

# ACCELERATOR SEMINAR

**Prof. Dr. Mei Bai**

Forschungszentrum Jülich, Universität Bonn

**Thursday, 04<sup>th</sup> May at 4 p.m.**

KBW lecture hall

Planckstraße 1, 64291 Darmstadt

## ***“From RHIC to COSY, an adventurous Journey”***

The Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory on Long Island, NY is a 3.84km circumference circular collider providing collisions of a variety of ions as well as polarized protons at a number of energies studying the early state of the universe, QCD physics as well as spin physics. The Cooler Synchrotron (COSY) at Forschungszentrum Jülich in Germany, on the other hand, is a 184 m circumference race-track synchrotron equipped with both electron coolers and Stochastic coolers to provide proton or deuteron beams for hadron physics experiments using internal targets between a kinetic energy of about 50 MeV up to about 3 GeV. In addition, COSY can also provide extracted beams at its three external beamlines. The light ion beams can also be polarized including tensor polarized deuteron beams, a unique feature of COSY. Despite the fact that COSY is a much smaller facility, its operation bears similar essential ingredients. The light ion beams can also be polarized including tensor polarized deuteron beams, a unique feature of COSY. Despite the fact that COSY is a much smaller facility, its operation bears similar essential ingredients. Now, as a test facility for the development of FAIR (Facility of Antiproton Ion Research), both detectors and the High Energy Storage Ring (HESR), as well as the feasibility investigation of direct EDM (Electric Dipole Moment) search of charged ion in a storage ring, the operation of this facility faces more challenges in many ways such as reaching high precision beam control, high precision machine modeling, robust operation, as well as expanding its capability to enable research from multidisciplinary scientific fields. This presentation will give you a brief introduction on both facilities including future HESR, along with their achievements and challenges. Motivations and challenges in beam physics and accelerator technology for storage ring based EDM search will also be presented.



Invitor: Dr. Giuliano Franchetti  
Deputies: Dr. Lars Groening, Dr. Holger Kollmus

GSI Helmholtzzentrum für Schwerionenforschung GmbH

