

Physics with Polarized Beams - A tutorial for experimenters and accelerator physicists

Lectures by Dr. Werner Vogelsang

November 20, 27, December 4, Wednesdays, at 3:00pm
in the Physics Seminar Room, Bldg. 510

Synopsis

High-energy QCD spin physics has been going through a period of much excitement and rapid developments ever since the measurement of the proton's spin-dependent deep-inelastic structure function g_1 by the EMC more than a decade ago. It has now entered its prime, primarily thanks to the advent of the RHIC-Spin program. The purpose of the lectures is to give an introduction into the field, targeting an audience of accelerator physicists, experimenters, and students.

The lectures will start with a brief summary of the tools needed to describe spin in high-energy reactions. We will then turn to processes that are “deeply-inelastic” in a broad sense. Such processes include the classic deep-inelastic lepton-nucleon scattering, and also many of the reactions relevant at RHIC-Spin. We will describe how they may be described theoretically. We will review the knowledge about the spin structure of the nucleon gained in the past, and discuss how measurements at RHIC and in other planned experiments in spin physics will improve it. Topics in this context will be perturbative QCD, spin-dependent quark and gluon parton distributions, transversity, single-spin asymmetries, the nucleon spin sum rule, off-forward parton distributions, nucleon form factors, and others.

Sponsored by the Center of Accelerator Physics