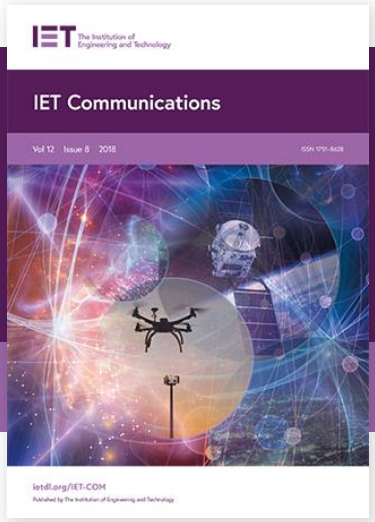
The Institution of Engineering and Technology

OPEN ACCESS

IET Communications



Call for Papers

Submission Deadline: 30 July 2021 | **Publication Date:** April 2022

Editor-in-Chief: Liuqing Yang, University of Minnesota, USA

Special Issue on:

Intelligent Metasurfaces for Smart Connectivity

Current 5G wireless systems depend heavily on the quality of the wireless propagation environment, which had conventionally been modelled as an exogenous entity that can only be adapted and not controlled. This is challenged by future wireless networks which integrate communication, sensing, and localisation in a single platform, and where the wireless environment is not treated as part of the network design parameters. This new vision of wireless network design is enabled by an emerging technology of Reconfigurable Intelligent Surfaces (RISs). RISs are thin layers of electromagnetic metamaterials capable of shaping radio waves that impinge upon them in ways that the wireless environment can be customised to fulfil specific system requirements. As a result, metamaterial-based RISs can create favourable propagation conditions by controlling the phase and amplitude of the impinging radio waves through nearly passive and low-cost scattering elements. Metamaterials exhibit electromagnetic properties that are sensitive to the working environment, such as temperature and humidity, which motivate wireless researchers to also use them as sensors. By exploiting the amplitude-frequency characteristic of specifically devised metamaterials, it is possible to detect small perturbations for sensing applications. Recently, metamaterials have received a surge in research and development interests in wireless communications and are seen as a promising transformative technology with the potential of fundamentally changing how wireless networks are implemented, optimised, and operated.

The aim of this special issue is to solicit high-quality unpublished research papers by experts from mobile communication industries and academia related to metasurface-empowered wireless networks. Topics of interest include but are not limited to:

- Physics-based modelling, hardware architectures, and testbed implementations of intelligent metasurfaces
- Channel modelling for intelligent metasurface-assisted wireless communications
- Performance limits of intelligent metasurface-based wireless communications
- Signal Processing and machine learning for intelligent metasurface-empowered wireless networks
- Algorithms and protocol design for intelligent metasurface-assisted wireless networks
- Deployment & network optimisation for intelligent metasurface-assisted communication
- Intelligent metasurface enabled RF sensing and localisation
- Intelligent metasurface-based sensor design
- Signal processing for intelligent metasurface-aided sensing
- Emerging applications, and integration of intelligent metasurfaces with existing wireless technologies (Massive MIMO, millimetre-wave communication, THz communication, D2D communications, UAV communications, energy harvesting)

From January 2021, The IET will begin an Open Access publishing partnership with Wiley. As a result, all submissions that are accepted for this Special Issue will be published under the Gold Open Access Model and subject to the Article Processing Charge (APC) of $2,200. For further information on APCs, and support for APCs including Wiley's institutional agreements and Research4Life initiative which offers waivers and automatic discounts for certain countries, please see our FAQs. To submit your paper and for more information about the journal please visit our website and read our Author Guide.

Guest Editors:

Dr Hongliang Zhang
Princeton University, USA
E: hz16@princeton.edu

Dr Zehui Xiong
Alibaba-NTU Joint Research Institute, Singapore
E: zxiong002@e.ntu.edu.sg

Prof Marco Di Renzo
CNRS & Paris-Saclay University, France
E: marco.direnzo@centralesupelec.fr