

Module title		Abbreviation
Conformal Field Theory 2		11-KFT2-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	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
<p>5 Minimal models (critical statistical mechanics models (Ising, tricritical Ising, 3 state Potts model, restricted solid-on-solid models), correlation functions of the critical Ising model, fusion rules and the Verlinde algebra, Landau-Ginzburg description of minimal models, modified Coulomb gas method and its application to the Ising model, superconformal models)</p> <p>6 Free bosons and fermions (mode expansions, twist fields, fermionic zero modes and fermion parity)</p> <p>7 Free fermions on the torus (operator implementation of the partition function, vacuum energies, representations of Virasoro algebra, the modular group and fermionic spin structures, Virasoro characters, critical Ising model on the torus, Jacobi theta function identities)</p> <p>8 Free bosons on the torus (Lagrangian formulation of the partition function, fermionization, orbifolds in general, <math>S_1/Z_2</math> orbifold, Gaussian and Askin-Teller models, duality between original and orbifold theories, marginal operators, the space of <math>c=1</math> theories)</p>		
Intended learning outcomes		
Acquisition of both practical and conceptional familiarity with the methods of conformal field theory. Basic understanding of critical phenomena, quantum field theory, and functional integration. Enhanced level of understanding in particular for students of theoretical physics by exposure to an ambitious method with significant applications in contemporary condensed matter physics.		
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)		
<p>a) written examination (approx. 90 to 120 minutes) or</p> <p>b) oral examination of one candidate each (approx. 30 minutes) or</p> <p>c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or</p> <p>d) project report (approx. 8 to 10 pages) or</p> <p>e) presentation/talk (approx. 30 minutes).</p> <p>If a written examination was chosen as method of assessment, this may be changed and assessment may instead 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 examination date at the latest.</p> <p>Language of assessment: English</p> <p>Assessment offered: In the semester in which the course is offered and in the subsequent semester</p>		
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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**Module appears in**

Master's degree (1 major) Physics International (2020)

Master's degree (1 major) Physics International (2024)