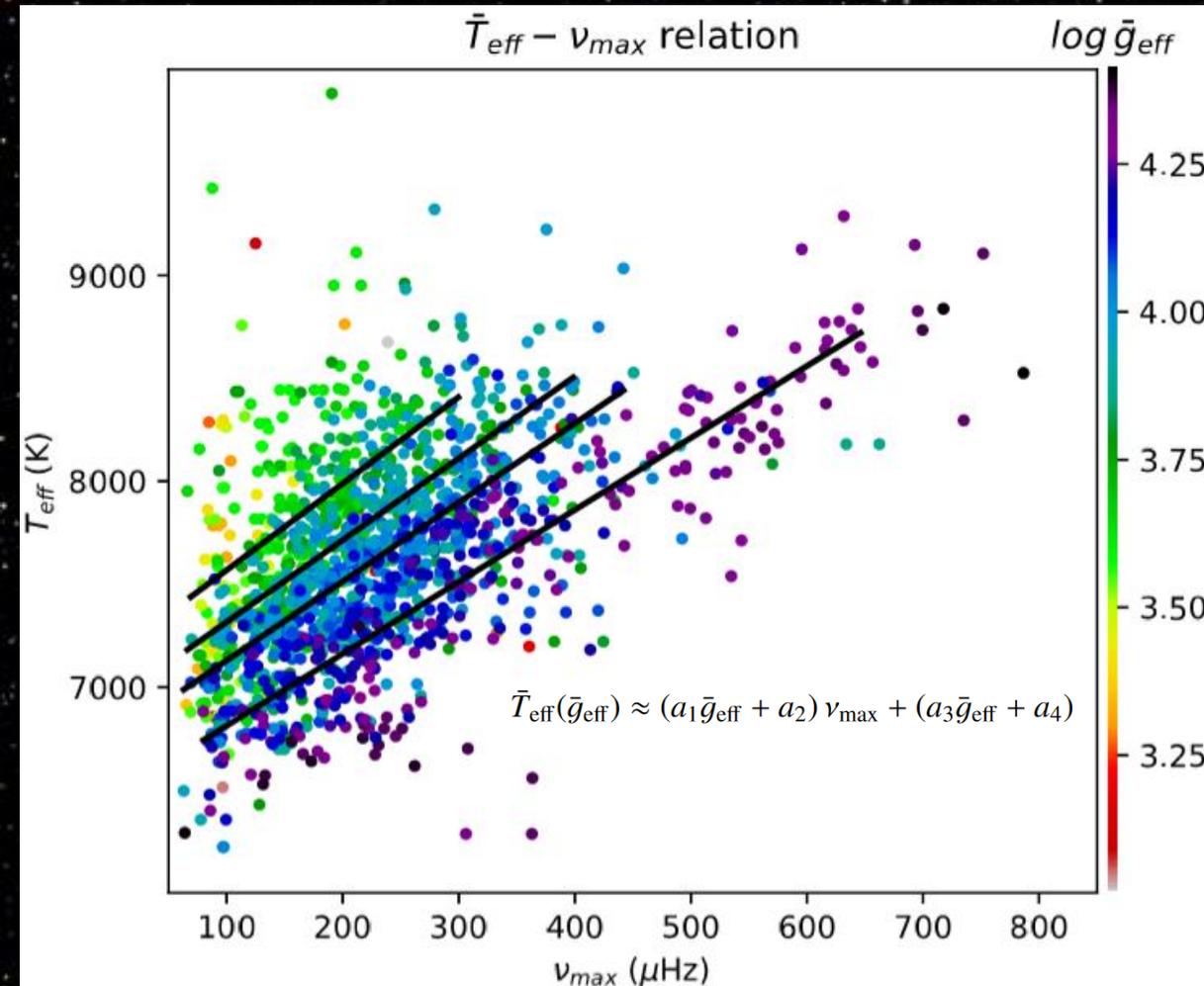


Unveiling the power spectra of δ Scuti stars with TESS.

The temperature, gravity, and frequency scaling relation



Temperature and frequency scaling relation for each group of δ Scuti stars with different values of their surface gravity.

BARCELÓ FORTEZA + 2020, A&A V638, A59 ([LINK](#))

δ Scuti stars may be characterized with the seismic indexes of their power spectra. Thanks to long-duration high-cadence light curves from TESS (Transiting Exoplanet Survey Satellite) space mission, we analysed more than two thousand of this kind of classical pulsators. In that way, we propose the frequency at maximum power (ν_{max}) as a proper seismic index since it is directly related with the intrinsic **temperature**, **mass** and **radius** of the star. This parameter seems not to be affected by rotation, inclination, extinction or resonances, with the exception of the evolution of the stellar parameters. Furthermore, we can constrain rotation and inclination using the departure of temperature produced by the gravity-darkening effect. This is especially feasible for fast rotators as most of δ Scuti stars appear to be.

Thus, it is possible to correct the position of the star in the HR Diagram and then improve the **age** determination using isochrone fitting. In addition, since δ Scuti stars are used as standard candles, it would be feasible to improve the **distance** determination to globular clusters and other galaxies. Moreover, exoplanetary research may benefit from our method since the calculation of the **habitable zone** depends on stellar parameters such as temperature.