

**Call for application for research scholarships
for post-graduate international candidates**

RESEARCH PROJECT N. 42

Title

Advanced Architectures Supporting Radiationless Anapole Modes

Scientific responsible (name, surname, role)

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Short description of the research activity (max 250 words)

Non-radiating configurations of electromagnetic sources, able to scatter tenuously when confined in particular architectures and materials (all-dielectric, metal-dielectric, graphene-based, etc.), have been investigated both theoretically and experimentally in recent years.

By putting together the efforts of the cloaking theory (as developed for all-dielectric or impedance coatings) and non-radiating techniques (as applied for the destructive interference of scattered fields, forming externally-invisible anapole modes), many other processes can be explained in physics, mainly starting from the study of electromagnetic interactions associated with the excitation of cloaking, anapole objects and invisible topologies of scatterers.

The project aims to study the characteristics of such field topographies, using innovative mathematical description, for example by finding advanced analysis techniques based on operator theory (and partial differential equations), for finding non-radiating devices within the null-space of the scattering operator.

Specific requirements (experiences, skills)

Good knowledge of Electromagnetics and wave propagation, strong basis on Mathematics and Physics, good level of English.

Website of the research group (if any)

Keywords (min 3, max 6)

Metamaterials, electromagnetic cloaking, anapole modes, induced invisibility

Research Area (max 1)

Electronics, Control and Telecommunication Engineering