Hands-on Seminar: Detector Construction (E/A) - physics723

Degree - M.Sc. in Physics (PO von 2014)

Module	**Elective Advanced Lectures: Experimental Physics**
Module No.	physics70a

Course	**Hands-on Seminar: Detector Construction (E/A)**
Course No.	physics723

Category	**Type**	**Language**	**Teaching hours**	**CP**	**Semester**
Elective	Laboratory	English	2	3	WT/ST

Requirements for Participation: Basic knowledge of particle physics

Preparation: physics618 is helpful but not mandatory

Form of Testing and Examination: Credit points can be obtained after successful construction and operation of the detector and preparing a written and/or oral report on a specific task

Length of Course: 1 semester

Aims of the Course: Students will design, construct, assemble and operate a particle detector.

Contents of the Course:

Students will construct, assemble and commission a particle detector. They will gain hands-on experience on detector construction. The students organize and execute the tasks of the project in personal responsibility. This includes many tasks common to more complex research or industrial projects. Topics include:

- order the needed detector components
- prepare CAD drawings
- prepare PCB layout
- develop electronic circuits
- produce and assemble detector parts
- vacuum technology
- cooling technology
- organize the work effort in personal responsibility
- communicate with team members and technical staff

Recommended Literature:

H. Kolanoski, N. Wermes, Teilchendetektoren, (Springer, Heidelberg, 2016)

W. R. Leo; Techniques for Nuclear and Particle Detection (Springer, Heidelberg 2. Ed. 1994)

K. Kleinknecht; Detektoren für Teilchenstrahlung (Teubner, Wiesbaden 4. überarb. Aufl. 2005)