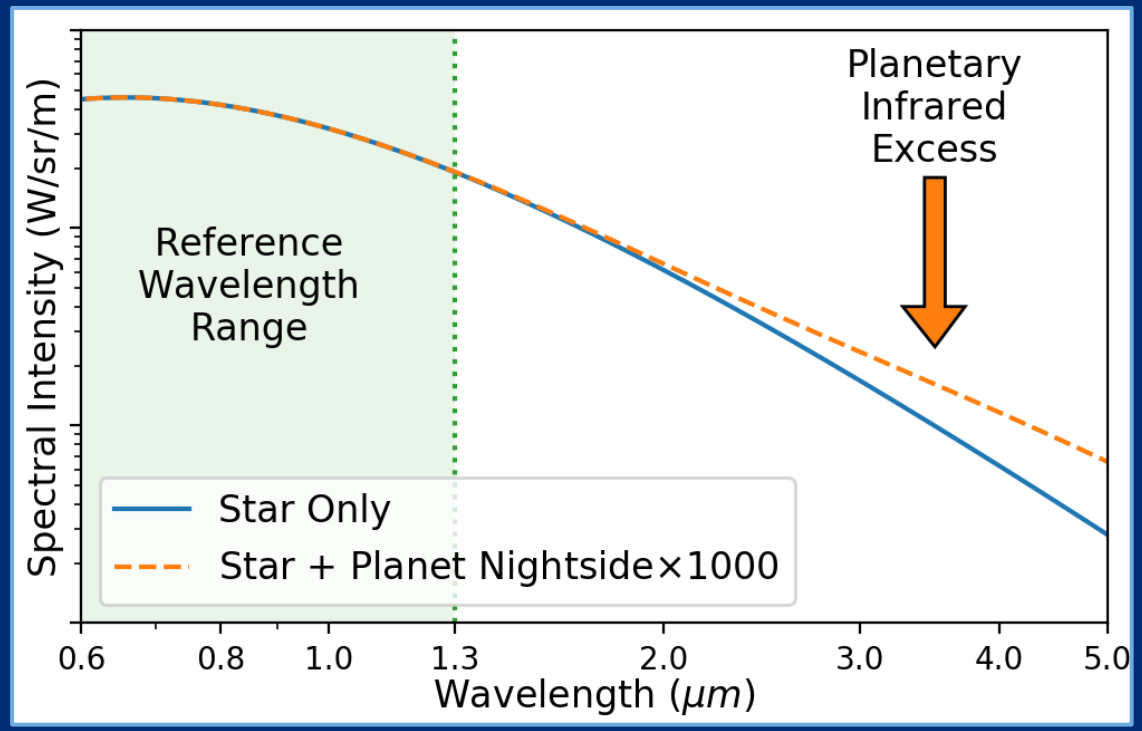
A New Method For Studying Exoplanet Atmospheres

- Planetary Infrared Excess (PIE) is a novel observational and analysis technique for studying the atmospheres of both transiting and non-transiting exoplanets
- PIE relies on acquiring simultaneous, broad-wavelength spectra and resolving planetary infrared emission from the stellar spectrum
- Possible exoplanet applications:
  - Sparsely-sampled phase curve observations to efficiently study atmospheric dynamics
  - Planet nightside temperatures via transit observations to constrain day-night heat redistribution
  - Search for life on non-transiting exoplanets orbiting the nearest M-dwarf stars (such as Proxima Centauri)



Conceptual depiction of PIE. Data from the reference wavelength range constrains the stellar parameters. The inferred infrared excess constrains the planetary parameters.

Planetary Infrared Excess (PIE) could revolutionize how we study exoplanet atmospheres.