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The PANDA experiment: antiproton physics at FAIR

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The new Facility for Antiproton and Ion Research (FAIR), under construction at the GSI laboratory at Darmstadt, in a few years will make available primary beams of ions, from hydrogen to uranium, and secondary beams of radioactive ions and antiproton with unique features.

In the large research areas opened by this new center (from atomic to plasma physics, to the study of nuclear matter up to extreme density conditions), the antiproton physics is an absolute innovation for this laboratory. Through an High Energy Storage Ring (HESR) for antiprotons, an antiproton beam will be available in a momentum range from 1.5 to 15 GeV/c, which will interact on a hydrogen target.

The products of the interaction, including hadronic systems with strangeness and/or charm, will be detected with the PANDA magnetic spectrometer (antiProton ANnihilation at DArmstadt), and the spectroscopic analysis will allow a detailed investigation on a number of open problems of the hadronic physics, as the quark confinement, the existence of non-conventional meson states (so-called glueballs and hybrids), the structure of hadrons and of the strong interaction, with particular attention to charmonium spectroscopy.

An overview of the scientific program of PANDA and the current status of the project will be presented.

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