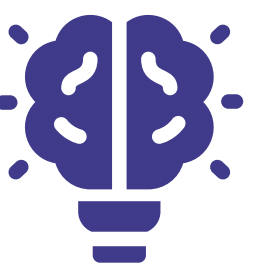


WHAT TYPES OF ROCKY WORLDS WILL TESS LIKELY DISCOVER?

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Jonti Horner & GALAH Collaboration



MOTIVATION

- TESS will discover hundreds of rocky worlds beyond our Solar system
- Can we use our own Solar System as a geological 'analog' for TESS planetary systems?
- Or will these worlds be unlike anything we have yet encountered?



METHODOLOGY

- We cross-matched the TIC with the galactic archaeology survey GALAH
- Obtained chemical abundances of 47,000 stars including 9,600+ C/O and Mg/Si molar ratios
- Using these molar ratios, we determined what types of rocky planets our GALAH stars might host



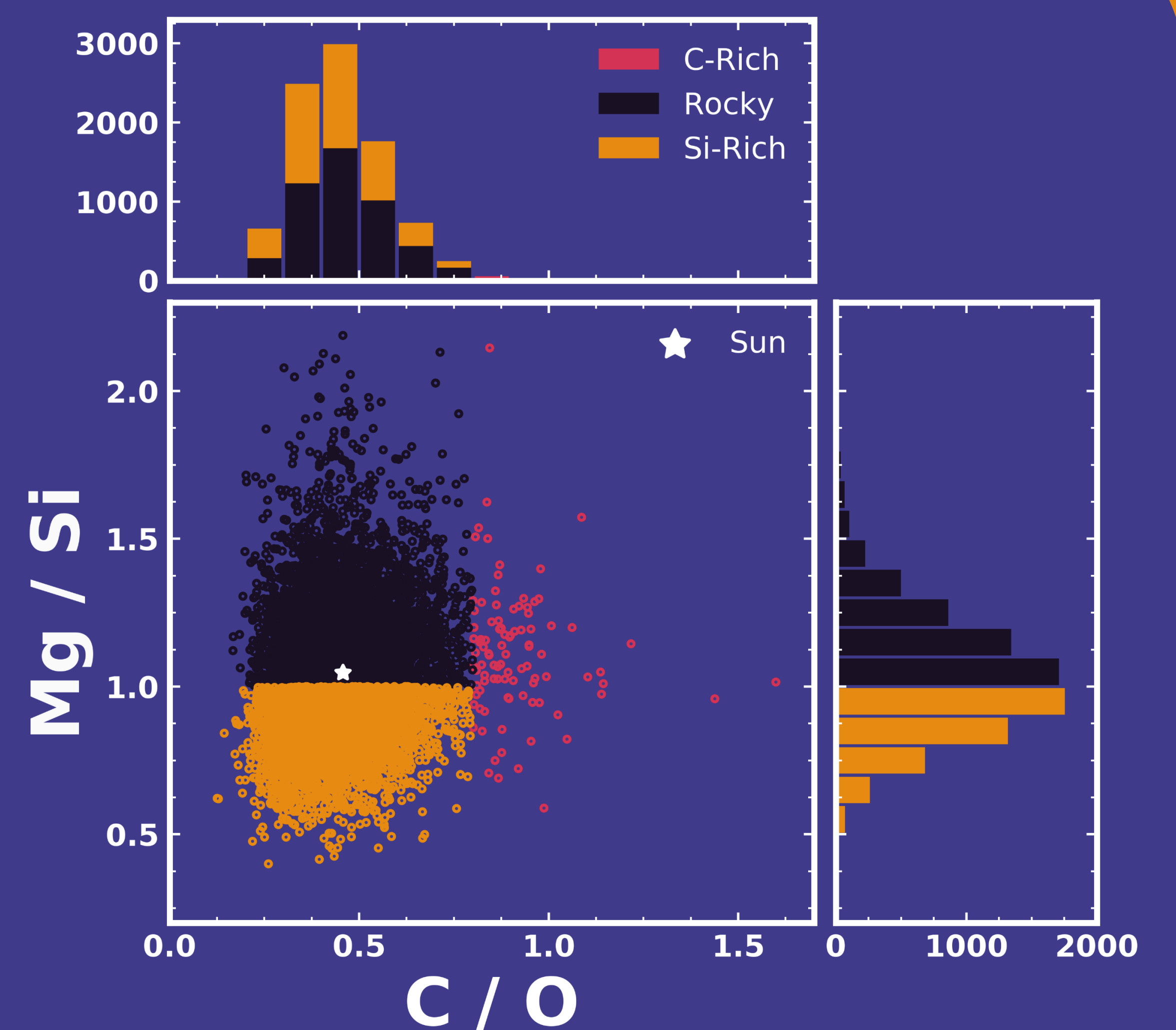
KEY RESULTS

- 54% of FGK stars in our sample have ratios that suggest they might host rocky planets geologically similar to those found in our Solar System
- 46% of stars have abundances suggesting they will host rocky worlds unlike any other planet within our Solar system, including 45% that could host "silicon-Rich" worlds



TAKE AWAY MESSAGES

- It is possible to use Solar system planets as geological analogs for rocky TESS exoplanets
- BUT will need exogeological experts to research implications for habitability on "silicon-Rich" and "carbon-Rich" exoplanets



Our Mg/Si and C/O molar ratios plotted above (with relative histogram distributions), suggest the majority of FGK stars observed by TESS may potentially host exoplanets that would be geologically similar to the Earth and Mars

arXiv

