### Module title
Quantum Transport in Semiconductor Nanostructures

### Abbreviation
11-QTH-102-m01

### Module coordinator
Managing Director of the Institute of Applied Physics

### Module offered by
Faculty of Physics and Astronomy

### ECTS
6

### Method of grading
Numerical grade

### Only after succ. compl. of module(s)
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### Duration
1 semester

### Module level
Graduate

### Other prerequisites
Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

### Contents
The lecture addresses the fundamental transport phenomena of electrons in nanostructures. This includes the topics of: ballistic and diffuse transport, electron interference effects, quantisation of conductivity, interaction phenomena between electrons, Coulomb blockade, thermoelectric properties, description of spin-dependent transport phenomena, topological insulators, solid-state quantum computers.

### Intended learning outcomes
The students have mastered the basics of electronics of nanostructures in theory and practice. They know functions and applications of respective components.

### Courses
V + R (no information on SWS (weekly contact hours) and course language available)

### Method of assessment
(a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes)

Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.

Language of assessment: German, English

### Allocation of places
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### Additional information
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### Referred to in LPO I (examination regulations for teaching-degree programmes)
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### Module appears in
- Bachelor’ degree (1 major) Physics (2010)
- Bachelor’ degree (1 major) Physics (2012)
- Bachelor’ degree (1 major) Nanostructure Technology (2010)
- Bachelor’ degree (1 major) Nanostructure Technology (2012)
| Master's degree (1 major) Physics (2011) |
| Master's degree (1 major) Technology of Functional Materials (2010) |
| Master's degree (1 major) Nanostructure Technology (2011) |
| Master's degree (1 major) FOKUS Physics (2011) |
| Master's degree (1 major) Functional Materials (2012) |