



Università degli Studi di Cagliari
Dipartimento di Fisica



Istituto Nazionale di Fisica Nucleare
Sezione di Cagliari
High Energy Theory
Group

Avviso di Seminario

Martedì 21 Novembre 2006
h. 15:00 – Aula C

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INFN, Laboratori Nazionali di Frascati

THE SPIN OF THE NUCLEON FROM THE HERMES POINT OF VIEW

One of the central challenges of contemporary nuclear and high energy physics is achieving an understanding of how quarks and gluons combine to make mesons, baryons and nuclei. One particular issue which has received much attention is how the constituent-parton spins combine to form the spin of the nucleon. The objective of the first measurements in *polarised* Deep Inelastic Scattering (DIS) was to determine what fraction of the nucleon's spin was carried by the quarks. It came as a shock to find that the spins of the quarks inside the nucleon don't combine to form the nucleon spin as expected from the constituent quark model, but yielded a contribution which was compatible with zero. These early results from experiments at SLAC and CERN provoked what was called the "spin crisis" and initiated a series of new experiments at laboratories in the U.S. and in Europe. All these experiments of ever increasing precision confirmed that the net contribution of the quarks' spins can account for only a fraction of the nucleon's spin. There must be other substantial contributions, possibly from gluons exchanged or from the orbital motion of the quarks and gluons about each other. HERMES at DESY in Hamburg (Germany) is a second generation experiment to study the spin structure of the nucleon by measuring not only inclusive but also semi-inclusive and exclusive processes in polarised DIS. A comprehensive overview will be given on how to access all the different contributions to the nucleon spin.

