GOETHE UNIVERSITÄT FRANKFURT AM MAIN

Fachbereich Physik
Institut für Theoretische Physik

CONDENSED MATTER THEORY SEMINAR

Subject: **Magnetoelasticity and many-body excitations in one dimension**

Speaker: **Dr. Oleksandr Tsyplyatyev (Goethe-Universität Frankfurt)**

Date & time: **Friday, June 16th, 2017 at 3.15 p.m.**

Venue: **Seminar room 1.114**

I will construct a many-body theory of magnetoelasticity in one dimension and will show that dynamical correlation functions of the quantum magnet, which connect the spins with phonons, involve all energy scales. Accounting for all magnetic states non-perturbatively via the exact diagonalisation techniques of Bethe ansatz, I will show that the renormalisation of the phonon velocity is a non-monotonous function of the external magnetic field and will identify a new mechanism for attenuation of phonons-via hybridisation with the continuum of excitations at high energy. Applications of this theory to ultrasound experiments in the one-dimensional regime of a anisotropic magnetic insulator, Cs2CuCl4, will be discussed.