## Module description

Module title					Abbreviation
Bosonisation and Interactions in One Dimension					11-BWW-Int-201-m01
Module	coord	inator		Module offered by	
Managing Director of the Institute of Theoretical Phy 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					
<ol> <li>Instability of Fermi systems in one dimension (1D)</li> <li>Abelian bosonisation and Luttinger liquids (spinless fermions, correlation functions, models with spin, renormalization group, and the sine-Gordon model).</li> <li>The below mentioned topics will be presented in different years:         <ol> <li>Interacting fermions on a lattice (Hubbard model, t/J model, transport properties)</li> <li>Bethe ansatz</li> <li>Spin-1/2 chains</li> <li>Disordered systems</li> <li>Non-abelian bosonisation and the WZW model (Kac-Moody algebras, Sugawara construction, Knizhnik-Zamolodchikov equation, applications of the WZW model)</li> </ol> </li> <li>Intended learning outcomes</li> </ol>					
Familiarity with the peculiarities of one-dimensional (1D) electron systems. Acquisition of the theoretical tools to					
Courses (type, number of weekly contact hours, language — if other than German)					
V (3) + R (1) Module taught in: English					
<b>Method of assessment</b> (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)					
<ul> <li>a) written examination (approx. 90 to 120 minutes) or</li> <li>b) oral examination of one candidate each (approx. 30 minutes) or</li> <li>c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or</li> <li>d) project report (approx. 8 to 10 pages) or</li> <li>e) presentation/talk (approx. 30 minutes).</li> <li>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.</li> <li>Language of assessment: English</li> <li>Assessment offered: In the semester in which the course is offered and in the subsequent semester</li> </ul>					
Allocation of places					
Additional information					
Workload					
180 h					
Teaching cycle					

8 83

Referred to in LPO I (examination regulations for teaching-degree programmes)

## 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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