

# **Green Satellite IoT: Energy-Efficient Communications and Computing in Space**

## **Organizers:**

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## **Aim and Scope:**

The rapid proliferation of Low Earth Orbit (LEO) constellations and the explosion of Internet of Things (IoT) devices have created a pressing need for sustainable space-based connectivity. As we move towards 6G, the integration of Non-Terrestrial Networks (NTN) with terrestrial IoT aims to provide ubiquitous coverage. However, this integration faces critical challenges regarding energy efficiency, both at the ground user terminal (often battery-powered) and the satellite payload (power-constrained).

This special session focuses on "Green Satellite IoT," exploring novel architectures, protocols, and algorithms designed to minimize energy consumption and carbon footprint. We aim to bring together researchers from academia and industry to discuss energy-efficient physical layer techniques, low-power MAC protocols, energy harvesting solutions, and AI-driven resource management for sustainable space-ground integrated networks.

## **Topics of Interest: We invite original contributions on the following topics:**

- **Energy-efficient modulation and coding schemes for Satellite-IoT.**
- **Green MAC protocols and Random Access techniques for massive SatIoT.**
- **Energy harvesting techniques for remote IoT terminals (Solar, RF, etc.).**
- **Wake-up radio technologies and sleep-mode management in NTN.**
- **AI/ML algorithms for energy-efficient routing and resource allocation.**
- **Optimization of LoRa/Sigfox/NB-IoT protocols over satellite links.**
- **Sustainable mega-constellation management and green networking.**
- **Battery-less IoT communications via satellite.**