1014-92-1354   **Lauren Ancel Meyers*** (`laurenmeyers@mail.utexas.edu`), Section of Integrative Biology, University of Texas at Austin, 1 University Station C0930, Austin, TX 78712. *Contact network epidemiology: Bond percolation applied to infectious disease prediction and control.*

In the early 20th century, two epidemiologists introduced a simple and powerful deterministic model for predicting infectious disease transmission which tracks the unidirectional movement of hosts among three states–susceptible (S), infected (I), and recovered (R). This *SIR* model provides important insight into the temporal progression of outbreaks and the efficacy of vaccination, and is the foundation for a recent proliferation in predictive methods. *Contact network epidemiology* is a particularly promising development in which bond percolation on random graphs is applied to modeling disease transmission through heterogeneous populations. My lecture will introduce the *SIR* model, explain its generalization to disease propagation on graphs in which vertices and edges represent individual hosts and disease-causing contacts, respectively, and link recent theoretical results to issues of public health. (Received September 28, 2005)