Experiments on the Structure of Hadrons

– physics 715 –

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generalities

- 2h lecture, Tue 16ct – 18
- 1h exercises
- organisation of exercises:
  2h every 2 weeks
- 4cp
- examination (written /oral):
  to be discussed

• lecture begins:	Tuesday, Oct. 10 (prel. disc.) / 17 (the real stuff)
• exercises begin:	in two weeks, presumably. Special announcement & time table.
• 1st examination:	last week of term, normal lecture time: Tue, Jan 30, (16 – 18 if written exam)
• 2nd exam:	Tue, Mar 19, 14 – 16 (at present still subject to change)

topics

- Hadron Physics ↔ quark-gluon / pion interactions
- key Experiments & discoveries
- key concepts

connect historic developments
to modern experiments

infos / material → **e-campus**

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- discovery of proton & neutron
- magnetic moment of the proton
- discovery and properties of the pion
- size of proton & neutron
  → proton radius puzzle
- discovery of quarks: Deep Inelastic Scattering
- “spin crisis“ of the nucleon
  → SMC & COMPASS experiments
- hadronic excitations: Discovery of the Δ(1232)
  → π-N scattering & meson photoproduction
- multi-quark exotic hadrons
  → Belle, LHCb & BGOOD experiments

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Advertisment:

- Master seminar ph654 on
- Exotic Multi-Quark States
- Talks on recent key experiments
- based on original literature
- Wednesday, 13ct (CR 2, PI)

format

- few basic slides for illustration of experiments
- and of physics / research context
- whiteboard / iPad explanations
- round table discussion
- seminar-style contributions of audience possible
- upon individual decision seminars may add to grade, complementing the regular exam

tutorial

- 1 hour per week
- our format: 2 hours every other week
- time and location to decide upon requirements of audience

Tutors

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Mrunmoy Jena s6mrjena@uni-bonn.de

Vlera Hajdini vlerahajdini@uni-bonn.de

literature

class will be based on

experiment related research papers
(to be provided through eCampus)

general physics context

Perkins,
Introduction to High Energy Physics (Cambridge Univ. Press, 2000 (4th ed.))

Gottfried, Weisskopf,
Concepts of Particle Physics (Oxford Univ. Press, 1986)

Thomas, Weise,
The Structure of the Nucleon (Wiley, 2001)

Cahn, Goldhaber,
The Experimental Foundations of Particle Physics (Cambridge Univ. Press, 2009)

Donnelly, Formaggio, Holstein, Milner, Surrow,
Foundations of Nuclear and Particle Physics (Cambridge Univ. Press, 2017)