The K Star Biosignature Detection Advantage for Directly Imaged Exoplanets

New modeling work seeks to address which exoplanets offer the best chance for discovering possible biosignatures from exoplanet atmospheres.

Artist's concept of a planet orbiting in the habitable zone of a K star.

- The simultaneous presence of oxygen and methane in an atmosphere is an especially strong biosignature. However, this observation may be difficult for planets orbiting G stars like our Sun due to the atmospheric chemistry driven by G star ultra-violet radiation.
- Computer simulations show that the atmosphere of a planet orbiting a lower mass K star can support an order of magnitude more methane in the presence of oxygen compared to a planet orbiting a G star like the Sun, and that exoplanets orbiting K stars may offer a “biosignature advantage” in the search for life elsewhere in the universe.
- Exoplanet observations that focus on those located around K stars may help identify in the near future whether there is life on other planets.

Arney (2019). *The Astrophysical Journal Letters.*