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Modelling the Milky Way's most metal-poor star

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Late-type ultra metal-poor stars are thought to be formed from interstellar gas enriched by only one to few supernovae. As such, their elemental abundances and total metal content are important in understanding the limits of star formation in the early universe and the chemical evolution of the Milky Way. In this talk, I will present an updated chemical abundance analysis of the most metal-poor star known to date (SDSS J102915+172927) using new stellar parameters from Gaia DR2 and a tailored 3D atmospheric model, first discussed by Caffau et al. (2011). This work showcases the advantages of state-of-the-art 3D atmospheric models and 3D NLTE radiative transfer compared to commonly used 1D LTE methods. In addition, we are revitalising and expanding the STAGGERgrid of 3D stellar models together with collaborators from Aarhus university. This is especially interesting in the prospect of upcoming large spectroscopic observing campaigns like GALAH, WEAVE, and 4MOST, which will release a wealth of spectroscopic data, including hundreds of thousands of metal-poor stars.

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