

<b>Module:</b>	<b>Specialization: Theoretical Physics</b>
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Module No.: physics61c

<b>Course:</b>	 universität <b>bonn</b>	<b>Theoretical Particle Physics</b>
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Course No.: physics615

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+2	7	WT

**Requirements for Participation:**

**Preparation:**

Advanced quantum theory (physics606)  
 Quantum field theory (physics755)  
 Group theory (physics751)

**Form of Testing and Examination:**

Requirements for the examination (written): successful work with the exercises

**Length of Course:**

1 semester

**Aims of the Course:**

Introduction to the standard model of elementary particle physics and its extensions (unified theories)

**Contents of the Course:**

Classical field theory, gauge theories, Higgs mechanism;  
 Standard model of strong and electroweak interactions;  
 Supersymmetry and the supersymmetric extension of the standard model;  
 Grand unified theories (GUTs);  
 Neutrino physics;  
 Cosmological aspects of particle physics (dark matter, inflation)

**Recommended Literature:**

T. P. Cheng, L.F. Li: Gauge theories of elementary particle physics (Clarendon Press, Oxford 1984)  
 M. E. Peskin, D.V. Schroeder; An introduction to quantum field theory (Addison Wesley, 1995)  
 J. Wess; J. Bagger; Supersymmetry and supergravity (Princeton University Press 1992)