

# Lecture on **Key Experiments in Hadron Physics**

(physics715)

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**winter term 23/24**

## **Contents & Generalities**

Many aspects of contemporary physics are in one or the other way related to what is labelled Hadron Physics, namely the physics of strongly interacting particles. It plays a role from the smallest to the largest scales, i.e. the interaction of quarks to cosmic processes.

This lecture focusses on key experiments and concepts that today's Hadron Physics is built upon. It connects historic developments to modern experiments and shall cover:

- discovery of proton and neutron
- initial and precision measurements of the magnetic moment of the proton
- discovery, quantum numbers and role of the pion
- measurement of size (and, if time permits: shape) of proton and neutron
- discovery of quarks and gluons
- spin "crisis" of the nucleon
- discovery of the  $\Delta(1232)$  and hadronic excitation spectra
- multi-quark exotic hadrons

The course is composed of 2h lecture and 1h exercises. The latter will be held in 2h blocks every other week. 4 cp will be awarded usually based on a written or oral examination (format to be discussed with participants). Alternatively, the possibility will be offered for students to present one of the experiments in seminar style (supported by a tutor).

## **Schedule**

The lecture is scheduled

- Tue 16ct – 18 (Conference Room 2, PI)
- 2 hours exercise groups will be organised every other week, time according to the requests of the audience.

The preliminary discussion (Vorbereitung) takes place Tuesday, Oct 10.