IEEE AWPL Special Cluster 2022 on
"Functionalized metasurface-based covers and unconventional domes for dynamic antenna systems"

Domes for antenna systems typically aim at protecting antenna arrays from the influence of outside environment, and their design is mainly driven by the minimization of its impact on the electrical and radiating performances of the antenna system, leading to domes as electromagnetically transparent as possible in the operative angular and frequency bandwidth. However, the inevitable interaction between antenna and dome may represent an interesting opportunity for increasing the dynamic performances of the antenna system. In this scenario, metasurfaces have demonstrated to exhibit the capability to mold the phase-fronts, amplitude profile or frequency of the interacting field, thanks to their engineerable surface properties in space and time domain. Such artificial surfaces can be used to build antenna domes with prescribed electromagnetic behaviors and even with new features such as the property of being tunable or switchable, thus resulting in a new class of devices: metasurface-enhanced covers or "metadomes". The aim of every metadome is two-fold: to protect the antenna system from the environment and to engineer new radiating and electrical performances of the antenna without the need to redesign the antenna system.

The objective of this special cluster is to collect the recent advancements in this field and provide an overview of the potentialities of this technology in antenna systems. Contributions are sought for, but not limited to, the following:

- EM modelling for analyzing antenna domes based on artificial dielectrics and metasurfaces.
- Analysis of coupling effects between radiators and unconventional or metasurface-based covers.
- New methods and advanced implementations of metasurface-based antenna covers for field manipulation.
- Analysis and/or design of domes enabling non-reciprocal antenna response
- Domes for the reduction of the scan blindness effect in wide scanning angular antenna arrays
- Unconventional domes for suppression of grating lobes in sparse antenna arrays.
- Domes/Antenna cover for implementing selective angular transmission
- Unconventional dome for beamforming or obtaining programmable shape beams and waveforms.

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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 (http://awpl.eleceng.adelaide.edu.au/authors.htm). 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. The publication charges will be at the standard rates for AWPL.

Key dates:

- Submission deadline: **March 31, 2022**
- First decision: May 15, 2022
- Revised manuscripts deadline: June 15, 2022
- Final decision: July 30, 2022
- Final manuscripts due by: September 1, 2022
- Online publication: Shortly after final manuscript submission
- Cluster publication: November 2022 issue of AWPL