1098-00-48 **Steven J Miller*** (sjm1@williams.edu), 18 HOXSEY ST, WILLIAMSTOWN, MA 01267. *Virus Dynamics on Star Graphs.*

The field of epidemiology has presented fascinating and relevant questions for mathematicians, primarily concerning the spread of viruses in a community. The importance of this research has greatly increased over time as its applications have expanded to also include studies of electronic and social networks and the spread of information and ideas. We develop techniques to analyze in detail the evolution of the systems over time coming from star graphs. We obtain detailed descriptions of the dynamical behavior by a mix of convexity results and an analysis of partial fixed curves arising from the corresponding difference equations. Our methods supplement other techniques in the literature by describing how the system approaches its equilibrium. Specifically, we determine the path the system takes to equilibrium as a function of the cure and infection parameters and 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 end with some generalizations to other networks. This is joint work with Thealexa Becker, Alec Greaves-Tunnell, Aryeh Kontorovich and Karen Shen. (Received December 27, 2013)