

Call For Papers

The 5th International Workshop on

Electromagnetic Information Theory

IEEE GLOBECOM, Kuala Lumpur, Malaysia

4-8 December, 2023



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Background and Scope

In order to meet the immensely higher data rate, reliability, and traffic demands in the 5G-Advanced/6G era, novel communication frameworks are rapidly emerging to fully utilize the electromagnetic waves, including holographic MIMO, extremely large antenna arrays, reconfigurable intelligent surfaces, OAM multiplexing, etc. To explore one such candidate, research into electromagnetic information theory (EIT) is actively underway in both academia and industry. EIT is an interdisciplinary framework to evaluate the fundamental limits of wireless communications by integrating deterministic electromagnetic wave (EM) theory and statistical information theory. Unlike traditional wireless communication frameworks, physically large antenna arrays, large intelligent surfaces, RF lens antenna arrays, holographic MIMO, and/or continuous-aperture MIMO will be used and analyzed more effectively with the EIT framework. At the same time, the physical properties of the OAM, the non-diffraction properties of the Bessel beam, and/or the acceleration properties of the Airy beam may open up new opportunities of under the EIT framework. It is expected that EIT will bring new theoretical analysis and system design paradigms to the future wireless communications.

While research into EIT based theoretical analysis, signal processing, channel modeling, antenna design, and standardization for the future wireless communications are still in the early stage, it is essential to establish a clear vision and provide guidance for the worldwide academic researchers and industrial partners with following topics:

- **Theoretical analysis for EIT:** Channel capacity analysis, degree of freedom of the time, frequency, and spatial domain, characteristic mode analysis, performance evaluation
- **Channel modeling for EIT:** Physics consistent channel modeling, computational electromagnetics based channel modeling, circuit theory based channel modeling, reactive near field, radiating near field and far field channel modeling
- **EIT based signal processing:** Beamforming and channel estimation for both near and far field, interference cancelation, joint system optimization, holographic MIMO, continuous-aperture MIMO
- **EIT based next generation antennas and beam manipulation:** Extremely large antenna arrays, large intelligent surfaces, reconfigurable antennas, reconfigurable intelligent surfaces, electromagnetic metasurfaces, wave manipulation, exploitation of physical properties of OAM, Bessel, and Airy beams
- **EIT based wireless communications and network:** Vision, outlook, new challenges, and opportunities of EIT towards 5G-Advanced/6G, EIT based network, new use cases

Important Dates

July 15, 2023

Workshop Paper Submission

September 15, 2023

Acceptance Notification

October 1, 2023

Final Paper Submission

Author Guideline

Please refer to www.5gworkshops.com/GC2023_EIT_WS.pdf for more information.

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