

Title: Matter-Antimatter Symmetry Violation and Matter Genesis

Lecturer: Dr Andreas Hoecker

Date and Times:

- 5th August at 10:15
- 5th August at 11:15
- 7th August at 9:15
- 8th August at 9:15

Summary of the proposed talk:

The lecture introduces the experimental facts, the empirical necessity and the theoretical concept of Matter-Antimatter symmetry violation ("CP violation") in particle reactions, leading to an excess of leptons and baryons (matter) in our universe. Different experimental phenomena of CP violation are discussed and a theoretical description of CP violation within the framework of the Standard Model is given. Recent experimental results on CP violation in the sector of B mesons are highlighted and interpreted. Projections into the future of this field are put into perspective with the expected outcomes of the LHC experiments at CERN. The lecture ends with an overview of theoretical models for the genesis of a matter excess (leptons and baryons) after the big bang as suggested in modern particle physics theory.

Prerequisite knowledge and references:

Basic knowledge of particle physics and the Standard Model

**Biography-
Brief CV:**

Student of physics at the University of Bonn, Germany between 1989 and 1994. Diploma thesis on the search for CP violation in tau-pair production as a member of the OPAL experiment at the Large Electron-Positron collider (LEP) at CERN.

From 1994 to 1997 doctoral student at the Laboratoire de l'Accelérateur Lineaire (LAL) in Orsay, France. PhD thesis on the measurement of the strong coupling constant with the ALEPH experiment at LEP. Phenomenological work on hadronic vacuum-polarisation contributions to electromagnetic observables.

Joined the French scientific organisation CNRS and the BABAR Collaboration (SLAC-Stanford, USA) in 1997.

Until 2005, detector-related work in BABAR and measurements as well as phenomenological analyses of CP violation in the B-meson system. Joined CERN in autumn 2005, since then working for the trigger system of the ATLAS experiment.