# ITU Journal

*Future and evolving technologies*

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The *ITU Journal on Future and Evolving Technologies (ITU J-FET)* is an international journal providing complete coverage of all communications and networking paradigms, free of charge for both readers and authors. The ITU Journal considers yet-to-be-published papers addressing fundamental and applied research. It shares new techniques and concepts, analyses and tutorials, and learnings from experiments and physical and simulated testbeds. It also discusses the implications of the latest research results for policy and regulation, legal frameworks, and the economy and society. This publication builds bridges between disciplines, connects theory with application, and stimulates international dialogue. Its interdisciplinary approach reflects ITU's comprehensive field of interest and explores the convergence of ICT with other disciplines. The ITU Journal welcomes submissions at any time, on any topic within its scope.

Special issue on

# Terahertz communications

## Call for papers

The Terahertz (THz) band from 0.1 THz to 10 THz will be of paramount importance for wireless communications in the next decade. In particular, due to its abundant frequency resources, the THz band will be a key to overcome the spectrum scarcity and capacity limitations inherent to current wireless systems. It is anticipated that THz band communications will enable unprecedented applications both at the macro-scale and at the nano-scale, ranging from high-speed satellite communications, ultra-high-capacity wireless fronthaul/backhaul in cellular networks, ultra-high-speed short-distance data transfer between devices, to inter/intra-chip communications and instantaneous data exchange between nano-scale devices.

However, many challenges unique to THz communications have to be still addressed. For example, molecular absorption and spreading losses are much more pronounced for the THz range compared to millimeter-wave (mmWave) frequencies, and device technology will impose more strict requirements on communication and networking paradigms than for the microwave frequencies related to, for example, a limited output power of amplifiers, analog-to-digital conversion (ADC) and digital-to-analog conversion (DAC) with fewer bits and higher phase noise levels of oscillators.

This special issue will present the most recent advances with respect to the theoretical foundations and practical applications of THz communications. Prospective authors are cordially invited to submit their original manuscripts on the following suggested (non-exclusive) list of topics:

## Suggested topics (but not limited to):

| | |
|---|---|
| **Channel modeling, waveform and receiver design** | • Channel characterization, modeling and measurements<br>• Modulation and coding<br>• Channel estimation, detection and equalization<br>• Robust transmission schemes<br>• Noncoherent receivers<br>• Machine learning aided THz transmission<br>• Physical layer security for THz communications |
| **Multiple antenna systems** | • Precoding, beamforming, beam alignment and beam tracking<br>• Intelligent surfaces assisted THz MIMO systems<br>• Massive MIMO THz communications |
| **Networking paradigms** | • Resource allocation and scheduling<br>• Multiple-access schemes<br>• Protocol design |
| **Devices, prototypes and implementations** | • THz communications circuits and devices based on electronics, photonics, and plasmonics<br>• Prototypes and implementations of THz communication systems<br>• Testbeds and experimental results |
| **Applications** | • THz communications for 6G and the IoT<br>• THz satellite communications<br>• THz intra/inter-chip communications<br>• THz communications for the Internet of Bio-Nano Things<br>• THz communications for scenarios with high mobility<br>• Further novel and innovative applications |

**Additional information:**
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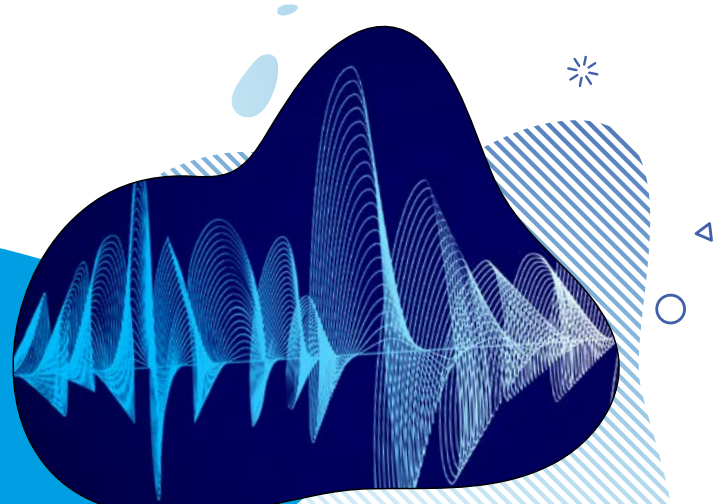

**Keywords**
Channel modeling, design of transmission schemes, (massive) MIMO communications, prototypes and implementations, networking paradigms, applications of THz communications

**Extended deadlines**
Paper submission: 12 April 2021
Paper acceptance notification: 31 May 2021
Camera-ready paper submission: 28 June 2021

**Paper submission**
This special issue calls for original scientific papers. Submitted papers should not be under consideration for publication elsewhere. Submissions must be made electronically using EDAS: Editor's Assistant at https://edas.info/N27930. Templates and guidelines can be found at https://www.itu.int/en/journal/j-fet/Pages/submission-guidelines.aspx

**Publication**
As soon as they get accepted, papers will be continuously published on the ITU digital library. They will then be bundled into the special issue digital publication.

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