

# The FAIR Project in 2005

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## 1. Introduction

In 2001, GSI, together with a large international science community, presented a Conceptual Design Report (CDR) [1] for a major new accelerator facility for beams of ions and antiprotons in Darmstadt. The concept for the Facility for Antiproton and Ion Research (FAIR) is based on extensive discussions and a broad range of workshops and working group reports, organized by GSI and by the international user communities over a period of several years.

It builds and substantially expands on many seminal developments made by GSI and its international users over the last decade in cooler-ring technology and physics for high-energy heavy ion beams. The central part of the FAIR facility are two superconducting synchrotrons which will deliver high intensity ion beams up to 35 GeV per nucleon for experiments with primary beams of ions up to uranium and with secondary (radioactive) ion beams and antiprotons. FAIR will open up unique opportunities for a broad spectrum of research programs comprising QCD studies with cooled beams of antiprotons, nucleus-nucleus collisions at highest baryon density, nuclear structure and nuclear astrophysics investigations with nuclei far off stability, high density plasma physics, atomic and material science studies, radio-biological investigations and other interdisciplinary studies.

## 2. Organization as an International Project Status of the FAIR project

Following an in-depth evaluation by the German Wissenschaftsrat (the science advisory committee of the German government) and its recommendation to realize the facility, the German Federal Government announced in February 2003 approval of the project, with Germany providing up to 75% of the needed funding (65% federal, 10% State of Hessen).

The International Steering Committee (ISC) of the FAIR project has been installed in February 2004 with the intention to work out and agree on a contract for the establishment of the international accelerator laboratory FAIR. Until the end of 2005 the following member countries have signed a Memorandum of Understanding (MoU), which expresses the intention to participate in the construction and operation of FAIR: China, Finland, France, Germany, Greece, India, Italy, Poland, Russia, Spain, Sweden, and the United Kingdom.

The new German government has affirmed in November 2005 that the financing of the German share of the FAIR construction cost (total investment) of approximately 1 billion € will be assured. Negotiations with the other FAIR member countries concerning their contributions are in progress.

In 2006, it is foreseen to sign an inter-governmental agreement (convention) that defines the legal and organizational form of FAIR and the contributions of all member countries.

The start of the construction is projected for 2007. FAIR shall be constructed in three phases until 2014. The full performance with the parallel operation of all experimental programs will be reached in 2015.

## 3. The FAIR Baseline Technical Report

The FAIR project developed significantly from the CDR in 2001 to the Baseline Technical Report (BTR) in 2006. The proposed research program and the accelerator concept have been worked out in more than 100 workshops. Significant R&D has been carried out and detailed design has been developed. A large fraction of this effort is funded by the European Commission.

About 2500 scientists from 44 countries have organized themselves in collaborations and have submitted Letters of Intent in 2004 and Technical Proposals in 2005 for the experiment programs at FAIR.



**Figure 1:** The six volumes of the FAIR Baseline Technical Report contain about 3500 pages.

