

Final paper for PHYS598 AQG

The final paper for this course will be worth 35% of your total grade. The report should discuss a relatively recent (from within the past several years) result from the field of atomic, molecular, and optical (AMO) physics or quantum optics, broadly defined (if you have reservations about the suitability of your choice, run it by me early). Your report should focus on one paper (or a few concurrent, related results), with a strong preference for an experimental result somewhat related to the course material. Spend some time finding topic that interests you, either related to your own research or something completely new about which you'd like to learn.

You can find recent papers related to AMO physics and quantum optics by searching journals like Physical Review Letters (PRL), PRX, PRA, Nature, Science, Nature Physics, etc. You can also search for preprints on the arXiv (please, no viXra), looking under categories such as Quantum Gases (cond-mat.quant-gas), Atomic Physics (physics.atom-ph), and Quantum Physics (quant-ph).

Your report should discuss several important aspects of the chosen work, including:

- What was the experiment studying? What were its results?
- Why the study was performed: What motivated this experiment? How does this study fit into the broader historical context of its field?
- How the study was performed: Summarize how the experiment was undertaken. As appropriate, explain the underlying physics related to the experimental results or techniques.
- What comes next: What do you see as being the most interesting possible future development related to this study?

The report should contain at least 1500 words, not including figure captions, and have a length of roughly 6-12 pages with all figures and references included. Figures that are copied from a source are allowed if appropriately cited; original figures (for example based on calculations relevant to the study) are also encouraged.

One goal of this exercise is to build your skills at performing background research on a new topic, so as to help you understand how it relates to past and present work. As such, it is expected that your report will include of order 10 references.

Plagiarism of any kind (including plagiarism of the work of other students in this class, of reports from previous semesters of related courses, or from published works) will result in a failing grade, so take care not to copy and take care to appropriately cite all referenced work.

Schedule for the assignment

Wednesday November 15: you should select the work that you will write about by this date, emailing me a link to the reference by 8 pm.

Tuesday December 19: the final paper will be due by this date. You are to email me your paper as a pdf by 8 pm. No final papers will be accepted after this date/time without a valid excuse.