

Using asteroseismology to calibrate spectroscopic ages for giants

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Asteroseismology permits us to infer masses for large samples of evolved red giant stars, which have also been the subject of comprehensive spectroscopic surveys. There is a strong correlation between the C/N ratio, mass and metallicity; this permits us to assign spectroscopic ages linked to a physical mechanism (the first dredge-up), as opposed to being a correlation. In this talk I critically analyze the strengths and weaknesses of this approach. I demonstrate the importance of an absolute asteroseismic mass calibration for reliable ages. Independent chemical evolution checks on C/N in unevolved stars are important for constraining the mass dependence of the first dredge up. Mixing on the RGB is an important confounding factor in metal-poor giants, and I discuss its impact for solar abundance stars. Finally, I discuss the prospects for using C/N as an age diagnostic in core He burning stars, where the current mass need not reflect the initial one.

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