

课程简介

SME323. 微纳光学

理论课，3 学分，3 学时/每周。先修课程：无

本课程旨在培养学生理解和定量分析微纳尺度光学过程的兴趣和能力，主要分为三部分：我们首先讲解传统光学显微镜分辨极限的角谱表示，理解消逝波的工作方式；其次我们将分析显微镜超分辨技术，量子化的光源会引入光学态密度的讨论；最后我们将介绍光镊受力，理解它们在精准测量中的角色和在微纳操控中的潜力。学生进行分组展示近年半导体微纳光学芯片的应用进展和新机理。

SME323. Principle of Nano-optics

Lecture, 3 credits, 3 hours per week. Pre-requisites: No.

The goal of this course aims to motivate the interests of students and foster their capability to quantitatively understand the fundamental concepts of nano-optics. We start with the angular spectrum representation to understand both the resolution limit of conventional optical microscopy, and the potentials provided by evanescent fields. We discuss the principles of super-resolution microscopy techniques, by introducing quantum light sources with a discussion on the optical density of states. Finally, we turn to optical forces and understand their role in precision measurements and the opportunities they provide for manipulation of nanoscopic objects. Students are highly encouraged to give group presentations of recent processes on nano-optics.