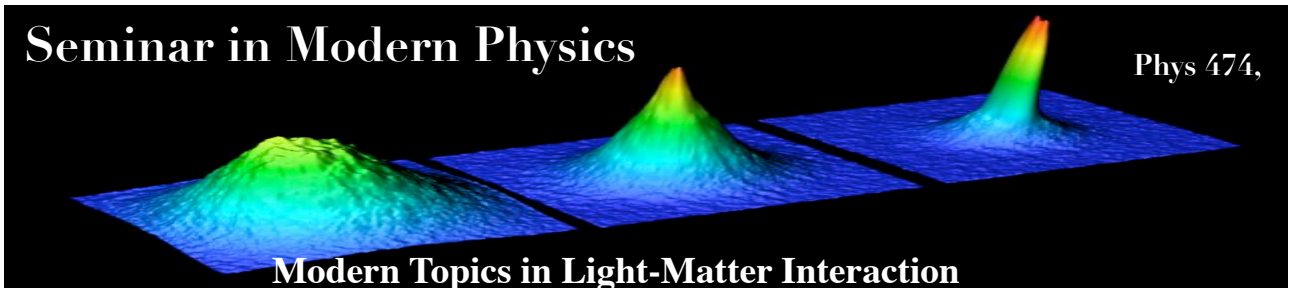

Syllabus

Course Description

This seminar will discuss and review some current topics of research in light-matter interaction and some of the research graduate students are presently conducting.

Students participating in the seminar will learn both the science discussed within the seminar and the best techniques to efficiently communicate scientific ideas using several media. Discussions of bad and good presentation techniques will be part of the seminar.

Students participating in the seminar will need to present two topics. The first topic must be picked at an organizational meeting that takes place at the beginning of the semester. The second topic will be a free choice matching the interest of each participating student.

Each seminar will consist in a presentation, a question and answer session, and a discussion about the effectiveness of the techniques used to convey the information.

Instructors:

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Time: F 9:10am-11am

Expectations:

Each student studies two topics. For each topic the student has to prepare the following

- Handout that closely resembles a standard physical review paper, and that has been prepared using the LaTeX/RevTeX typesetting package. The handout has to be handed in 2 days before the presentation day to allow for correction by the instructor. The corrected final version will be distributed to other students
- Slides for a presentation The slides should be discussed with one of the instructors before presentation.
- Oral presentation in seminar sessions. The presentation should be practiced with the other students before presentation in the seminar. The seminar is open to the public.

Additionally the students are required

- to attend all the presentation and to actively participate in the discussions
- to attend selected Physics Colloquia and to prepare notes for a critique of the talk

Grades:

All bulleted items in the expectation will be counted with equal weight.

Suggested topics for presentations

- The principle of a Raman Laser and its application in a first all-silicon laser
- Creation of entangle photons through non linear interaction and its application in quantumcryptography
- Interaction between single atoms and single photons in high finesse optical cavities
- Principles of Laser Cooling for the creation of BEC
- Principle and demonstrations of semiconductor quantum-dot lasers
- Micro-rings in integrated optics
- Integrated optical waveguides with hollow, gas-filled or liquid-filled chores.
- Intel's silicon electro-optic modulator. Implications and Limitations
- Holographic disks for data storage: state of the art, limitations, and promises.