

IAS Seminar

Topic: **Nucleon Matrix Elements: From Charges to nEDM**

Speaker: Prof. Rajan Gupta, Los Alamos National Laboratory, Los Alamos, USA

Contents: I will describe the progress made in lattice QCD calculations needed to put constraints on new physics at the TeV scale. In particular, I will analyze the strength of possible new scalar and tensor interactions and their detection in neutron β decay and at the LHC, and of novel charge-conjugation and parity (CP) violating interactions that will be constrained by the electric dipole moment of the neutron (nEDM). The Lattice QCD calculations that enable these probes of new physics are the matrix elements of these interactions within the nucleon state. Strategies for obtaining high statistics results using the all-mode-averaging method and for mitigating excited-state contamination will be discussed. I will then present high statistics results for (i) the charges that probe new scalar and tensor interactions; (ii) calculations of the quark electric dipole moments and their implications for nEDM and constraints on Split SUSY model; and lastly (iii) describe a new method for calculating the matrix elements of the CP violating quark chromo electric dipole moment operator that also constrains new physics through its contributions to the nEDM.

Time: Wednesday, 20 April 2016, 14:00

Venue: Jülich Supercomputing Centre, Hörsaal, building 16.3, room 222

Anyone interested is cordially invited to participate in this seminar.

sgd Prof. Dr. Dr. Thomas Lippert