

How do Stellar Surveys Like GALAH and GAIA Improve Our Understanding of Planetary Systems?

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Credits: ESA/Hubble, M. Kornmesser
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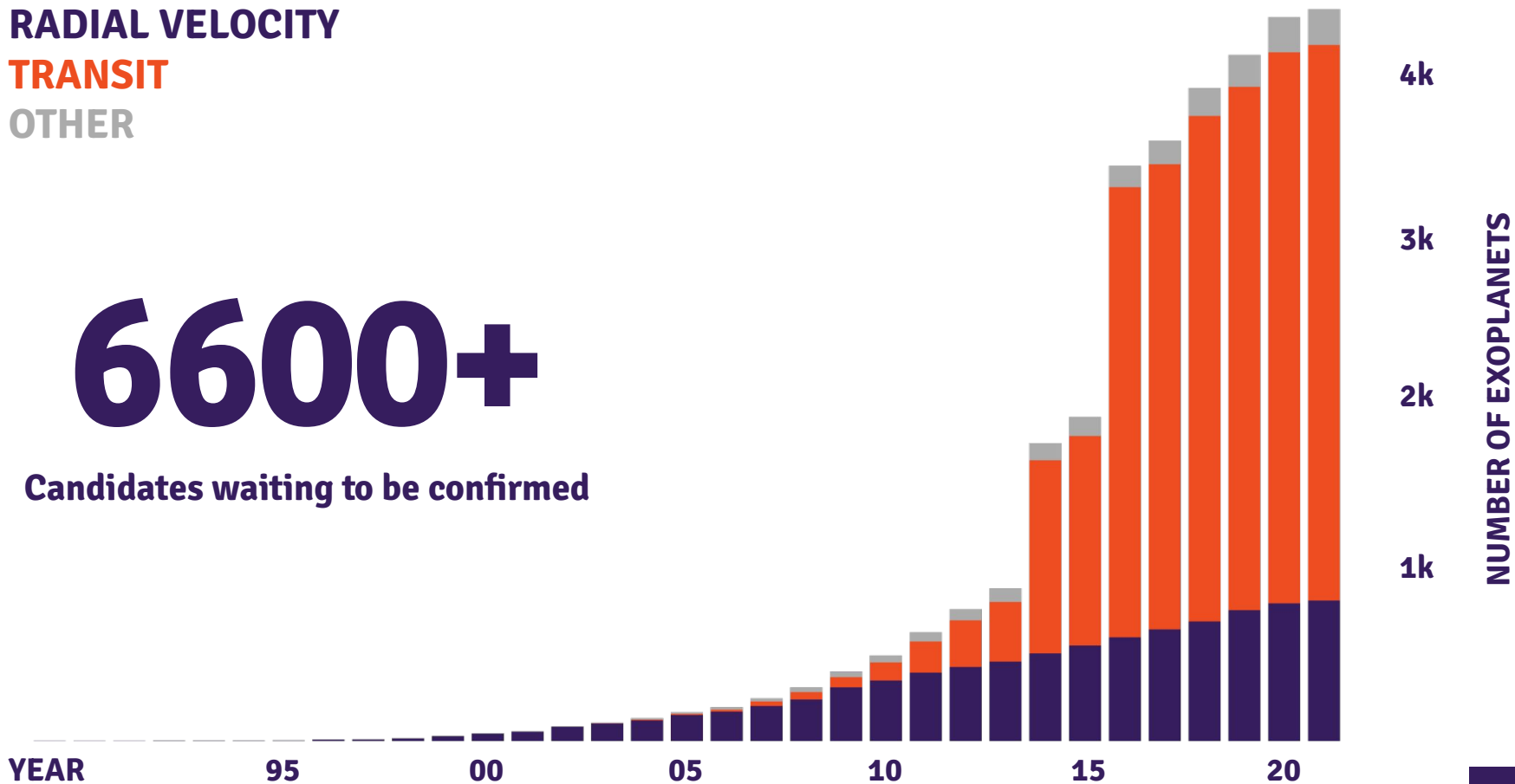
RADIAL VELOCITY

TRANSIT

OTHER

6600+

Candidates waiting to be confirmed





T_{eff} , $\log g$,
[X/H],
Mass, Radius,
Distance,
Luminosity

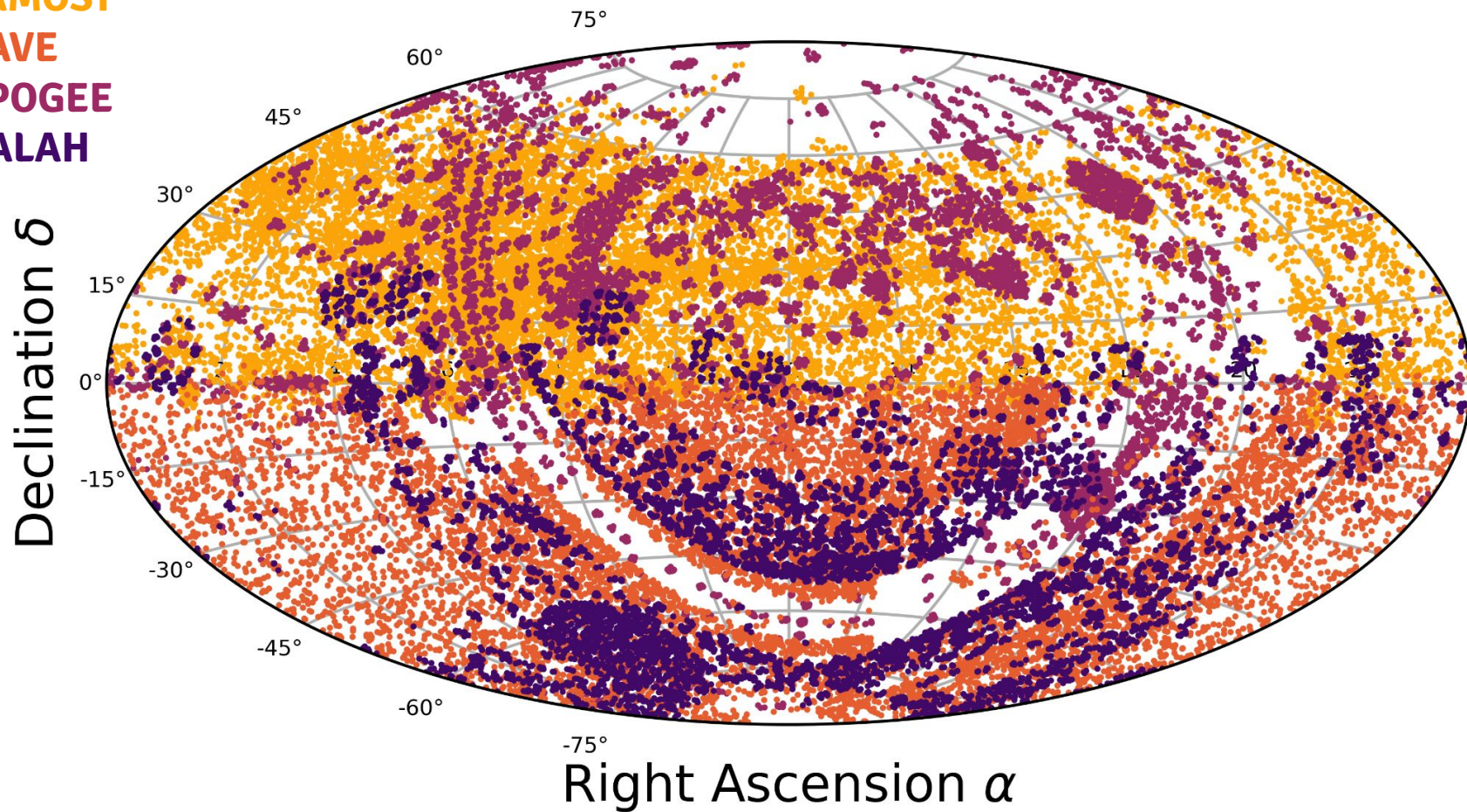


Transit
Depth
Radial
Velocity
+ models



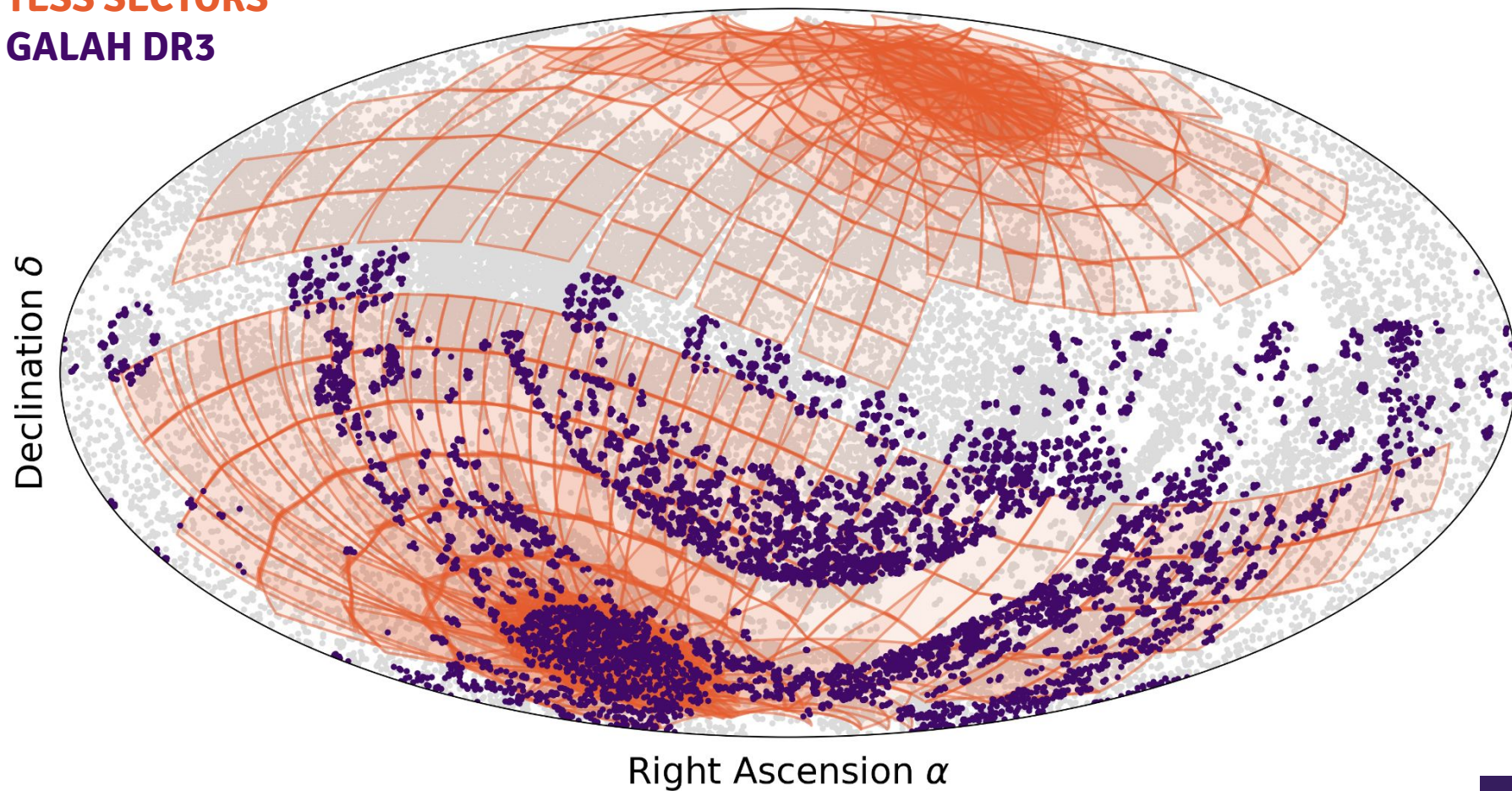
Mass, Radius,
Density,
Composition,
Period,
au, HZ etc.

LAMOST
RAVE
APOGEE
GALAH



TESS SECTORS

GALAH DR3





GALAH DR2

**Teff, log g ,
[Fe/H],
[alpha/Fe]**

GAIA DR2
**parallax, G,
BP, RP**
2MASS
J, H, Ks

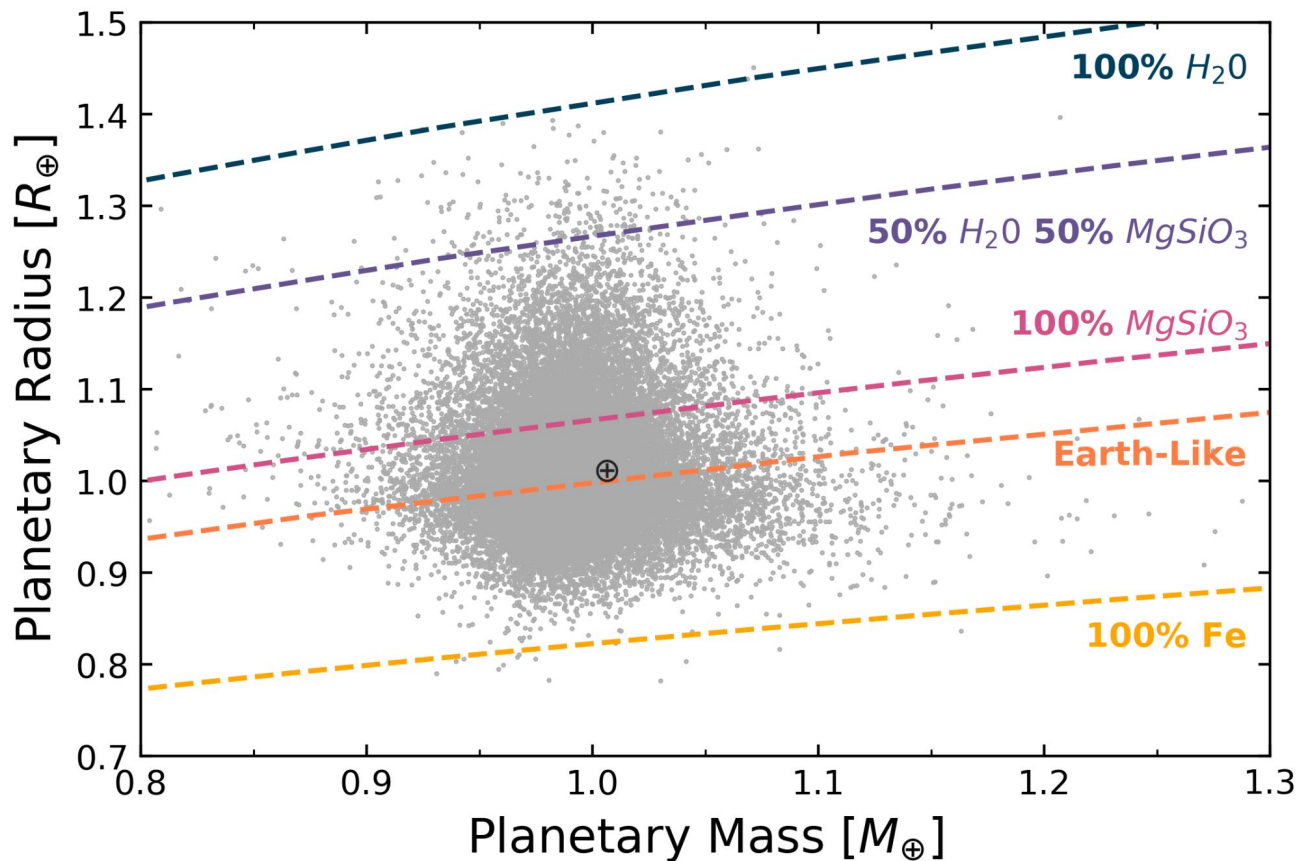


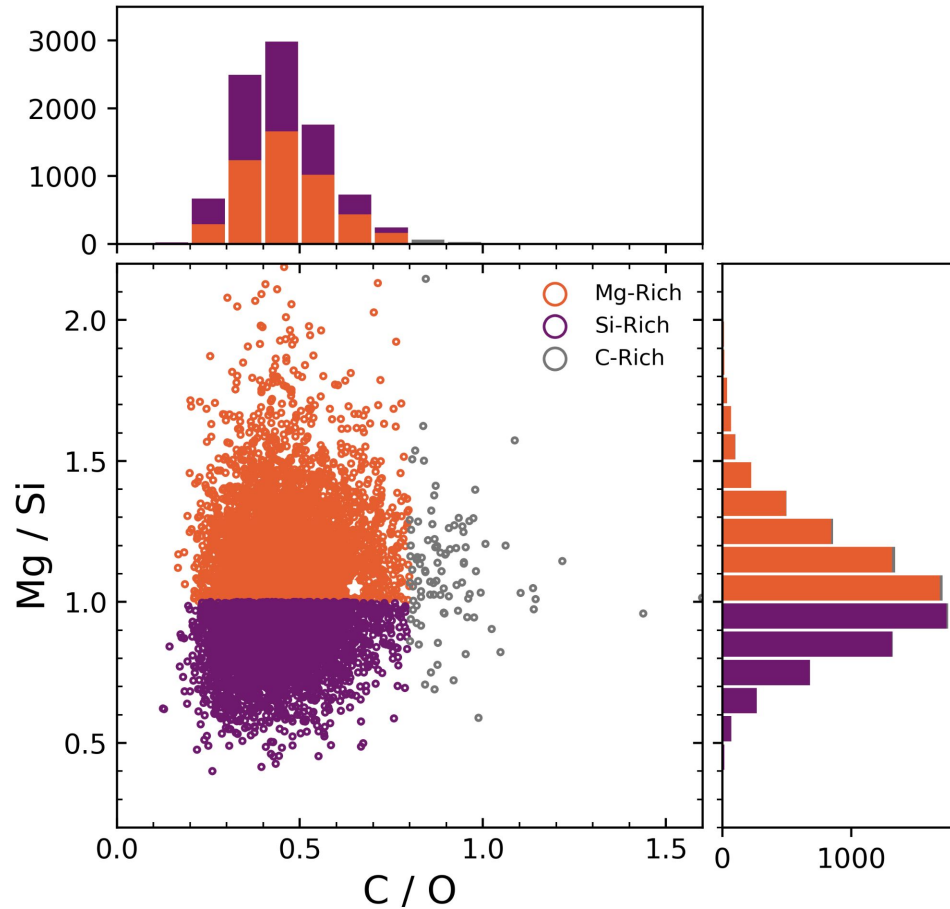
**Mass, Radius,
Luminosity,
Age, HZs,
[X/H], X/Y**

GALAH-TESS Catalog

47k + stars, 23 abundances, 4 key abundance ratios

Choice of Stellar Parameters MATTER!!!





Stellar abundances help
with composition

**EXOPLANETS WILL BE
COMPOSITIONALLY
DIVERSE FROM THE
SOLAR SYSTEM**

Might be more complex

Adibekyan+ 21, Plotnykov & Valencia 20, Wang+ 18



GALAH DR3

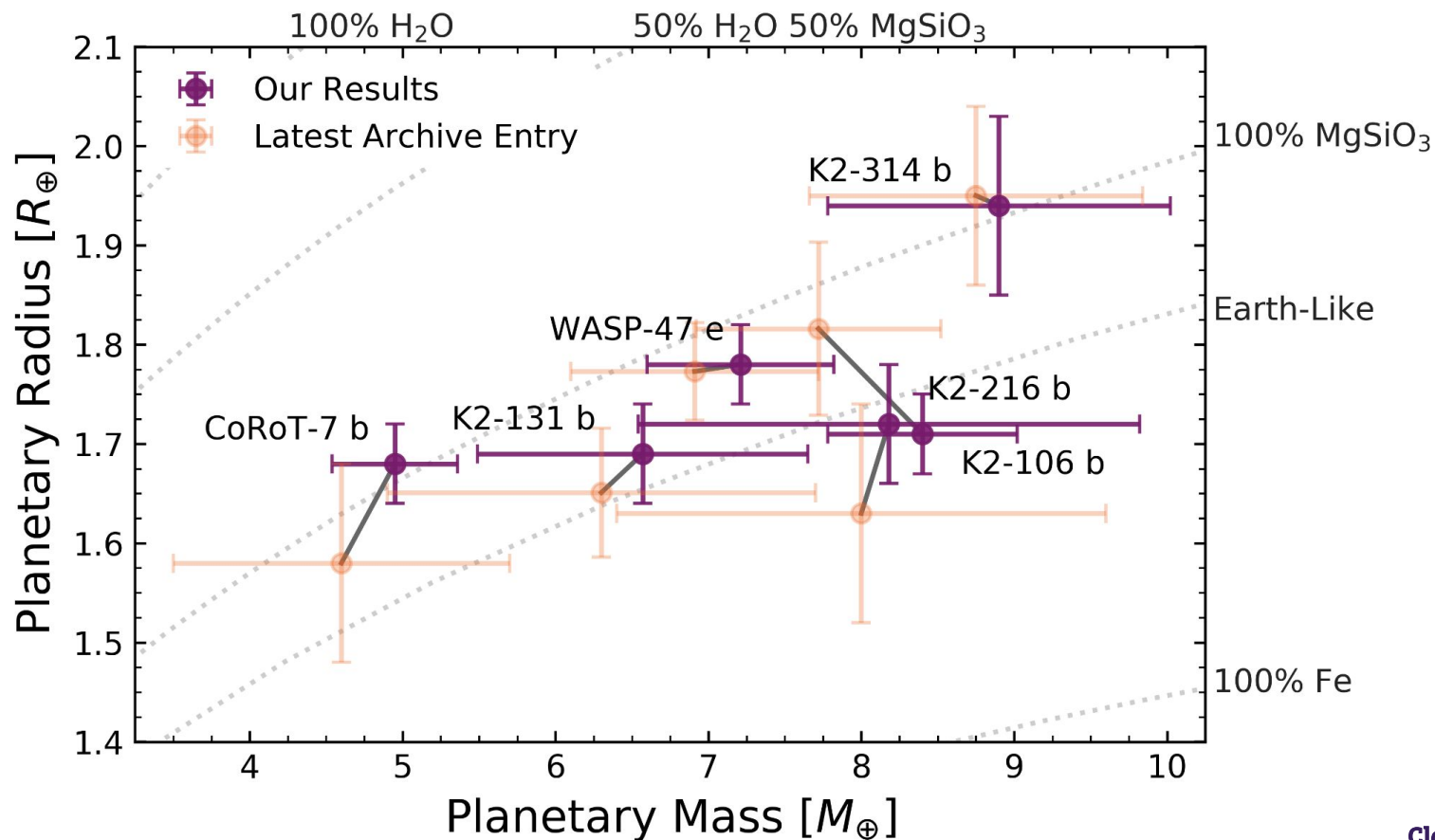
**Teff, log g ,
[Fe/H],
[alpha/Fe]**

GAIA EDR3
**parallax, G,
BP, RP**
2MASS
J, H, Ks



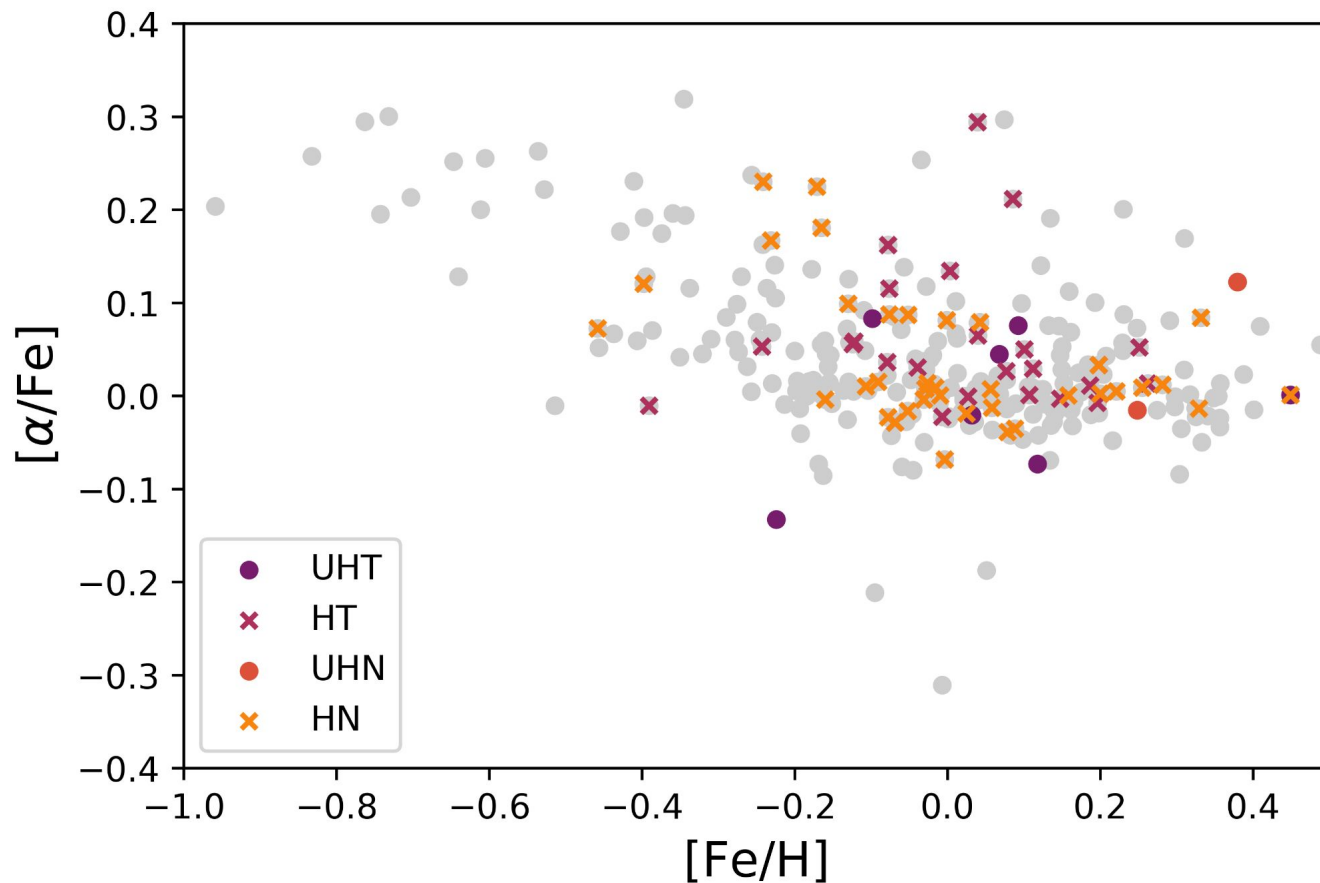
**Mass, Radius,
Luminosity,
Age, HZs,
[X/H], X/Y**

New Stellar Parameters + Weighted Mean = More Precise Exoplanets

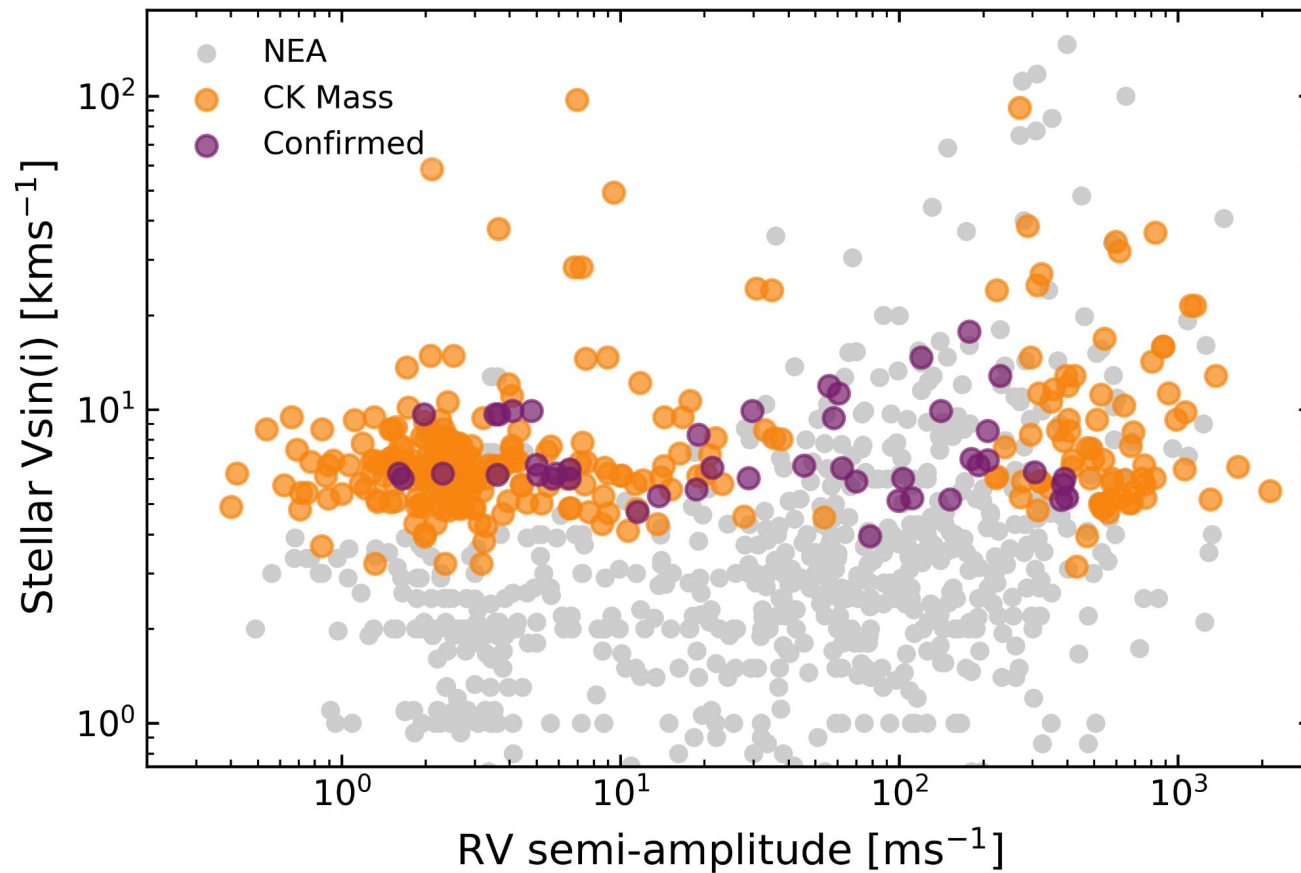


Ultra Hot Neptunes Favour Iron-Rich Stars?

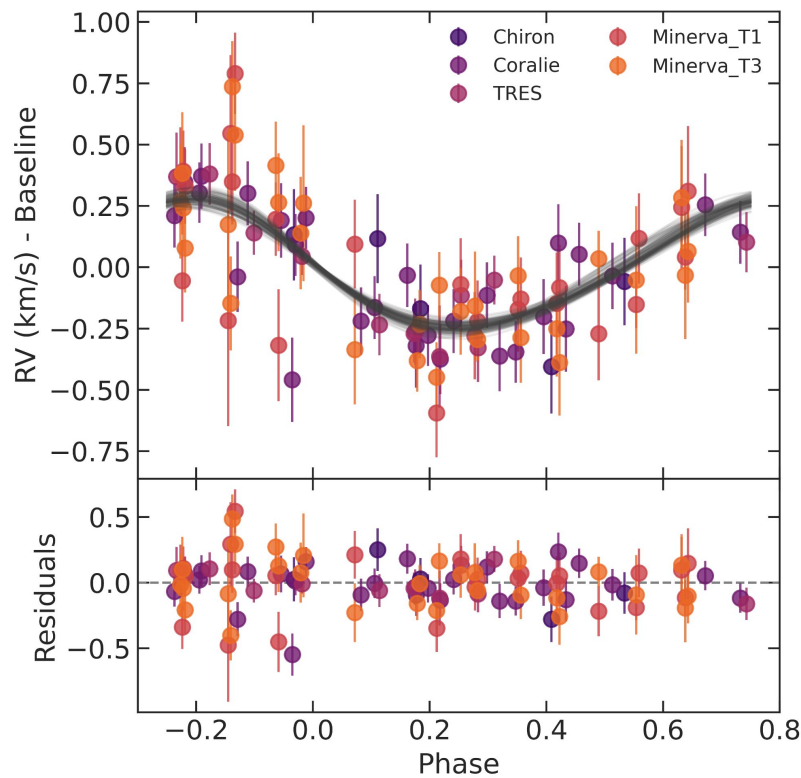
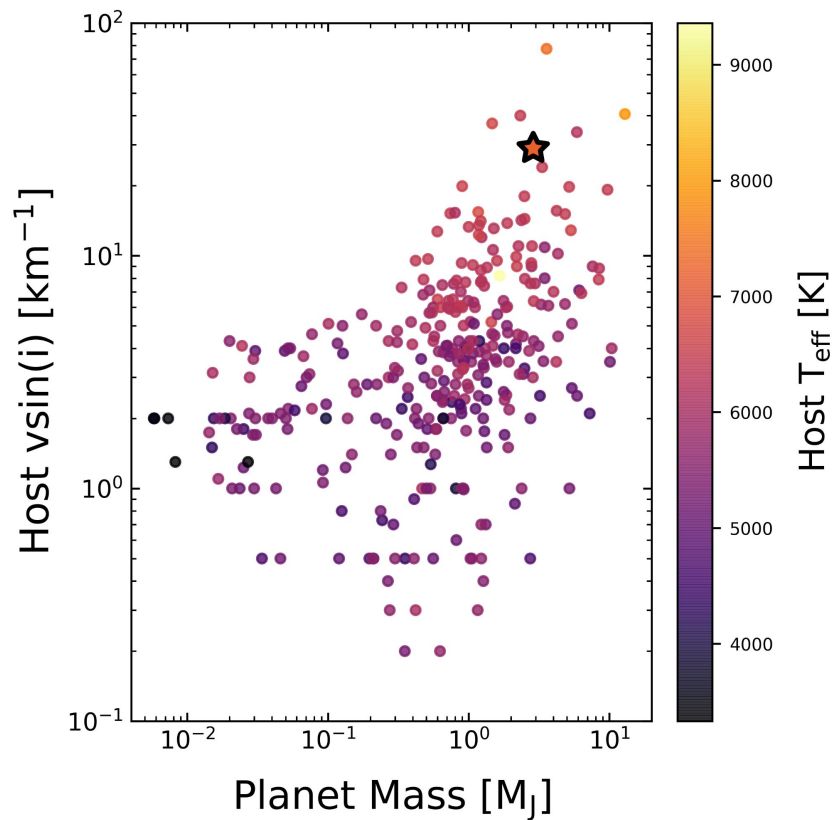
Dai+ 20



Confirming candidates will be tough....



But not impossible ;)



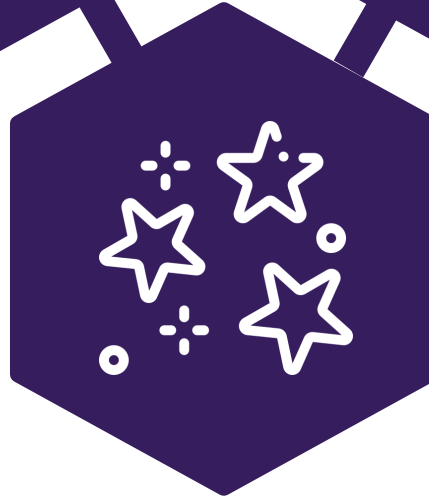
**Characterising
Exoplanets**



**Characterising
The Milky Way**
Carrillo+ 20



**Characterising
Stars**



TL;DW

Large-stellar galactic archaeology surveys are vital for exoplanetary science

Used both a weighted mean approach to archival data and GALAH data to refine fundamental properties of exoplanets

Some signs that Ultra Hot Neptunes might favour iron-rich stars compared to their smaller rockier counterparts

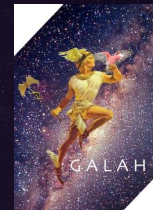
High stellar rotational velocities will make mass confirmation challenging for most GALAH candidates



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