Grading Rubric : Research Assignment 7 FINAL REPORT

Name: [Ernster,Tugg C](https://github.com/ternster03/ASTR400B.git)

1. **Miscellany (4.5/5)** 
   1. The report must be written in LaTeX using the emulateApJ or MNRAS formatting. ( 0.5/1)

not 2 columns

* 1. Informative Title, Name (1/1)
  2. Proper Grammar (0.5/1)
  3. All references properly cited ( 1/1)
  4. Acknowledgements with code citations (1/1)

1. **Abstract ( 4.5/5)**

(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 0/0.5

(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)

dark matter halo insufficiently defined

tidal stripping missing physics of the process (gravitational binding force is insufficient relative to tidal force).

Jacobi radius definition missing the fact that this is the radius for a rotating object in orbit (i.e. this isn’t just the static tidal force calculation - see lecture notes), also the equation is incorrect.

1. **Introduction ( 8.5/ 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 0.5/1

how does the dark matter evolution affect galaxy evolution?

* 1. Define “Galaxy” according to (cite) Willman & Strader and “Galaxy Evolution” 0.5/1

no citation

* 1. Overview our current understanding of the topic (par 3) 2/2
  2. What are the open questions in the field? With citations (par 4) 2/2
  3. Cite at least 3 journal papers (not including willman & strader). Use BibTex for formatting citations 1/1
  4. Include at least one figure from those papers to motivate your work – the figured must be discussed in the text. Caption must have citation, not plagiarized + punchline (what is the takeaway message) 1.5/2

missing citation

1. **Section 2: This Project: ( 3.5/5)**

(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) 1.5/3

circular arguments.

1. **Section 3: Methods (7 /10)** 
   1. Paragraph 1: describes the simulation you are using and what code was used to create it (citations) 0/1

What is GSS? what about the MW. sims not described. something got confused here.

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

order of operations is off – should compute the jacobi radius first to then identify the particles that would use to compute velocity dispersion

* which snapshots were used “possibly after” the merger - not specific
  1. Include a figure to describe methods with caption 1.5/2

missing punchline

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

Jacobi radius equation is not correct - mhost is supposed to be mass enclosed within the separation of the galaxy and the host.

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

Jacobi radius calculation needs to have m\_host as mass of M31 within the separation of the two galaxies.

1. **CODE: (8/10)**
   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. 3/4

code is incorrect - velocity dispersion is not computed correctly, computing the mean of the sum … ?

* 1. Code Github Repository is well organized and Code for Final Project is well documented. 1/2
  2. Code check-ins attended **if 2/3 are not attended/rescheduled this entire section is graded as 0.**

Code is not included in github - PDF file only, cannot be compiled.

1. **Section 4: Results ( 19/20)**
2. Paragraph 1: Describes Plot 1 4/4
3. Plot 1 included with caption + punchline 4/4
4. Paragraph 2: Describes Plot 2 4/4
5. Plot 2 included with caption, independent code+ punchline and quantitative 7/8

Discussion is qualitative - there is a “spike” in the velocity dispersion. This should be quantified.

1. **Section 5: Discussion (13.5/15)**
2. Par 1: Result 1.
   1. Does the result agree or disagree with hypothesis? 2.5/3

the satellite isn’t “expanding” just because the jacobi radius gets larger again. That is just telling you the radius at which material could be bound, and that bound radius does change.

The velocity dispersion is changing because of tidal impulses - gravitational forces that are acting to heat the system up.

1. Par 2:
   1. How does this result relate to existing work ? 5/5
   2. What is the importance/meaning of this result for our understanding of galaxy evolution? /4
   3. What are the uncertainties 2/3

what does “blank galaxy particle” mean?

1. Repeat for subsequent results
2. **Section 6: Conclusion (10 /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 2/2
   3. Last Paragraph: Future directions, how could you improve the analysis/code? 6 /6

11. Total 84 /100