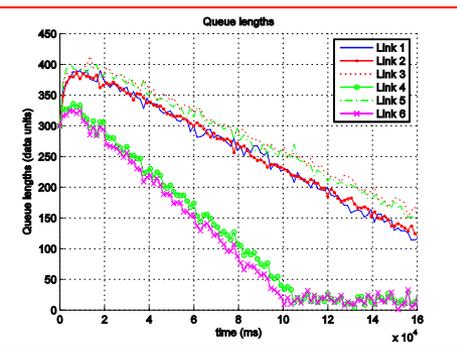


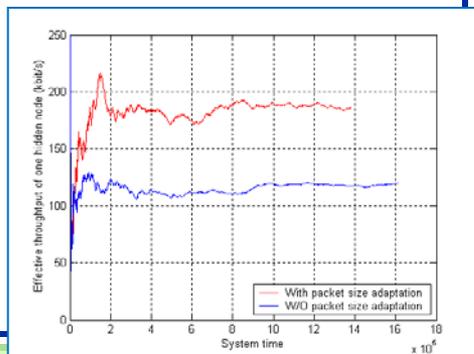


# FY08 MURI: Tools for the Analysis and Design of Complex Multi-Scale Networks (PI: J. Walrand, U.C. Berkeley.)



← Short queues in ad hoc network with new simple distributed protocol

Improved throughput (red) with new adaptive protocol →



## Objectives:

1. Improve understanding of time and space scales in networks
2. Develop practical, efficient, robust protocols for wireless networks

## DoD COLLABORATION

ARL, ARO

Approaches: Duality in convex programming; mixing time of Markov chains; Poisson counter models; invent new protocols.

## Army Relevance:

1. First practical, easy to implement, low-complexity, high-performance, robust protocols for ad hoc networks
2. Improved WLAN protocols over widely available hardware

## Accomplishments to date (sample):

1. New distributed, throughput-optimal, adaptive, low complexity protocols for congestion control, routing, multiple access in ad hoc networks under ideal CSMA operations.
2. Extensions for reduced delay and to practical models with collisions.
3. Improved WLAN algorithms through AP signaling and new collision estimation algorithms.