

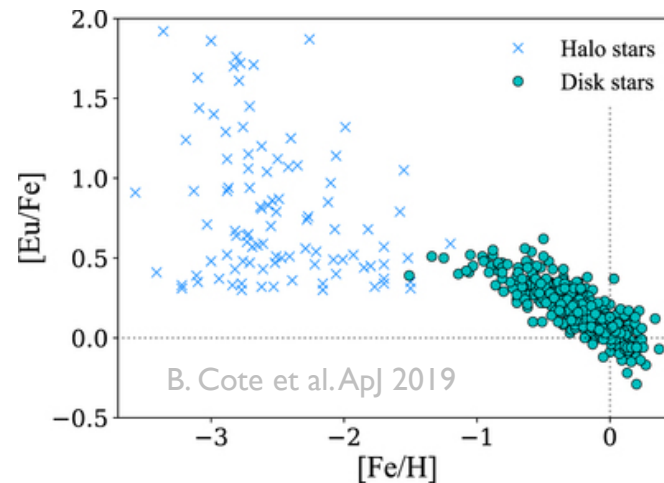
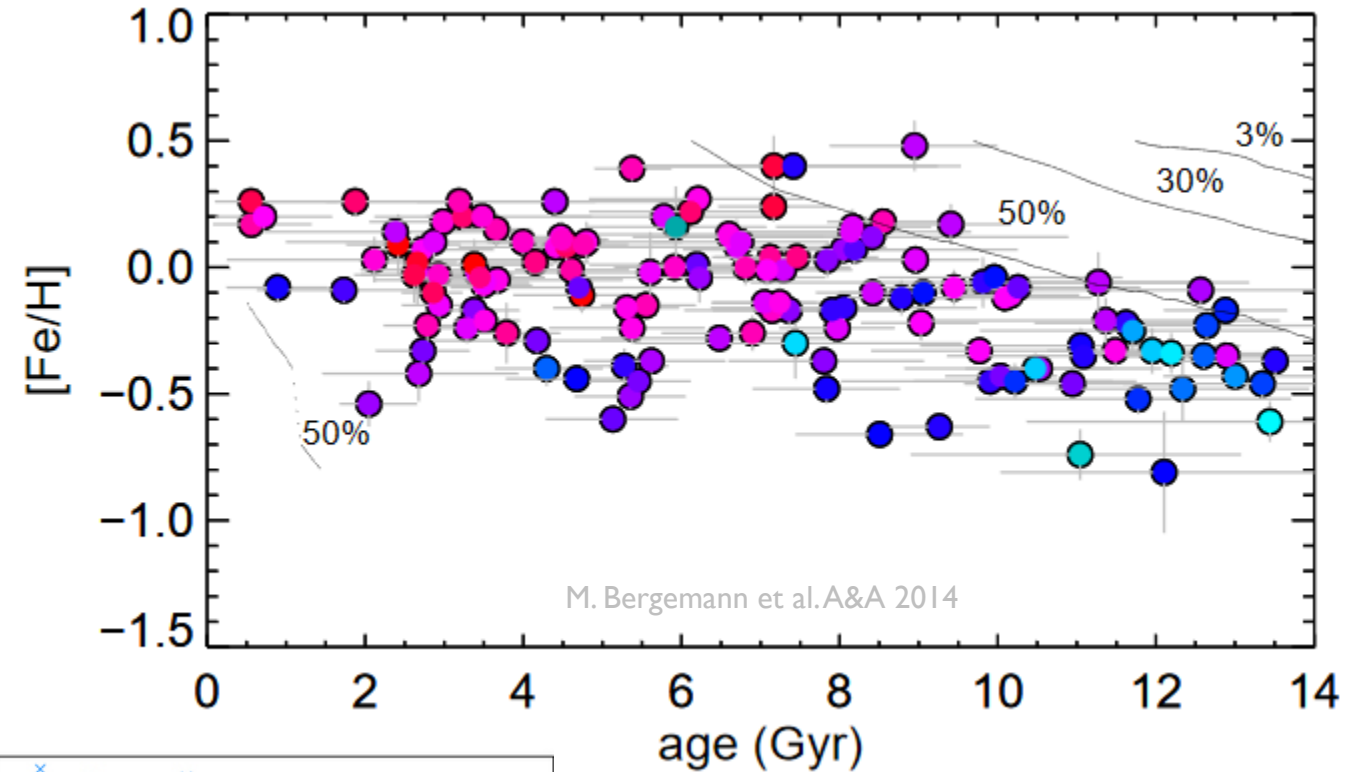
An introduction to
Stellar Spectra

Zach Meisel

Ohio University - ASTR1000

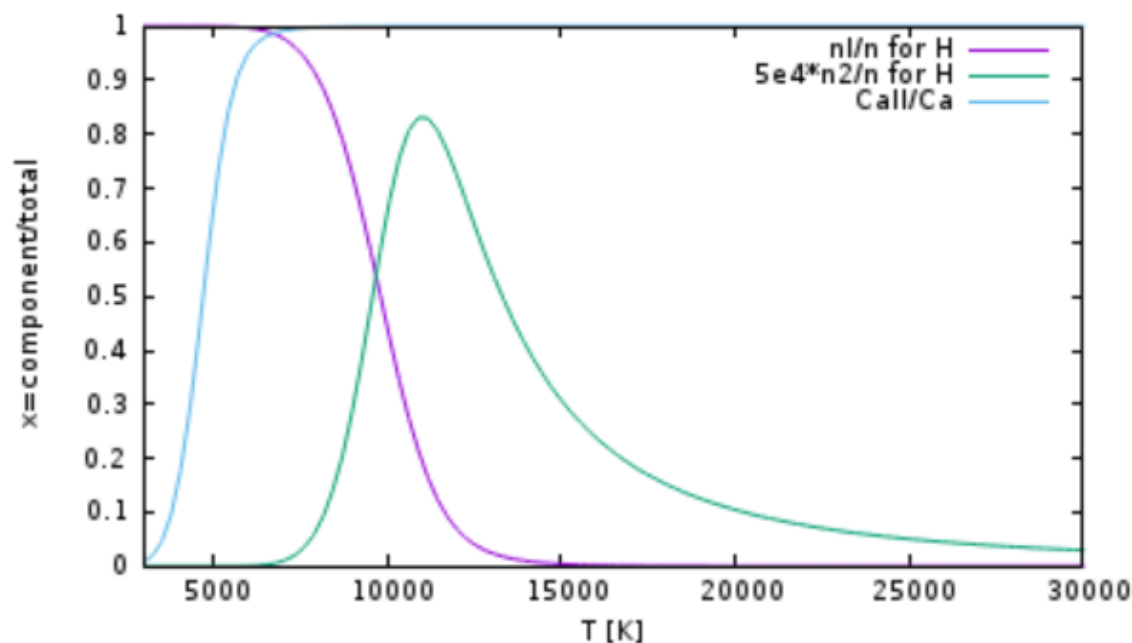
Spectra can tell you the stellar composition ...but

- Most stars are pretty similar in composition!
- Spectra are nonetheless extremely valuable, providing constraints on the stellar temperature, radius, and motion
- Importantly, some stars do vary quite a bit in composition, and these are key to understanding the origin of the elements

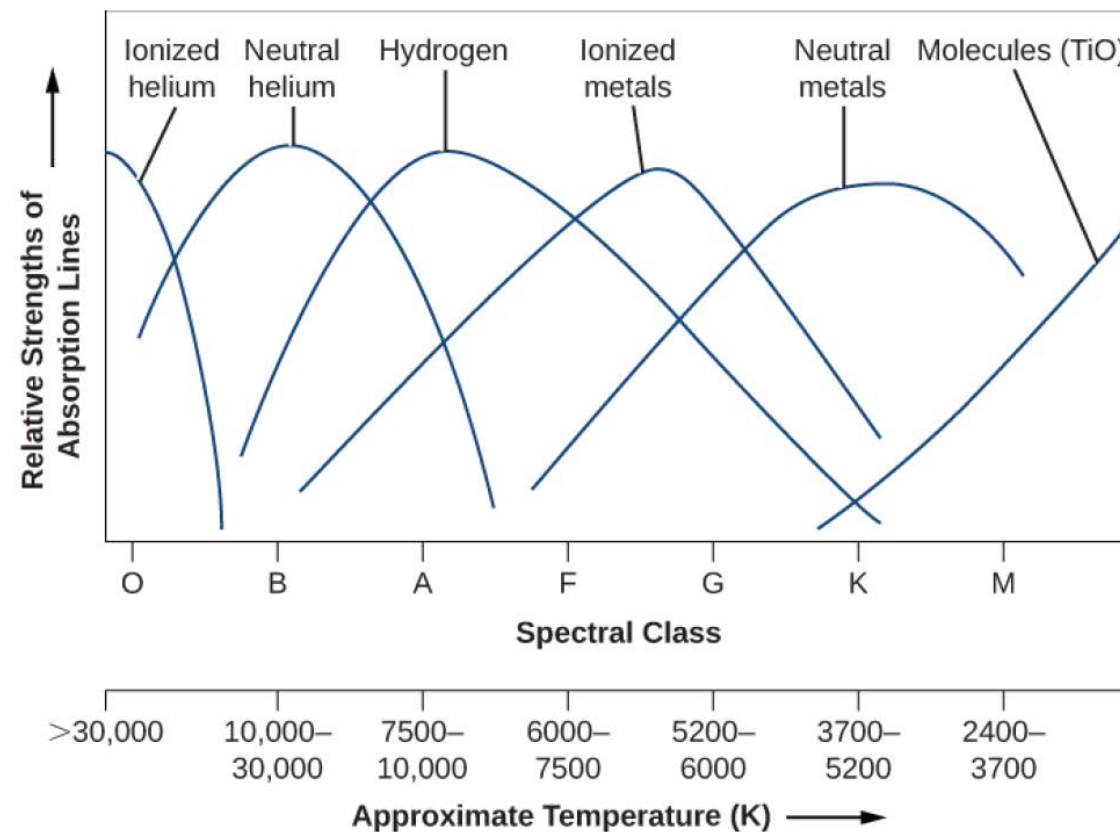


Spectra & stellar temperature

- Recall from “introduction to spectra” that the degree of atomic ionization and excitation will depend on the temperature.

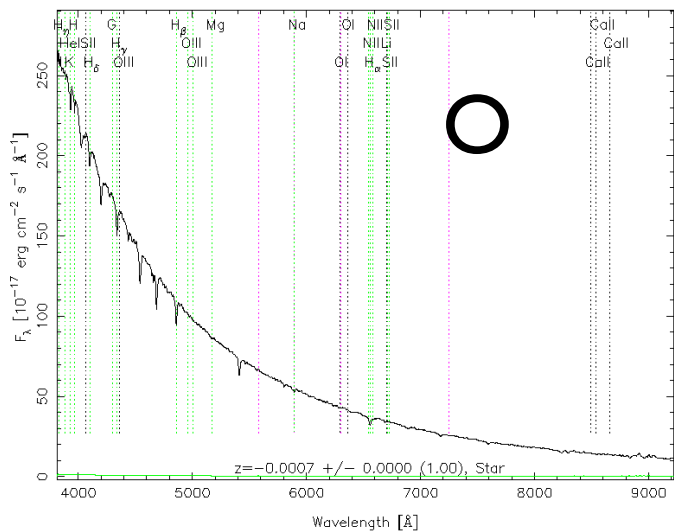


- Atomic (and molecular) absorption therefore depends sensitively on the temperature and so the relative strength of lines determines the spectral type

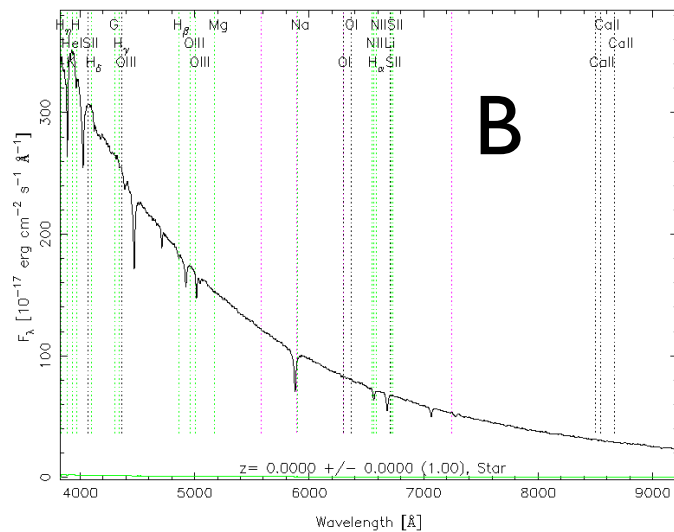


Spectra & stellar temperature (a.k.a. classifications)

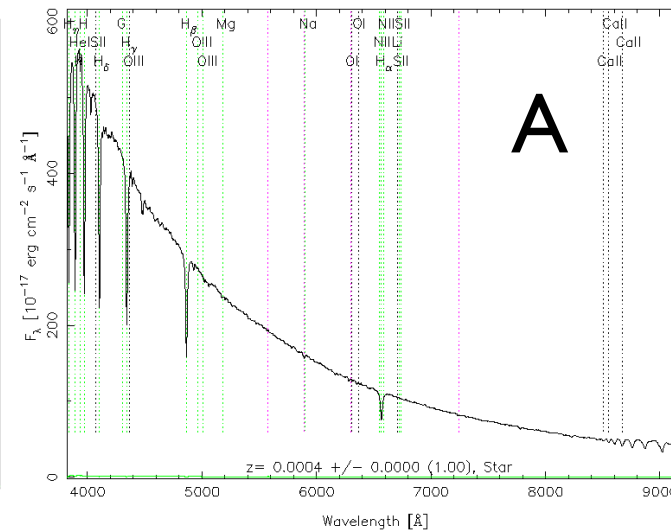
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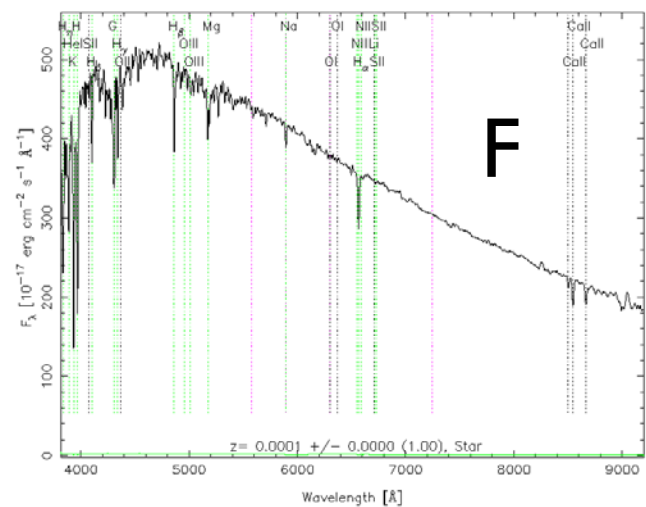
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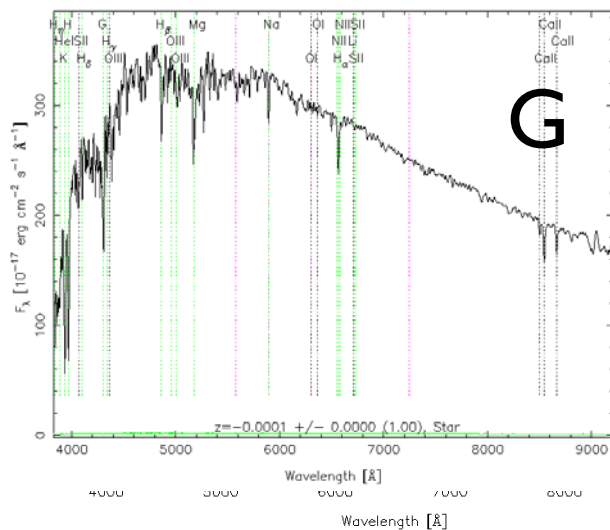
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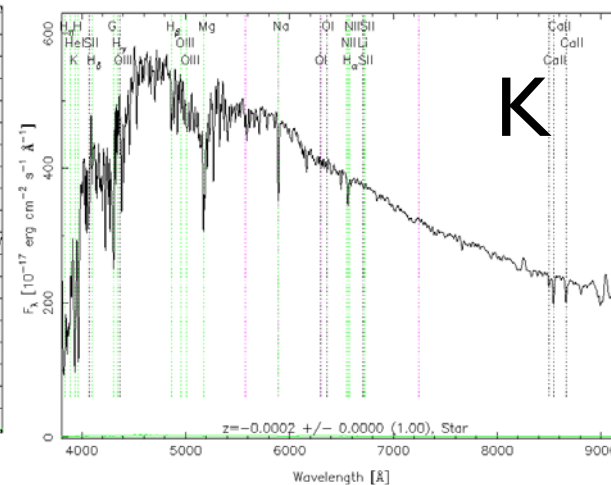
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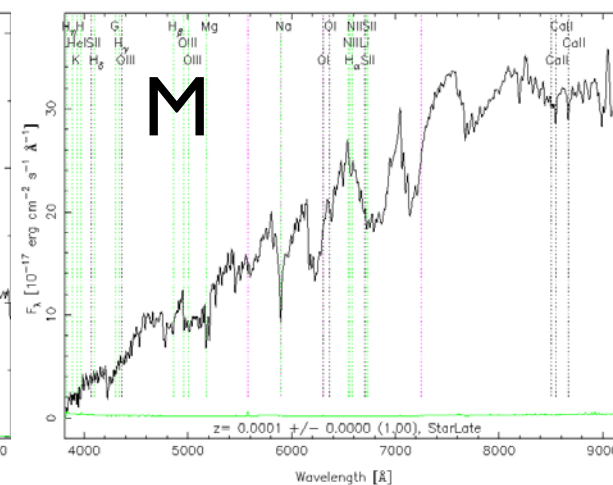
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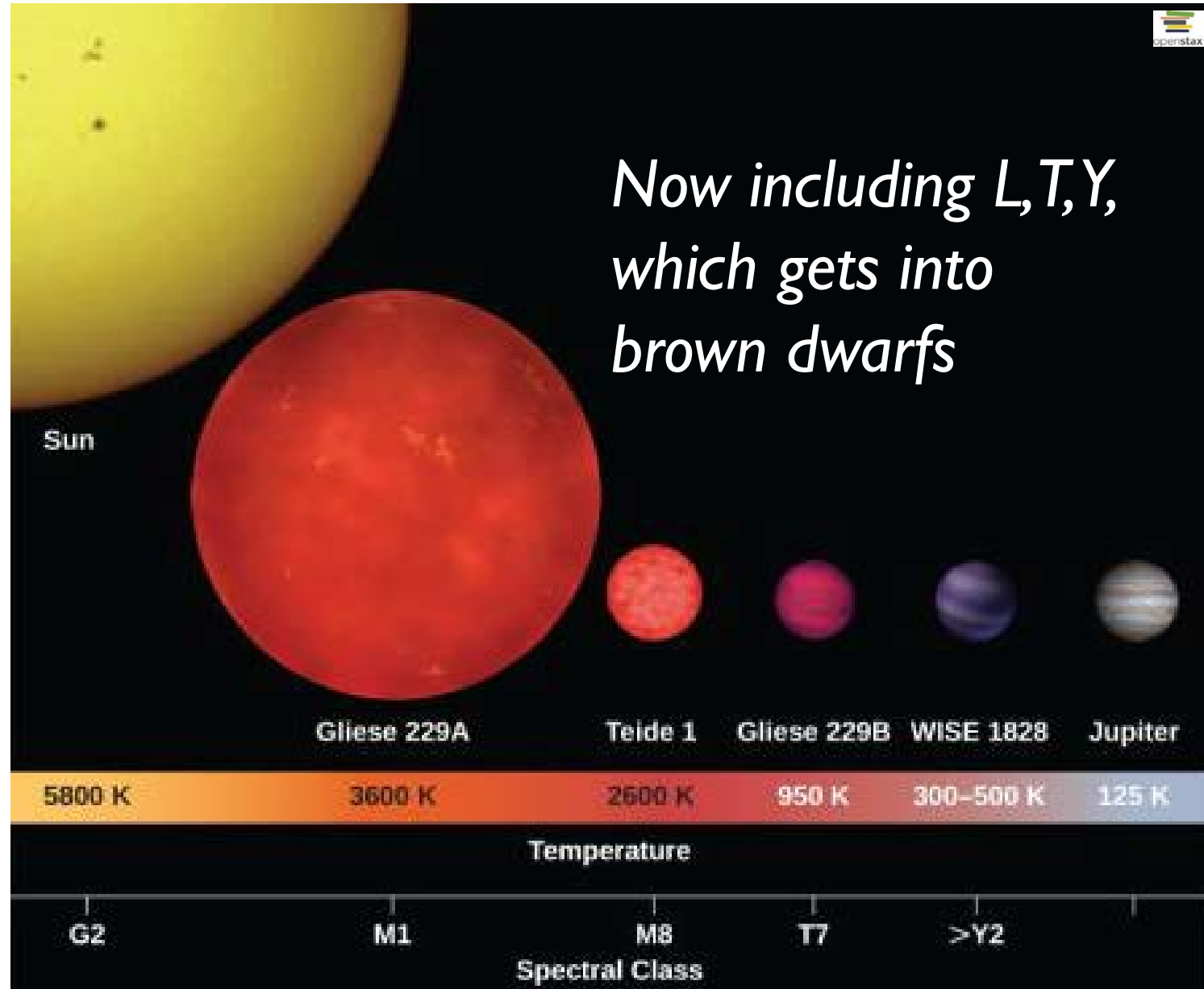
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RA=27.66583, DEC=-1.13947, MJD=51793, Plate= 402, Fiber=204

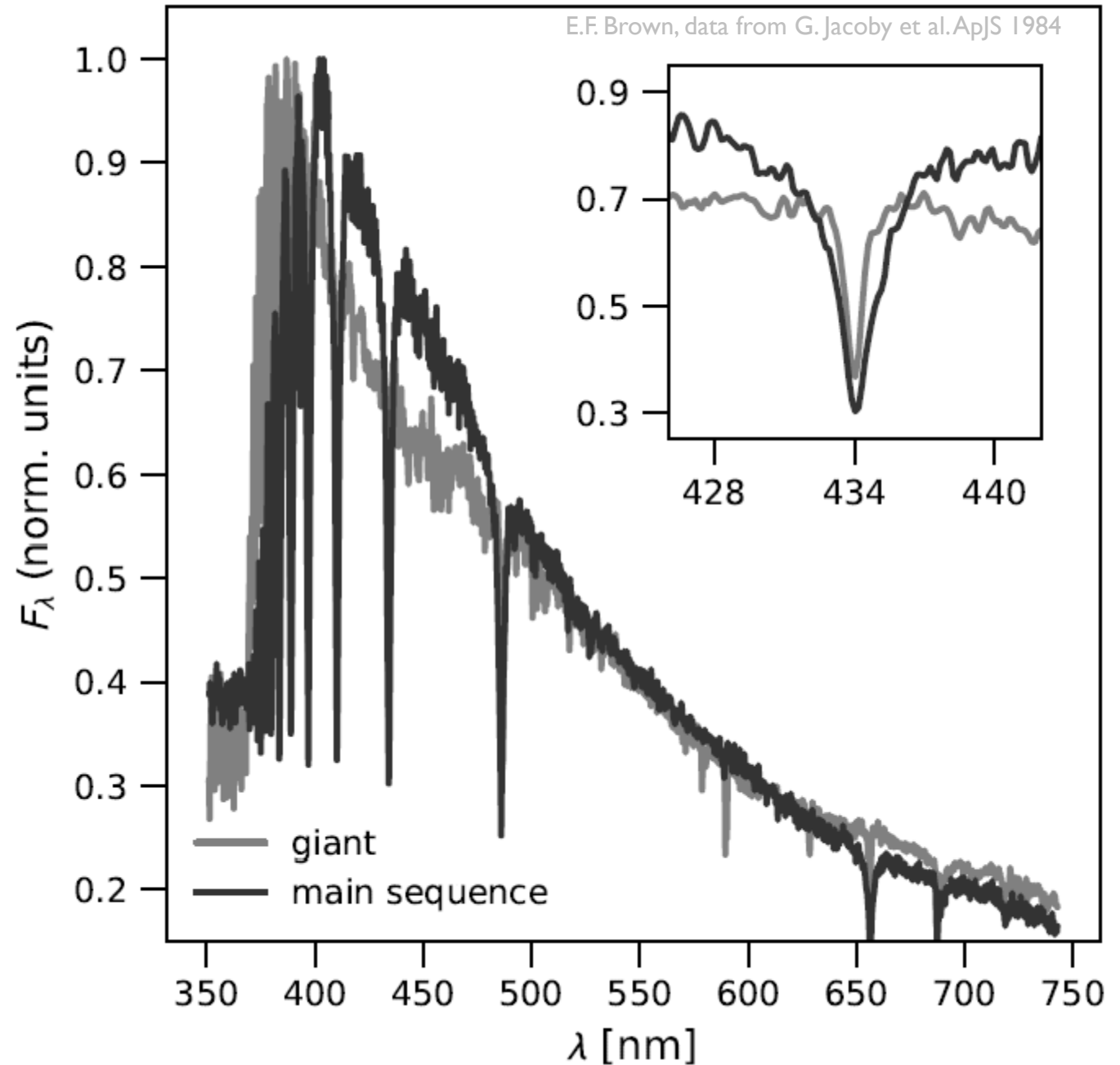


Spectra & stellar temperature (a.k.a. classifications)



Spectra & stellar radii

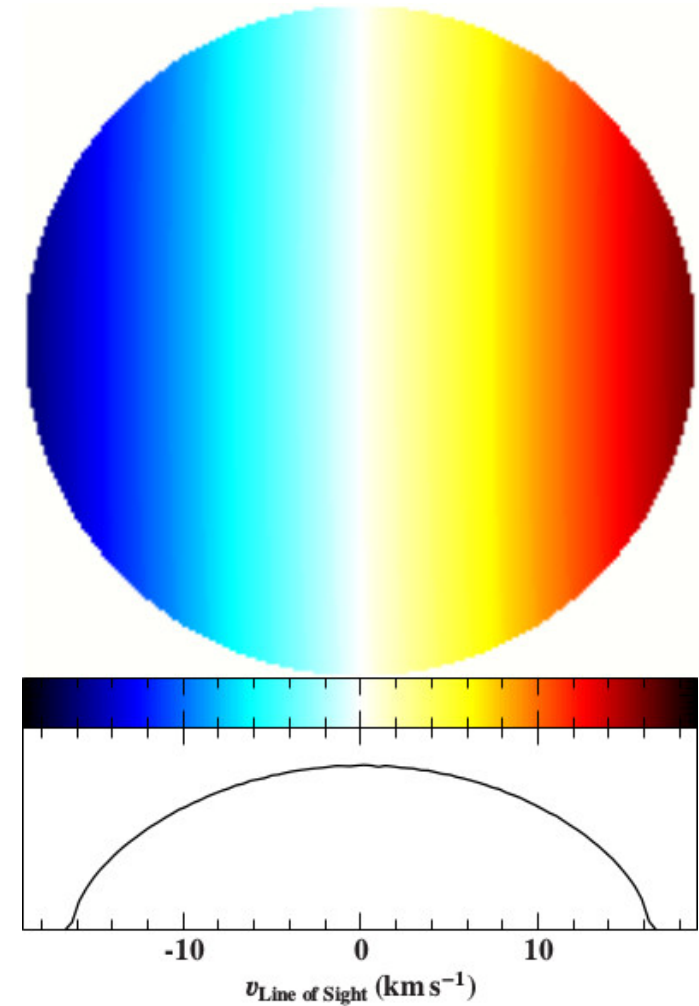
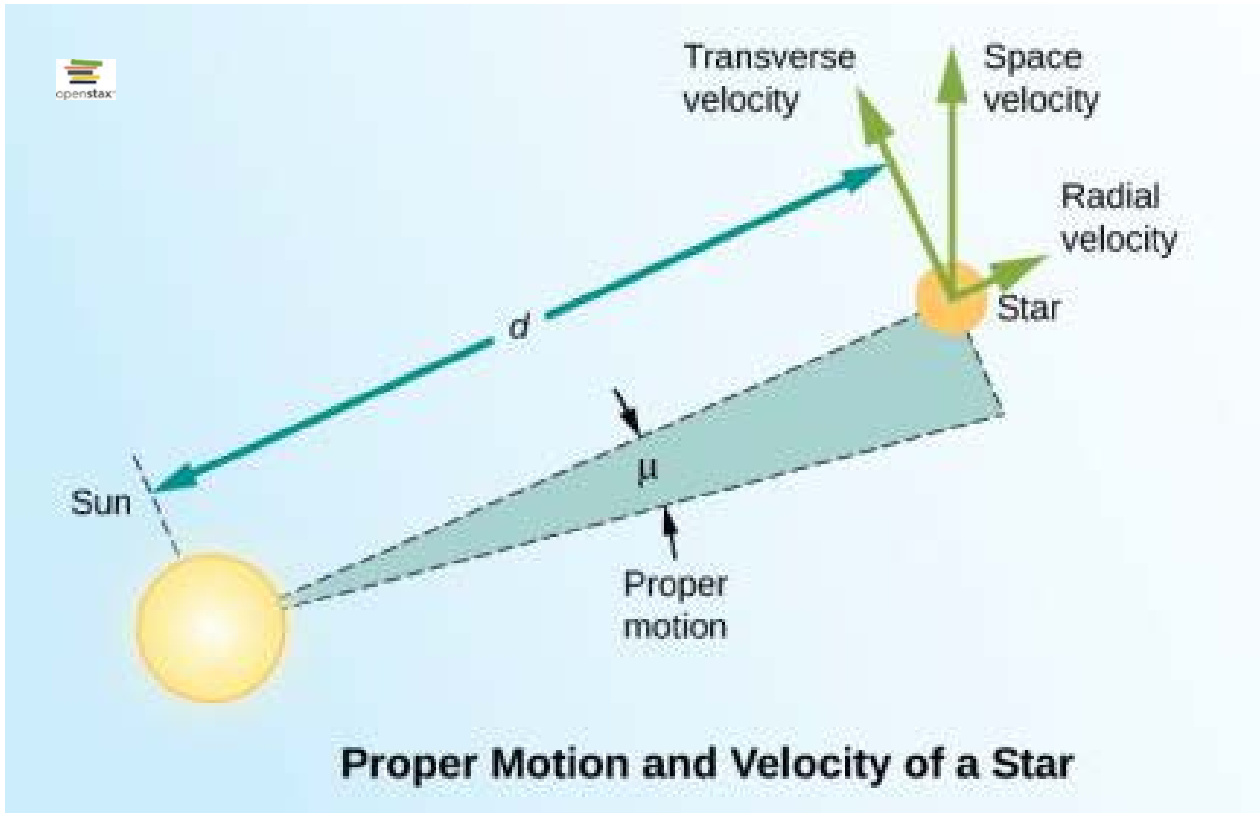
- While the location of a spectral line indicates an element is present, the width of a spectral line contains information too
- Aside from rotation (see *Introduction to Spectra*), the width is also related to the pressure in the local environment.
 - Closer to the rest of the star
= more collisions
= broader spectral line
 - Further from the rest of the star
= fewer collisions
= narrower spectral lines



Spectra & stellar motion

Can use spectra for radial velocity

and rotation rate



(see *Introduction to Redshift*)

