

Module description

| Module title | | | | | Abbreviation |
|--|------|--------------------------------------|---------------------|----------------------------------|--------------------|
| Theory of Relativity | | | | | 11-RTT-Int-201-m01 |
| Module coordinator | | | | Module offered by | |
| Managing Director of the Institute of Theoretical Physics and Astrophysics | | | | Faculty of Physics and Astronomy | |
| ECTS Method of grading | | Only after succ. compl. of module(s) | | | |
| 6 | nume | rical grade | | | |
| Duration | | Module level | Other prerequisites | | |
| 1 semester | | graduate | | | |
| Contents | | | | | |
| Mathematical Foundations Differential forms Brief Summary of the special relativity Elements of differential geometry Electrodynamics as an example of a relativistic gauge theory Field equations of the fundamental structure of general relativity Stellar equilibrium and other astrophysical applications Introduction to cosmology | | | | | |
| Intended learning outcomes | | | | | |
| Familiarity with the basic physical and mathematical concepts of general relativity. Mathematical understanding of the formulation in terms of differential forms. Understanding of the formal similarity between electrodynamics and the theory of general relativity, viewing both of them as gauge theories. Application of the theory to simple models of stellar equilibrium. First contact with elements of cosmology. | | | | | |
| Courses (type, number of weekly contact hours, language — if other than German) | | | | | |
| V (3) + R (1) Module taught in: English | | | | | |
| Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) | | | | | |
| a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 mi- nutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (ap- prox. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may in- stead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original exami- nation date at the latest. Language of assessment: English Assessment offered: In the semester in which the course is offered and in the subsequent semester | | | | | |
| Allocation of places | | | | | |
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| Additional information | | | | | |
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| Workload | | | | | |
| 180 h | | | | | |
| Teaching cycle | | | | | |
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| Referred to in LPO I (examination regulations for teaching-degree programmes) | | | | | |
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SI 83

(LOELTS

Module appears in

Master's degree (1 major) Physics International (2020) exchange program Physics (2023) Master's degree (1 major) Physics International (2024)

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