GOETHE UNIVERSITÄT FRANKFURT AM MAIN

Fachbereich Physik
Institut für Theoretische Physik

CONDENSED MATTER THEORY SEMINAR

Subject: **Bose-Einstein Condensates and the Thin-Shell Limit in Anisotropic Bubble Traps**

Speaker: **Prof. Dr. Francisco E.A. dos Santos (Federal University of São Carlos)**

Date & time: **Friday, 8th of December 2023 at 3:15 p.m.**

Venue: **Room 01.114**

Abstract

Within the many different models, that appeared with the use of cold atoms to create BECs, the bubble trap shaped potential has been of great interest. However, the relationship between the physical parameters and the resulting manifold geometry remains yet to be fully understood for the anisotropic bubble trap physics in the thin-shell limit. Here, we aim at this goal by showing how the parameters of the system must be manipulated in order to allow for a non-collapsing thin-shell limit. In such a limit, a dimensional compactification takes place, thus leading to an effective 2D Hamiltonian which relates to up-to-date bubble trap experiments. At last, the resulting Hamiltonian is perturbatively solved for both the ground-state wave function and the excitation frequencies in the leading order of deviations from a spherical bubble trap.