Master thesis in experimental particle physics: Photosensor characterisation for the ALICE upgrade at the CERN-LHC

Physicists have been trying to confirm the existence of a **quark-gluon plasma** (QGP) and to study its properties. It is believed that the universe used to be in such a **state shortly after the big bang** (~ micro seconds). It is an important test of quantum chromodynamics and it will influence our microscopic understanding of the world, at an elementary particle level, as well as at a scale of cosmology.

It is considered that heavy-ion collisions are the only promising way to study the QGP in a systematic way, and the **ALICE experiment at the Large Hadron Collider** (LHC) at CERN, carries out such an experiment on the largest scale in the history. The experiment plans a large upgrade in 2019-2020 in order to be able to collect data in a more precise and efficient way.

The Stefan Meyer Institute is working on the V0+ detector of the FIT sub-detector system on this upgrade campaign. The V0+ comprises a large disk of scintillator segmented in 5 concentric directions as well as in 8 radial directions. Each segment is coupled to a bundle of optical fibres which guide photons from the scintillator segment to a photosensor. The detector measures reaction planes and centralities of the collisions online and contributes to the trigger decision.

We search for a master student who will work on this project. **A successful candidate is expected to work on a characteristics test of a photosensor and to take part in a detector test at CERN in November 2017.**

Planned start: Summer 2017

Contact: Ken Suzuki (ken.suzuki@oeaw.ac.at),
Johann Zmeskal (johann.zmeskal@oeaw.ac.at),
Michael Weber (michael.weber@oeaw.ac.at)