



## PHYSIKALISCHES KOLLOQUIUM

*Referent:* **Prof. Dr. Markus Schumacher**  
Experimentelle Teilchenphysik,  
Universität Freiburg



*Thema:* **The Higgs boson: status of deciphering its nature**

*Zeit und Ort:* Dienstag, 20.12.2016, 16:40 Uhr  
Recknagel-Bau, Hörsaal REC/C213, Haeckelstr. 3

*Leiter:* Prof. Dr. Arno Straessner

*Kurzfassung:* In summer 2012 the ATLAS and CMS collaborations at the Large Hadron Collider announced the discovery of a new particle in the search for the Higgs boson of the Standard Model of particle physics with a mass of about 125 GeV. Since then significantly more data have been collected at a center-of-mass energy of 8 TeV until the end of 2012 and also at the new energy frontier of 13 TeV since June 2015. These data sets allow to address questions like: is it a Higgs boson? Are the properties consistent with the expectations in the Standard Model of Particle Physics or do we see hints for „New Physics“? To answer these questions, a precise determination of the mass, the production rates and decay branching ratios are required. In several extensions of the Standard Model a modified or extended Higgs sector is closely linked to explanations used to solve other open questions like the nature of Dark Matter or new sources of CP-violation. The Colloquium will review our current knowledge about the nature of the discovered Higgs boson and discuss examples of the connection between Higgs boson physics and other open questions in particle physics.

*Kurzbiographie:* Markus Schumacher studied at Bonn University, where he obtained his diploma degree (1996) and Ph.D. degree (1999) working at the OPAL experiment at the Large Electron Positron Collider (LEP) at CERN. As a fellow at DESY he worked for the International Linear e+e-Collider project on R&D for a Time Projection Chamber and prospects for Higgs physics. In 2001 he returned to Bonn as „assistant professor“ and joined the ATLAS collaboration and started working on Higgs bosons physics at the Large Hadron Collider (LHC) at CERN. For two years he held a professorship at Siegen University and since 2008 he is professor at Freiburg University. His main research field is the investigation of electroweak symmetry breaking and the search for and investigation of Higgs bosons in the Standard Model and beyond with the ATLAS experiment at the LHC.

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