

# FAIR - The Universe in the Laboratory

FAIR will be the next-generation facility for fundamental and applied research with antiprotons and ion beams. It will provide world-unique accelerator and experimental facilities, allowing for a great variety of unprecedented forefront research in physics and applied sciences. FAIR is an international project with 10 partner countries and more than 2500 scientists and engineers from more than 50 countries involved in the planning and construction of the accelerators and associated experiments.

FAIR research focuses on the structure and evolution of matter on both a microscopic and a cosmic scale, bringing our Universe into one laboratory. In particular, FAIR with its four scientific pillars will expand the knowledge in various scientific fields beyond current frontiers, addressing the following:

- The properties of the strong force and its role in shaping the basic building blocks of the visible world around us and in the evolution of the universe;
- Test of symmetries and predictions of the Standard Models, as well as the search for physics beyond it;
- The properties of matter under extreme conditions, at both the subatomic and the macroscopic scale of matter; and
- Applications of high-intensity, high quality beams in research areas that provide the basis for, or indirectly address, issues of applied sciences and technology.

In particular FAIR will open a new era in nuclear astrophysics.

The talk will introduce FAIR, its unique scientific

Opportunities, and the status of the realization of the project.