40 YAW

Celebrating 40 Years of Actions on Mobile and Wireless Communications

Components for Beyond-5G physical and network layers

Andreas F. Molisch, Prof., University of Southern California, USA

Abstract

While network operators are in the middle of deployment of 5G, and the benefits and challenges are coming into focus, research has already started on what will ultimately become Beyond 5G (6G and above) wireless – not just in the cellular world, but also local area networks, personal area networks, and internet of things. This talk will give a broad overview of the topics that (in my view) have a good chance of impacting B5G, ranging from physical layer techniques, to networking. For the PHY, the talk will touch upon new modulation formats such as OTFS, multi-stream multiplexing including massive MIMO, cell-free distributed massive MIMO, and orbital angular momenta, to the specific challenges and opportunities of sub-Terahertz communications. For the networking side, a discussion about the convergence of communication, computation, and caching, which generalizes mobile edge computing, will be discussed. A discussion of emerging applications that can make use of all these innovations will conclude the talk.

Bio

Andy Molisch received his degrees (Dipl.Ing. 1990, PhD 1994, Habilitation 1999) from the Technical University Vienna, Austria. He spent the next 10 years in industry, at FTW, AT&T (Bell) Laboratories, and Mitsubishi Electric Research Labs (where he rose to Chief Wireless Standards Architect). From 1994 to 2008, he was strongly involved in COST (231, 259, 273), including as Chair of the Channel modelling group. In 2009 he joined the University of Southern California (USC) in Los Angeles, CA, as Professor, and founded the Wireless Devices and Systems (WiDeS) group. In 2017, he was appointed to the Solomon Golomb – Andrew and Erna Viterbi Chair. His research interests revolve around wireless propagation channels, wireless systems design, and their interaction. He has published 5 books, 300 journal papers, and 400 conference papers. He is also the inventor of 70 patents, and co-author of some 70 standards contributions. His work has been cited more than 67,000 times, his h-index is 109, and he is a Clarivate Highly Cited Researcher. He is a Fellow of the National Academy of Inventors, Fellow of the AAAS, Fellow of the IEEE, Fellow of the IET, an IEEE Distinguished Lecturer, and a member of the Austrian Academy of Sciences. He has received numerous awards, among them the IET Achievement Medal, the Technical Achievement Awards of IEEE Vehicular Technology Society (Evans Avant-Garde Award), the IEEE Communications Society (Edwin Howard Armstrong Award), and the Technical Field Award of the IEEE for Communications, the Eric Sumner Award.