IEEE AWPL Special Cluster 2024 on
"Intelligent and Highly Efficient Antennas/Metasurfaces for 6G"

The evolution of wireless technology has seamlessly integrated the physical world with pervasive signal coverage. A defining trait of emerging 6G systems is their enhanced ability to flexibly generate electromagnetic radiations and strategically control their propagation in space. This is crucial for a plethora of innovative services, notably environmental sensing and smart applications. Traditional control methods predominantly operate at lower frequencies where the challenges of manufacturing and energy consumption are minimal. However, the transition to millimeter-wave and terahertz bands in 6G introduces challenges and complexities. This amplifies the demand for highly-efficient, easily-implemented antenna and propagation solutions. Furthermore, in the nuanced landscape of real-world propagation, there's an imperative to smartly manage electromagnetic signals to optimize wireless connectivity, especially for complex environments in real scenarios. Nowadays, with the advent of sophisticated optimization strategies such as machine learning, the design and deployment of intelligent antennas and metasurfaces in such intricate environments are now within reach.

This special cluster addresses the pressing need to advance intelligent antennas/metasurfaces and integrated propagation optimization technologies, aiming to enable exceptional connectivity links in real-world settings. Its focus is on pushing the boundaries of science and technology pertaining to intelligent and highly efficient antennas/metasurfaces for the forthcoming 6G wireless networks. The aim is to gather and connect leading global researchers and experts, promoting the sharing of their latest research findings and progress in this field. While this cluster eagerly welcomes various research topics, it especially seeks contributions in the following areas:

- Reconfigurable intelligent surfaces (RISs)
- Reconfigurable antennas and arrays
- Metasurface antennas
- Electromagnetic propagation
- Millimeter-wave and terahertz antennas
- Traveling wave and lens antennas
- Adaptive/smart antennas
- Machine-learning based optimization
- Tuning materials and methods
- Integrated sensing and communications for 6G

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Prospective authors are encouraged to contact the Guest Editors if they have any questions or want to confirm 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 (http://awpl.ee.cuhk.edu.hk/resources.html). 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, 2024**
- First decision: May 15, 2024
- Revised manuscripts deadline: June 15, 2024
- Final decision: July 30, 2024
- Final manuscripts due by: September 1, 2024
- Online publication: Shortly after final manuscript submission
- Cluster publication: November (or December) 2024 issue of AWPL