

Ay124 Research Project – Due 6 March 2016

Below are listed some suggested topics for research projects. The idea is to get a sense of what the current thinking on one of these subjects is, and to present it in a well-organized and thoughtful fashion in the form of a $\sim 5 - 10$ page report. Please include your own informed views of remaining questions and what might be done to address them.

If none of these topics appeals to you, you may come up with your own, subject to approval by Chuck. Advice on where to begin searching the literature can be obtained from anyone, including the instructor, fellow students, post-docs, etc.

In addition to your paper, you will also be preparing a ~ 10 minute talk (5 – 8 slides) on the same material, to be delivered to your classmates at the end of the term.

Suggested Topics for Research Projects

1. The distance to the Galactic Center
2. The GAIA Mission and the Galactic distance scale
3. The Black Hole at the Galactic Center
4. The Mass of the Milky Way Galaxy
5. Local Group Dwarf Galaxies: Implications for Dark Matter
6. The Formation of Present-Day Elliptical Galaxies
7. The History of the Galactic Bulge
8. The Origin and Maintenance of Spiral Structure in Galaxies
9. The Stability of Galaxy Disks
10. The Stellar IMF as a Function of Environment
11. The Faint End of the Stellar Luminosity Function
12. The Age of the Milky Way Disk
13. How do Galaxies Get Their Gas?
14. The Global Star Formation Law (a.k.a. the “Kennicutt-Schmidt Law”)
15. State of the Art in Stellar Population Synthesis
16. The Chemical Evolution of Galaxies
17. The Demographics of Central Black Holes in Galaxies
18. The Stellar Mass - Metallicity Relation (and its evolution)