Call for Papers
IEEE Transactions on Antennas and Propagation
Special Issue on "Antennas and Propagation Aspects of 5G Communications"

Wireless mobile technologies have over 6.8 billion cellphone subscriptions in use today, with 2/3 of all traffic expected to be video within 3 years, and with an additional 25 billion connections predicted within 5 years based on the introduction of millimeter wave radio spectrum[1,2]. Recently, the wireless community has conceived the notion of 5G – a new generation of mobile wireless technology that will deliver multi-gigabit-per-second data speeds, with orders of magnitude more capacity and lower latency than today's wireless systems. Millimeter-wave (mmWave) and THz frequencies are now being investigated by major research institutions and industry[3,4]. Regulatory officials throughout the world are beginning to assign mmWave spectrum for 5G mobile applications. Unprecedented challenges lie ahead in the antenna and propagation fields as low cost, intelligent antennas, and new radio propagation modeling and prediction techniques for future 5G wireless networks must emerge to support the new frequency bands and wireless system architectures. Research methodologies must not only address the unique antenna and propagation characteristics for future microwave/mmWave/THz systems, but must also simultaneously be universally applicable and compatible across a diverse range of mobile terminals and platforms, thus enabling revolutionary use cases and applications in areas, such as vehicle or peer-to-peer communications, cloud computing, virtual reality and the Internet of Things (IoT). Practical implementation issues will be challenging at mmWave frequencies and above.

mmWave and Terahertz research has been the subject of four past IEEE TAP special issues (April 2013, October 2009, November 2007, and July 1970). In this special issue, the focus is on the system design issues of the next generation of consumer wireless systems (5G), and is not confined to a particular frequency band. With this broader 5G focus, this issue hopes to attract more readers and submissions from outside the traditional AP-S community. Recently published special issues such as the IEEE Transactions on Circuits and Systems-II (December 2015) and the IEEE Communications Magazine (September/December 2014) emphasized 5G technology and system designs, underlining the rapidly growing interest in this topic. This special issue will serve as a catalyst to initiate an unprecedented discussion within IEEE AP-S to frame the search for key antenna and propagation methodologies that will enable the 5G era. This issue will include both invited and open-call papers. Topics of interest include, but are not limited to, low-cost, high gain intelligent antennas, with a strong focus on practical implementations, novel feed networks, and components compatible with future 5G radio architectures, electromagnetic analysis and simulation techniques for adaptive arrays, MIMO, massive-MIMO, beam-steering, or beam combining architectures at microwave or mmWave/THz frequencies, antenna-in-package, antenna-on-chip, channel modeling and propagation prediction, and measurements related to future wireless implementations, use cases, and system architectures. **To maintain focus on the electromagnetic aspects of 5G, all antenna-related manuscripts must take into account real world impacts such as mutual coupling, non-ideal antenna patterns, and implementation challenges. Propagation/channel modeling manuscripts must be based upon a physical electromagnetic approach, and not based merely on curve-fitting or black-box parameterization.**

Manuscripts should conform to the requirements for regular T-AP papers, as specified in the Information for Authors on the web site at http://ieeeaps.org/aps_trans. Potential contributors may contact the Guest Editors by e-mail to determine the suitability of their contribution to the special issue. All invited and contributed papers must be submitted through the T-AP Manuscript Central web site (https://mc.manuscriptcentral.com/tap-ieee), with a statement to the Editor-in-Chief of the IEEE Transactions on Antennas and Propagation that they are intended for this Special Issue.

Guest Co-Editors

Dr. Duixian Liu IBM, USA duixian@us.ibm.com	Prof. Wonbin Hong POSTECH, Korea whong@postech.ac.kr	Prof. Wei Hong Southeast University, China weihong@seu.edu.cn
Prof. Cyril Luxey UNSA, France Cyril.LUXEY@unice.fr	Prof. Theodore S. Rappaport New York University, USA ted.rappaport@nyu.edu	

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1. CISCO, "Cisco Visual Networking Index: Mobile Data Traffic Forecast Update, 2013-2018," 2014
2. T. S. Rappaport, et. al., http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&&arnumber=6515173
3. Ericsson 5G research news: http://www.ericsson.com/news/1873727
4. Samsung demo: http://www.samsung.com/global/business/networks/insights/news/samsung-electronics-sets-5g-speed-record-at-7-5gbps-over-30-times-faster-than-4g-lte