A Message From the Editor-in-Chief: Introducing the Special Article Collection on Antennas and Propagation for Emerging 5G/6G Communications

IN THE August 2024 issue, I am happy to present the continuation of our Special Article Collections initiative, launched in 2023 on the occasion of the journal's 70th anniversary [1], aimed at identifying and grouping online articles, generally spread along a number of different printed issues and focused on a current relevant topic, of interest to the international scientific community. The selected articles make up a virtual collection, composing a Virtual Special Issue (VSI). Although the readers do not have a physical special issue due to the dispersed publication of articles, the articles of each VSI are organized and made available in dedicated sections on TAP's website, along with other supporting material, including videos, featured articles' content, and authors' stories, to further showcase the research presented in the articles of the VSI.

The curation of VSIs on timely topics within the antennas and propagation field is a testament to our continuous commitment to facilitating our readership's exciting journey of learning, discovery, and innovation. By highlighting cutting-edge research published in the IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, we aim to provide our readers with access to high-quality, impactful content that reflects the current state and future potential of the antennas and propagation field.

The new VSI on "Antennas and Propagation for Emerging 5G/6G Communications" is part of a set of commemorative activities in celebration of the 75th Anniversary of the IEEE Antennas and Propagation Society (AP-S). In this landmark year, we continue our series of VSIs with a special article collection highlighting transformative antennas and propagation technologies that are in the spotlight for making advanced connectivity a reality.

This VSI is motivated by the role of advanced connectivity, realized through wireless low-power networks, 5G and 6G cellular, Wi-Fi 6 and 7, low-Earth-orbit satellites, and other telecommunications technologies, as a key enabler of highly interactive and context-aware scenarios, with a broad range of applications and sectors, spanning from industry, logistics, healthcare, transportation, or massive telemetry, just to name a few. With the proliferation of the Internet of Things and the evolution toward proactive and predictive environments, demand has surged for advanced wireless communication devices and systems in current 5G and future 6G networks. These systems now require transmission rates in the terabit-per-second range, ultralow latencies, high reliability, and dense device connectivity, posing significant challenges in device, channel, and system design. The VSI explores novel antenna designs along with propagation analysis and measurement techniques to meet these stringent demands and highlights emerging novel devices for communication systems as well as new application scenarios and domains being envisaged.

Curated by a panel of distinguished Guest Editors, the VSI features 31 carefully selected articles published in the Transactions during 2022 and 2023, covering key areas, including antenna design, propagation analysis, novel devices such as metasurfaces and RIS technologies, as well as emerging applications and scenarios [2]. I am grateful to our Guest Editors, Francisco Falcone, Mohsen Khalily, Zhi Ning Chen, Theodore Rappaport, and Paolo Rocca for undertaking a significant endeavor in compiling this comprehensive collection of articles.

I cordially invite you to explore the VSI on "Antennas and Propagation for Emerging 5G/6G Communications" [3] and join us in celebrating the rich history and dynamic future of the AP-S.

Happy reading!

REFERENCES

[1] M. Salucci, G. V. Eleftheriades, D. Erricolo, Y. M. Pan, and K. S. Nikita, "Celebrating 70 years of the transactions: Some of the articles that made history in the AP-S," *IEEE Trans. Antennas Propag.*, vol. 71, no. 5, pp. 3768–3774, May 2023, doi: 10.1109/TAP.2023.3265599.

[2] F. Falcone, M. Khalily, Z. N. Chen, T. Rappaport, and P. Rocca, "Editorial: Special article collection on antennas and propagation for emerging 5G/6G communications," *IEEE Trans. Antennas Propag.*, vol. 72, no. 8, pp. 6173–6176, Aug. 2024, doi: 10.1109/TAP.2024.3428288.

[3] *TAP Special Article Collection: Antennas and Propagation for Emerging 5G/6G Communications*. Accessed: Jul. 26, 2024. [Online]. Available: https://ieeeaps.org/ieee-tap/special-issues/antennas-and-propagation-for-emerging-5g-6g-communications

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