IEEE AWPL Special Cluster 2025 on
"Advanced Integration Designs in Antennas and Arrays Meeting the New Radio Frequencies Demand for Coming 6G Era"

The sixth-generation wireless technology, termed "6G" by the global wireless communication industry, has generated a significant surge of research enthusiasm in both academia and industry. As expected, 6G will move from connecting people and things to connecting intelligence compared to 5G. To achieve this goal, wireless systems need to be able to intelligently sense their surroundings and exchange data simultaneously, and wireless power transfer is sometimes desired at the same time to guarantee some low-power sensors work properly all along. In addition to the traditional frequency spectrum allocated below 7 GHz, new radio frequencies in the millimeter-wave and terahertz bands have been proposed to facilitate vastly increased data transmission rates and enable more precise sensing. It is foreseeable that 6G radio frequency (RF) systems will be equipped with multiple functionalities, capable of operating simultaneously across different frequency bands. Consequently, these emerging demands will undoubtedly boost the concerning researches of antennas and arrays encompassing theories, structures, materials, processing techniques, and applications, etc.

This special cluster is dedicated to collecting and disseminating the latest global advancements in new structures, design methodologies, materials as well as processing techniques that can be applied in the integration designs of antennas and arrays for 6G communications, with particular emphasis on (but not limited to) the following areas:

- Integration designs for antennas, arrays and antenna modules capable of simultaneously operating across the traditional sub-7 GHz band and millimeter or terahertz bands.
- Ultrawideband antennas and arrays.
- Reconfigurable antennas and arrays.
- Novel integration/fusion designs for antennas and other components to meet the demands of new radio frequencies in 6G communications, e.g., filtennas, duplexing antennas and arrays, etc.
- Antennas and arrays utilizing low-loss new materials or advanced processing techniques.
- Advanced array synthesis, packaging and optimization techniques.
- Compact, integrated millimeter-wave or terahertz phased arrays.
- Multibeam antennas.
- Terahertz on-chip antennas and high-power radiating oscillator arrays.

The Guest Editors of this Special Cluster are:

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Prospective authors are encouraged to contact the Guest Editors for any questions or to determine the suitability of their contribution for this special cluster. Papers should be prepared following the same submission instructions as for regular IEEE AWPL manuscripts (four-pages technical content maximum and one reference page, double-column, IEEE format), available via the Information for Authors website. The authors should indicate in the cover letter to the Editor-in-Chief that the manuscript is being submitted in response to the Call for Papers for the focused cluster. Prospective authors should refer to the timeline below for key dates.

Key dates:

- Submission deadline: **March 31, 2025**
- First decision: May 15, 2025
- Revised manuscripts deadline: June 15, 2025
- Final decision: July 30, 2025
- Final manuscripts due by: September 1, 2025
- Online publication: Shortly after final manuscript submission
- Cluster publication: November (or December) 2025 issue of AWPL