



EMERGING WIRELESS NETWORKS

February 6 - 10, 2017

ORGANIZING COMMITTEE: Francois Baccelli (University of Texas at Austin), Suhas Diggavi (UCLA), Christina Fragouli (UCLA), Shyam Gollakota (University of Washington), Zhu Han (University of Houston), and Alejandro Ribeiro (University of Pennsylvania).

Scientific Overview

There is a strong need for more efficient bandwidth use and higher mobile speeds today, given that the global mobile traffic is projected to increase nearly 11-fold between 2013 and 2018. The number of wireless devices has already reached 7 billion, while smart devices that have high computing resources and network connection capabilities increasingly dominate the market. This number is set to increase by an order of magnitude as we enter into the age of Internet-of-things (IoT), where smart sensing and machine-to-machine communication is envisaged to explode in the coming decade (with applications to smart health, smart environments etc.). All this points to fundamental new challenges which will require insights from mathematics, information theory, computer science as well as economics to resolve.

In order to address these challenges, over the next 5 years, there will be a new wireless standard developed ("5G") which has a target of orders-of-magnitude increase in system capacity. In order to enable this, as well as to deal with the envisaged proliferation of IoT devices, current technologies will be insufficient, and fundamental new ideas need to be developed. This workshop will explore fundamental new ideas in wireless networks and its connections to mathematics. There are several workshops and conferences devoted to wireless systems and implementations, but there are none as far as we know that will connect traditionally disparate areas such as wireless network information theory, applied mathematics, economics and computer science. The workshop will bring together researchers working on several fundamental aspects which could have an important impact in future wireless networks. The mathematical tools that will be involved include information theoretic and entropy inequalities, coding theory, probabilistic analysis including analysis of (randomized) algorithms, convex optimization, stochastic geometry, random matrices etc.

Confirmed Speakers

Syed Ali Jafar (University of California, Irvine), **Venkat Anantharam** (University of California, Berkeley), **Salman Avestimehr** (University of Southern California), **Francois Baccelli** (University of Texas at Austin), **Natasha Devroy** (University of Illinois at Chicago), **Suhas Diggavi** (UCLA), **Michelle Effros** (California Institute of Technology), **Christina Fragouli** (UCLA), **Shyam Gollakota** (University of Washington), **Ashish Khisti** (University of Toronto), **P. Vijay Kumar** (Indian Institute of Science), **Mohammad A. Maddah-Ali** (Bell Labs), **Muriel Medard** (Massachusetts Institute of Technology), **Urs Niesen** (Qualcomm), **Ayfer Özgür** (Stanford University), **Matt Reynolds** (Duke University), **Alejandro Ribeiro** (University of Pennsylvania), **Ashutosh Sabharwal** (Rice University), **Gesualdo Scutari** (Purdue University), **Devavrat Shah** (Massachusetts Institute of Technology), **Shlomo Shamai** (Technion - Israel Institute of Technology), **John Smee** (Qualcomm), **Leandros Tassioulas** (Yale University), **Daniela Tuninetti** (University of Illinois at Chicago), **Aylin Yener** (Pennsylvania State University), **Wotao Yin** (UCLA), and **Heather Zheng** (University of California, Santa Barbara).

Participation

Additional information about this workshop including links to register, can be found on the webpage listed below.

Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

www.ipam.ucla.edu/wn2017

