



# Keynote speakers

## ISWCS 2016

Poznań, Poland



Prof. Andrea Goldsmith, Stanford University, US



- TALK TITLE:

The Road Ahead for Wireless Technology: Dreams and Challenges

- TALK DESCRIPTION:

Wireless technology has enormous potential to change the way we live, work, and play. Future wireless networks will support Gigabit per second multimedia communication between people and devices with high reliability and uniform coverage indoors and out. Software will create a virtual wireless network cloud, enabling resource management, seamless connectivity, and roaming across heterogeneous access networks, including WiFi and cellular systems. Wireless technology will also enable smart and energy-efficient homes and buildings, automated highways and skyways, and in-body networks for analysis and treatment of medical conditions. The shortage of spectrum will be alleviated by advances in cognitive radios, and breakthrough energy-efficiency algorithms and hardware will be employed to make wireless systems “green”. There are many technical challenges that must be overcome in order to make this vision a reality. This talk will describe what the wireless future might look like and some of the innovations and breakthroughs that are required to realize this vision.

- BIOGRAPHY:

Andrea Goldsmith is the Stephen Harris professor in the School of Engineering and a professor of Electrical Engineering at Stanford University. She was previously on the faculty



of Electrical Engineering at Caltech. She co-founded and served as CTO of both Acclera, Inc., which develops software-defined wireless network technology, and of Quantenna Communications Inc., which develops high-performance ultra-reliable WiFi chipsets. She has previously held industry positions at Maxim Technologies, Memorylink Corporation, and AT&T Bell Laboratories. Dr. Goldsmith is a Fellow of the IEEE and of Stanford, and she has received several awards for her work, including the IEEE Communications Society and Information Theory Society joint paper award, the IEEE Communications Society Best Tutorial Paper Award, the National Academy of Engineering Gilbreth Lecture Award, the IEEE Communication Theory Technical Committee Recognition Award, the IEEE Wireless Communications Technical Committee Recognition Award, the Alfred P. Sloan Fellowship, and the Silicon Valley/San Jose Business Journal's Women of Influence Award. She is author of the book "Wireless Communications" and co-author of the books "MIMO Wireless Communications" and "Principles of Cognitive Radio," all published by Cambridge University Press. She received the B.S., M.S. and Ph.D. degrees in Electrical Engineering from U.C. Berkeley.

Dr. Goldsmith served on the Steering Committee for the IEEE Transactions on Wireless Communications, and has previously served as editor for the IEEE Transactions on Information Theory, the Journal on Foundations and Trends in Communications and Information Theory and in Networks, the IEEE Transactions on Communications, and the IEEE Wireless Communications Magazine. Dr. Goldsmith participates actively in committees and conference organization for the IEEE Information Theory and Communications Societies and has served on the Board of Governors for both societies. She has been a Distinguished Lecturer for both societies, served as the President of the IEEE Information Theory Society in 2009, founded and chaired the student committee of the IEEE Information Theory society, and currently chairs the Emerging Technology Committee and is a member of the Strategic Planning Committee in the IEEE Communications Society. At Stanford she received the inaugural University Postdoc Mentoring Award, served as Chair of its Faculty Senate, and currently serves on its Faculty Senate and on its Budget Group.



Prof. Alex Wyglinski, Worcester Polytechnic Institute, US



- TALK TITLE:  
Biology Meets Cognitive Radio - Using Nature to Make Good Decisions
- TALK DESCRIPTION:  
Over the past 15 years, the wireless community has extensively looked at cognitive radio as a means for enabling wireless systems to intelligently adapt to and learn from its operating environment. Much research has been conducted on devising robust and spectrally agile transmission schemes, computationally efficient processing architectures, games and other medium access control mechanisms for enabling the sharing of wireless resources within a specific location, and versatile radio frequency hardware. At the core of any cognitive radio is its "engine", a veritable radio brain used to perform both decision-making and learning. Researchers have looked at a wide range of methods for performing cognitive radio decision-making and learning, including machine learning, swarm behavior, and other types of artificial intelligence. In this talk, I will focus on how important the biological sciences are with respect to the evolution of the cognitive radio brain, including lessons learned from applying techniques such as genetic algorithms and neural networks. I will also include in this talk some recent research into the usage of simpler social animals such as bumblebees.
- REVISED\* BIOGRAPHY:

Dr. Alexander M. Wyglinski is internationally recognized as an expert in the field of wireless communications, cognitive radio, connected vehicles, software-defined radio, dynamic spectrum access, electromagnetic security, vehicular technology, wireless system optimization and adaptation, autonomous vehicles, and cyber-physical systems. Dr.



Wygłinski is an Associate Professor of Electrical and Computer Engineering and an Associate Professor of Robotics Engineering at Worcester Polytechnic Institute, Worcester, MA, USA, as well as the Director of the Wireless Innovation Laboratory (WI Lab).

Dr. Wygłinski is very active in the technical community, serving on the organizing committees of numerous technical conferences and several journal editorial boards. These activities include serving as the General Co-Chair for both the 2013 IEEE Vehicular Networking Conference and the 82nd IEEE Vehicular Technology Conference in Fall 2015. Dr. Wygłinski's editorial board commitments include the IEEE Communications Magazine, IEEE Transactions on Wireless Communications, and IEEE Transactions on Communications. Starting January 2016, Dr. Wygłinski became President-Elect of the IEEE Vehicular Technology Society, an applications-oriented society of approximately 4200 members that focuses on the theoretical, experimental and operational aspects of electrical and electronics engineering in mobile radio, motor vehicles and land transportation.

Throughout his academic career, Dr. Wygłinski has published approximately 40 journal papers, over 80 conference papers, nine book chapters, and two textbooks. He is currently being or has been sponsored by organizations such as the Defense Advanced Research Projects Agency, the Naval Research Laboratory, the MITRE Corporation, the Office of Naval Research, the Air Force Research Laboratory Space Vehicles Directorate, The MathWorks, Toyota InfoTechnology Center U.S.A., and the National Science Foundation. Dr. Wygłinski is a Senior Member of the IEEE, as well as a member of Sigma Xi, Eta Kappa Nu, and the ASEE.



Prof. Adam Wolisz, Technische Universität Berlin, Germany



- TALK TITLE:

Smartifying Wireless Networks

- TALK DESCRIPTION:

The design of wireless networks is recently dominated by the push towards being better: offering higher capacity, higher throughput per user , lower latency... I will argue that the investment in new infrastructure meeting user needs can be significantly reduced if the following aspects are considered:

a/ the high inefficiency of todays applications in usage of the networks

b/ context dependent predictability of the information needs of the user

c/ location and mobility dependent expected connectivity

- BIOGRAPHY:

Adam Wolisz received the Diploma degree in 1972, the Ph.D. degree in 1976, and the Habil. degree in 1983, all from the Silesian University of Technology, Gliwice, Poland. He worked several years with the Dept of Complex Automation Systems (later Institute of Theoretical and Applied Informatics of the Polish Academy of Sciences) in Gliwice, Poland



and GMED Fokus in Berlin leading activities in Computer Networks and distributed System Design and Evaluation

He joined Technische Universität Berlin, Berlin, Germany, in 1993, where he is currently a Chaired Professor in Telecommunication Networks and an Executive Director of the Institute for Telecommunication Systems. He is also an Adjunct Professor with the Department of Electrical Engineering and Computer Science, University of California at Berkeley, Berkeley, CA, USA. His current research interests include architectures and protocols of communication networks, wireless/mobile networking, and sensor networks

Google Scholar profile:

<https://scholar.google.de/citations?user=Gq8gWX4AAAAJ&hl=de&oi=ao>

Web-pegge with publications and other materials, including viedo:

<http://www.tkn.tu-berlin.de/research/videos/>



Prof. Ruediger Urbanke, Ecole Polytechnique Fédérale de Lausanne,  
Switzerland,



- TALK TITLE:

To Be Provided soon

- TALK DESCRIPTION:

To Be Provided soon

- BIOGRAPHY:

Rüdiger L. Urbanke obtained his Dipl. Ing. degree from the Vienna University of Technology, Austria in 1990 and the M.Sc. and PhD degrees in Electrical Engineering from Washington University in St. Louis, MO, in 1992 and 1995, respectively.

He held a position at the Mathematics of Communications Department at Bell Labs from 1995 till 1999 before becoming a faculty member at the School of Computer & Communication Sciences (I&C) of EPFL. He is a member of the Information Processing Group.

He is principally interested in the analysis and design of iterative coding schemes, which allow reliable transmission close to theoretical limits at low complexities. Such schemes are part of most modern communications standards, including wireless transmission, optical communication and hard disk storage. More broadly, his research focuses on the analysis of graphical models and the application of methods from statistical physics to problems in communications.

From 2000-2004 he was an Associate Editor of the IEEE Transactions on Information Theory and he is currently on the board of the series "Foundations and Trends in Communications



and Information Theory." Since 2013 he has been a Member of the Board of the Information Theory Society as well as a Distinguished Speaker. From 2009 till 2012 he was the head of the I&C doctoral school and in 2013 he served as Dean a. i. of I&C.

Dr. Urbanke is a recipient of a Fulbright Scholarship. He is a co-author of the book "Modern Coding Theory" published by Cambridge University Press a co-recipient of the 2002 and the 2013 IEEE Information Theory Society Paper Award, the 2011 IEEE Koji Kobayashi Award, as well as the 2014 IEEE Hamming Medal.



Dr. Patrick Marsch, Nokia Networks, Poland



- TALK TITLE:

Expanding the human possibilities through 5G mobile communications – from research to standardization to commercial roll-out

- TALK DESCRIPTION:

To be provided soon

- BIOGRAPHY:

Patrick Marsch received his Dipl.-Ing. and Dr.-Ing. degrees from Technische Universität Dresden, Germany, in 2004 and 2010, respectively. He was the technical project coordinator of the project

EASY-C, where the world's largest research test beds for LTE-Advanced were established. After heading a research group at TU Dresden, Germany, he is now heading a radio research department within Nokia Networks, Wrocław, Poland. He has (co-)authored 50+ journal and conference papers, has received four best paper awards, been editor of or contributor to several books and has been awarded the Philipp Reis Prize for pioneering research in the field of Coordinated Multi-Point (CoMP). Patrick is also the technical manager of the 5G-PPP project METIS-II.



Prof. Eric Ström, Chalmers University of Technology, Sweden



- TALK TITLE:

5G Ultra-Reliable Communications for Vehicular Applications

- TALK DESCRIPTION:

Applications enabled by Cooperative Intelligent Transport Systems (C-ITS) represent a major step towards making the road transport system safer and more efficient (green), and thus suited for a sustainable future. Wireless communication between vehicles and road infrastructure is an enabler for high-performance C-ITS applications. State-of-the-art communication systems for supporting low-latency C-ITS applications are based on IEEE 802.11 medium access control (MAC) and physical (PHY) layers. In this talk, we argue that a well-designed 5G system can complement or even replace these systems. We will review the C-ITS application requirements and explain how these are well aligned with the foreseen generic 5G service of ultra-reliable machine-type communication (uMTC). Key technology components suitable for constructing the uMTC service are identified: reliable service composition (RSC) and device-to-device (D2D) links for all-to-all broadcast communication, operational at high mobility and with varying degree of network assistance. Important problems for future studies, including radio-resource management, medium access control, and physical layer challenges, are discussed.

- BIOGRAPHY:



Erik G. Ström (S'93–M'95–SM'01) received the M.S. degree from the Royal Institute of Technology (KTH), Stockholm, Sweden, in 1990, and the Ph.D. degree from the University of Florida, Gainesville, in 1994, both in electrical engineering. He accepted a postdoctoral position at the Department of Signals, Sensors, and Systems at KTH in 1995. In February 1996, he was appointed Assistant Professor at KTH, and in June 1996 he joined Chalmers University of Technology, Göteborg, Sweden, where he is now a Professor in Communication Systems since June 2003. Dr. Ström currently heads the Division for Communications Systems and leads the competence area Sensors and Communications at the traffic safety center SAFER, which is hosted by Chalmers. His research interests include signal processing and communication theory in general, and constellation labelings, channel estimation, synchronization, multiple access, medium access, multiuser detection, wireless positioning, and vehicular communications in particular. Since 1990, he has acted as a consultant for the Educational Group for Individual Development, Stockholm, Sweden. He is a contributing author and associate editor for Roy. Admiralty Publishers FesGas-series, and was a co-guest editor for the Proceedings of the IEEE special issue on Vehicular Communications (2011) and the IEEE Journal on Selected Areas in Communications special issues on Signal Synchronization in Digital Transmission Systems (2001) and on Multiuser Detection for Advanced Communication Systems and Networks (2008). Dr. Ström was a member of the board of the IEEE VT/COM Swedish Chapter 2000–2006. He received the Chalmers Pedagogical Prize in 1998 and the Chalmers Ph.D. Supervisor of the Year award in 2009.