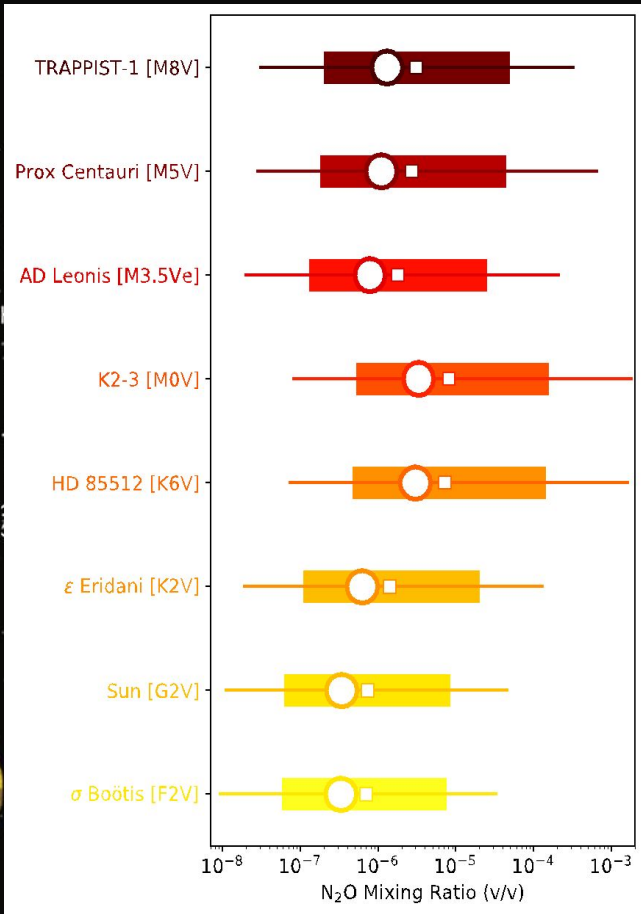


N₂O as a Biosignature for Exoplanets



Predicted accumulation of N₂O on Earth-like planets orbiting FGKM stars with surface fluxes of 0.0-100 Tmol yr⁻¹

N₂O, a product of biological nitrogen metabolism, could accumulate to detectable abundances on terrestrial exoplanets, making it a potential indicator for the presence of life beyond Earth.

- Biogenic gases in the atmosphere of distant exoplanets are a promising approach for inferring the presence of life. The most reliable gases to consider remains an area of active debate.
- This study predicted N₂O concentrations over a range of atmospheric oxygen levels, host star spectral types, and N₂O surface fluxes using linked series of biogeochemical and photochemical models. Results showed plausibly detectable levels of N₂O productivity on an exoplanet like TRAPPIST-1e.
- The James Webb Space Telescope and future exoplanet observatories could be used for future N₂O observations of Earth-like planets orbiting K dwarf stars.