**Job Description**
*Doctoral Position*

# DC3: Inverse-designed metasurfaces for SWaP-C reduction in avionic applications.

**Doctoral position at** Indra Sistemas, S.A., in Madrid, Spain.

**Main supervisor:** Dr. Jorge Montero Valor [INDRA]

**Co-supervisors/mentors:** Prof. Viktar Asadchy [Aalto] and Prof. Ana Díaz-Rubio [UPV]

**Objectives:**

Develop reconfigurable intelligent surfaces (RIS) suitable for integration into low-cost, medium-performance AESA systems requiring electrically controlled beam steering, while meeting stringent constraints on efficiency, reconfiguration methods, overall cost, simplicity, weight reduction, and low power consumption.

These constraints will be embedded into the design methodology through data-driven modelling approaches, and their fulfilment will be demonstrated experimentally.

Multiple fabrication strategies—such as additive manufacturing using polymer-matrix composites (PMC) and graphene—will be investigated. Alternative materials and processes will also be evaluated to assess their impact on electromagnetic performance, manufacturability, final system cost, and overall reductions in mass and power requirements.

This position is part of the MetaTune Doctoral Network "Reconfigurability using inversely designed metasurfaces", which has been funded under the Horizon Europe Marie Skłodowska-Curie Actions (MSCA) program.

**Acquire knowledge:** During this thesis a proper foundational and advanced knowledge on the electromagnetic and system-level principles governing RIS-enabled beamforming for low-cost, medium-performance AESA architectures shall be acquired. This includes understanding the achievable beam steering range, angular resolution, and sidelobe behaviour; the dynamic responsiveness of the RIS elements to control signals; and the phase stability that must be maintained across the operational bandwidth to avoid beam degradation. Develop familiarity with the sources and mitigation of phase and amplitude aberrations introduced by material properties, fabrication tolerances, and reconfiguration mechanisms. Additionally, gain insight into the trade-offs between performance, power consumption, weight, and implementation cost, in order to guide the optimal design of scalable, efficiently reconfigurable RIS tiles for practical AESA with reduced SWaP-C.


**→ Go to the project webpage for more information**

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**What METATUNE Offers:**

- Work contract at the Indra for 36 months funded through the MSCA network, with the additional benefits for employees (public and universal health system, free schools, etc.).
- One 4-month stay at the University of Aalto, in Finland and one 3-month stay at the Polytechnic University of Valencia, in Spain are foreseen in the research plan.
- Opportunity to pursue a PhD degree at a leading European university within a collaborative, international network.
- Training program including research-specific and transferable skills courses.
- Active participation in workshops, conferences, and network-wide events to build professional and scientific connections.
- Stimulating, multidisciplinary, and international research environment within a prestigious European training network.

**Starting date:** November-December 2026.

**Deadline for online application:** May 31, 2026 (but candidates are encouraged to apply as soon as possible).

**Mandatory Requirements:**

- You must have a finalised **master's degree** in fields related to the research topic: Telecommunications Engineering, Applied Physics, Optics, Electrical Engineering, Material Engineering.
- You should **not have a doctoral degree** at the time of recruitment.
- You must not have resided or carried out your main activity (work, studies, etc.) in Spain for more than **12 months in the 36 months** immediately before the recruitment (this is a requirement from the funding authority).
- Strong skills in the **English** language.

**→ Apply Now!**