

Final Project: Analyzing a journal article from the field of GW physics

Instructions:

Please choose and read a journal article. A list of possible articles is provided in the following google doc:

<https://docs.google.com/document/d/15NeJOcfyAqzF-sMW-mST9W49LvEr8KkWFuOgyJEQBU/edit?usp=sharing>

It is also possible to select an article on your own and get it approved by Dr. Caudill. Only one student per article is allowed so please check this on the google doc first.

Please prepare a report to answer the following questions. Try to paraphrase or summarize in your own words where possible, rather than directly quoting the article, unless a direct quote requested. In preparation for writing your own scientific articles, it is recommended that you prepare your report using LaTeX.

The report should be emailed to Dr. Caudill by Friday, May 29, 2020.

Questions to answer in your report:

- 1) What kind of article is this? For example, is it an article that presents new results, proposes a new idea, reviews information, or something else?
- 2) What is the purpose/hypothesis/aim/objective of the article? Include, in quotations, the exact statement in the paper that the authors use to describe this purpose. Hint: It may be included in the abstract or introduction as a purpose statement or hypothesis.
- 3) Why was this study important? In other words, what was the “gap” in scientific knowledge that the authors were trying to fill by doing this study?
- 4) Outline clearly, in a bulleted list, the main result(s) or outcome of the paper.
- 5) Describe the results/outcome of the paper in your own words. Do these results successfully address the purpose/hypothesis/aim/objective of the article?
- 6) What questions did you have while reading the article? For instance, are there steps that weren't explained well enough? Or do the authors use terminology or jargon that was not explained?
- 7) Summarize clearly, in a bulleted list, the steps/measurements/methods used by the authors to obtain their results.
- 8) Summarize any problems or limitations that the authors suggest could be affecting their results.
- 9) Do you see any additional problems or limitations to their research? What other criticisms do you have?
- 10) Find the plot in the paper that best demonstrates the main results. We call this a Figure-of-Merit (FOM). Include a copy of this FOM (with the proper citation) and describe in detail what is being plotted. In the rare case that there is no FOM, can you describe a figure that would have been helpful for the paper?

11) What are the fundamental principles from the field of gravitational-wave physics that this research is built upon? For example, do the authors utilize equations describing the merger of two black holes or use an alternative theory of gravity's prediction for gravitational waves? For each of these principles, try to include the presentation(s) and slide number(s) from our course that touched on this topic. If there was nothing from the course, add a suggestion for where and how this topic could be included.