Grading Rubric : Research Assignment 7 FINAL REPORT

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1. **Miscellany (4/5)** 
   1. The report must be written in LaTeX using the emulateApJ or MNRAS formatting. ( 1/1)
   2. Informative Title, Name (1/1)
   3. Proper Grammar ( 1/1)
   4. All references properly cited ( 0/1)

something weird with teh formatting of the citations. why are there initials ahead of the names? Missing volume number, page number

* 1. Acknowledgements with code citations (1/1)

1. **Abstract (5 /5)**

(a) A sentence that defines the Broad Galaxy Evolution topic 1/1  
(b) A sentence that says why the Galaxy Evolution topic is important 1/1

(c) A sentence that introduces the simulations 0.5/0.5

(c) A sentence that says what specific simulation question you are exploring 0.5/0.5

(e) A sentence(s) that states what you found 1/1  
(f) A conclusion about importance of finding(s) for the Galaxy Evolution Topic 1/1

1. **Keywords (6/10)**
   1. 5 keywords listed and defined in the text (2 per word)

missing mass ratio of major merger -1

“galaxies” was not one of the allowed keywords -2

hernquist profile missing definition of “a” -1

1. **Introduction (7 / 10)**
   1. Define the Proposed Topic in Galaxy Evolution (par 1) 1/1
   2. State why this topic matters to our understanding of galaxy evolution 1/1
   3. Define “Galaxy” according to (cite) Willman & Strader and “Galaxy Evolution” 0/1

incorrect definition, not all galaxies have gas. missing citation.

* 1. Overview our current understanding of the topic (par 3) 1.5/2

there isn’t a tension between “observed” and “mass derived rotation” curves as you have written it. there are questions of how to explain the observed curve using a mass profile..

* 1. What are the open questions in the field? With citations (par 4) 2/2
  2. Cite at least 3 journal papers (not including willman & strader). Use BibTex for formatting citations 1/1
  3. Include at least one figure from those papers to motivate your work – the figure must be discussed in the text. Caption must have citation, not plagiarized + punchline (what is the takeaway message) 0.5/2

no figure citation, lines not explained, panels not explained. figure isn’t discussed in the text so not clear for the motivation since in the end you were not studying the mass weighted rotation curves

1. **Section 2: This Project: ( 5/5)**

(a) State what question(s) you are exploring (Paragraph 1) 1/1

(b) Which of the open questions does this project address? (Paragraph 2) 1/1

(b) Why is the open question interesting/important? How will your study address the question? (Paragraph 3) 3/3

1. **Section 3: Methods ( 6.5/10)** 
   1. Paragraph 1: describes the simulation you are using and what code was used to create it (citations) 0/1

wrong citation. simulation itself not described.

* 1. Defined N-body 1 /1
  2. Paragraph 2 : Overview approach. 1.5/2

intro and methods discuss the mass-weighted rotation curves and the rotation curves of MW, but results do not have these. it’s fine to not have done all of this, but it shouldn’t be discussed in th methods if you aren’t going to do it.

* 1. Include a figure to describe methods with caption 1.5/2

fig 3 caption is insufficient to explain what is in the plot.

* 1. Paragraph 3: Describe calculations with terms defined 1/2

terms in the equations are not defined (M, r, etc)

* 1. Paragraph 4: Describe the plots you need 1/1
  2. Paragraph 5: Hypothesis   1/1

1. **CODE: (10/10)**
   1. Code header that explains the goal 2/2
   2. Code is documented 2/2
   3. Significant work done in extension of code from class work. 4/4
   4. Code Github Repository is well organized and Code for Final Project is well documented. 2/2
   5. Code check-ins attended **if 2/3 are not attended/rescheduled this entire section is graded as 0.**
2. **Section 4: Results ( 18/20)**
3. Paragraph 1: Describes Plot 1 4/4
4. Plot 1 included with caption + punchline 3/4

plot is missing the punchline

1. Paragraph 2: Describes Plot 2 4/4
2. Plot 2 included with caption, independent code+ punchline and quantitative 7/8 looks like some misinterpretation of the snapshot numbers (which indicate time) relative to separation.
3. **Section 5: Discussion (11/15)**
4. Par 1: Result 1.
   1. Does the result agree or disagree with hypothesis? 2/3

the sentence that the “MW and M31 may act as a single galaxy” doesn’t quite makes sense.

Discussion would be clearer if you related your findings to the actual orbit - you get the largest change in the rotation curves at a particular distance, but does that happen *after or before*  the closest approach? And how *long after* ? e.g. could it take time for the mass redistribution to impact things? From color bar of fig 5, the largest deviations seem to happen *after the closest approach?*

1. Par 2:
   1. How does this result relate to existing work ? 4/5

missing the timing of the changes relative to the pericenter in your analysis makes it hard to place in context with existing work.

* 1. What is the importance/meaning of this result for our understanding of galaxy evolution? 2/4

not sure what “modulated by structural dynamics and mutual gravitatioanl influence means”. again the timing would have helped this discussion.

* 1. What are the uncertainties 3/3

1. Repeat for subsequent results
2. **Section 6: Conclusion ( 9/10)**
   1. Paragraph 1, Summarize 1-4 in abstract 2/2
   2. Paragraph 2: highlight one key finding, what it means and whether it agrees/disagrees with hypothesis 1/2

* Mpc, vs kpc.
* You discuss the MW, but no results for the MW were shown earlier.
* You do discuss that the timing here - but the separation being larger doesn’t alone mean that it occurred before the closest encounter. since the MW and M31 get close and then then get further apart.

- for the first encounter the separation is still large, so it’s not a collision

* 1. Last Paragraph: Future directions, how could you improve the analysis/code? 6/6

11. Total 81.5/100