1077-VJ-2175 **Alexander Greaves-Tunnell*** (ahg1@williams.edu), **Thealexa Becker**, **Aryeh Kontorovich**, **Steven Miller**, **Pradeep Ravikumar** and **Karen Shen**. *Virus Dynamics in Star Graphs.*

The field of epidemiology has presented fascinating and relevant questions for mathematicians, primarily concerning the spread of viruses in a society. The importance of this research has greatly increased over time as its applications have expanded to include studies of electronic and social networks and the spread of information and ideas. We study the SIS (Susceptible Infected Susceptible) model for virus propagation on star graphs. These graphs feature a single hub with n spokes, and model well many systems, such as certain airline networks.

We determine the long-term behavior as a function of the cure and infection rates, as well as the number of spokes n. For each n we prove the existence of a critical threshold relating the two rates. Below this threshold, the virus always dies out; above this threshold, all non-trivial initial conditions iterate to a unique non-trivial steady state. We discuss generalizations to other networks. (Received September 21, 2011)