1163-92-287   **Churni Gupta*** (`churnibidisha@ufl.edu`), 2915 SW 13 ST, Gainesville, FL 32608, and **Necibe Tuncer** and **Maia Martcheva**. *A Network Immuno-epidemiological HIV Model.* Preliminary report.

In this talk we formulate a multi-scale nested immuno-epidemiological model of HIV on complex networks. The system is described by ordinary differential equations coupled with partial differential equations. First, existence and uniqueness results of the immunological system is proved. Next, wellposedness of the multi-scale system is established. We derive an explicit expression of the basic reproduction number of the immuno-epidemiological model. Existence and stability of disease free equilibrium and endemic equilibrium is established. Numerical simulations suggest that with all things held fixed, if the number of nodes in the network is increased, so is the basic reproduction number. Further, we find that for a scale free network the number of infected individuals at equilibrium is a hump-like function of the within-host reproduction number; however, the dependence becomes monotone if the network has predominantly low connectivity nodes or high connectivity nodes. (Received September 01, 2020)