



Announcement

Photonics

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Description

Today's experiments and technologies based on use of light rest on principles and methods of photonics. We will address in this course some fundamental but also advanced topics relevant for this field of research. Among other topics, focus will be placed on optics and semiconductor physics in service of quantum optics.

Expected learning outcome

To understand how to generate, use, treat, and detect light in experiments.

Content (tentative – subject to changes on popular demand).

- Generation of light; lasers.
- Laser light and how to handle it.
- Optical processes in nonlinear media.
- Methods and application of light conversion.
- Characterization and detection of light.
- Optical elements in service of quantum optics. What should I know?
- Quantum dots as sources of single photons, pairs. Quantum dot as memories.
- Photonic structures and why do we need them.
- Single photons sources; applications.
- ...

Prerequisites

Interest in Optics, Semiconductor Physics, and/or Quantum Optics

Assessment

The course includes lectures, student presentations, and problem sets. Active participation throughout the semester is required.

Instruction language

English

Literature

Saleh B.E.A., Teich M.C. Fundamentals of photonics

Boyd, Nonlinear optics

Peter W. Milonni, J. H. Eberly. Lasers.

+ a number of recent paper and review chapters.

Attendance time

5 hours per week