

## **SS8: Emerging Solutions, Protocols and Technologies for Reliable, Scalable and Energy-efficient 5G/B5G Networks**

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### Topic and Scope

It is expected that there will be an expansion of traffic volume due to the increased number of connected devices, i.e., 50 billion internet-connected devices by the year 2020. The fifth generation (5G) wireless communication networks is currently attracting extensive research interest from both industry and academia. It is widely agreed that in contrast to 4G, 5G should achieve 1000 times the system capacity, 10 times the spectral efficiency, higher data rates (i.e., the peak data rate of 10 Gb/s and the user experienced rate of 1Gb/s), 25 times the average cell throughput, 5 times reduction in end-to-end (E2E) latency and 100 times connectivity density. Meanwhile, International Telecommunication Union (ITU) has classified 5G services into enhanced mobile broadband (MB), ultra-reliable and low-latency communications (URLLC), and massive machine type communications (MTC) with a high variability of their performance attributes. The Exabyte flood is further complemented with the challenges of provisioning robust and reliable interconnectivity for MTCs. The demand for such machine type communication is fueled through the emerging need of all-connected societies to derive innovative transformations across various vertical sectors.

The 5G and beyond networks aims to combine several unique technological solutions such as: Higher frequency communications (mmWave), Massive MIMO systems, device/user and content centric communication, M2M communication, energy harvesting and wireless power transfer, cooperative communications and network coding. These underline key targets can be achieved via appropriate combination of these technological ingredients. These emerging areas brings the promise of enabling flexible, scalable, highly configurable and reliable network functions as well as complete solutions for future 5G mobile networks.

These enabling technologies can support massive peak data rates, however, delivering these data rates for E2E services while maintaining reliability and ultra-low-latency to support emerging applications and use cases will require rethinking all layers of the protocol stack as outlined in the recent activities of the third generation partnership project (3GPP).

### Call for Papers

Only technical papers describing previously unpublished, original, state-of-the-art research, and not currently under review by a conference or a journal will be considered. Topics of interest include, but are not limited to:

- Adaptive waveforms, RF energy harvesting, and adaptive modulation and coding techniques for low-power IoT systems
- Waveforms and multiple access techniques for 5G/B5G
- Cloud-assisted solutions for resource management in IoT systems
- Communication challenges and solutions for the applications of IoT in WBANs, WSNs, M2M, D2D, V2V, SatCom, and cellular systems
- Multi-hop and cooperative communications for IoT systems
- Orthogonal/non-orthogonal multiple access and access control schemes for IoT systems
- PHY/MAC layer algorithms for supporting IoT devices in 5G systems such as massive MIMO, small cells, full duplex, and mmWave systems
- Resource allocation, spectrum sharing, and interference mitigation
- SDN and virtualization techniques for IoT networks
- Ultra fast signal processing technologies and architectures
- Interference mitigation and management techniques for 5G/B5G
- Device centric frameworks such as Device to device communications and its application to public safety
- Smart transportations (car to car communications, automated driving, smart navigation, etc.)
- High capacity broadband solutions for airplanes and high-speed transportations
- 5G network architectures for distributed and flexible network functions
- Smart manufacturing and automation industry
- UAVs/drones for emergency and crowd network coverage
- Spectrum aspects of URLLC, e.g., carrier frequency and spectrum requirements
- Network slicing and network functions virtualization for 5G/B5G
- Use case applications and requirements for 5G/B5G.
- 5G Testbeds and experimentations

### Invited Keynote Speakers

- Prof. Luis Da Silva, Trinity College Dublin
- Prof. Muhammad Ali Imran, University of Glasgow, UK