

## AKjDPG 1: Tutorials

Time: Monday 9:00–12:15

Location: Geb. 30.23: 3/1

**Tutorial** AKjDPG 1.1 Mon 9:00 Geb. 30.23: 3/1  
**Meet the Higgs boson** — ●SARAH HEIM — DESY

The Higgs boson was discovered in 2012 as the last missing piece of the Standard Model of Particle Physics. It is often seen as a key particle in our search for the origins of dark matter and the matter-antimatter asymmetry. In this tutorial, I will cover basic Higgs theory, the discovery of the Higgs boson, and our state-of-the-art knowledge of the Higgs boson properties, as well as possible connections to physics beyond the Standard Model.

**15 min. break**

**Tutorial** AKjDPG 1.2 Mon 10:45 Geb. 30.23: 3/1  
**Introduction to particle physics detectors** — ●MICHAEL LUPBERGER — Research and Technology Center for Detector Physics, Bonn, Germany — Helmholtz-Institut für Strahlen- und Kernphysik, Bonn, Germany — Physikalisches Institut, Bonn, Germany

Advancing humankind by gaining fundamental knowledge of what holds together the world at its core is the subject of particle physics. This knowledge gain requires efforts in several domains, such as theory, experiment design, detector development and construction, electronics, big data computing and data analysis and interpretation. In all of these domains, cutting-edge methods and concepts are required. For example, due to the exceptional and demanding requirements, the majority of our experimental setups to probe nature are not available off-the-shelf.

Detector physics, R&D, construction, and instrumentation hence are one domain of particle physics equally relevant as the others.

In this tutorial, I will briefly introduce the basic concepts of the physics of particle detectors. Taking the ATLAS and other experiments as examples, we will walk through the different technologies, their strengths and weaknesses as well as recent developments. We will also look at "services" for the detectors and how information is transferred out of the detector.