

# Invited Talk: Sustainable and Multifunctional Wireless Networks

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**Abstract.** The future global cellular infrastructure will underpin a variety of applications, such as smart city solutions, urban security, infrastructure monitoring, and smart mobility, among others. These emerging applications require new network functionalities that go beyond traditional communication. Key network KPIs for 6G include Gb/s data rates, cm-level localization,  $\mu$ s-level latency, and Tb/Joule energy efficiency. Additionally, future networks must support the UN's Sustainable Development Goals to ensure sustainability, net-zero emissions, resilience, and inclusivity. The multifunctionality and net-zero emissions agenda call for a redesign of multi-access technologies for 6G and beyond. In this talk, I focus on enabling multifunctionality in signals and wireless transmissions as a means of reducing hardware redundancy and minimizing carbon footprint. We will explore the emerging field of integrated sensing and communications (ISAC), which represents a paradigm shift towards combining sensing and communication functionalities within a single transmission, utilizing a single spectrum and ultimately sharing a common infrastructure.