

# ACMS Applied Math Seminar

**Justin Tzou**  
**Thursday, October 29**  
**154 Hurley Hall**  
**3:30- 4:30 PM**



## **Effect of Trap Mobility On First Passage Times In One and Two Dimensions**

Various problems in nature may be formulated in terms of mean first passage times (MFPT) of Brownian particles in the presence of traps. A typical example in cellular biology involves transport of molecules between the nucleus and cytoplasm of a cell. While most existing works focus on stationary traps, many scenarios may involve traps or targets that are non-stationary (e.g., predator-prey dynamics, search and rescue, diffusion-limited reactions). We discuss here the formulation of one and two-dimensional MFPT problems in the presence of traps undergoing random and prescribed motion. In simple geometries, we exploit symmetries that allow for analysis by means of asymptotic methods to quantify effects of trap mobility. We also highlight some interesting and counter-intuitive results that arise due to the motion of the traps.

Authors: Joint works with T. Kolokolnikov, A. Lindsay, S. Xie

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