

# MEMBERSHIP ANALYSIS OF GLOBULAR CLUSTER M92 WITH APOGEE (APACHE POINT OBSERVATORY GALACTIC EVOLUTION EXPERIMENT) DATA

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# GLOBULAR CLUSTERS: WHAT ARE THEY

- Exactly what they sound like: Close-Stars!
  - To be more precise they are gravitationally bound group of stars
  - They appear to be a bundle of stars in the night sky
  - Furthermore, they tend to possess similar chemistry so you can imagine the stars within a cluster as stellar siblings!

# GALACTIC FAMILY PHOTOS

- Like siblings, stars in globular clusters were born in very similar environments
- When they're grouped based on their resemblances you can gain insight into their home lives
  - I.e. their parents- the interstellar medium at the time of their birth, and their grandparents-the stars that have died and shed their chemicals into the interstellar medium

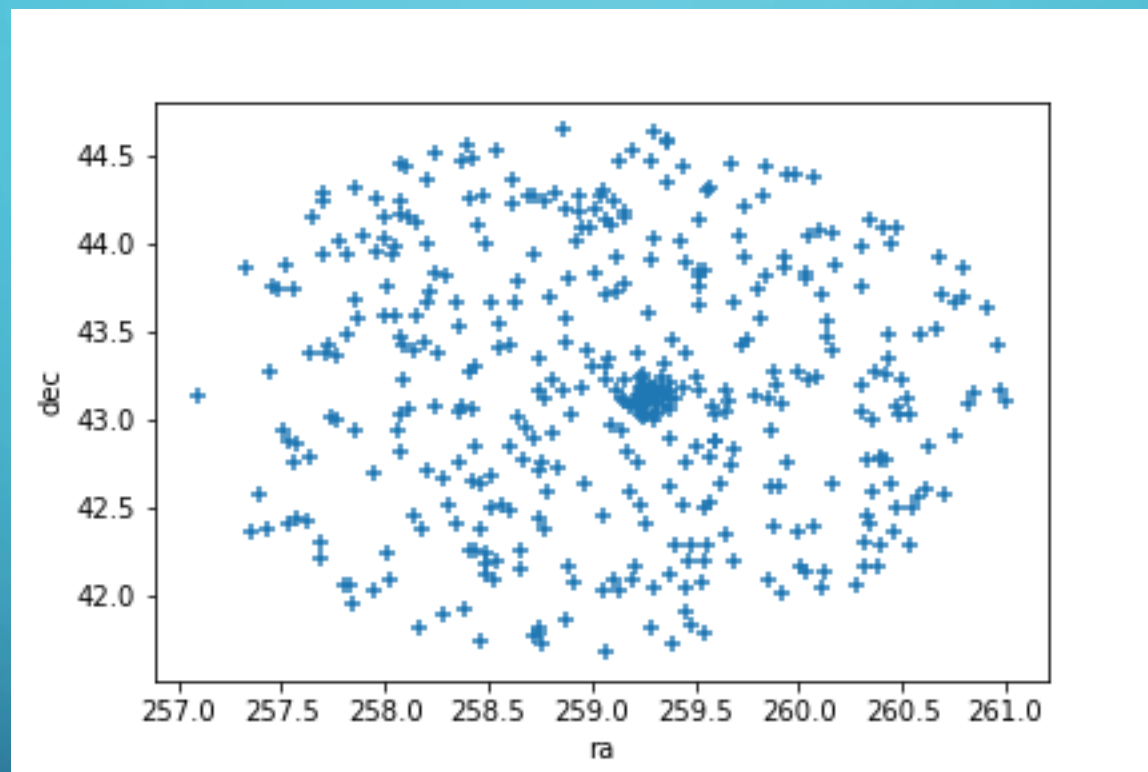
# GALACTIC ESTRANGEMENT

- Similarly to how you may move out of your hometown and never text your family or former friends again, Stars may be pulled out of their original orbits by a process known as Tidal Disruption
- But just like you cant completely cast off your origins these stars can't completely eradicate the characteristic accent of their Podunk hometown
  - They share the same signature characteristics, like how Luke Hemsworth shares his more famous brothers square jaw and blue eyes

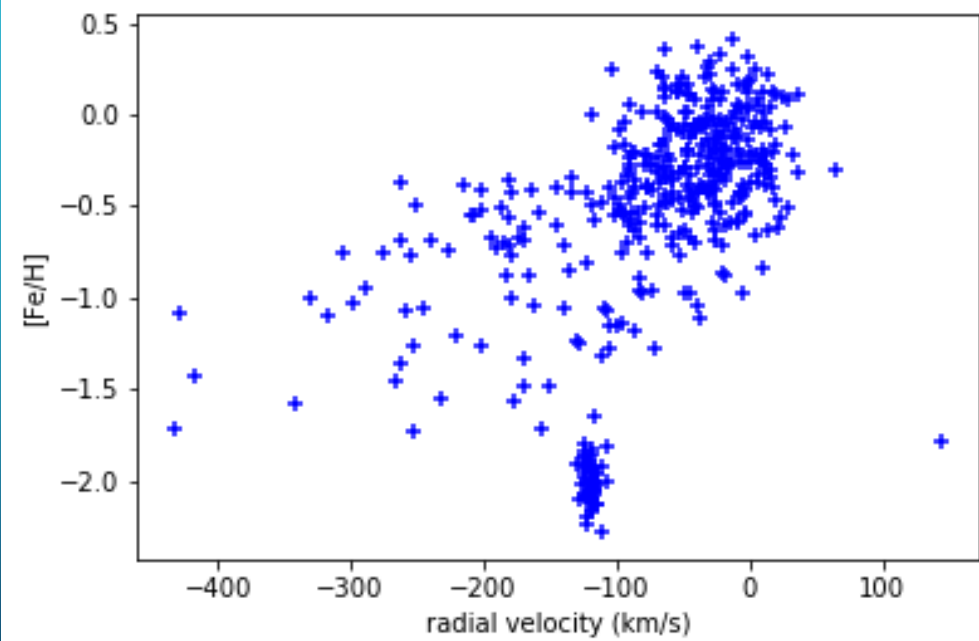
# SPACE PRIVATE DETECTING

- By examining the chemical compositions of these stars we can also determine whether they're related in the first place!
  - Some stars can get in the way of the family pictures, like Kimmy Gibbler from Full House
- We looked at traits such as the amount of iron and hydrogen in a star and compared those to other stars within the general area
  - Stars which abundances fell within accepted values were determined to be part of the cluster
- We also examined radial velocity: the speed at which a star is moving towards or away from the sun

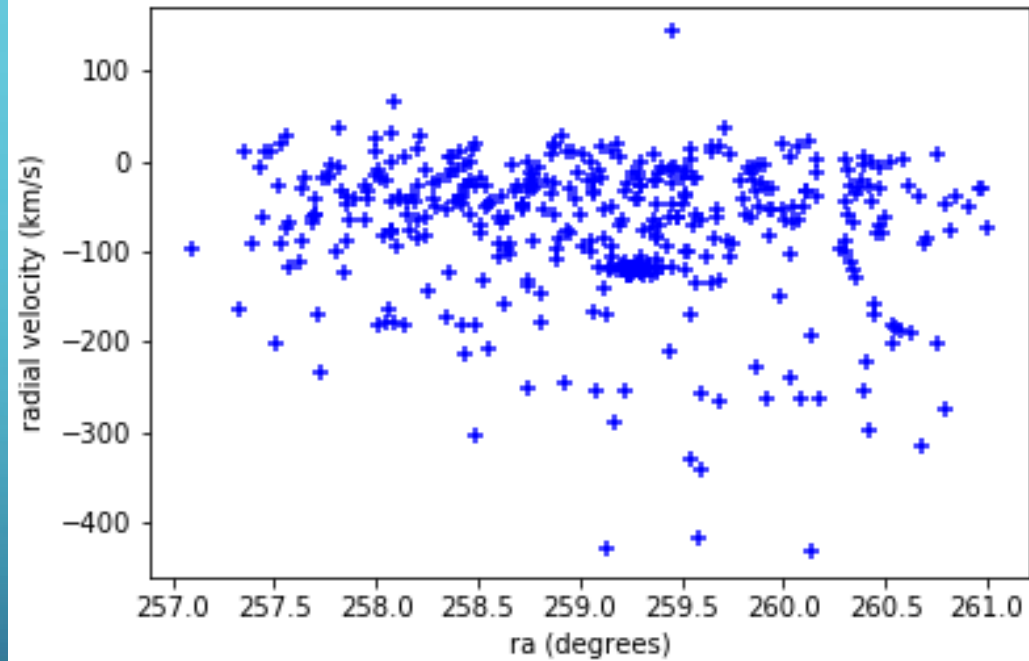
# INVESTIGATION



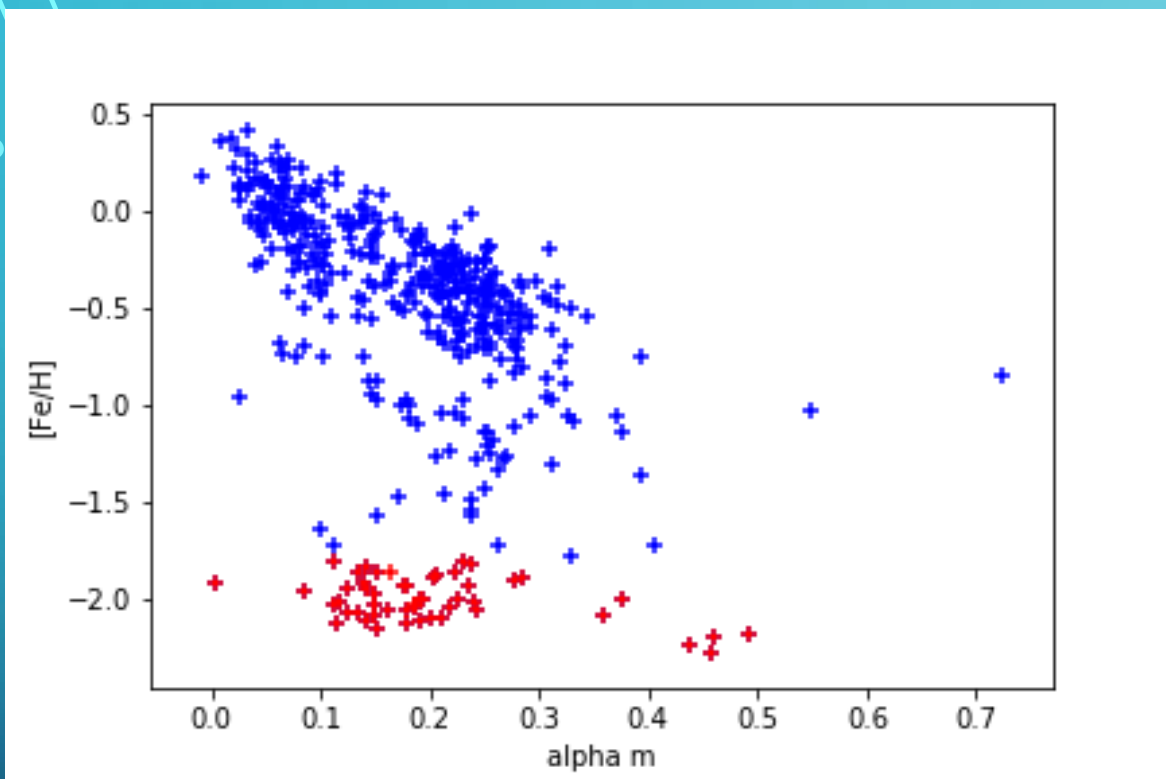
Right Ascension vs Declination (No Cuts)



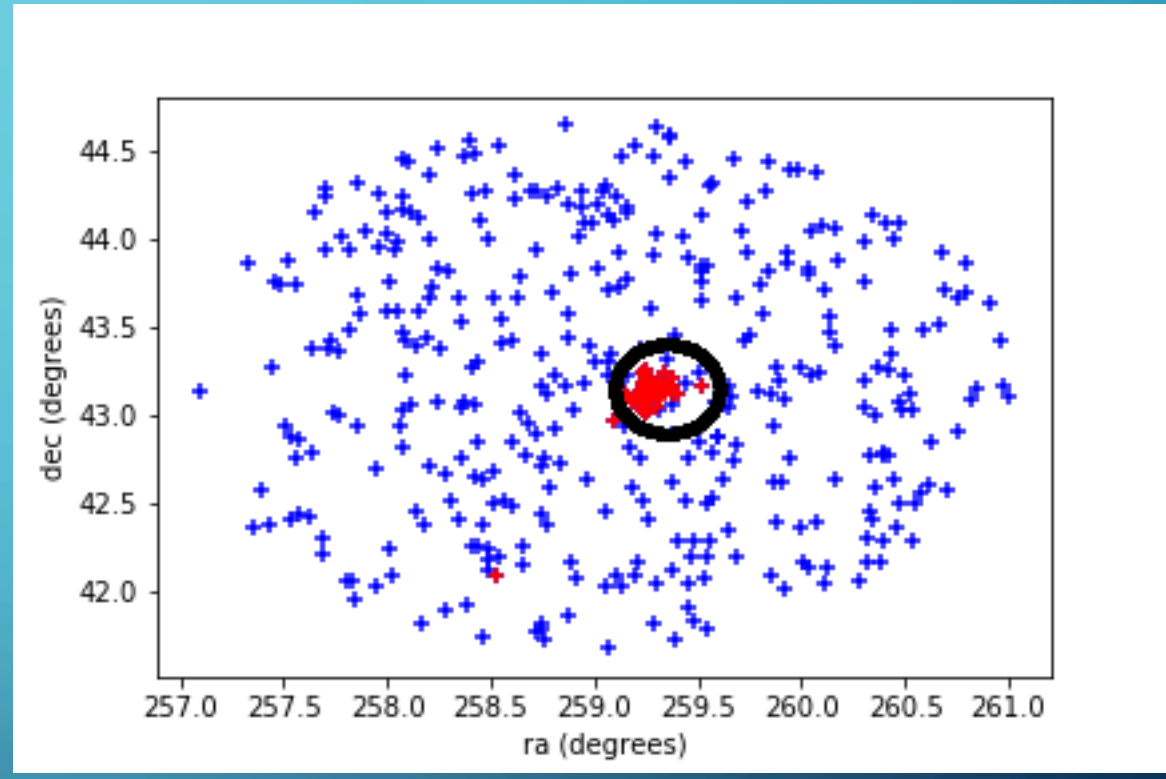
Iron vs Radial Velocity



Radial Velocity vs Right Ascension



Alpha m/ Iron Plot



New Ra/Dec Plot



# CONCLUSION (WHY NOT LEAVE THEM BE?)

- As we all know the modern nucleic familial structure is a fundamental unit of capitalist society.
- The metaphor is falling apart a bit here- or is it working all too well? Get woke.
- Anyway, back to stars- Globular Clusters are a fundamental unit of galactic formation

# IF THE NSA WONT GIVE ME PRIVACY DON'T EXPECT ME TO EXTEND SUCH MERCY TO STARS

- By learning more about Star Clusters we can gain valuable insight into the processes which formed our Galaxy
- This goes double for old star clusters, such as those in the Galactic Halo
  - Clusters like, M-92 for example
- However this only works if we know which stars are in clusters
  - Hence the detecting.

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