GSI - FAIR Colloquium

Main Lecture Hall (SB1 1.120), 64291 Darmstadt, Planckstraße 1

Tuesday, June 21, 2016,
16:15 Uhr (Tee ab 15:45)

Pre-colloquium for students at 15:30

Josef Pochodzalla - University of Mainz

It's a strange world - where QCD meets gravity

Strangeness nuclear physics is a broad and topical research area, which embodies all the aspects of strange particle interactions with nuclei. Its range extends from Λ hypernuclei which were discovered in 1952 and explored -- although insufficiently -- ever since, through poorly known doubly-strange hypernuclei, to speculated exotic macroscopic forms of multistrange dense matter which could be realized e.g. in the inner cores of neutron stars. The recent observation of massive neutron stars with about twice the solar mass and the expected appearance of hyperons at about two times nuclear density remains an unresolved mystery in neutron stars (``hyperon puzzle''). At present, our incomplete understanding of the underlying baryon-baryon and of even more subtle multi-body interactions in baryonic systems seems to be the most probable reason for this dilemma. Thus, the study of the strong force in dense stellar objects and the determination of the EoS remains even after many decades of research one of the biggest challenges for physics. High energy nuclear reactions, radioactive beams mapping the chart of nuclear stability and precision studies of nuclear few body systems contribute to this task. Strangeness nuclear physics with its many facets is an essential protagonist in this big adventure.

In this talk, recent results from MAMI and J-PARC on the spin dependence of the charge symmetry breaking in the L-N interaction will be presented, thus underlining the importance of precision experiments. Furthermore, prospects for the FAIR facility will be discussed.

Einladender: Lars Schmitt

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