Call for Papers

Track ST1 – Selected Topic: Millimeter-wave, terahertz and optical communications and networking

Track Chairs:

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Scope and Motivation:

High-frequency technologies such as millimeter wave (mmWave), terahertz, and optical communications are seen as the key to meeting the increasing data demand from multiple sources such as connected vehicles, robots, drones, and human interactions, by overcoming spectrum scarcity issues and capacity constraints in current networks by providing exceptionally high bandwidth. This high-frequency wireless communication can enable extensive applications characterized by massive connectivity, denser networks, and highly secure transmissions, especially relevant for 6G networks. In addition, the use of high frequencies opens opportunities for innovative wireless sensing applications such as high-resolution radar and localization. However, realizing these high-frequency applications includes several challenges, such as very high propagation losses, lack of well-developed technology, and new networking solutions which require fundamentally new solutions. In addition, the coexistence of these frequencies with the sub-6GHz bands is not yet fully understood. In this context, this track aims to capture the latest advances in millimeter waves, terahertz, as well as optical communications and networking, paving the way to 6G and beyond.

Main Topics of Interest:

The millimeter-wave, terahertz and optical communications and networking track seeks original contributions in the following areas, as well as others that are not explicitly listed but are closely related:

- Coexistence across multiple frequency bands
- Novel networking solutions for the high frequency bands
- Solutions for implementing high frequency technology in Industry 4.0 and beyond
- Information theoretic analysis of high frequency for high frequency technology
- Channel estimation techniques for high frequency technology
- Ultrabroadband modulation and waveform design for high frequency technology
- Beamforming, precoding and space-time coding schemes for high frequency technology
- MAC layer design for high frequency technology
- Interference management for high frequency technology
- Resource allocation and transmit power control in high frequency technology
- Relaying and routing in high frequency technology
- System-level modeling and experimental demonstrations for high frequency technology
- Integration of high frequency technology with sub-6GHz transmission
- AI-based design for high frequency technology
- Industry perspectives and use cases at high frequency spectrum of operation.
- High frequency joint radar estimation and data communication
- Experimental datasets for diverse application scenarios