



ICTS Seminar (HYBRID)

Title : Quantum Condensate Shells: From ground-based lattices to Space

Speaker : Smitha Vishveshwara (University of Illinois)

Date : Tuesday, 18th July 2023

Time : 03:30 PM (IST)

Abstract : Bose-Einstein Condensates trapped in spherical geometries are expected to be found in unique settings from co-existent superfluid-Mott insulating phases in optical lattices to neutron stars. On Earth, however, such freely standing shells generally cannot exist due to gravitational sag. Here I describe our theoretical studies of condensate shells in close connection with experiments, first in the optical lattice setting and then in microgravity conditions aboard the International Space Station (ISS) performed on its Cold Atom Laboratory. I discuss the collective mode structure of shell shaped condensates and related signatures of hollowing, macroscopic quantum interference effects in time-of-flight experiments, and vortex behavior. In instance of shells in microgravity, I present the thermodynamics of expanding shells realized aboard the ISS and the exciting journey that brought these experiments to Space.

Venue : **Offline:** Madhava Lecture Hall (ICTS)

Online: Please click the below link to join the seminar.

<https://icts-res-in.zoom.us/j/86370305181?pwd=MXBvZWxQbmVDZVlwQ3hDaTJSU213UT09>

Meeting ID: 863 7030 5181

Passcode: 181811