Grading Rubric : ASTR400B Research Assignment 2

Name: [Larson,Coco Renee](https://github.com/CocoLarson/ASTR400b)

**A Introduction 10 / 10**

Each of the below points should be a separate paragraph in your introduction.

1. Define the Proposed Topic. 1/1
2. State why this topic matters to our understanding of galaxy evolution. 2/2
3. Overview our current understanding of the topic. 2/2
4. What are the open questions in the field? 2/2
5. Cite at least 3 journal papers. Use BibTex for formatting citations 1/1
6. Include at least one figure with caption from those papers to motivate your work. 2/2

**B. The Proposal 8 / 10**

They must answer each of the below questions as separate subsections.

1. What specific question(s) will you be addressing? 1/1
2. How will you approach the problem using the simulation data? Here you should outline the codes you’d need to write. It can be in general terms. 3/5
3. Include at least one figure that illustrates your methodology. 2/2
4. What is your hypothesis of what you will find? Why do you think this will occur? 2/2

**C. Misc. 4/5**

1. Proper Grammar 1/1
2. Included a bibliography 1/1
3. In Latex and ApJ/MNRAS formatting 1/2
4. On Time/On Github 1/1

**TOTAL** 22**/25**

**Late Penalty:**

* if submitted on due date, but after 5 PM  **(-5 points).**
* Proposals will **not be accepted** after the due date.

**Comments: -2: contours alone are not sufficient to determine the tri-axiality of the halo. You would need to fit ellipses. Talk to us. -1: need better latex accuracy.**

**The Figures 2 and 3 you provided are of the stellar disk. Your project is about the dark matter halo of the merger remnant - make sure that you are studying the shape of the dark matter particle distribution. Be specific about what particle type you are using.**

**To determine the shape of the dark matter distribution you will need to examine the shape in multiple projections (XY,YZ, XZ). You can then define the shape by:**

1. **Using contour codes from Lab 7 on the 2D histogram distribution of the dark matter in the 3 different projections. Then fitting ellipses to the contours.**
2. **You can use the python library photutils to fit ellipses to the dark matter distribution in the 3 different projections. This tool will provide the ellipse properties (like semi-major axis etc) . Chat with Himansh about how to use this tool.**

**You need to decide at what radii you are going to determine the shape of the halo and justify why you picked that radius. You could repeat the steps above at different radii.**

**Then explain how you will use the fitted ellipse axis ratios to decide whether the shape of the halo is triaxial vs prolate vs oblate.**