

JANUARY

03

**COLLOQUIUM**  
DEPARTMENT OF  
PHYSICS, IIT GUWAHATI



# **Cavity Optomechanical Sensing and Manipulation of an Atomic Persistent Current**

**5:15 pm-6:15 pm**  
**3rd January 2022**

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## ***Abstract***

I will describe our recent theoretical work, which initiates contact between two frontier disciplines of physics, namely, atomic superfluid rotation and cavity optomechanics. It considers an annular Bose-Einstein condensate, which exhibits dissipationless flow and is a paradigm of rotational quantum physics, inside a cavity excited by optical fields carrying orbital angular momentum. It provides the first platform that can sense ring Bose-Einstein condensate rotation with minimal destruction, in situ and in real time, unlike demonstrated techniques, all of which involve fully destructive measurement. It also shows how light can actively manipulate rotating matter waves by optomechanically entangling persistent currents. Our work opens up a novel and useful direction in the sensing and manipulation of atomic super flow.

Online Platform : Microsoft Teams

Youtube Link: <https://youtu.be/>

Facebook page: <https://www.facebook.com/>