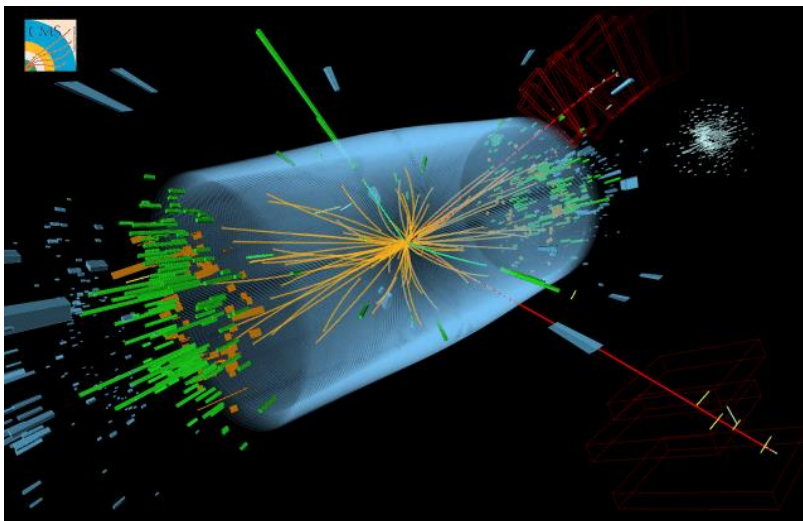


## 4.6 Million Euros for Particle Physicists

Federal Ministry of Education and Research Funds Work of KIT Physicists at the European Research Center CERN



Particle tracks after a proton-proton collision producing a Higgs boson. They were recorded by the CMS detector of CERN's LHC accelerator. (Photo: © 2012 CERN / CMS Collaboration)

Particle physicists of Karlsruhe Institute of Technology are granted of about EUR 4.6 million for research at the European Research Center CERN in the current funding period. With these funds, the BMBF wishes to finance current operation and further development work at the CMS detector that contributed to the discovery of the Higgs boson in 2012. At KIT, about 70 physicists in eight working groups focus on the operation, further development, and physical data analysis of the CMS.

Recently, the 27 km long LHC accelerator ring of CERN started operation again. It now makes protons collide at the record energy of 13 TeV, nearly twice the energy of past measurements. And it is planned to more than double the collision rate of protons again. By analyzing the data, KIT physicists hope to obtain a far better understanding of the properties of the Higgs boson and of the existence of dark matter. In addition, they search for further Higgs bosons that were postulated by theories, such as the so-called supersymmetry.

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The KIT researchers do not only focus on the current experiment, but also on the long-term use of the detector. They set up a long-term research and development program that concentrates on the design of a new silicon track detector that is to replace the world's largest silicon strip detector accommodated in the CMS prior to the high-intensity phase of the LHC. KIT's Institute of Experimental Nuclear Physics (IEKP) and the Institute of Data Processing and Electronics (IPE) are involved in this work. The KIT working groups are headed by professors de Boer, Husemann, Müller, Quast, and Weber. The group of KIT researchers is the largest group of a university at CERN. KIT's Thomas Müller is the spokesperson of all German research groups involved in the CMS project.

Experimental work is supported by KIT's theoreticians, also with funding by the BMBF. Their precision calculations are required to produce reliable prognoses of Higgs properties and postulate physical processes beyond the standard model of particle physics. KIT's computer scientists operate GridKa, one of eleven tier-1 computing centers worldwide that process and store data of CERN's large-scale experiments.

Current funding for a period of three years is granted under the BMBF project "Elementary Particle Physics by the CMS Experiment at the LHC" (BMBF-FSP 104) and the BMBF research infrastructure project (FIS project 05H2015) "Improvement of the Track Detector for the Phase II Upgrade of the CMS Experiment."

**Karlsruhe Institute of Technology (KIT) is a public corporation pursuing the tasks of a Baden-Wuerttemberg state university and of a national research center of the Helmholtz Association. The KIT mission combines the three core tasks of research, higher education, and innovation. With about 9,400 employees and 24,500 students, KIT is one of the big institutions of research and higher education in natural sciences and engineering in Europe.**

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The photo may be downloaded at <https://cdsweb.cern.ch/record/1459462>.