Grading Rubric : ASTR400B Research Assignment 2

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**A Introduction 9 / 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. 1/2
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 0/1
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: need more coherent description of why the topic matters to galaxy evolution, -2: based on the kinematic maps you will generate, how will you actually determine which galaxy contributes more to the remnant kinematics ? Talk to us. -1: need better sentence structuring.**

**To refine the question, consider: What is the contribution of M31 stars vs. MW stars to the velocity dispersion profile of the merger remnant at ONE snapshot after the system merges.**

**Bigger Picture: How does the kinematics of the remnant of a major merger depend on the kinematics of the progenitors? e.g. M31 has a faster rotation curve than the MW, so do its stars contribute more to the final velocity dispersion? As you say, M31 is also more massive .**

**To do this:**

1. **Compute the total velocity dispersion of all stars (MW+M31 disk +bulge) in radial bins from the center of the merger remnant**
2. **Compute the velocity dispersion of just MW stars (disk+bulge) in radial bins from the center**
3. **Repeat #2 for M31**
4. **Then determine the fraction of the total dispersion that is in MW or M31 stars. You could e.g. make a plot of the fraction as a function of radius → MW dispersion/Total dispersion and M31 dispersion/Total dispersion vs radius**

**If you have time you could repeat the above at a few more points in time after the merger to see if it changes at all.**

**Be specific about what codes from the homeworks you will be using.**

**You should consider using the higher resolution snapshot file to do this study**