

# The K Star Biosignature Detection Advantage for Directly Imaged Exoplanets



**What is the science question?** Which exoplanets offer the best chance for discovering possible biosignatures, the remotely observable signs of life that will be sought from exoplanet atmospheres?

**What were your findings?** The simultaneous presence of oxygen and methane in an atmosphere is an especially strong biosignature. However, these gases may be difficult to simultaneously detect for planets orbiting G stars like our Sun due to the atmospheric chemistry driven by G star ultra-violet radiation. Our computer simulations find 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 our Sun.



Artist's concept of a planet orbiting in the habitable zone of a K star. (figure credit: NASA)

**What was the impact?** This finding tells us that exoplanets orbiting K stars may offer a “biosignature advantage” in the search for life elsewhere in the universe. We should thus concentrate our exoplanet observations on those located around K stars.

**Why does it matter to non-scientists?** One of the most profound scientific questions that could be answered in the near future is whether there is life on other planets.

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