1116-00-46   **Jennifer Chayes***, Microsoft Research, Cambridge, MA. *Network Science: From the Online World to Cancer Genomics.*

Everywhere we turn these days, we find that networks can be used to describe relevant interactions. In the high tech world, we see the Internet, the World Wide Web, mobile phone networks, and a variety of online social networks. In economics, we are increasingly experiencing both the positive and negative effects of a global networked economy. In epidemiology, we find disease spreading over our ever-growing social networks, complicated by mutation of the disease agents. In biomedical research, we are beginning to understand the structure of gene regulatory networks, with the prospect of using this understanding to manage many human diseases. In this talk, I look quite generally at some of the models we are using to describe these networks, processes we are studying on the networks, algorithms we have devised for the networks, and finally, methods we are developing to indirectly infer network structure from measured data. I'll discuss in some detail particular applications to cancer genomics, applying network algorithms to suggest possible drug targets for certain kinds of cancer. (Received September 23, 2015)