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| <b>Module:</b> | <b>Elective Advanced Lectures:<br/>Theoretical Physics</b> |
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| <b>Module No.:</b> physics70c |
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| <b>Course:</b> | <br>universität <b>bonn</b> | <b>Selected Topics in Modern<br/>Condensed Matter Theory (T)</b> |
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| <b>Course No.:</b> physics7503 |
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| Category | Type                   | Language | Teaching hours | CP | Semester |
|----------|------------------------|----------|----------------|----|----------|
| Elective | Lecture with exercises | English  | 3+2            | 7  | WT       |

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| <b>Requirements for Participation:</b> |
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| <b>Preparation:</b> |
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| <ul style="list-style-type: none"> <li>+ Introductory Condensed Matter Theory</li> <li>+ Quantum Mechanics</li> <li>+ Statistical Physics</li> </ul> |
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| <b>Form of Testing and Examination:</b> |
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| oral or written examination |
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| <b>Length of Course:</b> |
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| 1 semester |
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**Aims of the Course:**

Knowledge of topics of contemporary condensed matter research  
 Knowledge of theoretical methods of condensed matter physics

**Contents of the Course:**

Covers topics and methods of contemporary research, such as

- + Feynman diagram technique
- + Phase transitions and critical phenomena
- + Topological aspects of phenomena in condensed matter physics

**Recommended Literature:**

R. D. Mattuck, A Guide to Feynman Diagrams in the Many-Body Problem  
 N. Goldenfeld, Lectures on Phase Transitions and the Renormalization Group  
 B. A. Bernevig, Topological Insulators and Topological Superconductors

The course can be taken in parallel to physics617 Theoretical Condensed Matter Physics.