1023-92-1364 **L.J.S. Allen**, **B.M. Bolker**, **Y. Lou** and **A.L. Nevai*** (anevai@mbi.osu.edu), Mathematical Biosciences Institute, 231 W. 18th Ave., The Ohio State University, Columbus, OH. *Asymptotic Profiles of the Steady States for an SIS Epidemic Patch Model.*

Spatial heterogeneity, habitat connectivity, and rates of movement can have large impacts on whether a disease persists or becomes extinct. In this talk, we consider the equilibrium properties of a frequency-dependent SIS epidemic patch model. Patch differences in local disease transmission and recovery rates characterize whether patches are low-risk or high-risk, and these differences collectively determine whether the spatial domain is low-risk or high-risk. We relate the basic reproduction number ($\mathcal{R}_0$) to the speed with which infected individuals move between patches. For low-risk domains, the disease-free equilibrium (DFE) is stable provided that the rate at which infected individuals move between patches lies above a threshold value. For high-risk domains, the DFE is always unstable. When the DFE is unstable, a unique endemic equilibrium (EE) exists. This EE tends to a spatially inhomogeneous DFE as the rate at which susceptible individuals move between patches becomes small. The limiting DFE is positive on all low-risk patches and can also be positive on some high-risk patches. Sufficient conditions for the limiting DFE to be positive or zero on high-risk patches are given, and these conditions are illustrated using numerical examples. (Received September 26, 2006)