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Linking the primordial composition of stars to the present-day composition of their rocky exoplanets

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Stellar atmospheres serve as a crucial gateway to understanding the primordial composition of planetary systems. As planet-forming disks dissipate within a few million years, stellar observations become the primary means to probe their remnants. While conventional models assume a direct correspondence between the compositions of rocky exoplanets and their host stars, recent work by Adibekyan et al. (2021) challenges this assumption. They showed that while there is a relation between the composition of rocky planets and their host stars, the relation is not one-to-one. However, their study had limitations: neglecting volatile elements (e.g. water) in planetary interiors and relying on present-day stellar abundances as proxies for primordial disk compositions, overlooking stellar evolution effects such as atomic diffusion. Over the past two years, the EXO-Terra project has addressed these limitations and expanded the dataset by approximately 50%. Through comprehensive analysis, we aimed to refine the understanding of the star-planet compositional link. I propose an oral presentation to share the findings of the EXO-Terra project, which directly align with the scientific objectives of PLATO, encompassing both stellar and planetary science cases.

Primary author: ADIBEKYAN, Vardan (IA/Univ. Porto)

Presenter: ADIBEKYAN, Vardan (IA/Univ. Porto)

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