



## Announcement

# Introduction to Matter-Wave Optics

Dr. Christian Brand

## Description

This lecture series gives a comprehensive introduction to the physics of matter-waves, covering particles from electrons up to massive molecules. In the course of the series the students learn techniques how to prepare, manipulate, and detect matter-waves. We will discuss the fundamental concepts of matter-wave experiments and show how they are harnessed for metrology, inertial sensing, and the search for new physics.

## Content

The content includes, but is not limited to:

- Beam splitter methods
- Interferometer concepts
- Dephasing and decoherence
- Metrology and sensing

## Literature

- A.D. Cronin, J. Schmiedmayer, D.E. Pritchard, Optics and interferometry with atoms and molecules. *Rev. Mod. Phys.* **81**, 1051-1129 (2009).
- G. Tino and M. Kasevich, Atom Interferometry. IOS Press (2014).
- H. Rauch and S. A. Werner, Neutron Interferometry. Oxford University Press (2015).
- F. Hasselbach, Progress in electron- and ion-interferometry. *Rep. Prog. Phys.* **73**, 016101 (2010)

## Instruction language

English

## Teaching methods

Lecture (3 hours per week) and Exercise (1 hour per week)

## Additional information

Written examination

## Lecturer

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