Grading Rubric : Research Assignment 7 FINAL REPORT

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1. **Miscellany (5/5)** 
   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 ( 1/1)
   5. Acknowledgements with code citations (1/1)
2. **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 (8/10)**
   1. 5 keywords listed and defined in the text (2 per word)

major merger 1:1 to 1:4 not 1:6 -1

Dm halo definition is not sufficient -1

1. **Introduction ( 9.5/ 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 1/1
   3. Define “Galaxy” according to (cite) Willman & Strader and “Galaxy Evolution” 0.5/1

incorrect definition of galaxy - missing kinematics part.

* 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 figure must be discussed in the text. Caption must have citation, not plagiarized + punchline (what is the takeaway message) 2/2

1. **Section 2: This Project: ( 4/5)**

(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)

the analogy with water isn’t accurate - water is a fluid DM is collisionless (only follows gravity) . You’ve added so many analogies that the meaning has gotten confused. It is better to pair back the language and be precise.

2/3

1. **Section 3: Methods (8 /10)** 
   1. Paragraph 1: describes the simulation you are using and what code was used to create it (citations) 1/1
   2. Defined N-body 1/1
   3. Paragraph 2 : Overview approach. 1.5/2

what is teh method for fitting the theory to the data? how will you know the fit it good?

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

figure is not referenced in the main text

Figure doesn’t explain how the parameters for the models are being determined.

* 1. Paragraph 3: Describe calculations with terms defined 1.5/2

there are some confusions – NFW profile term rho\_o not correctly defined - not initial density, but inner. splash back radius relation to R200 and Rvir is incorrect.

* 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 ( 14/20)**
3. Paragraph 1: Describes Plot 1 4/4
4. Plot 1 included with caption + punchline 4/4
5. Paragraph 2: Describes Plot 2 2/4

how did you decide the right values for the mass and the scale radii. why did you set them both to be the same? Need to discuss the values you used for the theory fits in the main text

How are you choosing the smallest radius to compute the plot?

The Mass of the combined halo for the fit is way too low ….

1. Plot 2 included with caption, independent code+ punchline and quantitative 4/8

something isn’t right in the code as the density profile of the combined halo can’t be so close to that of each individual galaxy – there is twice as much mass at any given radius.

also something isn’t right with the inner regions of the plot. It shoudn’t plateau in the inner regions.

Plot needed to be more quantitative - how did you decide the comparison to the theoretical density profile was a “good fit” ? E.g. you could take the ratio of the theoretical model and the simulation result

1. **Section 5: Discussion (13/15)**
2. Par 1: Result 1.
   1. Does the result agree or disagree with hypothesis? 3/3
3. Par 2:
   1. How does this result relate to existing work ? 3/5

i don’t understand yoru findings concerning mass redistribution. the density profiles from your plots don’t look that different in the outer regions from what they were initially (fig 6)

* 1. What is the importance/meaning of this result for our understanding of galaxy evolution? 4/4
  2. What are the uncertainties 3/3

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 84.5/100

Paper is too long -2