

Special Session on

“AI-Native 6G Networks: Self-Evolving Network Management and Orchestration”

Special Session co-Chairs:

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Brief description

AI/ML-driven methodologies are expected to play a central role in enabling self-evolving network management and orchestration capabilities. Moving beyond traditional rule-based automation, 6G networks will rely on data-driven intelligence to dynamically optimize resources, predict network behavior, and autonomously adapt to changing service demands, user mobility patterns, and heterogeneous deployment scenarios.

This special session, entitled “Autonomous 6G Networks: Self-Evolving Network Management and Orchestration,” aims to bring together researchers and industry experts to explore cutting-edge innovations in this domain. Key topics of interest include, but are not limited to,

- AI-native network architectures for both RAN and CORE NETWORK,
- closed-loop automation,
- intent-based networking,
- agentic workflows,
- digital twins, and
- the integration of communication, computing, and sensing.

Particular emphasis will be placed on

- scalable and trustworthy AI/ML frameworks,
- distributed learning approaches (e.g., federated and edge learning), and
- real-time orchestration mechanisms aligned with emerging 6G system requirements.

By fostering interdisciplinary discussions, this session will contribute to shaping the future of autonomous network operations. It will provide a platform to present novel theoretical advances, experimental results, and practical deployments, while also addressing open challenges such as data availability, model generalization, explainability, and standardization. Ultimately, the session seeks to accelerate the transition toward intelligent, self-evolving 6G networks capable of delivering seamless, efficient, and resilient connectivity.

Special session will also introduce 6G-SMART (6G Self Organising and Managing Open Radio Access Network) Celtic-Next project early outputs via Demo showcases, as well as the Demo of “an agentic orchestration and operations control plane in action for telco cloud environments”.

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Potential support

6G-SMART Project Consortium