

## ADVANCED RADIO FREQUENCY TECHNOLOGY FOR WIRELESS NETWORK SECURITY

### Technology in Development:

- AFRL Phase I SBIR awarded April 2007



SUNY

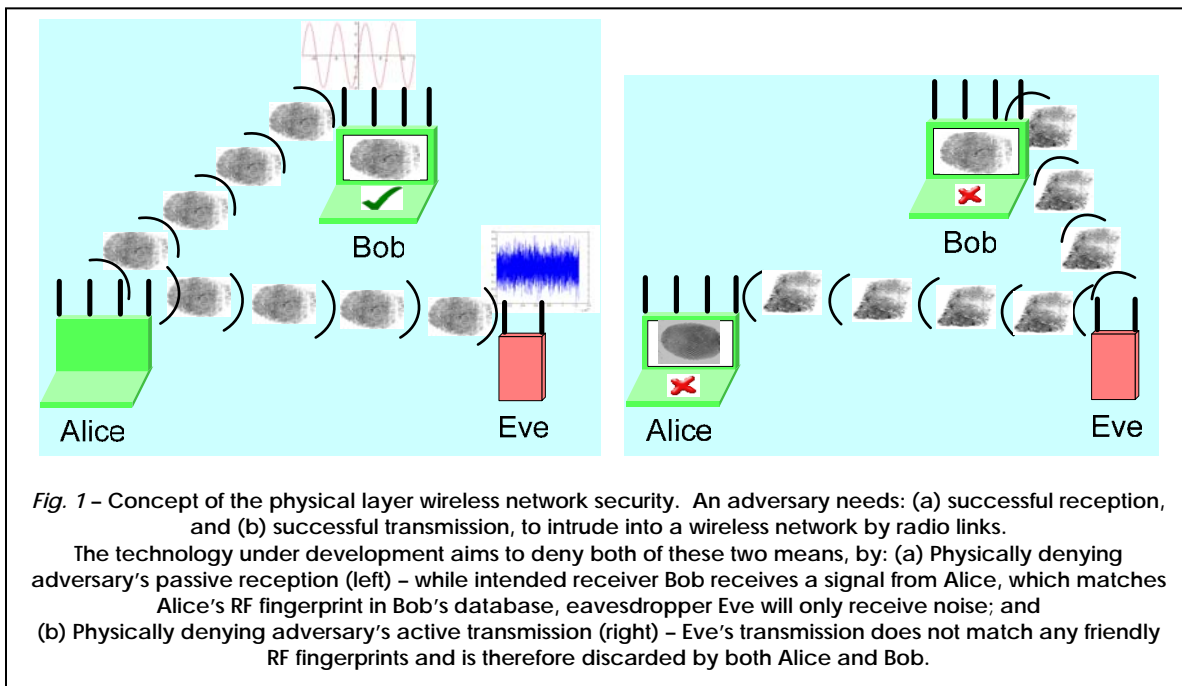
THE STATE UNIVERSITY of NEW YORK

### General Description:

Various forms of wireless information assurance measures have been proposed and implemented, mostly in the data link and network layers, e.g., user names and passwords, MAC addresses, SSL certificates, WEP/WPA keys, etc. The security of these measures comes ultimately from the encryption keys shared *a priori* among the communication parties, which may not be sufficiently secure – encryptions can be cracked, it is only a matter of time and resources.



GIRD Systems, teaming with L-3 Communications Nova Engineering and the State University of New York (SUNY) Binghamton, is developing an innovative physical layer wireless security technology and associated algorithms. This new method is based on the promising near future OFDM-MIMO communications with multiple transmit and receive antennas, and combines two of the latest proposed physical layer security methods that are able to restrict physical access of an intruder into a wireless network. Figure 1 illustrates the basic concept of this new technology. Combined with existing upper layer security measures, this new technology is capable of making a wireless network very secure.



### Hardware Implementation:

The hardware implementation of this technology will leverage Nova's commercial product NovaRoam software defined radio (SDR). Nova's OFDM NovaRoam is an existing, proven commercial mobile IP router that provides an OFDM physical layer, MANET routing and full IP protocol stack. The OFDM physical layer used in NovaRoam is based upon Nova's military JTRS WNW OFDM implementation, which is completely in software and is easily modified to include the physical layer network security algorithm implementation.

