

# Searching for the signatures of terrestrial planets in “hot” analogs

Jonay I. González Hernández

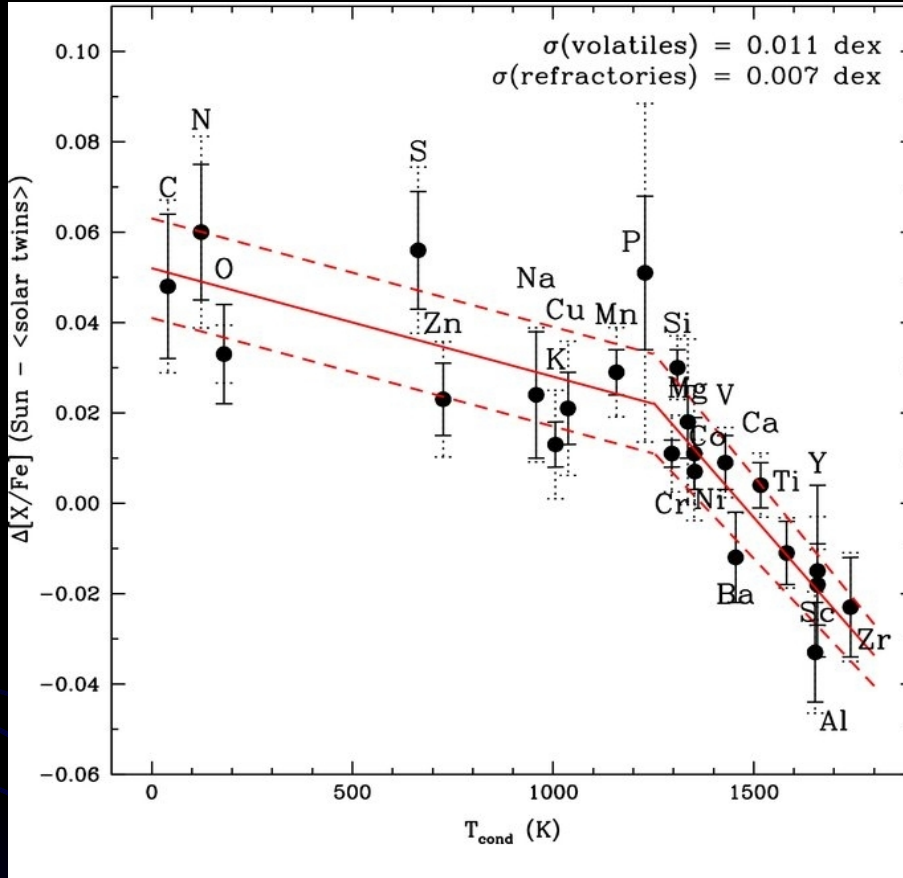
Instituto de Astrofísica de Canarias (IAC)

In collaboration with:

E. Delgado-Mena, G. Israelian,  
S. Sousa, N.C. Santos,  
S. Udry



# Solar twins : $[X/Fe]_{\text{SUN-STARs}}$ vs. $T_c$



They found the Sun has less abundance of refractory elements than field solar twins.

They interpreted this as a signature of terrestrial planets in the solar system

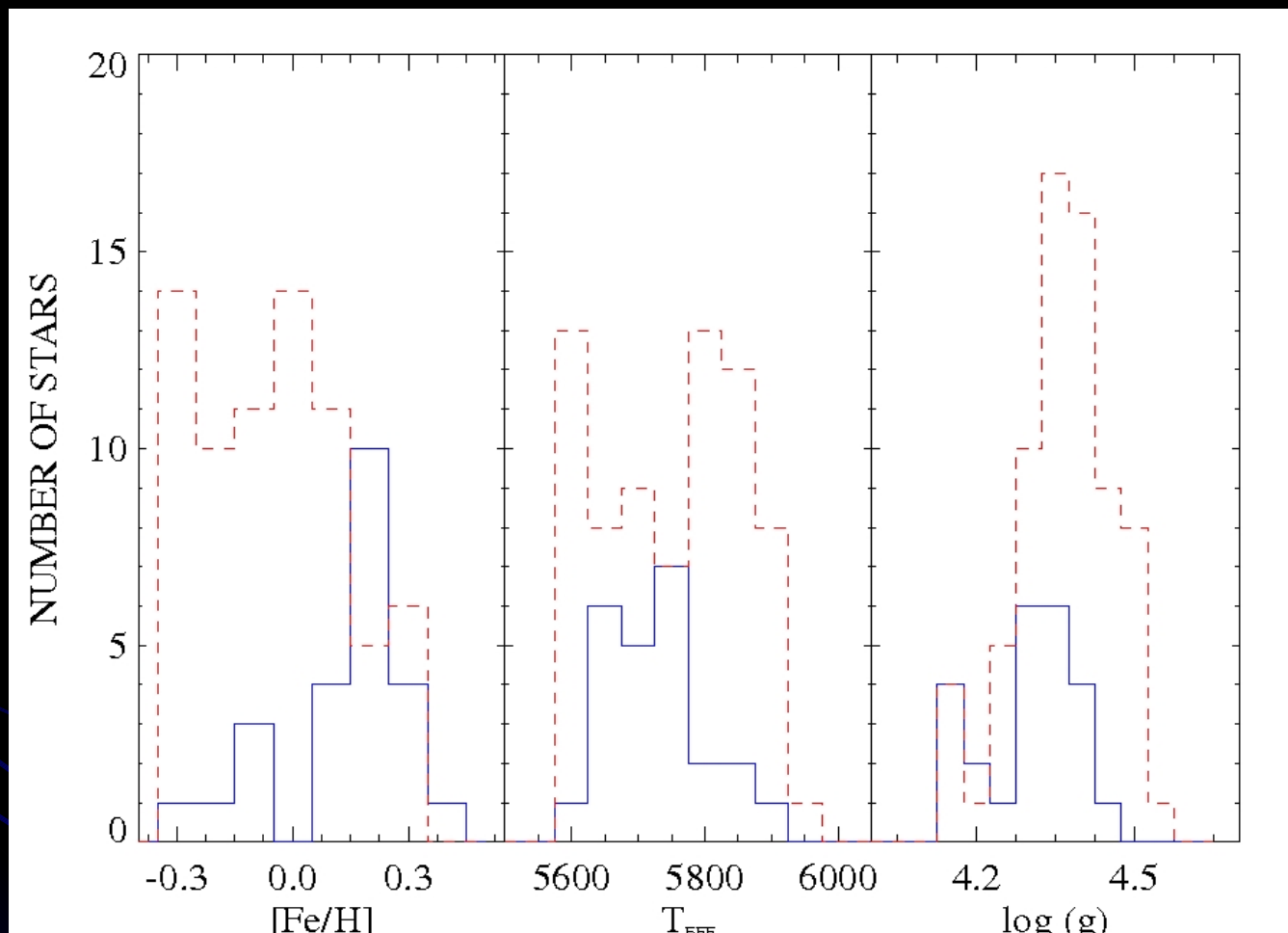
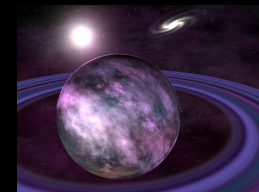
Chemical abundance ratios of 11 solar twins.

Two fits are shown in two  $T_c$  ranges :  $0 < T_c(\text{K}) < 1200$

$1200 < T_c(\text{K}) < 1800$

Meléndez et al. (2009, ApJ, 704, L66)

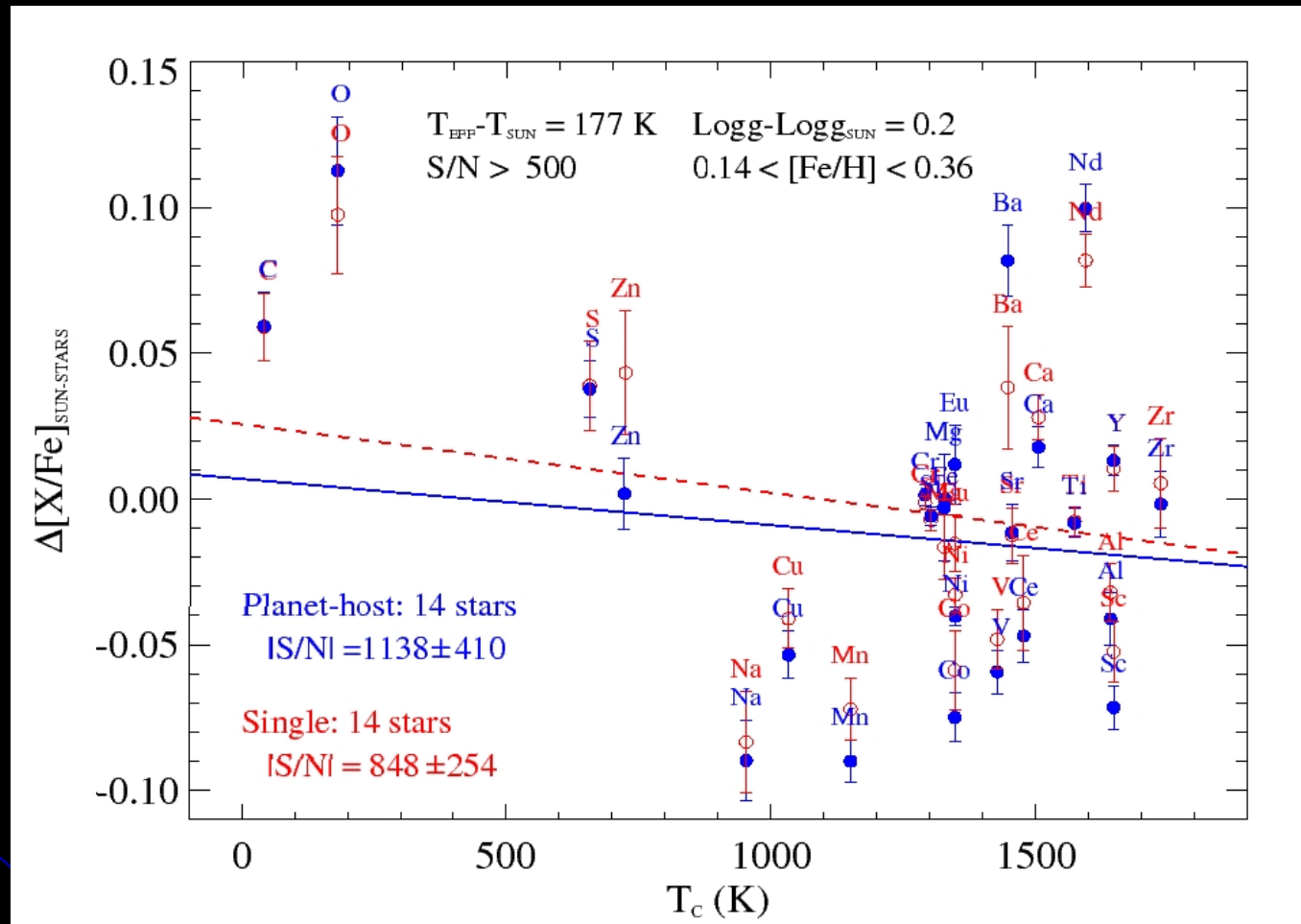
# Solar analogs



95 solar analogs containing 71 stars without planets and 24 stars hosting planets from high-resolution and high S/N HARPS and UVES spectra

González Hernández et al. (2010, ApJ, 720, 1592)

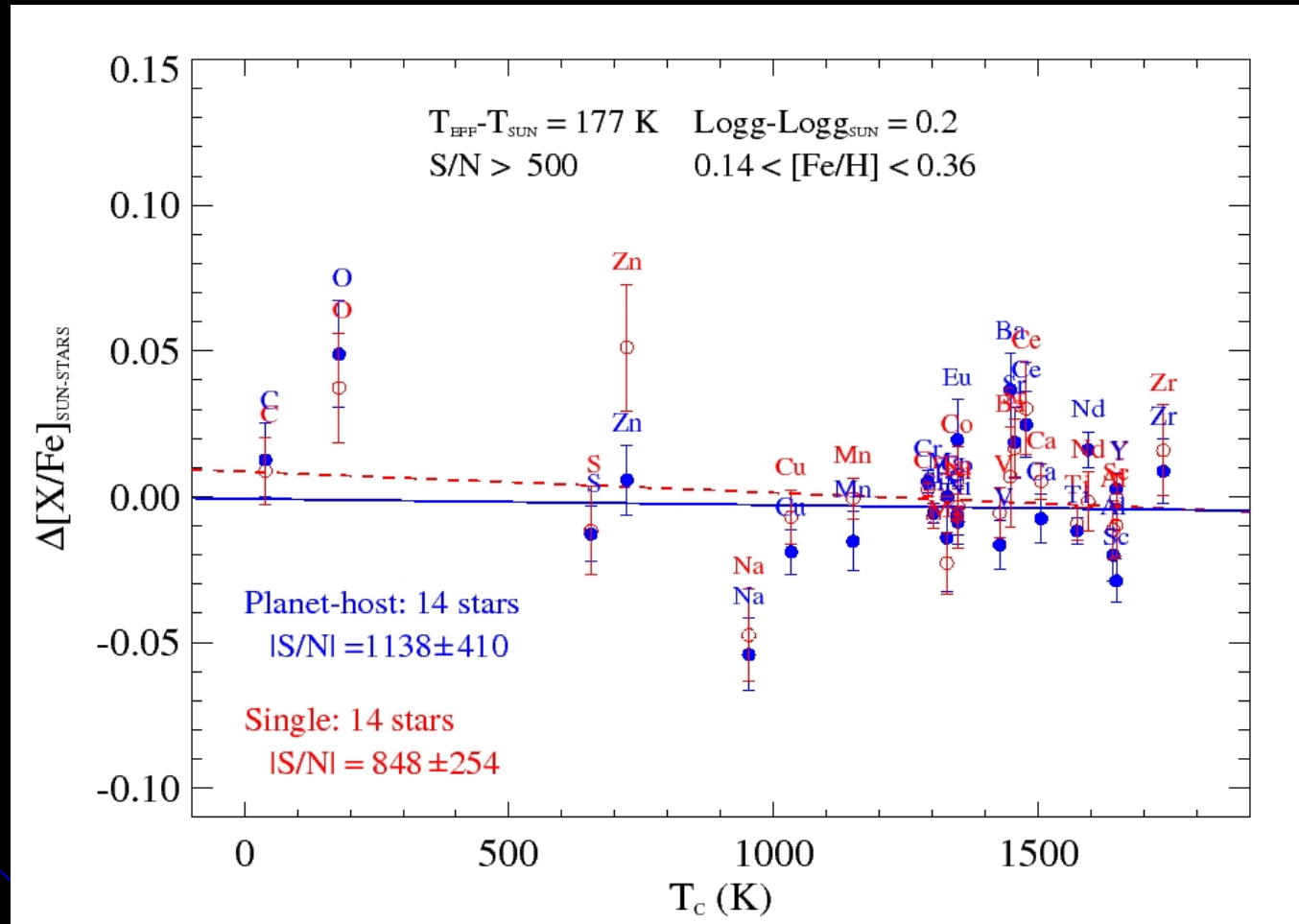
# Metal-rich solar analogs



36 solar analogs, 14 with and 14 without planets with similar stellar parameters and metallicities

González Hernández et al. (2010, ApJ, 720, 1592)

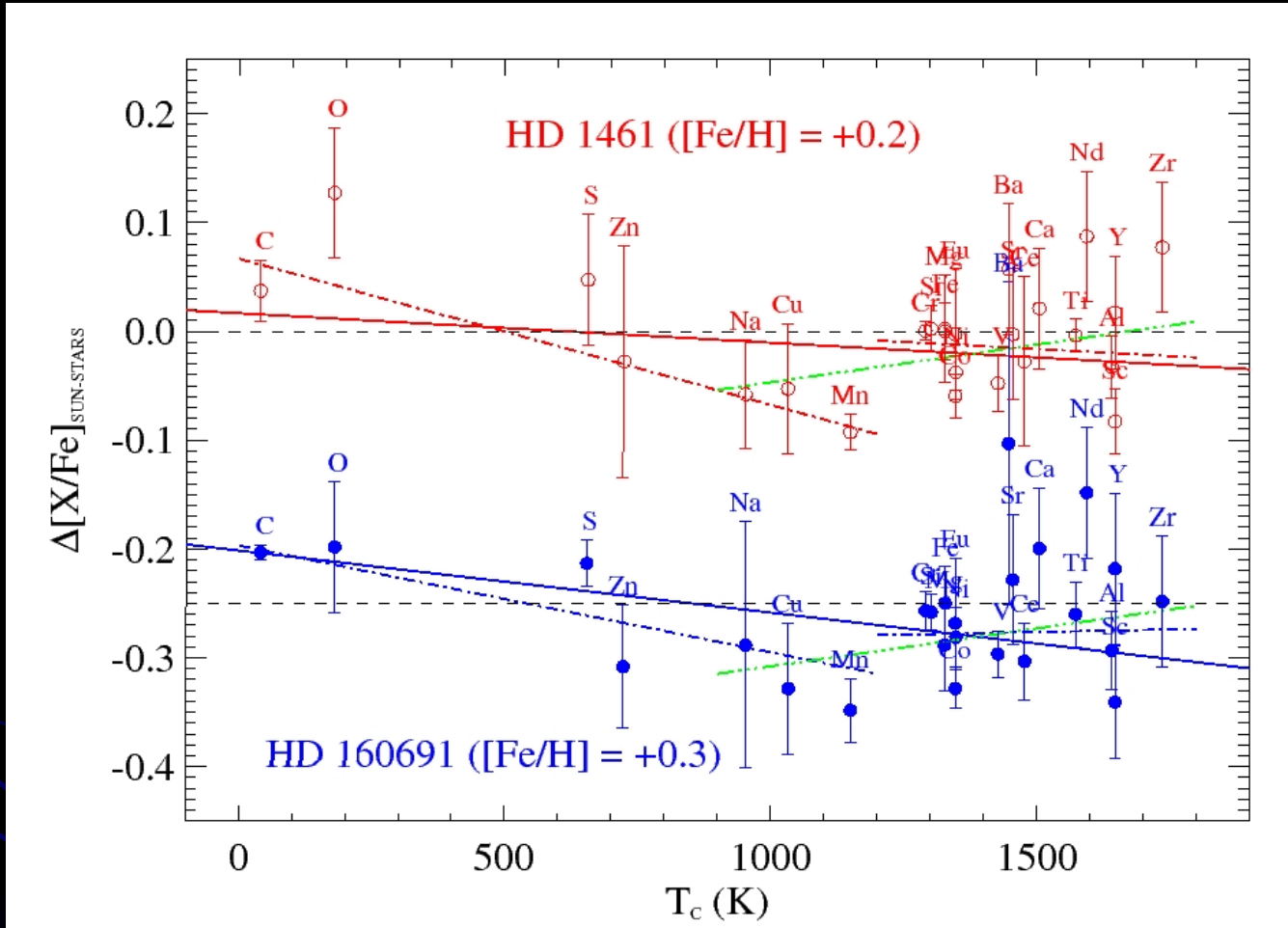
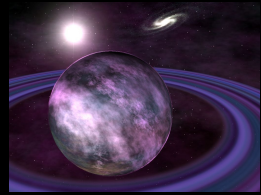
# Metal-rich solar analogs



36 solar analogs with and without planets with similar stellar parameters and metallicities

González Hernández et al. (2011, Cool Stars 16)

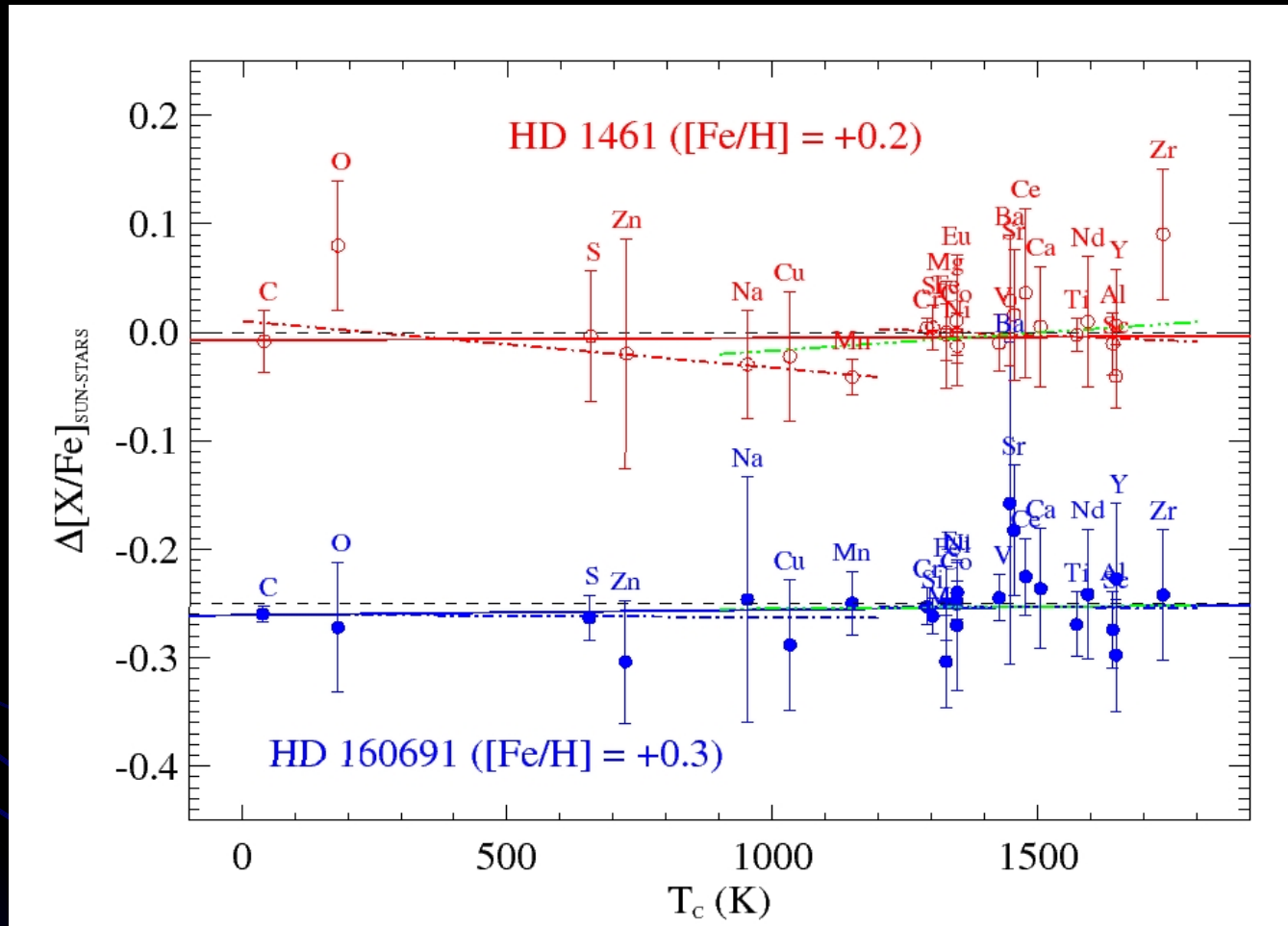
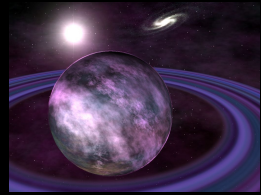
# Super-Earth like planets



Two metal-rich solar analogs containing one Super-Earth like planet each with 7 and 11 Earth masses

González Hernández et al. (2011, IAU S276)

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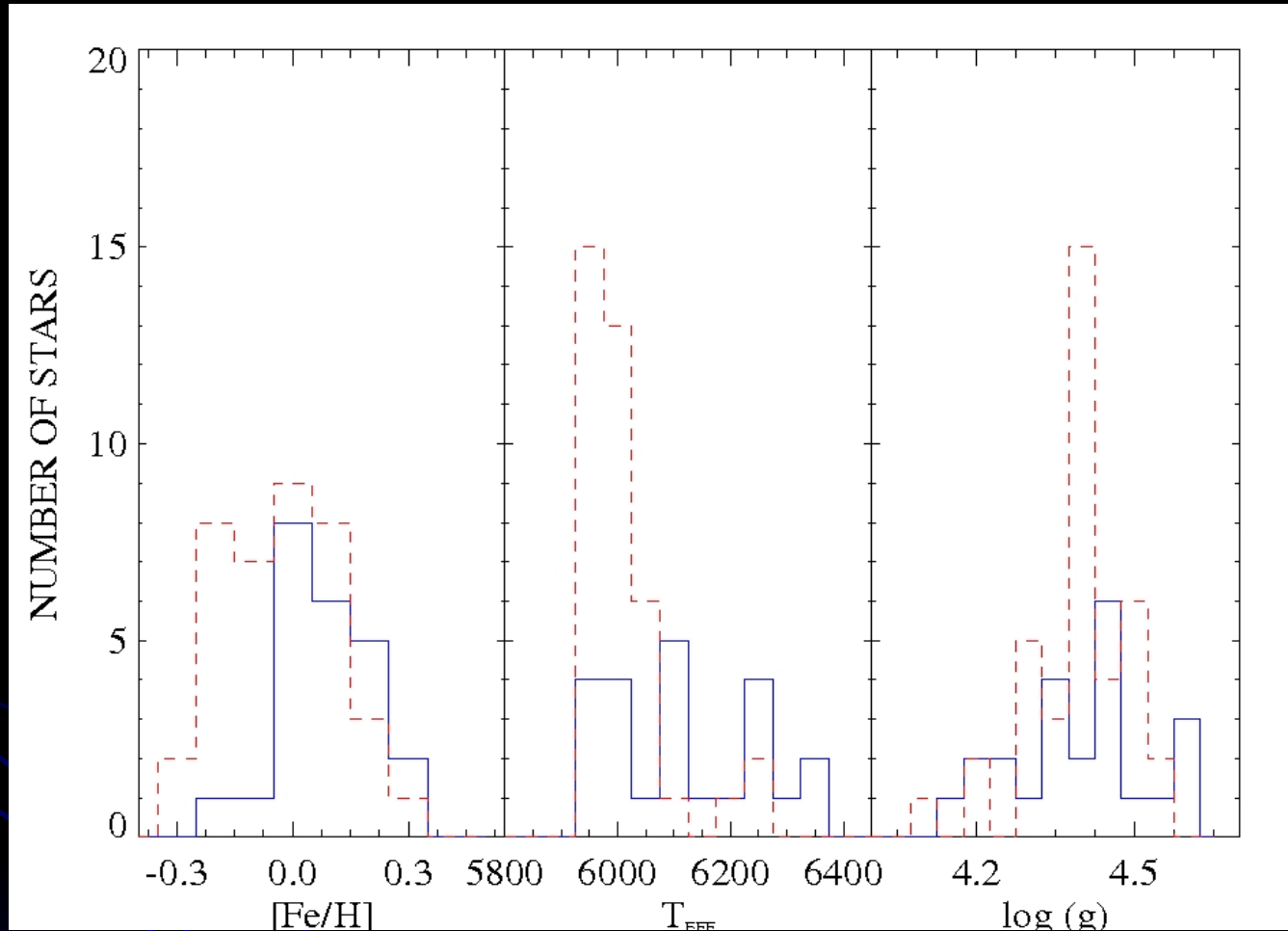


## Conclusions:

- ❖ We may conclude that there is no reason to expect that stars with massive planets should contain terrestrial planets and two stars with already detected Super-Earth like planets should not or that the amount of refractory metals in planet hosts depends only on the amount of terrestrial planets.
- ❖ It seems plausible that many of our targets host terrestrial planets



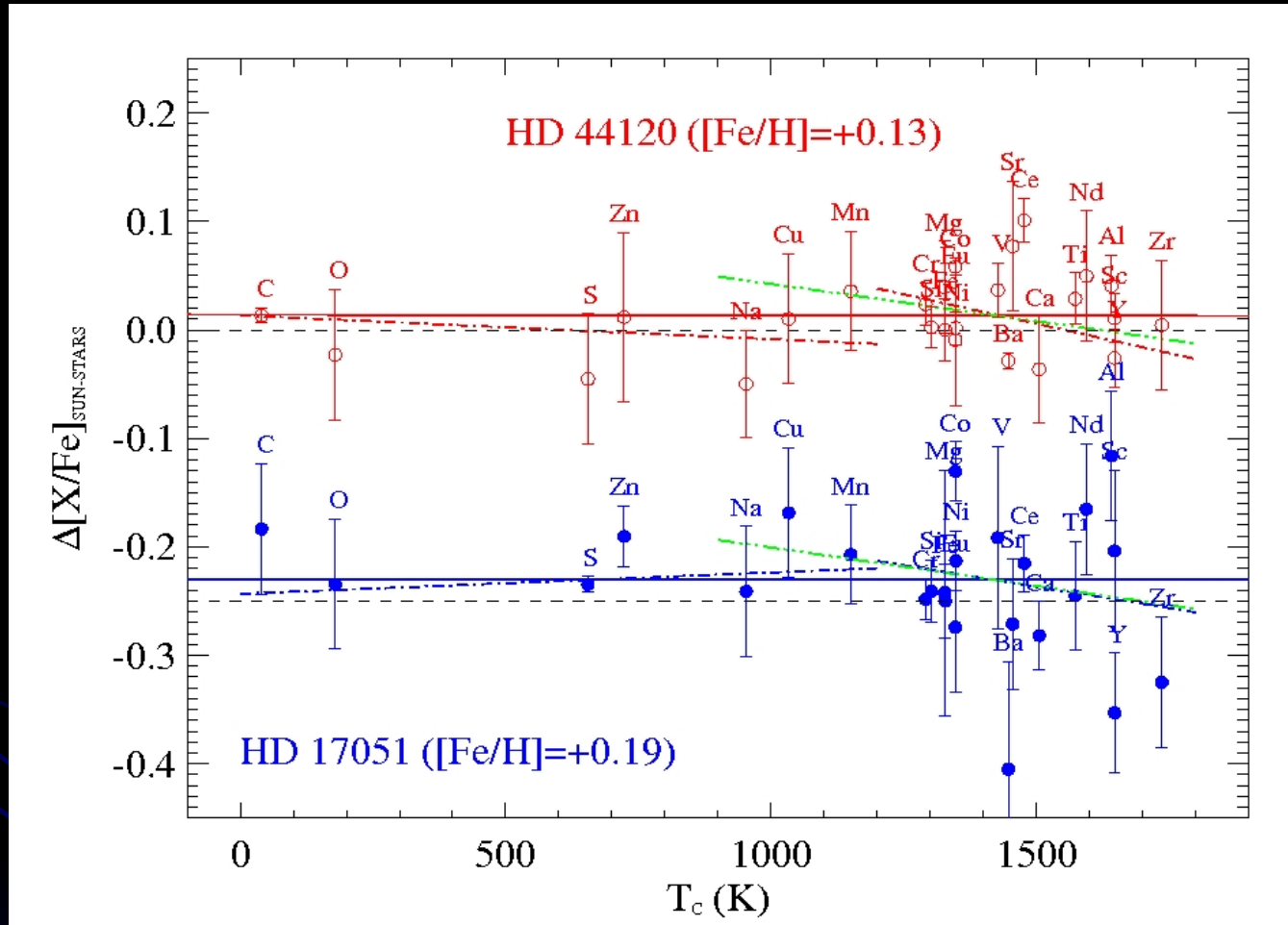
# “Hot” analogs



61 “hot” analogs with  $T_{\text{EFF}} > T_{\text{SUN}}$  containing 38 stars without planets and 23 stars hosting planets from high-quality HARPS and UVES spectra  
González Hernández et al. (2011, in preparation)



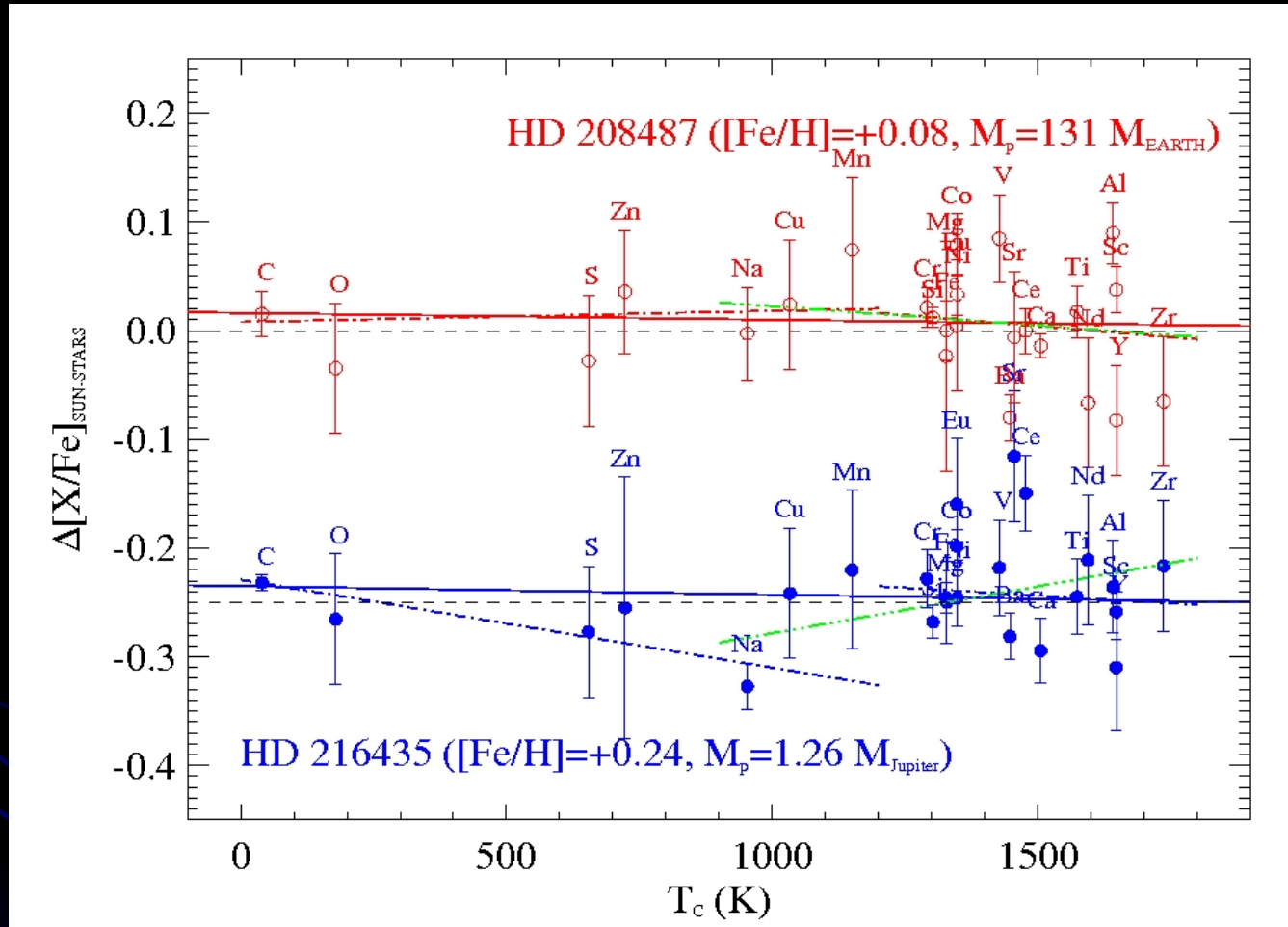
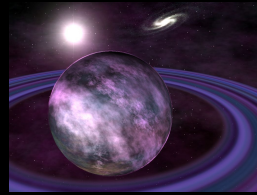
# “Hot” analogs



Two “hot” analogs without planets with  $T_{\text{EFF}} \sim 6052\text{K}$  and  $6227\text{K}$  that may be used as a reference stars for the sample of “hot” analogs

González Hernández et al. (2011, in preparation)

# “Hot” analogs



Two “hot” analogs with planets with  $T_{EFF} \sim 6146K$  and  $6008K$  that host saturn-like and jupiter-like planets, respectively

González Hernández et al. (2011, in preparation)

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