Module: Advanced Laboratory Course

Module No.: physics601

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Category	Type	Language	Teaching hours	CP	Semester
Required	Laboratory	English	3+2	7	WT/ST

Requirements for Participation:
Requirement for experiment 12 is astro800 Introduction to Astrophysics or an equivalent basic knowledge in astrophysics.

Preparation:
Recommended for experiment 13 is lecture astro841 Radio Astronomy: Tools, Applications, Impacts

Form of Testing and Examination:
Experiments are selected from the catalogue of laboratory set-ups offered. 9 cumulative lab-units (LU) are required. One of the experiments 1-3 is compulsory for physics students. The experiments 12-14 are compulsory for astrophysics students. Requirements for the module examination (written report for every laboratory): successful completion of the experiment and initial oral questioning

Length of Course:
1 semester

Aims of the Course:
The student shall gain insight in the intricate workings of physics in relevant advanced experiments. The student gains experience in the setting up of a proper experimental environment and experiences the intricacies of forefront experimental research and presenting his/her results.

Contents of the Course:
Advanced experiments are carried out. Experimenting time in units of 8 hrs, preparation time and report writing each ~15 hrs. Further details are listed in the catalogue of laboratories. The experiments are chosen among those being offered and after consultation with the head of the course.
In the accompanying seminar the students report about one experiment. This experiment will be selected after consultation with the head of the course.

Recommended Literature:
Hand outs and literature will be distributed with the registration for an experiment

Catalogue of laboratories: (subject to change, for an up to date catalogue see http://www.praktika.physik.uni-bonn.de/module/physics601)
1. Properties of Elementary Particles (Bubble Chamber events): 3 LU
2. Analysis of Decays of Heavy Vector Boson Z0: 3 LU
3. Atlas: 3 LU
4. Holography: 2 LU
5. Photovoltaic and Fuel Cell: 2 LU
6. Optical frequency doubling: 2 LU
7. Laser Spectroscopy: 2 LU
8. Photonic Crystals: 2 LU
9. Mößbauer-Effect: 1 LU
10. Nuclear Gamma-Gamma Angular Correlations: 1 LU
11. Beta+-Annihilation: 1 LU
12. Optical Astronomy: 3 LU
13. Wave propagation on coaxial cables and waveguides / Setup of a radio-astronomical receiver: 2 LU
14. Photometry of stars: 2 LU