

**Friday, November 4, 2016**

**4:10 – 5:00 PM**

**Barnard/EPS 103**

**Multiple-input multiple-output (MIMO)  
optical communication systems**

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**Abstract:**

The long-haul telecommunications traffic due to cloud computing, internet of things, 5G wireless, and the worldwide generation and web storage of an unprecedented amount of data, is expected to grow by 30%-60% per year in the near future. Such rapid exponential annual growth can cause severe congestion in the fiber-optic backbone network within the next ten years.

Few-mode fibers (FMFs) and multicore fibers (MCFs) have the potential to replace single-mode fibers (SMFs) in congested optical communications links. Space-division multiplexing (SDM) can be used to transmit independent data streams on different fiber modes or cores. Coherent detection and digital signal processing (DSP) algorithms can be used to compensate interference due to coupling among modes or cores, respectively. Multiple-input multiple-output (MIMO) optical communications systems use all aforementioned technologies for the reliable transmission of information between two locations.

The purpose of this tutorial presentation is to explain the basic principles of optical MIMO transmission and to provide a research roadmap for long-haul optical communications for the near future.

**Host: Rufus Cone**

**\*\*\* Refreshments served in the EPS second floor atrium at 3:45 \*\*\***