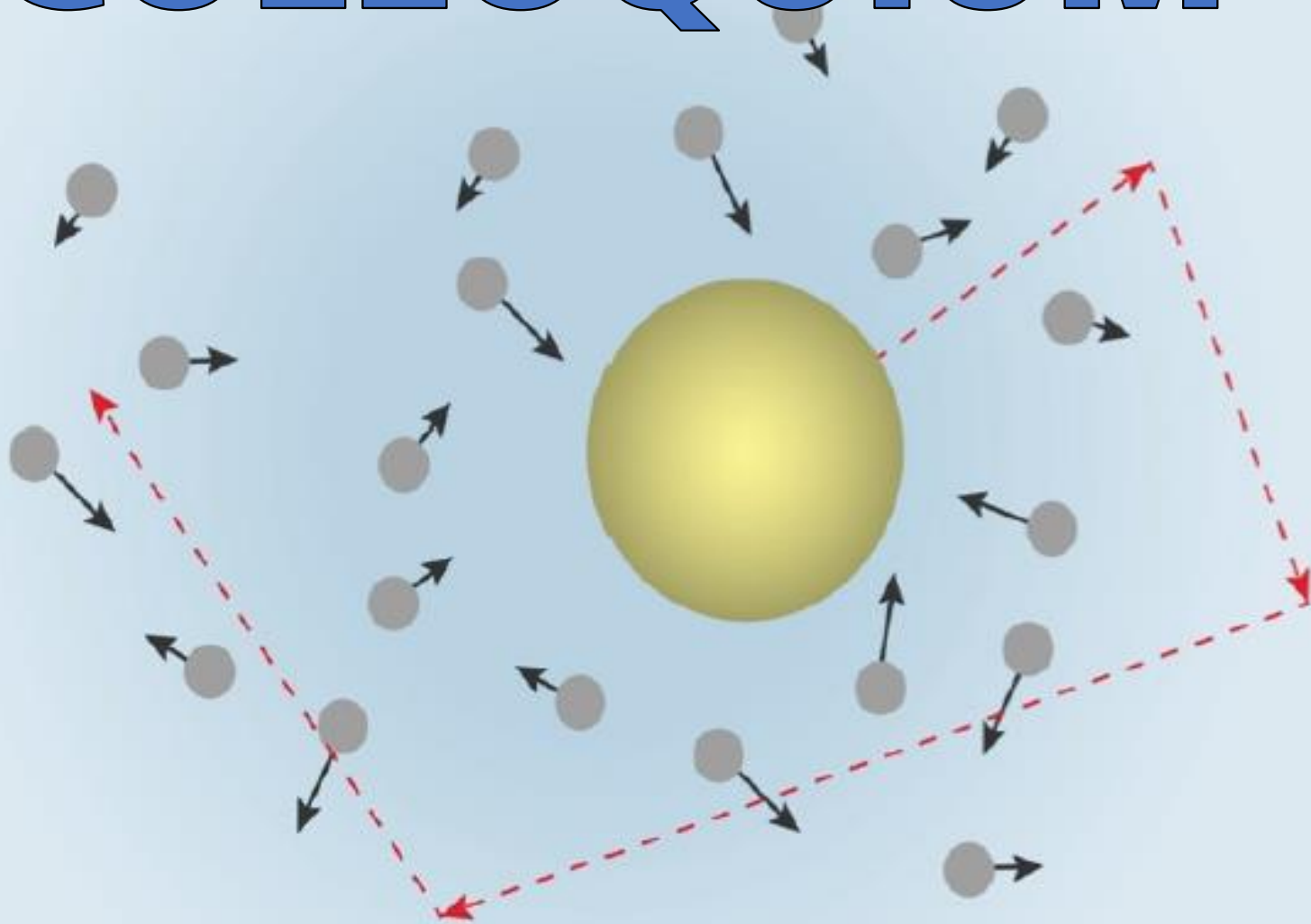


# COLLOQUIUM



**4 -11-19**

**UPUL RUPASSARA**

Dept of Mathematics  
Southern Illinois University

Place: Neckers 156

Time: 3:00pm

Reception immediately  
following in the Math Library.

**SIU** Southern Illinois  
University  
CARBONDALE

**Title: Joint exit time and place distribution for Brownian motion on Riemannian manifolds and the asymptotic independence condition**

Abstract: The joint distribution of first exit time and place of Brownian motion from normal balls of sufficiently small radius is considered. The asymptotic expansion of the joint Laplace transform of exit time and spherical harmonics of exit position is derived for a ball of small radius. A generalized Pizetti's formula is used to expand the solution of the related partial differential equations. These expansions are represented in terms of curvature in the manifold. The geometric properties of Riemannian manifolds are derived in the case where the first exit time and place are statistically independent. In particular, it is proven that an Asymptotic Uncorrelated Condition (AUC) involving orders of first exit time and position equivalent to the certain level of curvature conditions depending on the level of asymptotics. Further, a generalized formula is derived for arbitrary moments of first exit time at corresponding orders of asymptotics.