Module: Elective Advanced Lectures: Experimental Physics

Module No.: physics70a

Course: High Energy Physics Lab (E)

Course No.: physics717

Category	Type	Language	Teaching hours	CP	Semester
Elective	Laboratory	English		4	WT/ST

Requirements for Participation:

Preparation:
Recommended: B.Sc. in physics, physics611 (Particle Physics) or physics618 (Physics of Particle Detectors)

Form of Testing and Examination:
Credit points can be obtained after completion of a written report or, alternatively, a presentation in a meeting of the research group.

Length of Course:
4-6 weeks

Aims of the Course:
This is a research internship in one of the high energy physics research groups which prepare and carry out experiments at external accelerators. The students deepen their understanding of particle and/or detector physics by conducting their own small research project as a part-time member of one of the research groups. The students learn methods of scientific research in particle physics data analysis, in detector development for future colliders or in biomedical imaging (X-FEL) and present their work at the end of the project in a group meeting.

Contents of the Course:
Several different topics are offered among which the students can choose. Available projects can be found at http://heplab.physik.uni-bonn.de. For example:
- Analysis of data from one of the large high energy physics experiments (ATLAS, DØ, ZEUS)
- Investigation of low-noise semiconductor detectors using cosmic rays, laser beams or X-ray tubes
- Study of particle physics processes using simulated events
- Signal extraction and data mining with advanced statistical methods (likelihoods, neural nets or boosted decision trees)

Recommended Literature:
Will be provided by the supervisor