



Πανεπιστήμιο
Κύπρου

The Department of Physics at the University of Cyprus
is organizing a seminar on

Tuesday, 14 of June 2016, time 4:00 p.m.

Room B228, Building 13, New Campus

Speaker:

Dr. Jacob Finkenrath
Cyprus Institute

“Search for Tetraquark $J^P = 0^+$ Candidates using Lattice QCD”

Recently there is experimental evidence that states with more than one quark and one antiquark or three quarks exist in nature. For example the Pentaquark states seen at LHCb suggest that the quark content is more rich. In my talk I will focus on states with four quarks constructed by meson-meson states and/or a diquark--anti-diquark pair.

A motivation for this calculation is to understand the anomalous mass ordering of the light scalar mesons. Light scalar mesons candidates like $a_0(980)$, $f_0(980)$, $s(500)$, $\kappa(900)$ can form a nonet similar to the pseudoscalar and vector meson nonets with a mass ordering that is not expected from a simple quark--anti-quark state. Moreover particles with a charm content like the D_{s0}^* meson or other charged $c\bar{c}X$ particles are suggested as possible tetraquark states.

I will present the status of our study on tetraquark candidates with $J^P = 0^+$ and flavor structure $q_1\bar{q}_2q_3\bar{q}_3$ with light quarks q_1 and q_2 (up- and down) and a heavy quark--anti-quark $q_3\bar{q}_3$ (strange or charm). The investigation is done by using Lattice QCD, a non-perturbative framework which can study QCD from first principles. The numerical task is a precise computation of correlation functions with different interpolating fields that include two- and four-quarks. This is necessary to quantitatively investigate the internal structure of mesons, which are potentially tetraquark states.

For more information please contact:
Department of Physics, telephone: 22892826