Module title | Abbreviation  
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**FOKUS Research Module Complex Systems** | 11-FM-PKS-092-m01  

**Module coordinator**  
chairperson of examination committee  

**Module offered by**  
Faculty of Physics and Astronomy  

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<th>ECTS</th>
<th>Method of grading</th>
<th>Other prerequisites</th>
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<tr>
<td>10</td>
<td>numerical grade</td>
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<th>Duration</th>
<th>Module level</th>
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<td>1 semester</td>
<td>graduate</td>
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### Contents

Specific and advanced knowledge for independent scientific work in the field of physics of complex systems.  
- Statistical mechanics and information theory.  
- Critical phenomena: Scaling law, phase transformations, Monte Carlo simulation. Random walk, stochastic processes beyond the thermal equilibrium.

### Intended learning outcomes

The students have special and advanced knowledge of independent scientific work in the field of physics of complex systems. They know and are able to apply the methods of Statistical Physics and non-linear dynamics, which are used to describe physics of complex systems, to current questions. They have acquired advanced knowledge of a specialist field and prove their knowledge in a seminar presentation.

### Courses

**Physik komplexer Systeme (Physics of Complex Systems):** V (2 weekly contact hours) + Ü/P (2 weekly contact hours), German or English, once a year (winter semester)  
**Kompaktseminar Komplexe Systeme (Block Taught Seminar Complex Systems):** S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break)

### Method of assessment

This module has the following assessment components  
1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages)  
2. Seminar: talk (approx. 30 to 45 minutes)  

Assessment components 1 and 2 will be offered in German or English.  
Students must register for assessment components 1 and 2 online (details to be announced).  
Assessment component 1 will be offered in the winter semester (details to be announced); details on when assessment component 2 will be offered to be announced.  
To pass this module, students must pass both assessment component 1 and assessment component 2.

### 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

Master's degree (1 major) FOKUS Physics (2010)  
Master's degree (1 major) FOKUS Physics (2011)