What will Kepler/K2 teach us about our *Galaxy*?

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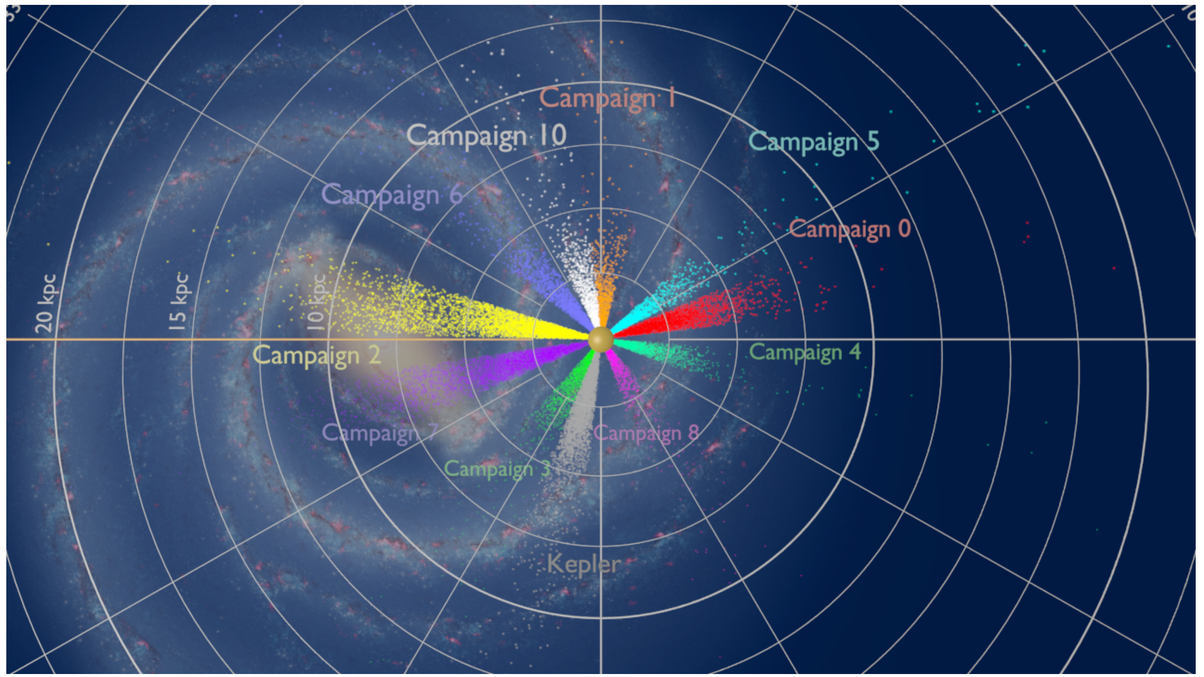
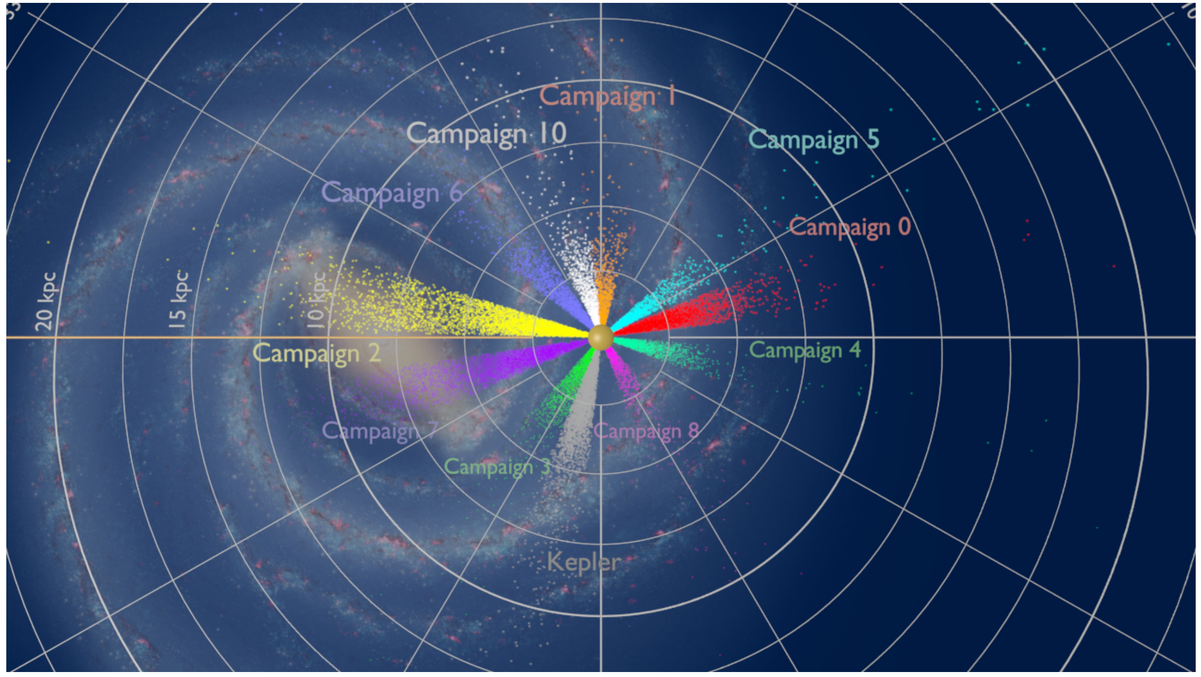


https://escience.aip.de/vis/flight-around-kepler2-targets/

Kepler/K2 a mission about statistics



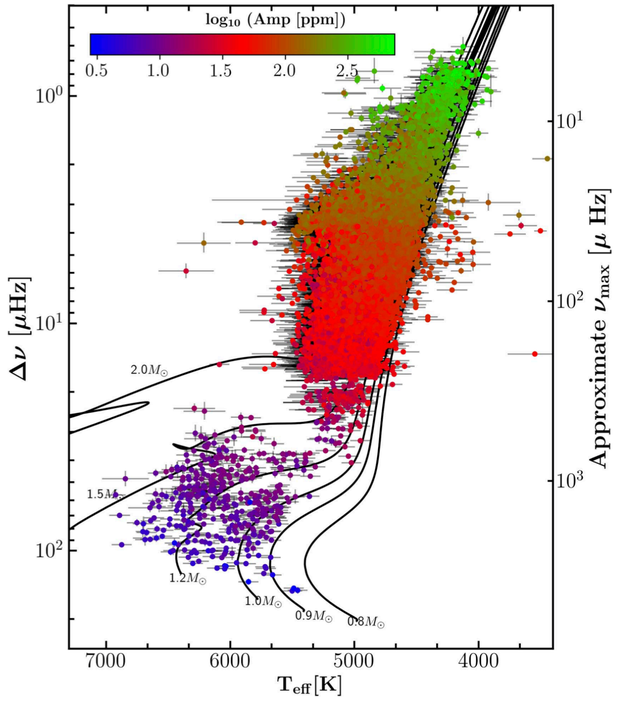
https://escience.aip.de/vis/flight-around-kepler2-targets/

Kepler data teaches us unique things about stars

e.g. fundamental stellar parameters

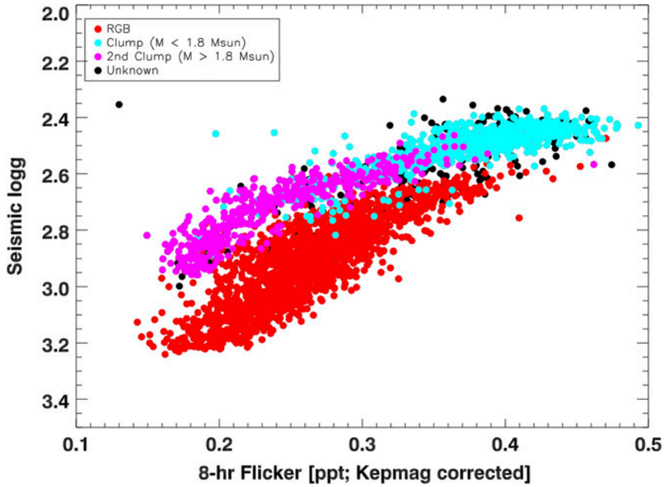
see D. Huber's talk earlier!

mass & radius



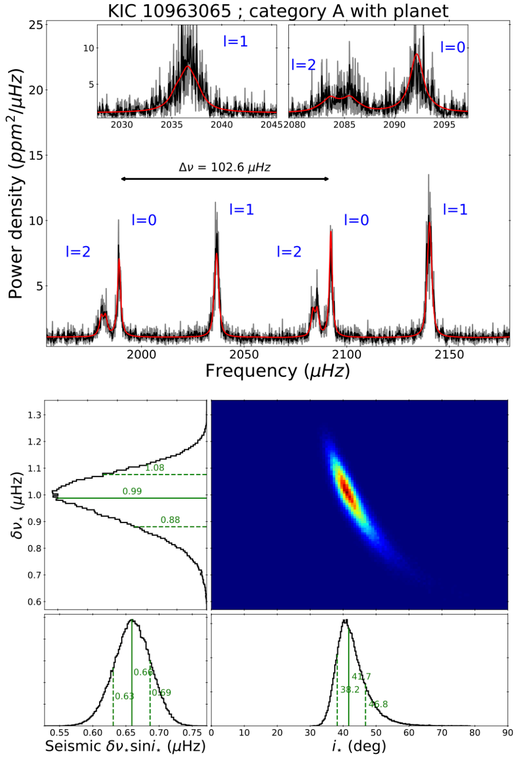
Yu+2018

log g



Bastian+2016

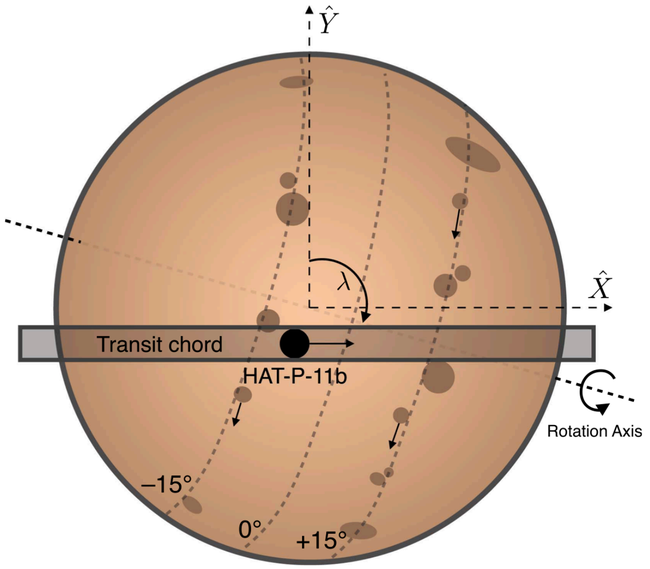
inclination (!)



Kamiaka+2018

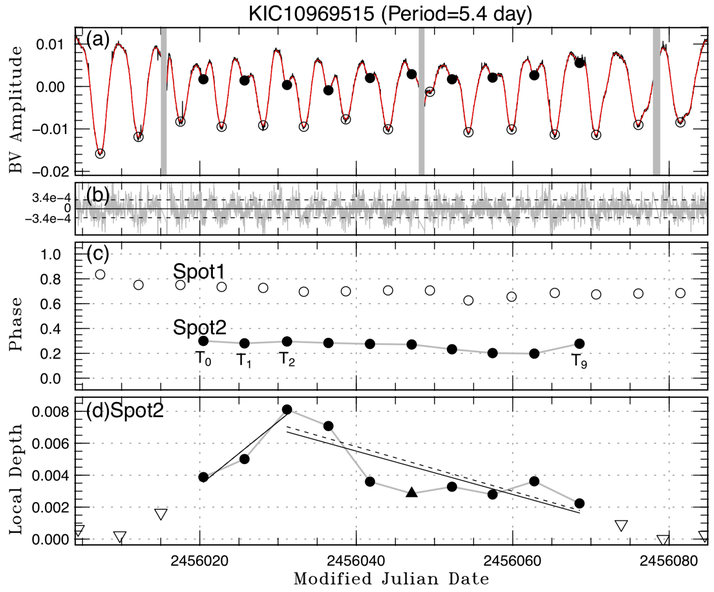
e.g. stellar magnetic activity

active latitudes



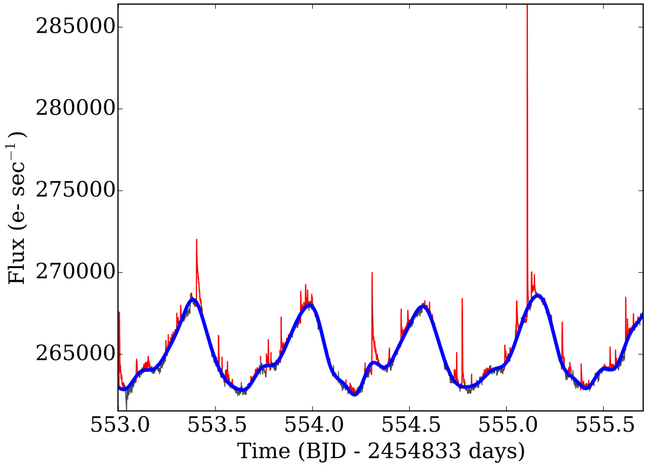
Morris+2017

starspot lifetimes



Namekata+2018

flares



Davenport 2016

Kepler provides us high resolution powerspectra, akin to high res spectra surveys

500k stellar light curves,
compare w/ SDSS & APOGEE for example

So many stars, can do “Galactic Archeology”!

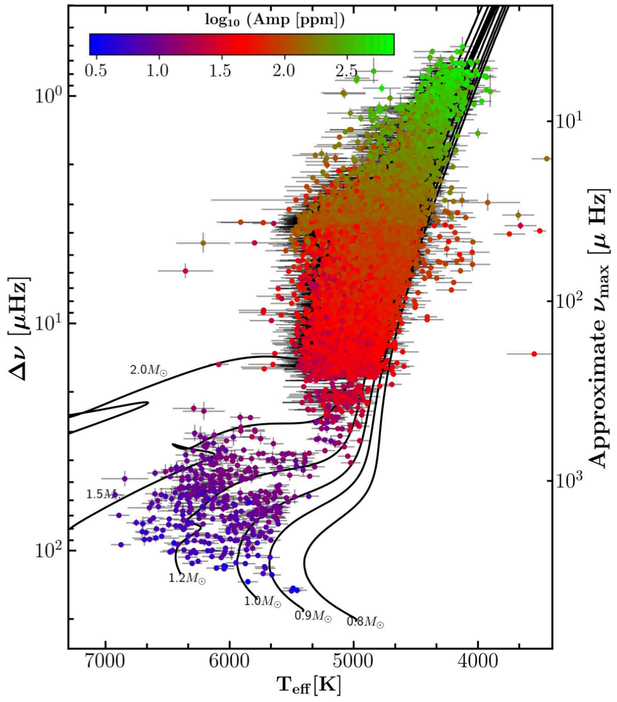
Many important stellar properties to address,

Age (I think) is the big goal

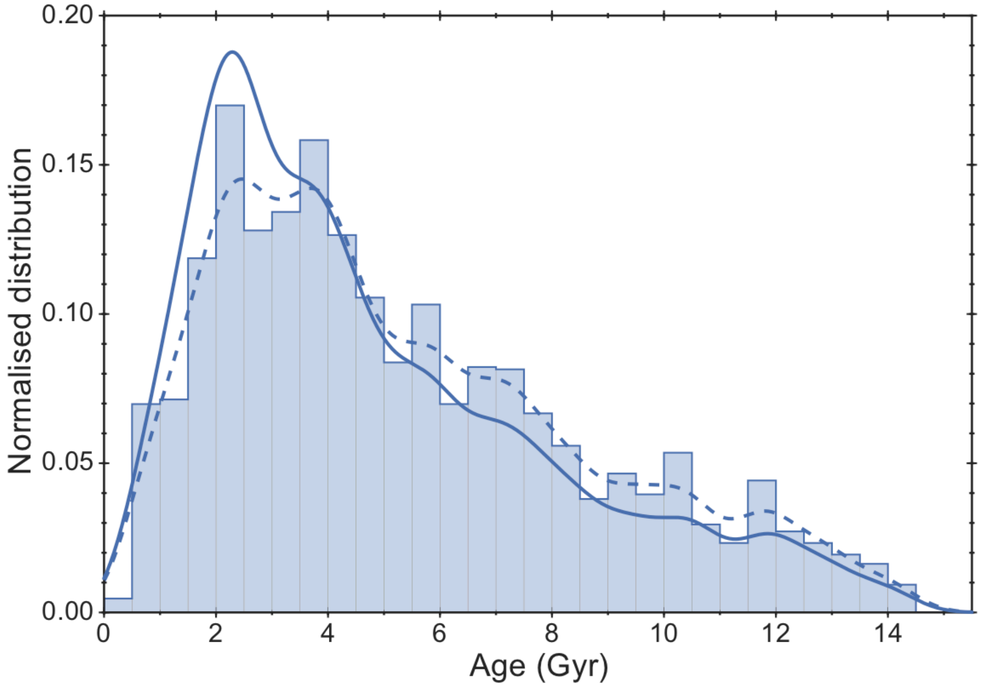
Using *Kepler* to find stellar ages

3 (quick) examples

1. Asteroseismic Ages

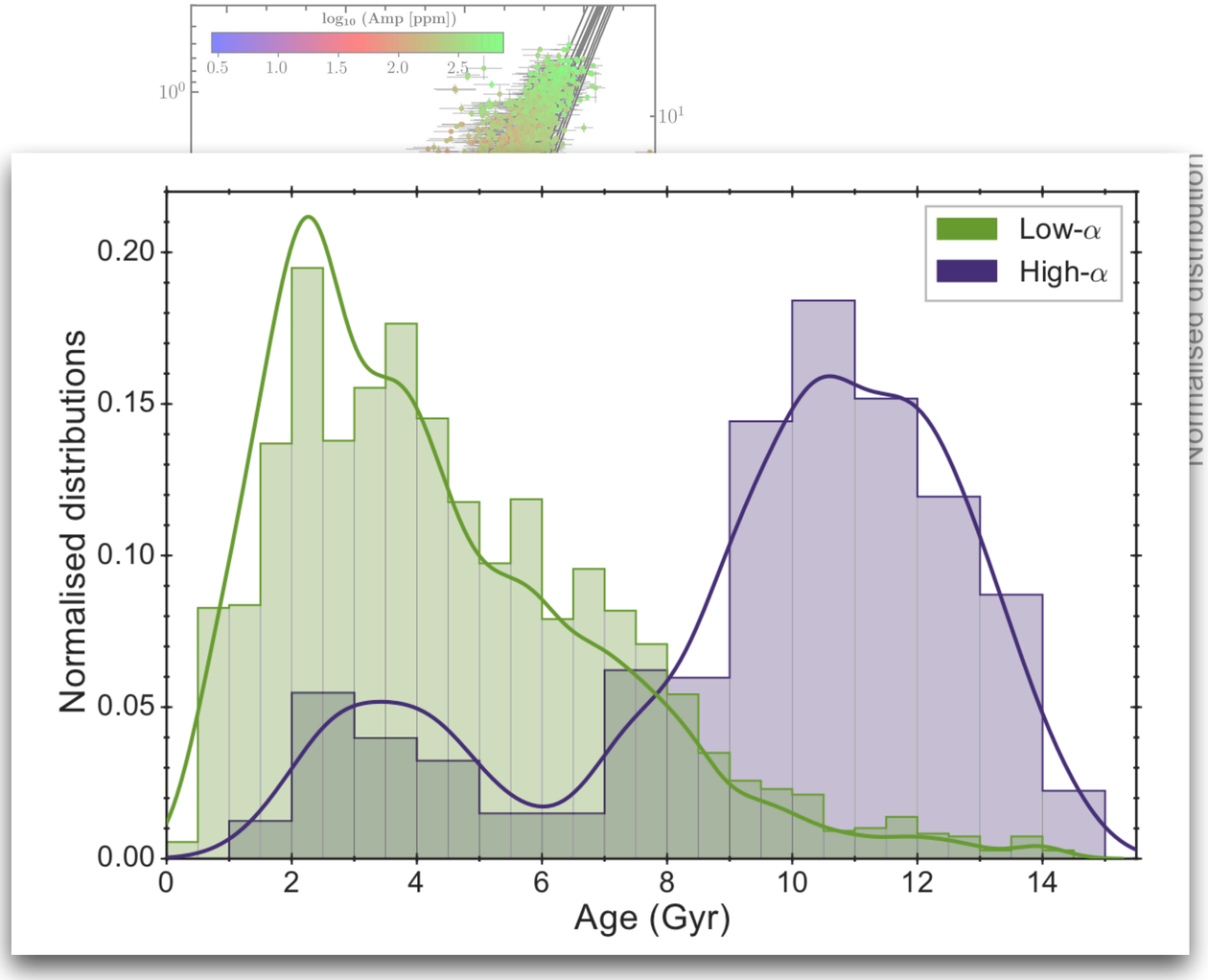


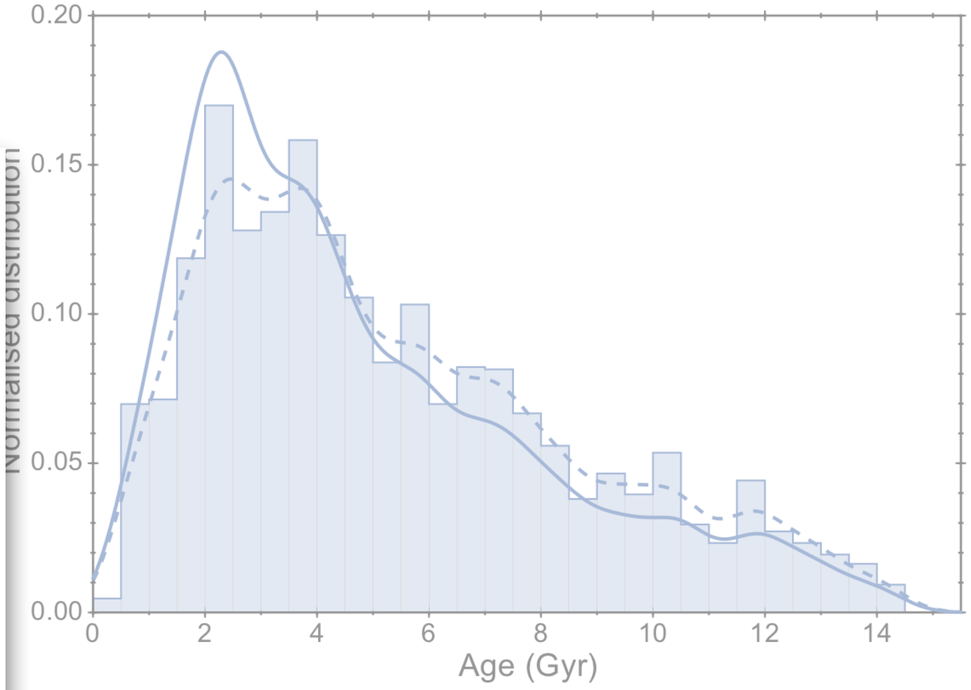
Yu+2018



Silva-Aguirre+2018

1. Asteroseismic Ages

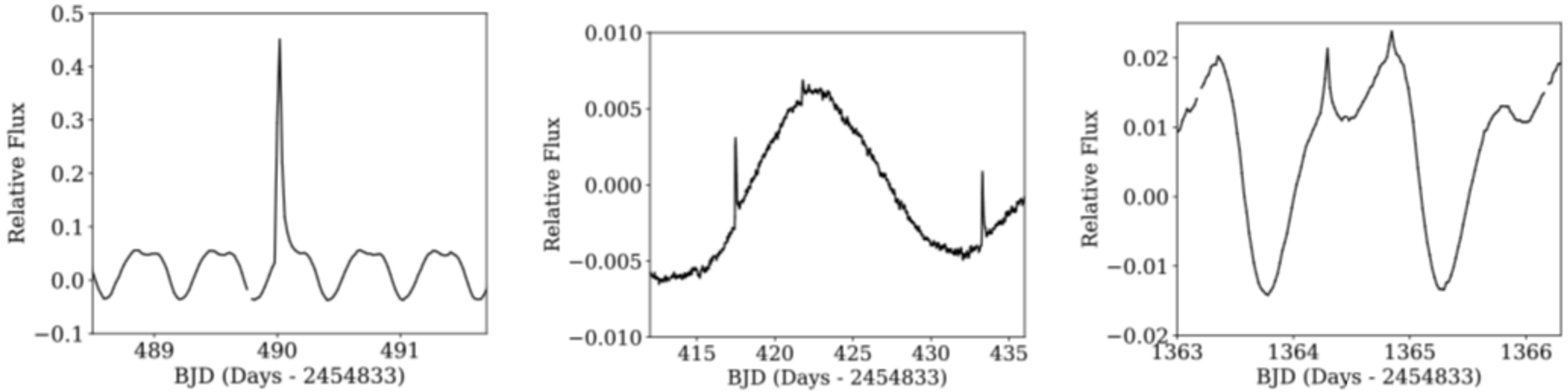




Silva-Aguirre+2018

2. Flare Rate Ages

Davenport+2019 (arXiv:1901.00890)



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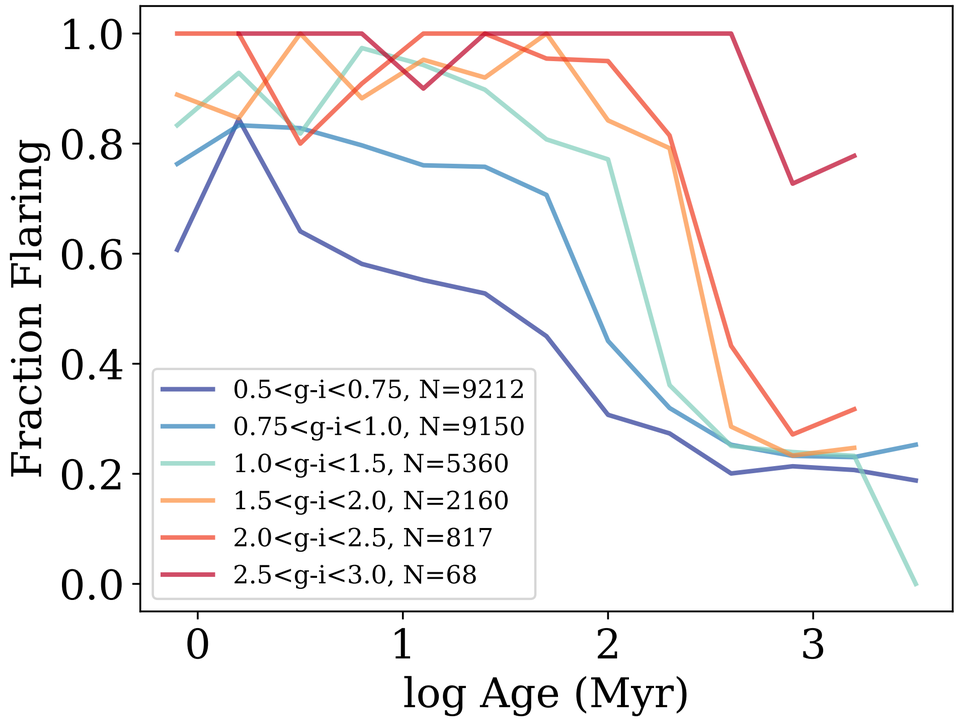
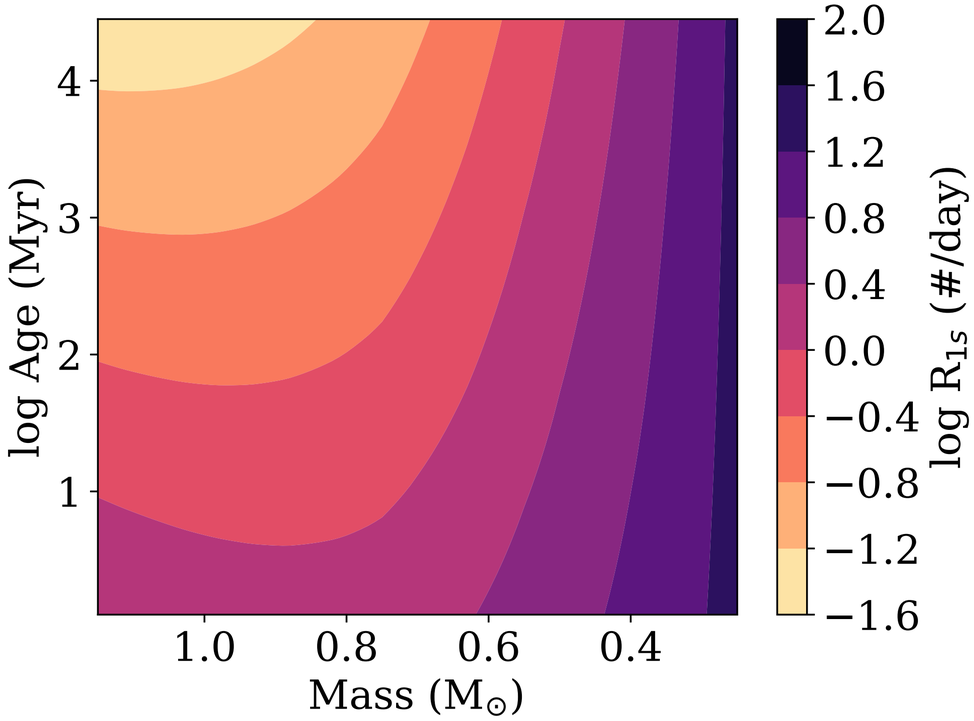
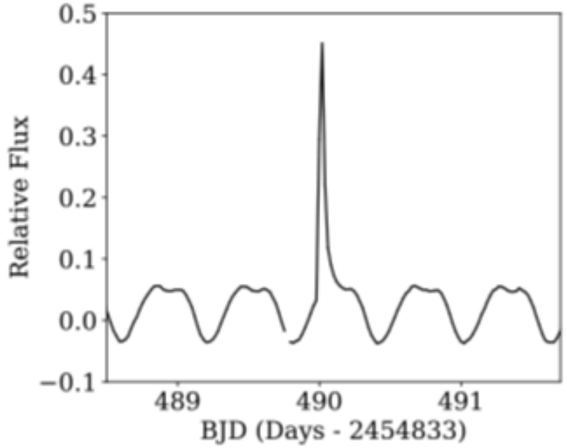


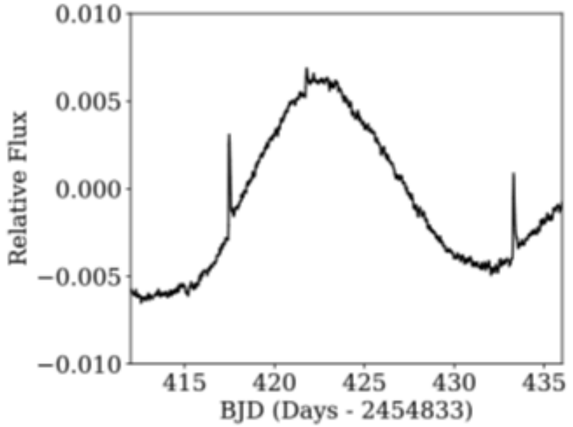
*Age here is from gyrochronology

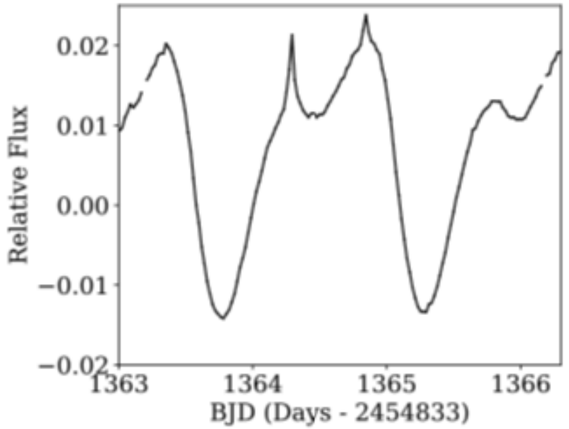


3. Gyrochronology: bimodal star formation history?

Davenport & Covey 2018



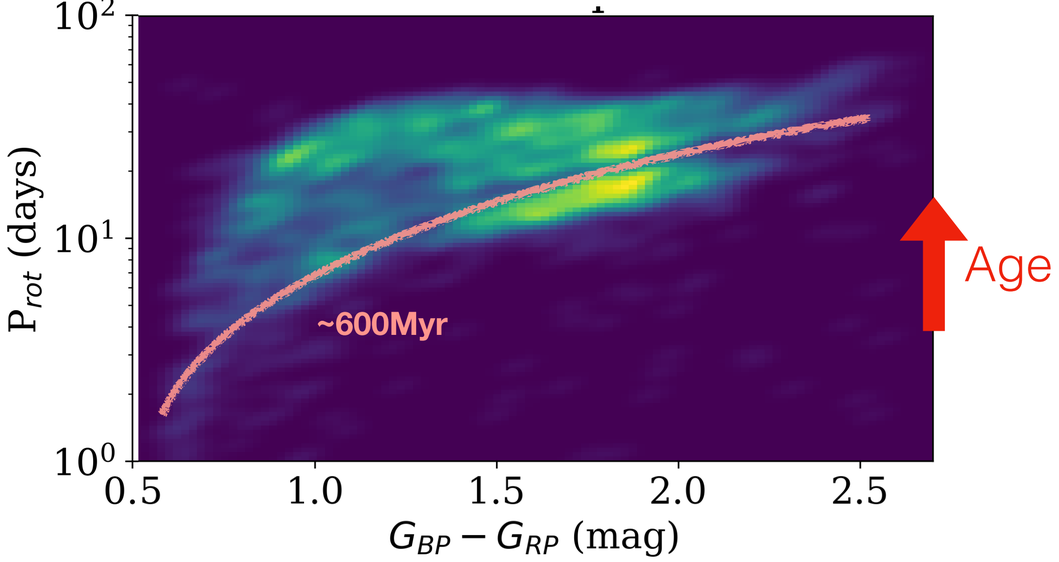




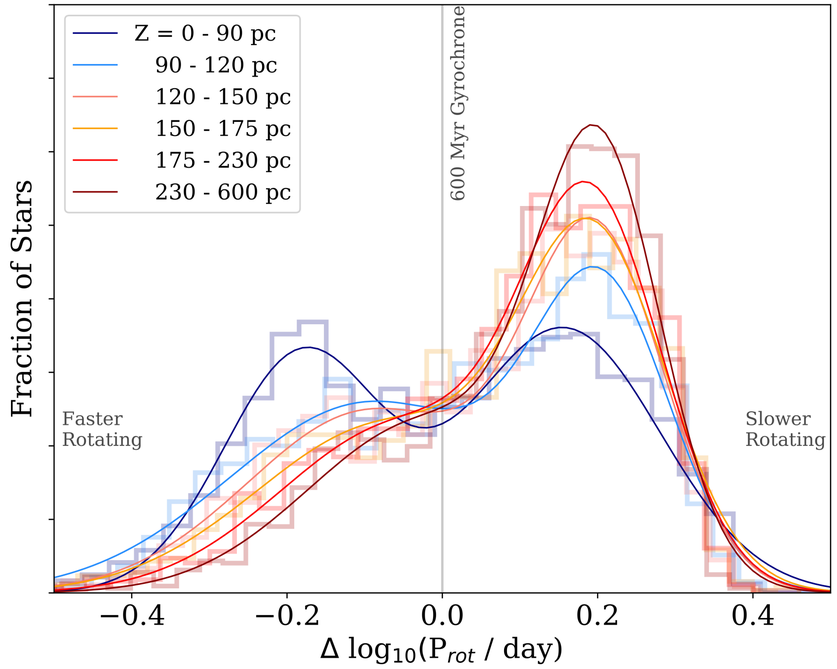
3. Gyrochronology: bimodal star formation history?

Davenport & Covey 2018

Using only Kepler + Gaia!



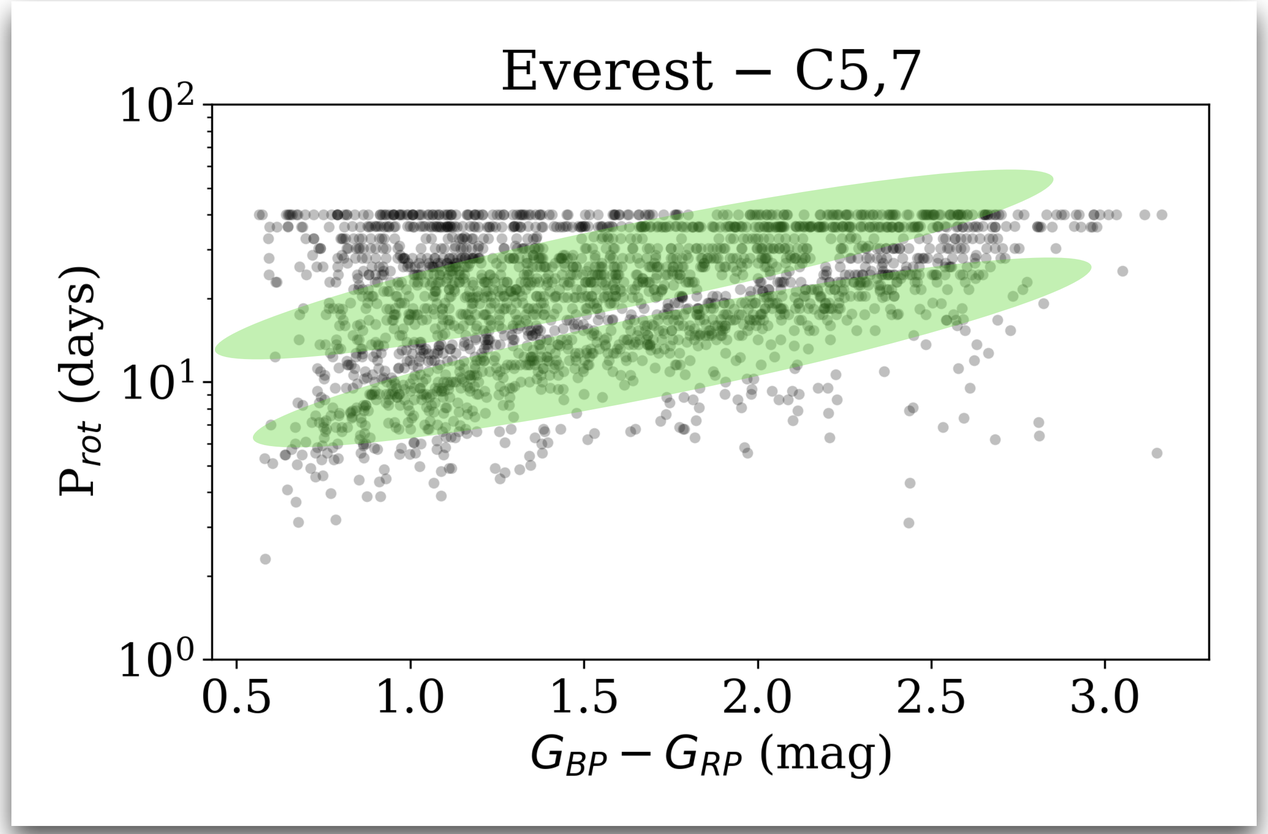
Bimodality *drops* with Galactic height!



3. Gyrochronology: bimodal star formation history?

Davenport & Covey 2018

Now finding evidence for bimodality in K2 fields!

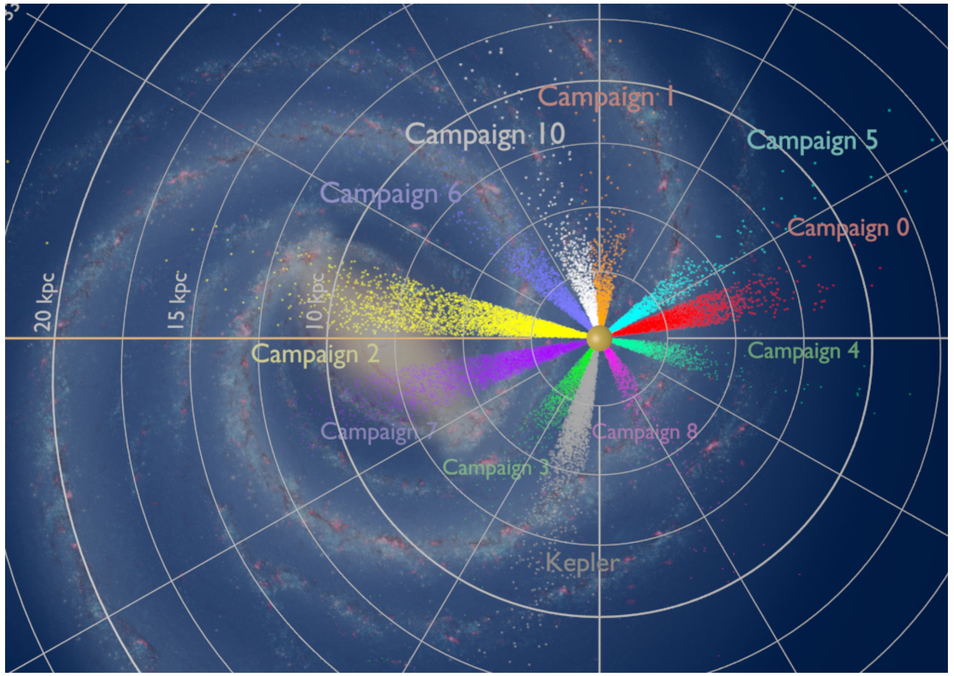


Z. Bell poster <u>today!</u>

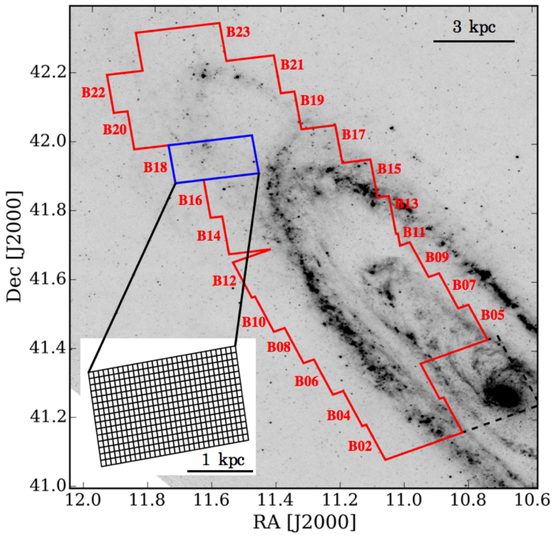
Star Formation Histories from *Kepler?*

~100 pc resolution!

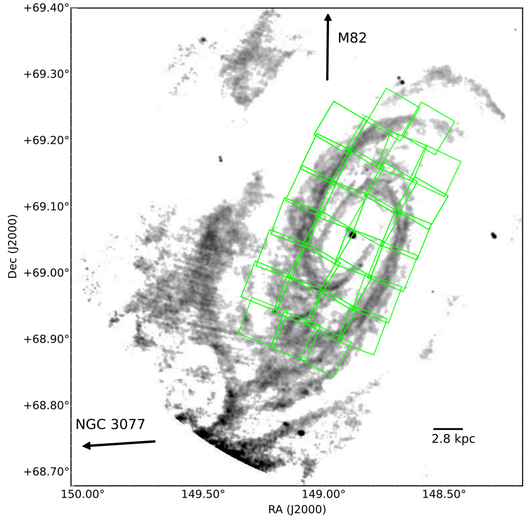
K2 fields



SFH from HST imaging for other galaxies



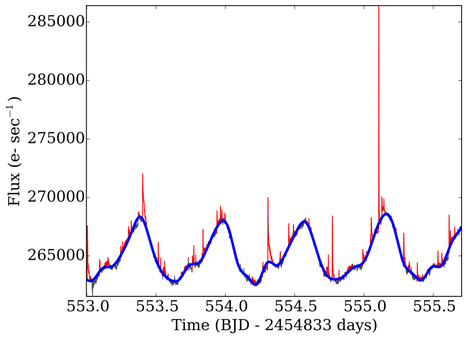
M31 (Lewis+2015)

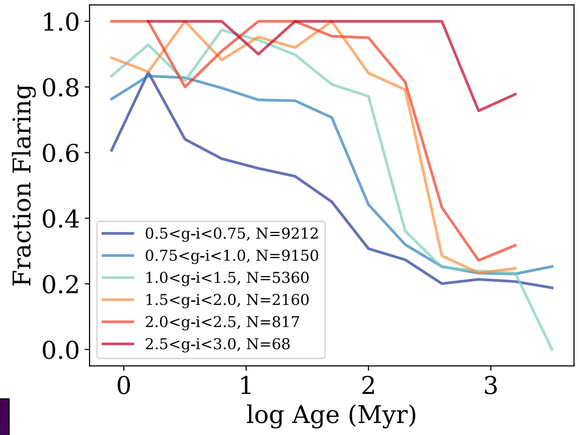


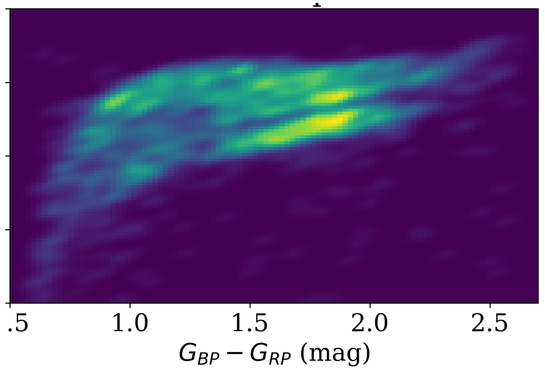
M81 (Choi+2015)

Star Formation Histories from *Kepler?*

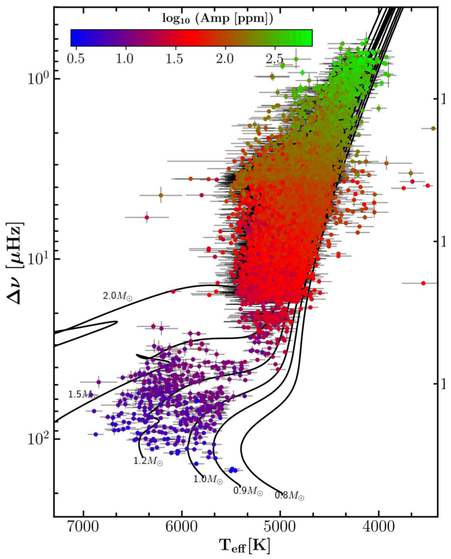
10-100 Myr timescales

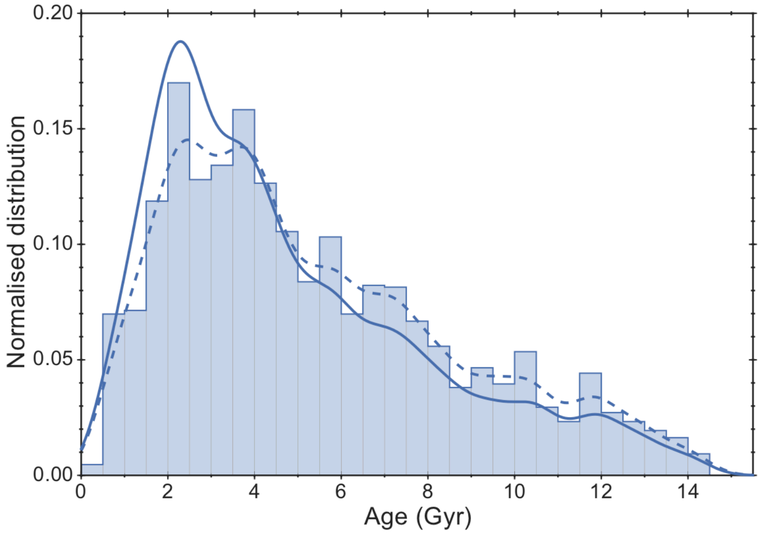






~Gyr timescales





Conclusions

1. *Kepler* provides high resolution powerspectra for 500k stars, comparable to best/modern stellar spectra surveys

2. we can get at age in many new ways

3. K2 covers enough volume to be interesting for star formation history, galactic archeology, spiral arms…

4. it's open season with TESS! ("medium resolution" survey)

& go see posters today