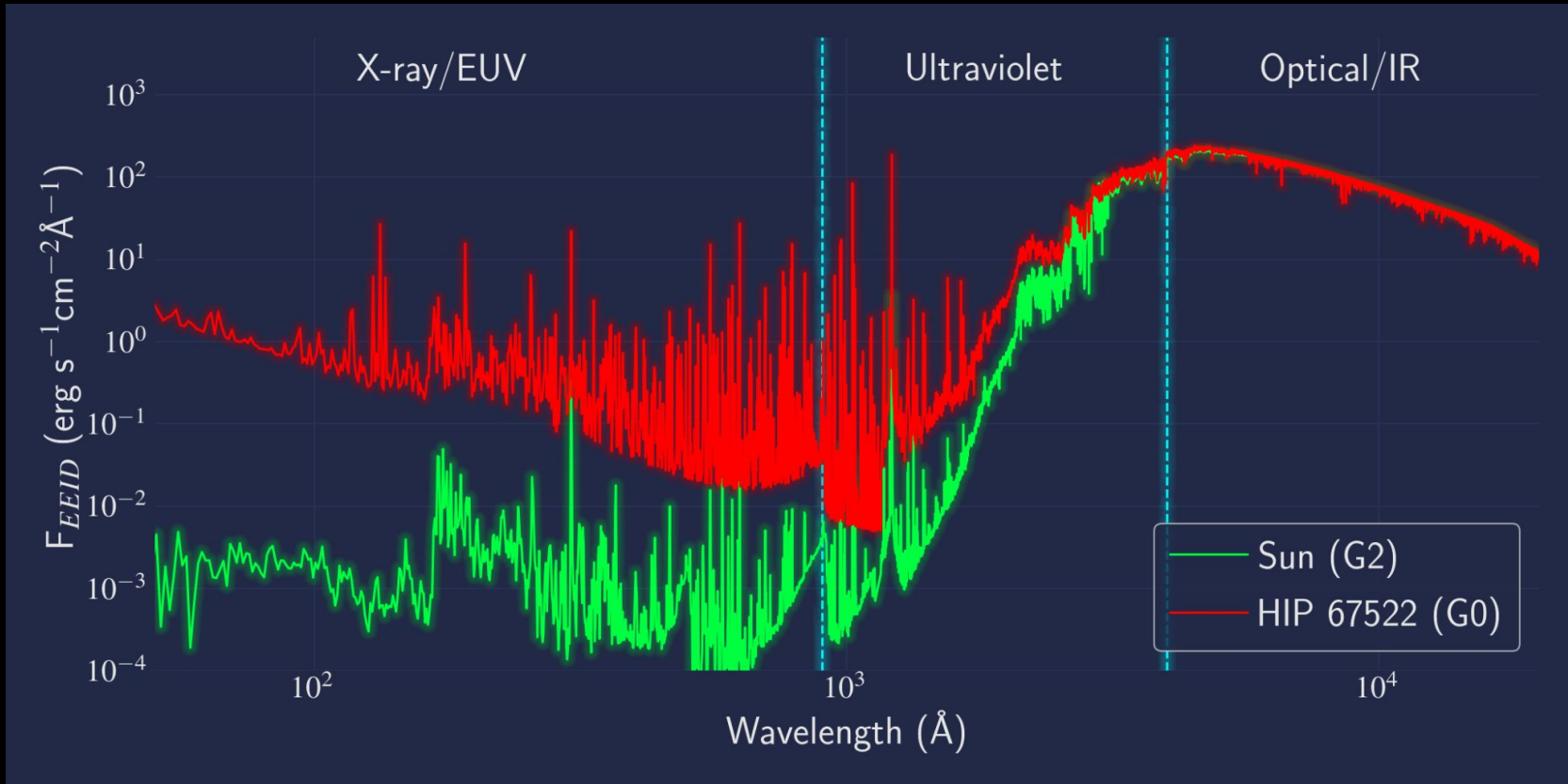
# Why do we care? (See France talk on Friday)



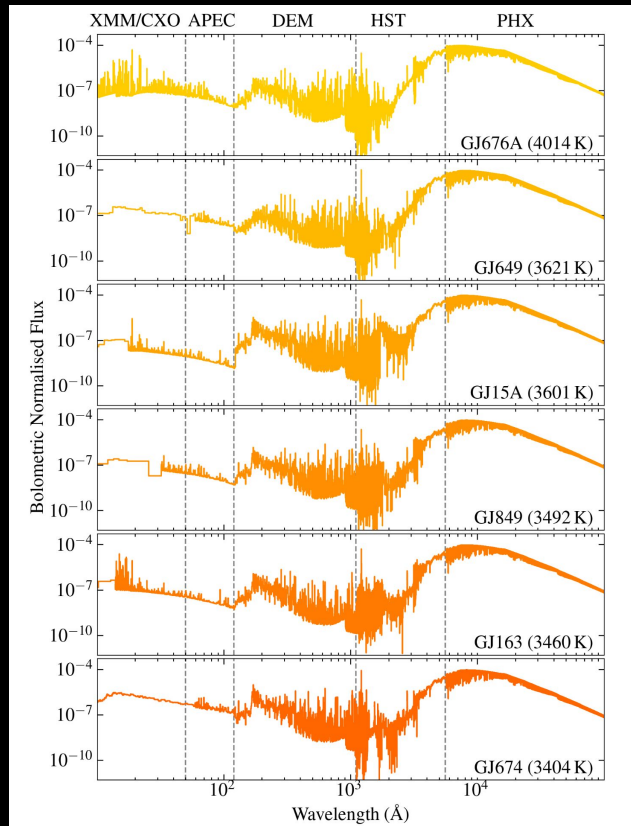
# Other stars are not the Sun



# Other Sun-like stars are not the Sun!



# Measurement of the Ultraviolet Spectral Characteristics of Low-mass Exoplanet Host Stars (MUSCLES)



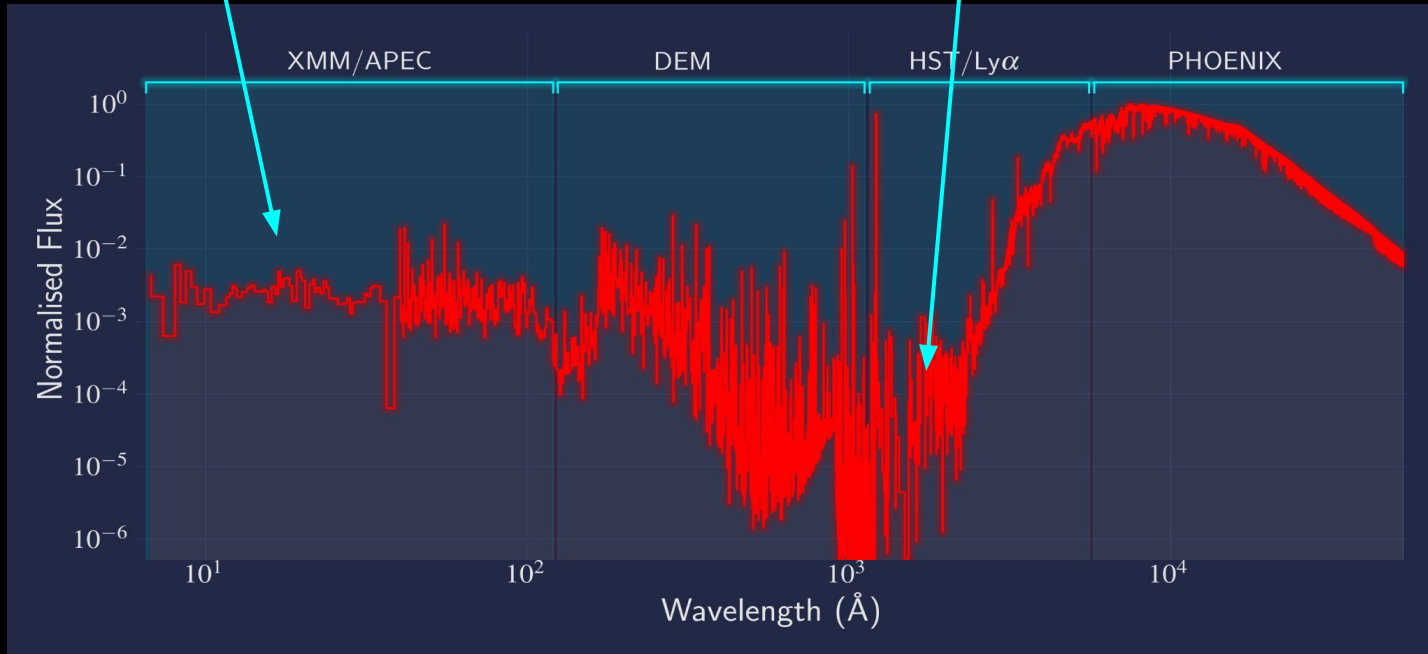
- MUSCLES: 11+ M&K dwarfs (France+14, Loyd+16)
- Mega-MUSCLES: 11 M dwarfs inc. TRAPPIST-1 (Wilson+21, 25)
- MUSCLES Extension for Atmospheric Transmission Spectroscopy (MEATS): 11 JWST ERS + GTO targets (Behr+22)
- Mega-MEATS: 20+ JWST GO targets (Wilson+ in prep 25(?))



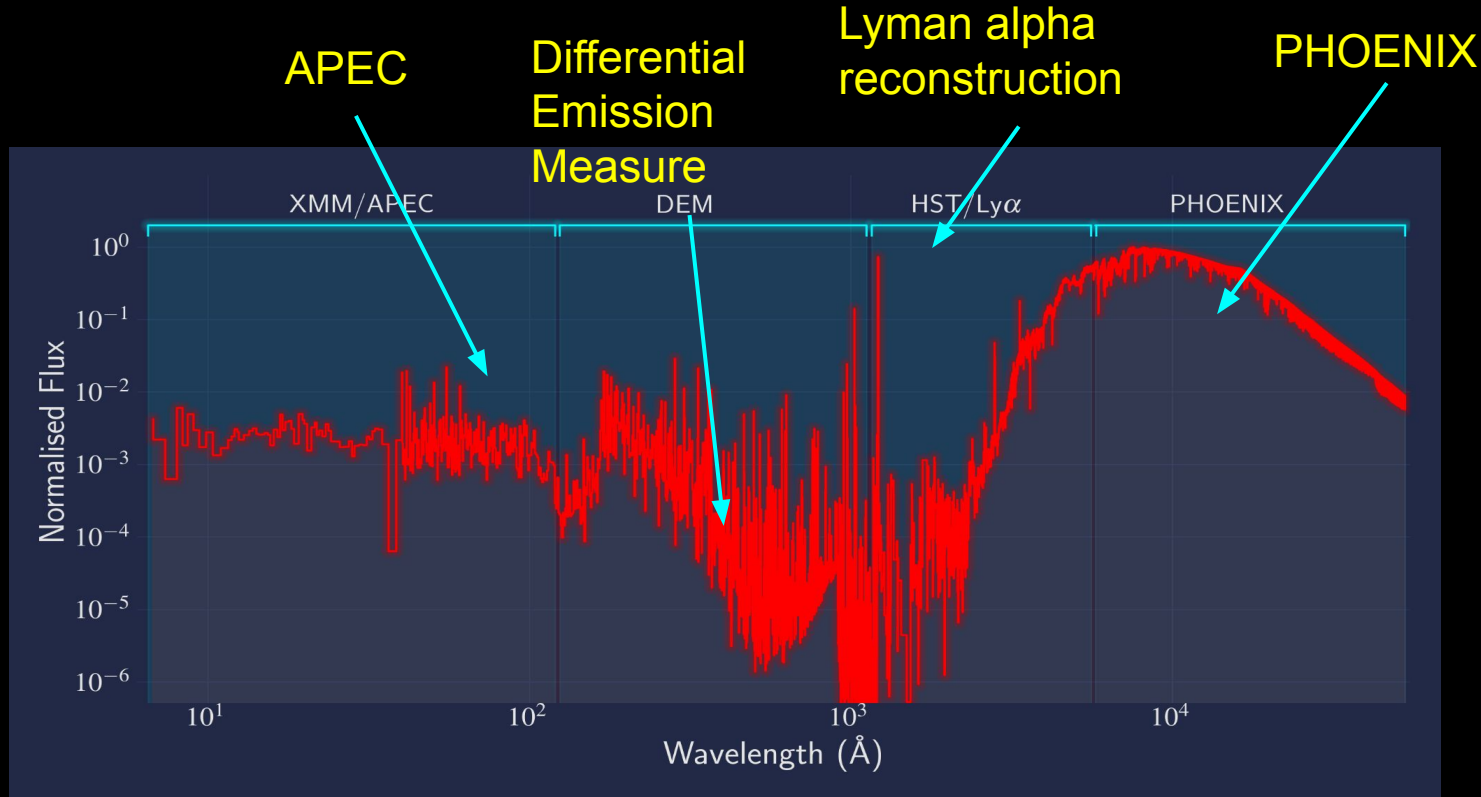
# How we build SEDs: Observations

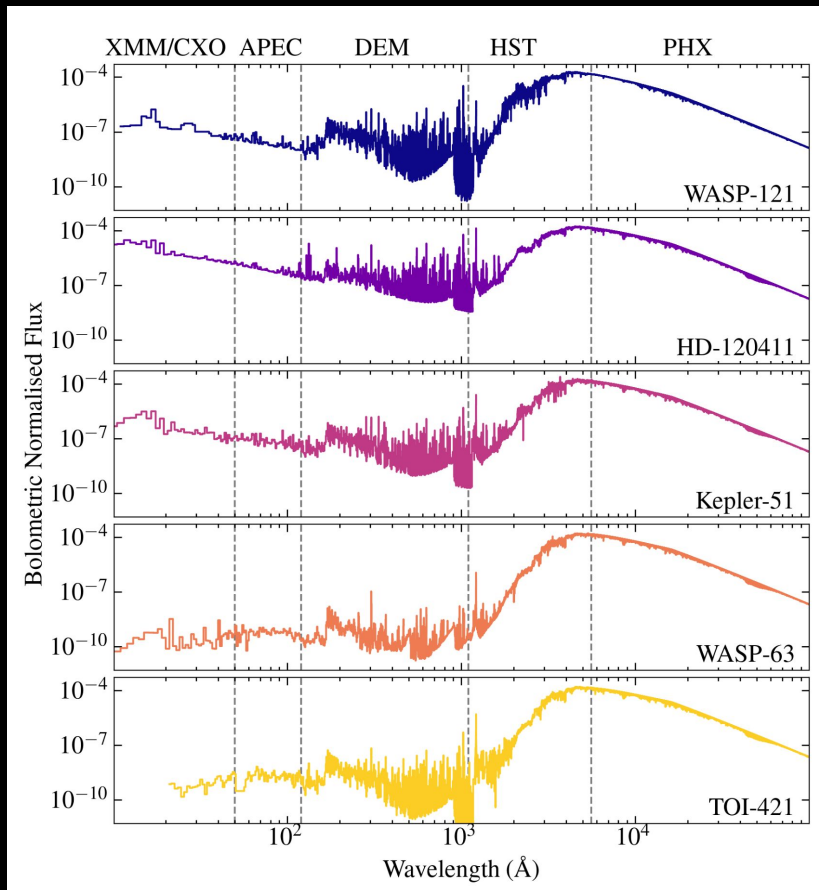
XMM/Chandra

HST COS/STIS



# How we build SEDs: Models





Get your SEDs here:

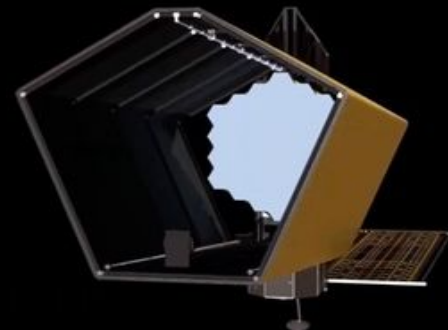
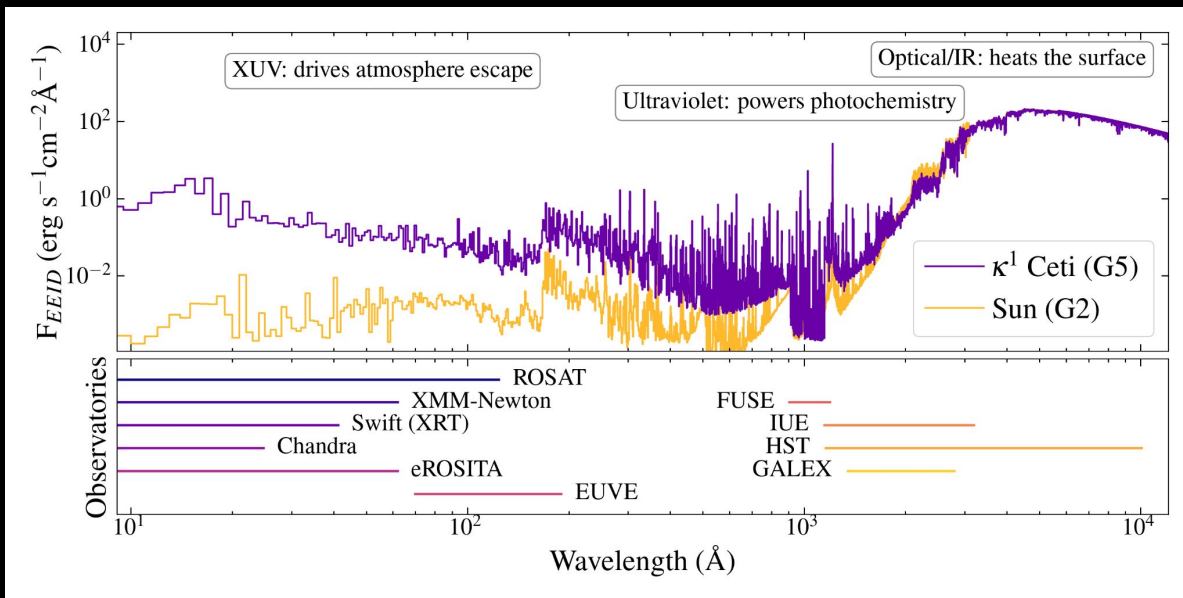


(Mega-MEATS not there yet,  
email me for SEDs)

<https://archive.stsci.edu/prepds/muscles/>

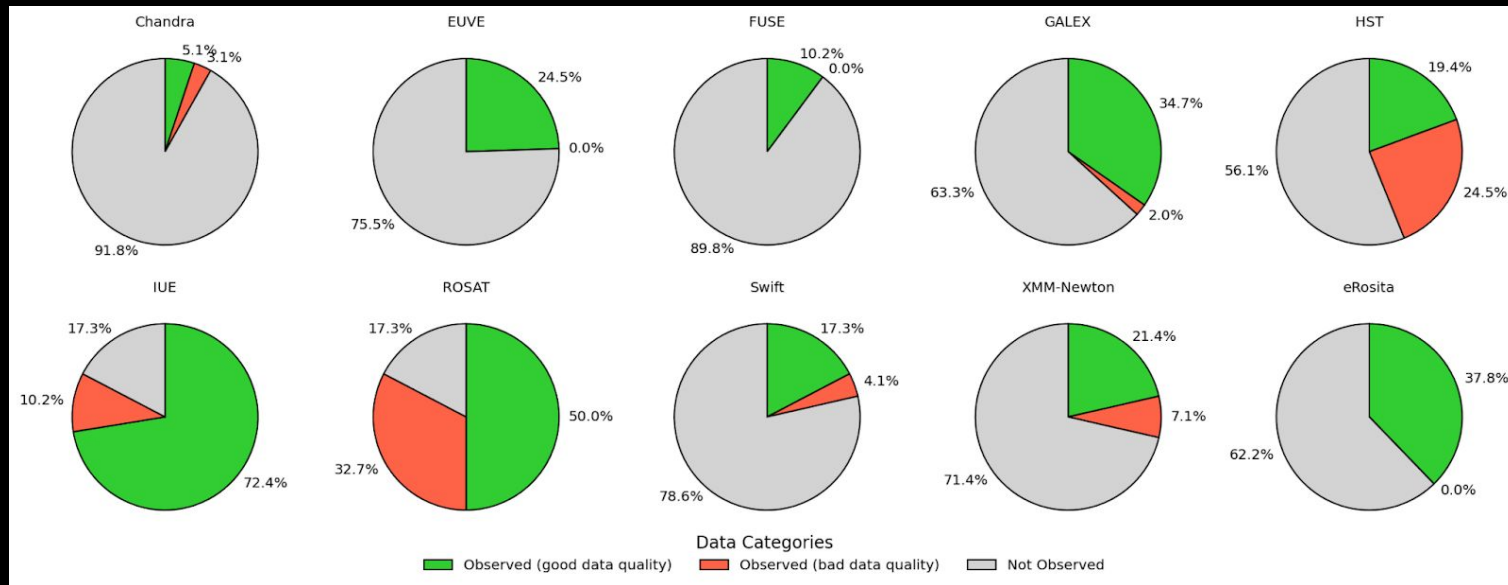
[david.wilson@lasp.colorado.edu](mailto:david.wilson@lasp.colorado.edu)

# The future: HWO target stars



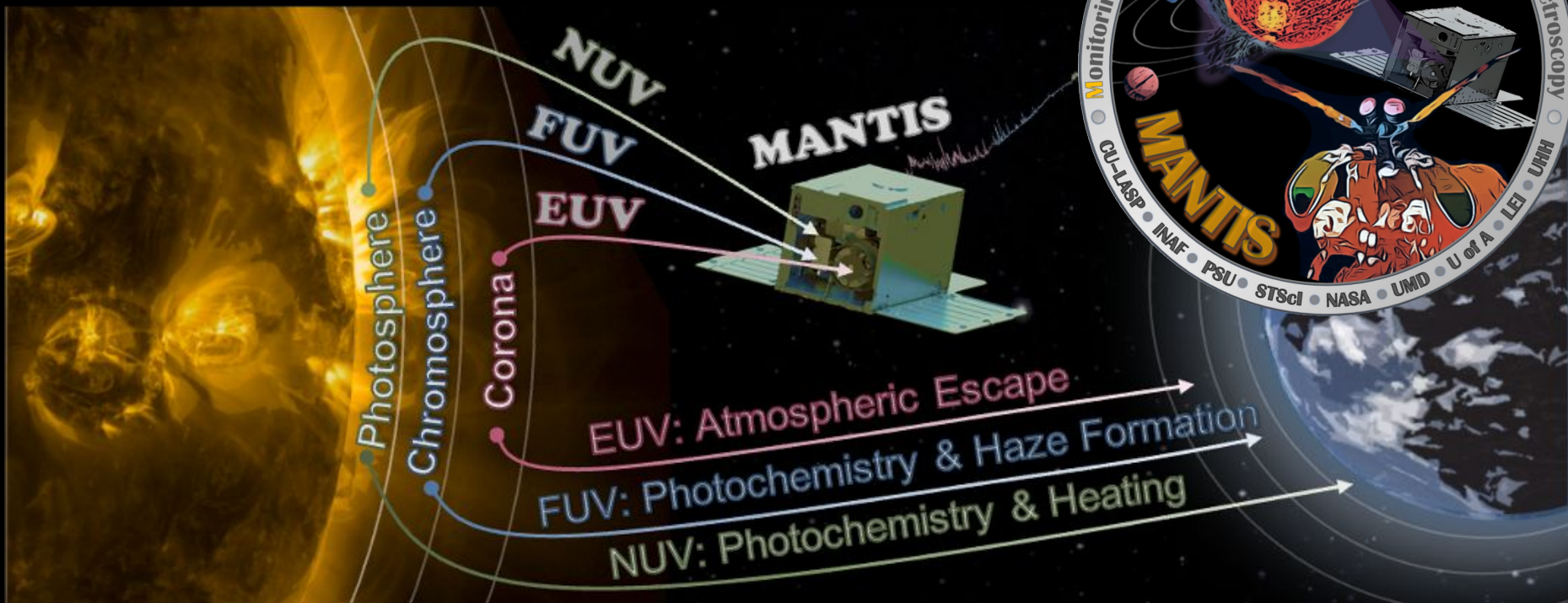
High-energy task group set up to assess the archival X-ray and UV data for the likely HWO planet search targets

# UV and X-ray data for the likely HWO targets is very patchy



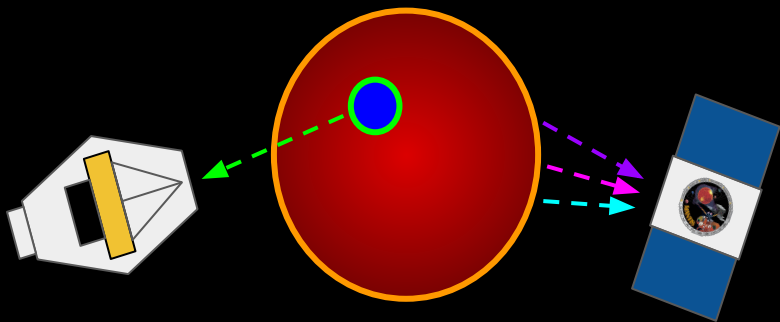
Obtaining precursor observations of the HWO target stars is essential while Hubble still works

# Monitoring Activity of Nearby stars with ultraviolet Imaging and Spectroscopy (MANTIS)

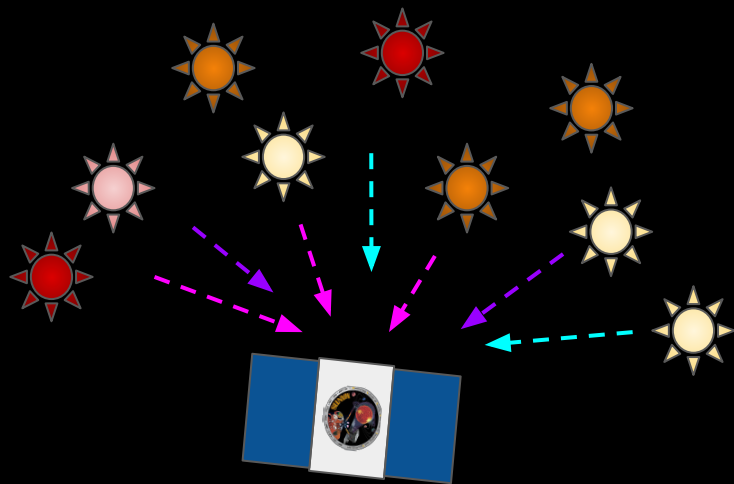


# MANTIS will launch in 2027 with two missions:

JUMP: Monitoring exoplanet host stars simultaneously with JWST observations



MUMS: NUV/FUV/EUV observations of nearby stars

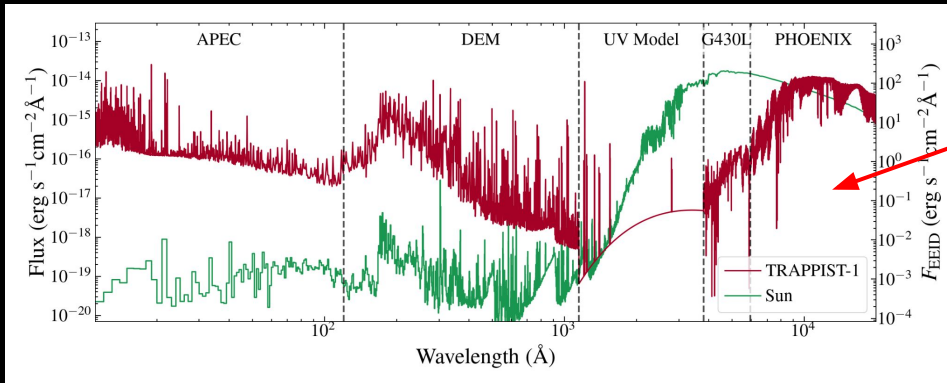


Ask me for a sticker!



# Conclusions

- UV and X-ray observations are vital inputs to understand exoplanet atmospheres chemistry and survival.
- We have dozens of SEDs: Get some of them at the QR Code or ask me.
- Observations of the HWO target stars need to be done now.
- MANTIS NUV/FUV/EUV cubesat launching in 2027.



Hey look it's TRAPPIST-1!