Grading Rubric : ASTR400B Research Assignment 2

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**A Introduction 8/ 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 0/1
6. Include at least one figure with caption from those papers to motivate your work. 1/2

**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. 5 /5**

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

**TOTAL** 21**/25**

**Late Penalty:**

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

**Comments: -1: missing figure 1 reference, -1: need at least 3 references in the bibtex citation format in the intro. Note, for Figure 2, plotted is not the face on disk - it is at an inclination.**

**Methods: -2 see below**

* **the COM code that you built for the homework uses an iterative process to determine the COM location - that should be explained.**
* **To study the remnant you need to combine the MW and M31 stellar particles (disk + bulge) into one array - those steps are missing in your methods. (e.g. concatenate)**
* **What snapshot number are you going to use and why? This should be after the merger only - you only need one snapshot but can look at a few if you wish.**
* **How are you going to determine the elliptical galaxy classification E0-E7? What is the definition ?**

**For visualizing the Remnant you have indicated multiple approaches. narrow this down to 1 or 2 and make sure that one of those methods will classify the elliptical as E0-E7, which is what you stated was one your primary proposal goals.**

**Your assigned topic is the shape of the remnant, rather than the kinematics, so instead of using the velocities, you can go two routes (you can do both but only need to do one):**

1. **To determine E0-E7 you will need to fit ellipses to the 2D Histogram images of the remnant. You can do this using the python library photutils (see Himansh). Then with the defined semi major and semi minor axis you can define the elliptical galaxy type.**

* **You’d need to decide what projection to do this in – if you use the XY plane would you get the same answer as the YZ plane?**
* **You can fit ellipses at multiple radii to decide if the shape changes as a function of radius.**

1. **You can fit a sersic profile to the stellar densities to determine whether the remnant is closer to a disk or elliptical. See Lab 6 .**

**Come talk to Prof Besla or Himansh about the above if not clear.**