

The background features a gradient from dark purple at the top to dark blue at the bottom, overlaid with a field of small white stars. Several faint, semi-transparent circular diagrams are scattered across the scene. These diagrams include concentric circles, dashed lines, and arrows, some of which are labeled with numbers such as 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, and 260, suggesting a scale or measurement related to the diagrams.

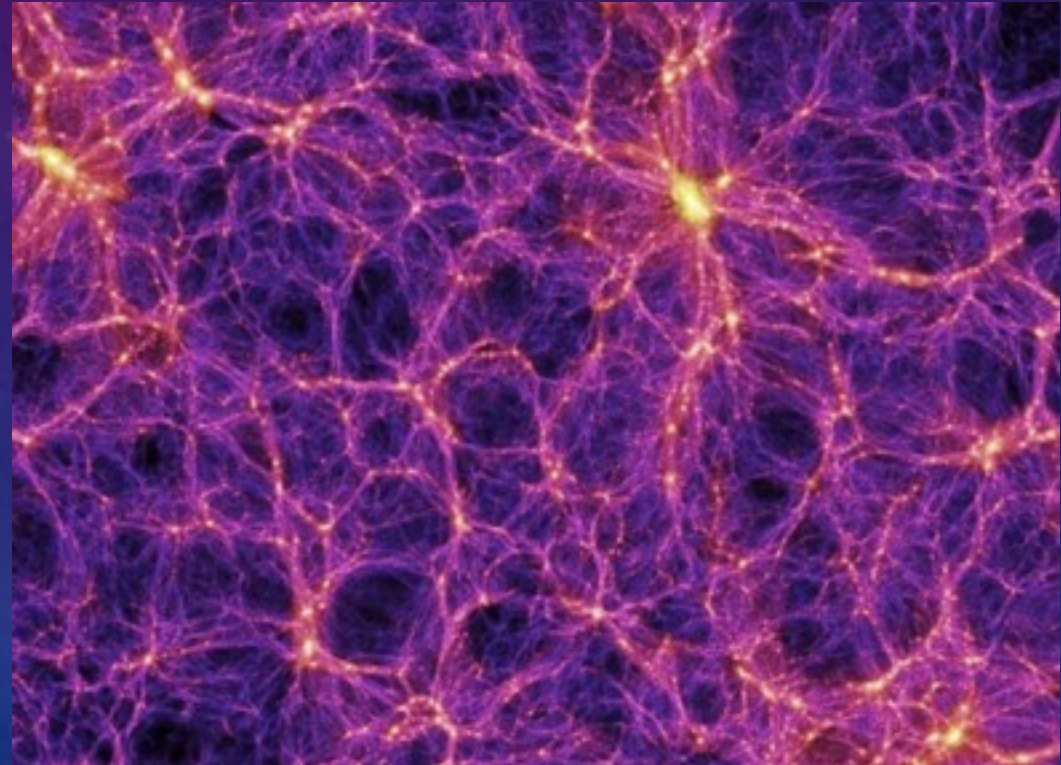
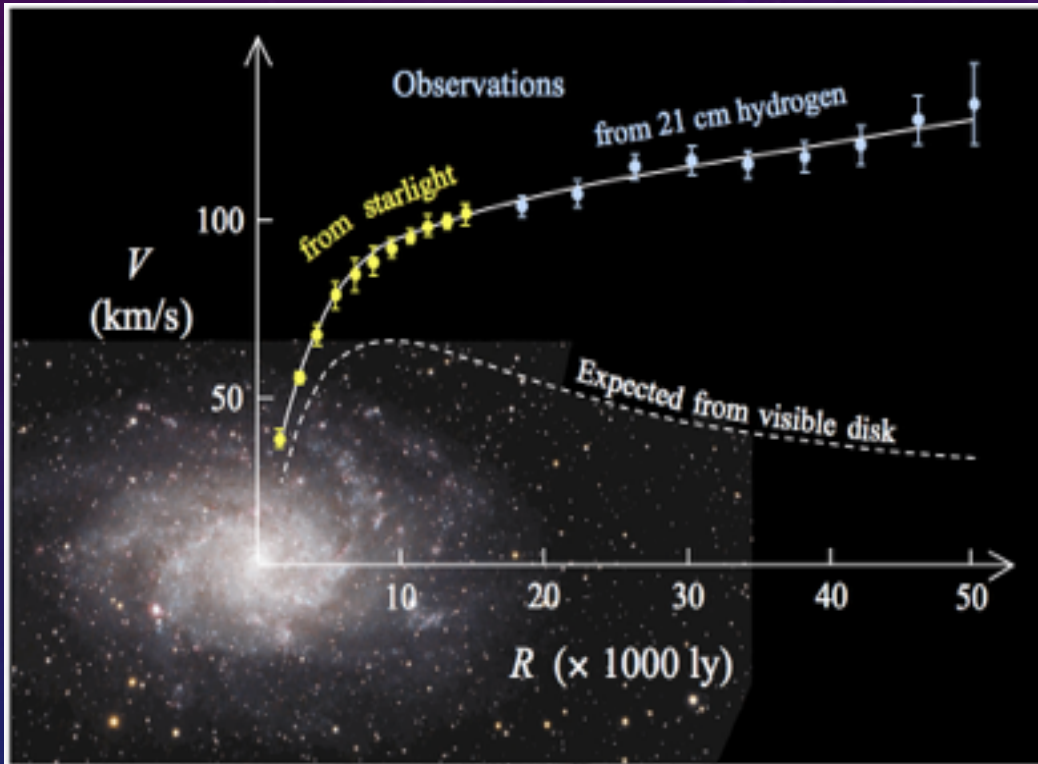
WHAT THE MILKY WAY STRUCTURE TELLS US ABOUT DARK MATTER

JORDAN GLISAN

INTRODUCTION TO DARK MATTER

Velocity is proportional to mass

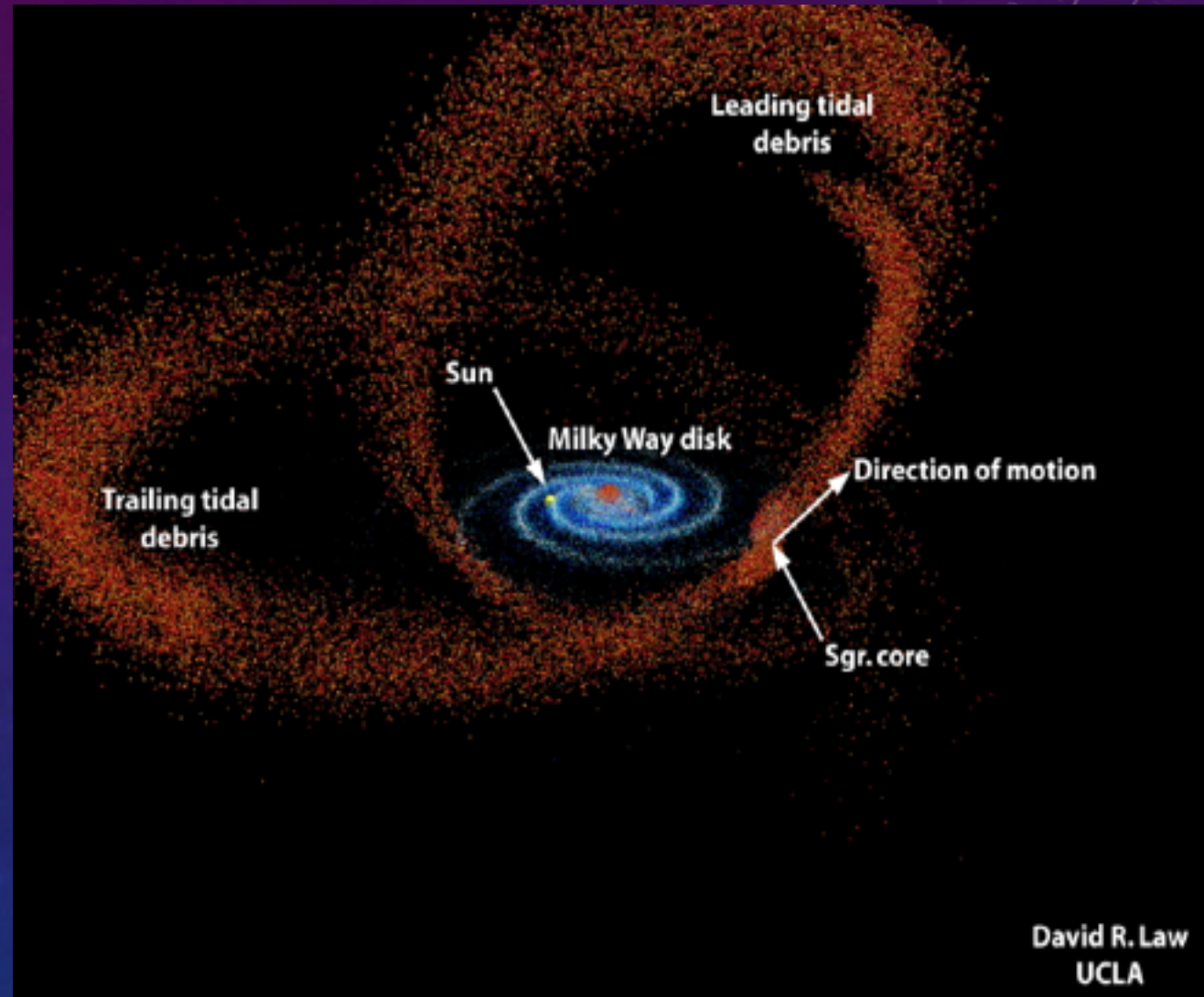
Simulation on a universally large scale



"Galaxy Rotation Curve." *Wikipedia*.
Wikimedia Foundation, n.d. Web. 03 Aug.
2016.

".logo.filled .inner, .logo:hover .inner { Opacity: 1; Fill:
Url(#rollover); }." *Millennium Simulation*. N.p., n.d. Web. 02 Aug.
2016.

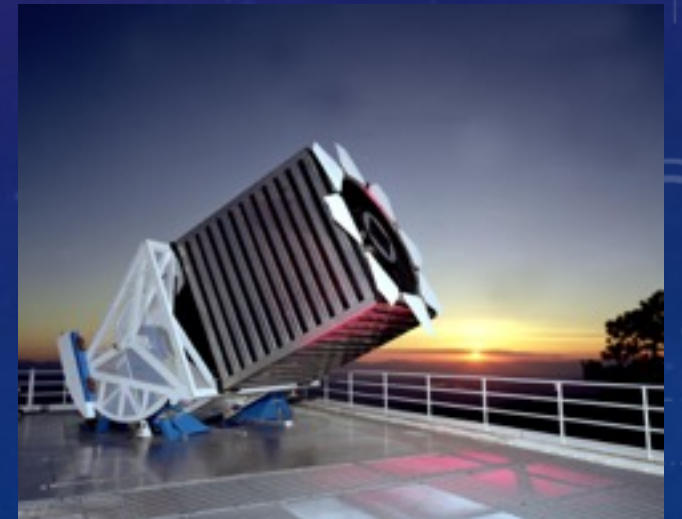
SAGITTARIUS DWARF GALAXY



N.d. Utoronto.ca, Toronto. Astronomers Map the Shape of Galactic Dark Matter. Web. 19 July 2016.

METHODS AND APPROACH

- Applying a set of techniques to a well studied object and applying them to a smaller object
- Studying the stellar chemistry and radial velocity of the Sagittarius Dwarf Galaxy and globular clusters
- Python programming language was used to read files and create various plots
- Looking at relative metallicities and radial velocities for stars, can we differentiate between coherent objects and Milky Way field stars?

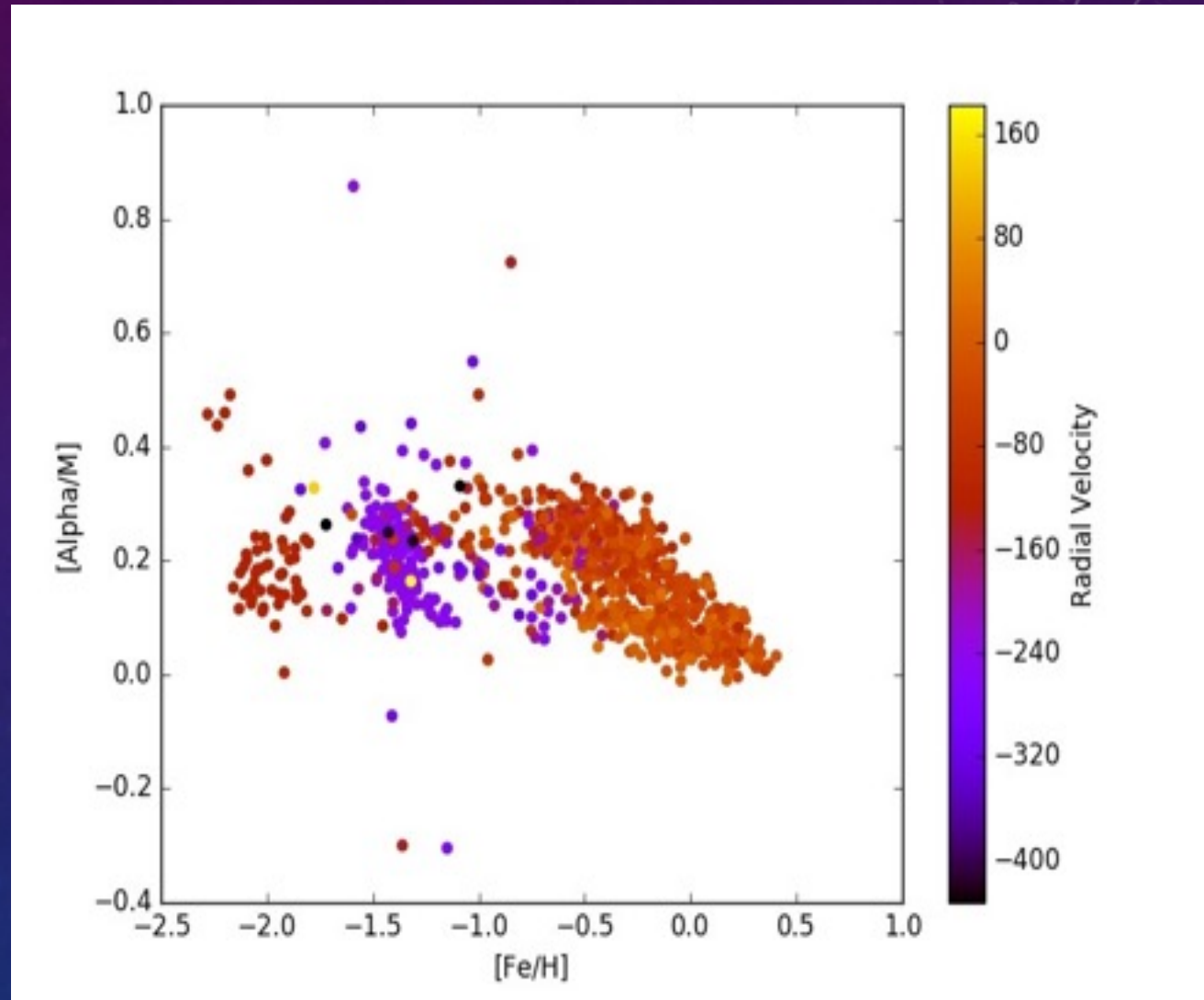


"Index of /~frieman/SDSS-telescope-photos." *Index of /~frieman/SDSS-telescope-photos*. University of Chicago, n.d. Web. 03 Aug. 2016.

M13 GLOBULAR CLUSTER

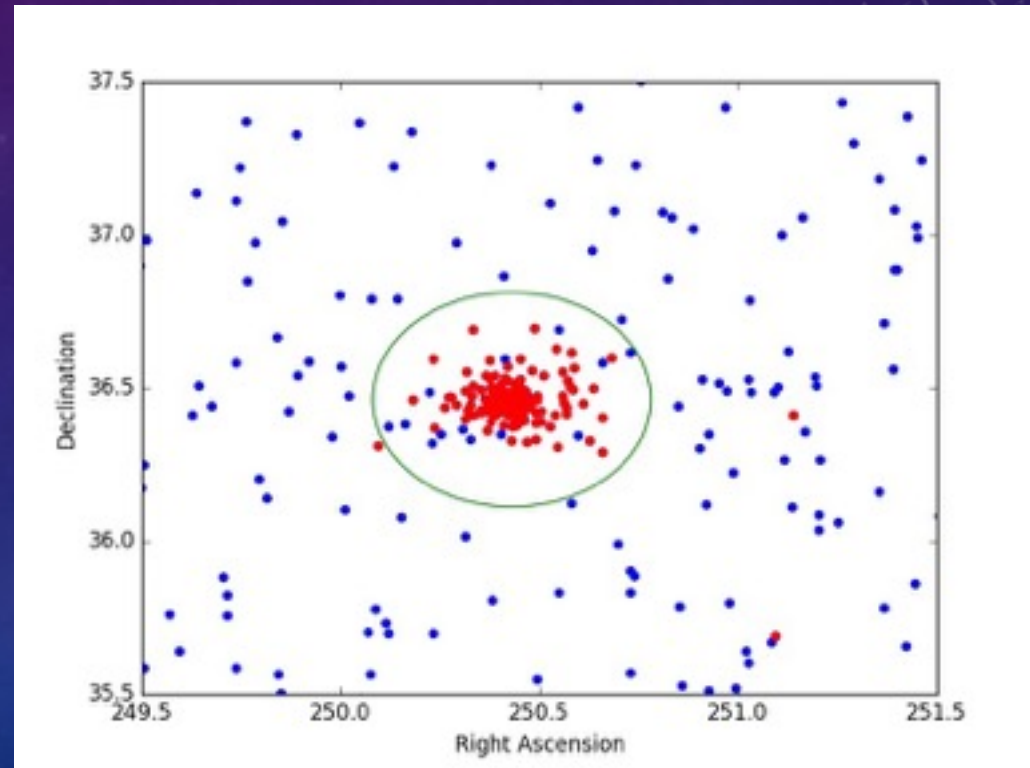
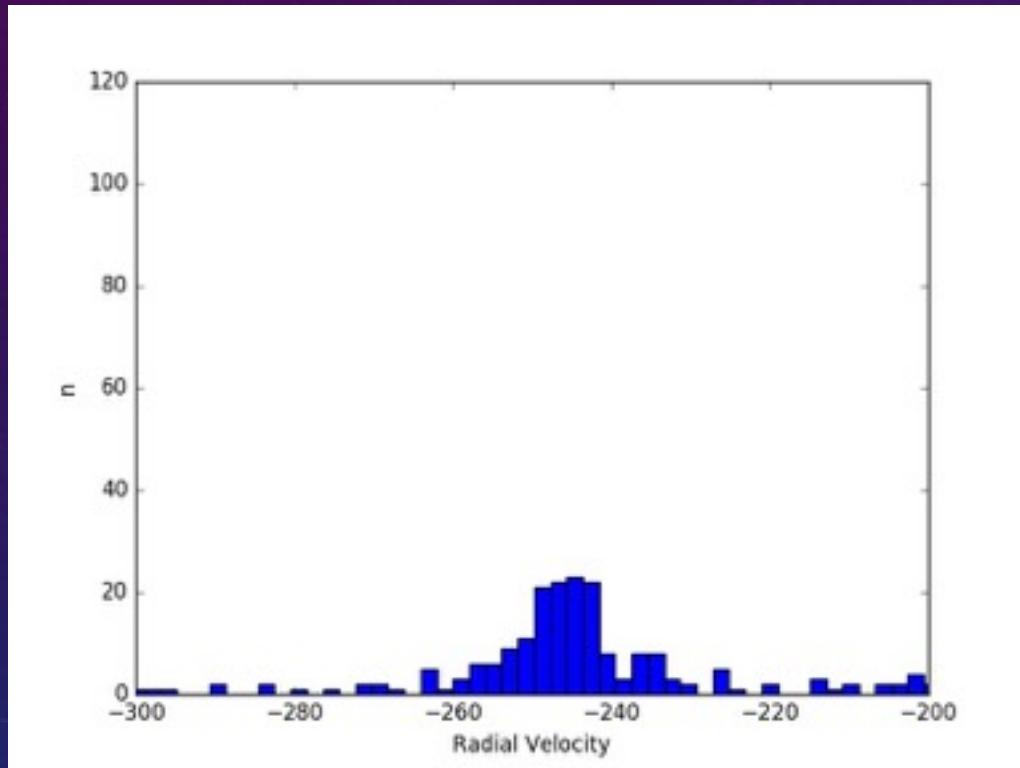
Metallicity Plot

Radial Velocity in km/s



M13 GLOBULAR CLUSTER

Tidal Radius: anything within tidal radius is bounded to that object by its gravity



CONCLUSION

- These methods have been used to identify the Sagittarius dwarf galaxy and separate it from the *Milky Way*
- The next step would be to continue upon this research and use this approach to try to further identify objects being disrupted by the *Milky Way*
- The stars that looked to have been pulled away from the M13 core are up for further investigation

ACKNOWLEDGMENTS

- Nitya Jacob Kallivayalil, Ph.D.
- Tobias Fritz, Ph.D.
- Paul Zivick
- Martine Lokken
- This research is supported by the NSF CAREER award 1455260 & NSF 11-543. Funding for SDSS-III has been provided by the Alfred P. Sloan Foundation, the Participating Institutions, the National Science Foundation, and the U.S. Department of Energy Office of Science. The SDSS-III website is [http:// www.sdss3.org/](http://www.sdss3.org/)



SAGITTARIUS DWARF METALLICITY PLOT

