Goldschmidt 2023 Abstract
https://doi.org/10.7185/gold2023.15317

Abundances from stellar burning for comparison to meteorite data

MARIA LUGARO[1], MATTIAS EK[2], MARIA K PETO[1], MARCO PIGNATARI[1], GEORGY V. MAKHATADZE[3], ISAAC JAMES ONYETT[4], GÁBOR G. BALÁZS[1], LORENZO ROBERTI[1] AND MARIA SCHÖNBÄCHLER[5]

[1]Konkoly CSFK Budapest
[2]ETH Zurich
[3]Centre for Star and Planet Formation (StarPlan), Globe Institute, University of Copenhagen
[4]Globe Institute, University of Copenhagen
[5]Institute of Geochemistry and Petrology, ETH Zürich
Presenting Author: maria.lugaro@csfk.org

Analysis of bulk meteorite compositions has revealed small isotopic variations due to the presence of material (e.g., stardust) that preserved the signature of nuclear reactions occurring in specific stellar sites. The interpretation of such anomalies provides evidence for the environment of the birth of the Sun, its accretion process, the evolution of the solar proto-planetary disk, and the formation of the planets. A crucial element of such interpretation is the comparison of the observed anomalies to predictions from models of nuclear burning in stars. To date this comparison has been limited to a handful of model predictions mostly because (i) the calculated stellar abundances need to be transformed into a specific representation, which nuclear astrophysicists are unaccustomed to, and (ii) the stellar models are not fully available to and manageable by cosmochemists and planetary science researchers. We are collecting predictions from two and seven sets of models, respectively, of asymptotic giant branch (AGB) stars and core-collapse supernovae (CCSNe), which are the main producers of stardust in the Galaxy, to feed them as input to open source codes that post-process the stellar abundances into the representation needed to be compared to the meteorite data. The final aim is to make available all the models and codes and accompany them with documents and papers with instructions for utilization by the whole community. We will present some preliminary example cases such as Mo in AGB stars and Ni in CCSNe. *This work is part of WP9 of the ChETEC-INFRA.eu project, which is funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008324 (ChETEC-INFRA).*