



**UNIVERSITY: Public University of Navarre (UPNA)**

**WIT PROGRAMME'S RESEARCH LINE NAME:**

Energy - Quantum materials for energy applications

**DOCTORAL PROGRAMME:** Doctorate in Communications Technology, Bioengineering and Renewable Energies <https://www.unavarra.es/escuela-doctorado/programas-de-doctorado/plan-actual/ingenierias-arquitectura/doctorado-tecnologias-comunicaciones-bioingenieria-energias-renovables>

**COMPLETE DESCRIPTION OF THE LINE**

Quantum materials consists of material platforms where nonclassical properties (entanglement, vacuum fluctuations, quantum coherence) lead to emergent material properties. Examples of quantum materials include atomically-thin materials and van der Waals heterostructures, where the possibility of engineering their atomic scale structure leads to extraordinary photonic, electrical, magnetic, chemical and thermal properties. Quantum materials are characterized by a wealth of physical phenomena. However, many of these effects are no yet fully understood. For the same reason, they remain technologically underexploited. Our research line combines theoretical and experimental efforts seeking for a more profound understanding photonic, electrical, magnetic, chemical and thermal properties, as well as the exciting opportunities they have to offer in the fields of renewable energies and energy management.

**RESEARCH GROUP NAME:**



Antenna Group

**COORDINATOR:**

- Last and first name; link to the “Portal of scientific production”:  
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<https://academicos.unavarra.es/CawDOS/?id=dd37a14b7a0b8572&idoma=es&tipo=activ&elme>
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**MEMBERS OF THE LINE RESEARCH:**

- Navajas Hernández, David
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- Pérez Escudero, José Manuel

**ANOTHER RESEARCH LINES OF THE GROUP:** list of them

- Antennas
- Metamaterials and periodic structures
- THz technology and applications
- Quantum technologies
- Sensing
- Thermal emission
- Microfabrication



- Entities involved in research lines and contact person:
  
- ✓ Academic entities:
  - KTH-Royal Institute of Technology, Sweden (Prof. O. Quevedo, [oscarqt@kth.se](mailto:oscarqt@kth.se))
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- Brief group overview

UPNA's Antenna Group has been actively working on different areas of applied electromagnetics for more than 20 years. During these years, it has become a world reference group in metamaterials and nanophotonics, as well as in other areas of applied electromagnetics, such as terahertz technology and corrugated horn antennas.

The group has 6 permanent members, 1 Ramón y Cajal fellow, 4 Post-Docs and 8 PhD students. During the last decade the group averages yearly more than 18 journal publications and attracts funds over 500.000 € per year from public and private sources. Out of these, the group is currently involved in 4 international research projects, among them projects ERC-2020-STG-948504 (ERC Starting Grant), H2020-FETOPEN-964450 and H2020-MSCA-ITN-2019-MENELAOS<sup>NT</sup>.

Its state-of-the-art facilities for manufacturing and test comprise an ISO-7 clean room for microfabrication and test equipment from RF to the IR, including the THz range.

<http://www.unavarra.es/antennas-group>

- Link of the group to the “Portal of scientific production”

<https://academicos.unavarra.es/CawDOS/?id=90701b928ac24ad4&idio ma=es&tipo=actGrupo>

**REQUIRED QUALIFICATIONS:** Engineering, Physics, Technology



Knowledge of electromagnetics. MSc Thesis in a topic in the fields of quantum optics, quantum materials, electromagnetics.