UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

INSPEM WEEKLY SEMINAR

48/2019

#UNSDG

Date & Time

Friday, 27th December 2019 @ 3.15 pm

Venue

al-Farabi Seminar Room, Second Floor, INSPEM

Presenter

Mr. Kalai Kumar Rajagopal

Dept. of Mathematics, Faculty of Science

Topic

Dissipative Dynamics of a Double-Well Bose-Einstein Condensate-Reservoir System

Abstract

The study on dissipative quantum system is not only fascinating but also mind-boggling at times. In this talk, I will illustrate our recent works on the dynamics of double-well Bose-Einstein condensate out-coupled to a thermal reservoir. The system is subjected to Markovian operational dynamics, obeying Fluctuation Dissipation theorem. We have provided new technique to calculate this two-mode BEC-environment system. Analytical solution for the interaction free condensate in the system is obtained by employing Laplacian method by solving the coupled linear Integro-differential equations. For the interacting BEC atoms however, we have resorted to numerical calculations. The effect of damping/decoherence, noise correlation, on-site interactions strengths on the population dynamics of the trapped atoms were analysed. We found dissipation acting concurrently with repulsion interaction drives the self-trapped BEC to quantum-tunnelling state for the T=0 case. At finite temperature, on the other hand, we observed that tunnelling of atoms between traps being suppressed in tandem with increasing of contact temperatures.