



# ***Mathematical Biology Seminar***



**Monday, January 16, 2012  
3 pm – 229 CAB**

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## ***Individual spatial memory as a parameter to distinguish population distribution patterns***

Recent studies have suggested that the long distance movements of some terrestrial mammals, such as the Mongolian gazelles, are not migratory, but rather nomadic. Moreover, the spatial heterogeneity and temporal predictability of resources were proposed as factors selecting for alternative movement strategies, such as sedentarism, migration, and nomadism. Here, we propose that, at the individual level, a dependence on spatial memory is also an important parameter to characterize the population-level patterns by which individuals of a species are spatially distributed. For instance, migratory animals have a long memory of the areas they prefer to revisit, whereas nomadic animals remember some last visited areas they avoid to revisit. We develop a computational model in which individuals' movement decisions are based on the animals' spatial memory of previously visited areas. Through this approach, we have delineated how the interplay between landscape persistence and spatial memory leads to sedentarism, migration, and nomadism.