

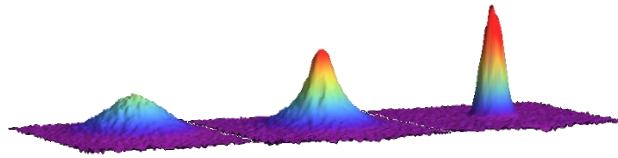
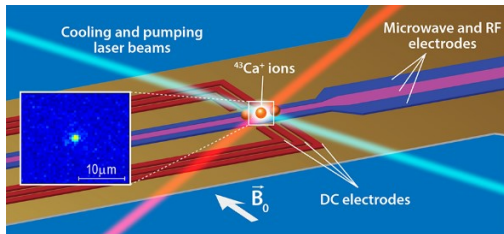
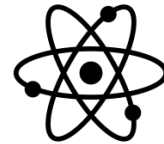
Physics 550: Atomic Physics (Winter 2021 – Remote Only)

Instructor: Subhadeep Gupta (deepg@uw.edu)

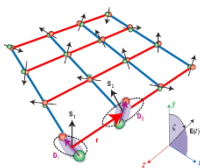
In this course we will cover core topics and discuss areas of current interest in atomic, molecular and optical (AMO) physics. The course is open to all graduate students and should be of interest to both experimentalists and theorists. The connections between AMO and other areas like condensed matter, nuclear and particle, and quantum information, also makes this a useful breadth class for many students.

The course material can be thematically grouped into the following areas:

- The internal structure of the atom and how it can be manipulated with electromagnetic fields in order to influence both internal and external dynamics.
- Interactions between atoms (eg. collisions, molecules) and how they can be controlled
- Fundamental atomic systems of current interest: eg, degenerate Bose and Fermi gases; atoms in optical lattices; trapped ions and atoms for precision sensing.
- Advanced applications of atomic physics such as the atomic clock which is key to time-keeping and the global positioning system (GPS).
- Emergent applications of atomic physics such as in quantum simulation and as quantum information processing platforms.



The class will meet two days a week, Tuesday and Thursday: 1230pm-150pm, remote only by Zoom. Classes will be a combination of lecture, discussion, and problem solving. We will also make frequent contact with relevant experimental results in the field. There will be HW assignments (4 total), and a final term paper. The topic for the paper should be related to the course. The instructor will provide a list of potential topics, but you are also free to come up with your own topic – but do consult and clear it with the instructor. You can use this opportunity to research a particular area that you have always wanted to know more about. The grade for the class will be 2/3 on HWs and 1/3 on final paper.



This course website with more details is at: <http://faculty.washington.edu/deepg/phys550/>
Feel free to email me at deepg@uw.edu if you have any questions about this course.

