

## **Special Session on “Integrated Sensing and AI-Driven Communication in 6G Perceptive Mobile Networks”**

### **Special Session co-Chairs:**

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**(<https://isac-newton.eu/>)**

### **Brief description**

This special session delves into the transformative paradigm of Integrated Sensing and Communication (ISAC) for future 6G perceptive mobile networks. The session addresses critical challenges in 6G wireless application scenarios that demand precise environmental information, such as inherent interference, complex sensing environments, and high-speed target tracking in cellular networks. The synergy between sensing and communication is explored by integrating advanced sensing and AI capabilities with improved communication, ultimately enabling novel services like real-time digital twins. Multidimensional information perception is highlighted, including the innovative use of metasurfaces for physical layer enhancements in both line-of-sight and non-line-of-sight scenarios. Furthermore, robust and reliable sensing is covered through novel prediction and situational algorithms, optimized monostatic, bistatic, or multistatic designs for adaptive location-time aware scheduling, and intelligent wireless radio resource management via machine learning-enabled radio access network mechanisms for real-time decision-making and zero-trust security.

### **Topics of Interest**

The Special Session invites original contributions including, but not limited to:

- Metasurface-based sensors
- Reconfigurable and metasurface-based antenna arrays
- Reconfigurable intelligent surfaces
- Metasurface-based synthetic aperture radar
- Machine learning and deep learning for metasurface design and control
- Frequency selective surfaces
- Monostatic, bistatic, and multistatic ISAC systems
- Machine learning-based beamforming
- Localization and situational awareness in ISAC networks
- Interference management and resource allocation in ISAC systems
- Intelligent resource allocation schemes for ISAC
- Machine learning-enabled open radio access networks
- Seamless user-centric random access and channel estimation in massive MIMO networks
- Real-time target recognition and tracking
- Digital cyber twins for cooperative 6G environments and zero-trust security
- Remote sensing and interference identification in non-terrestrial networks