



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

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

High capacity communications in THz – Corrugated planar antennas

**DOCTORAL PROGRAMME:** Doctorate in Communications Technology, Bioengineering and Renewable Energies: <https://www.unavarra.es/escuela-doctorado/doctorate-programs/current-plan/engineering-and-architecture/doctorate-in-communications-technology-bioengineering-and-renewable-energies?languageId=1>

**COMPLETE DESCRIPTION OF THE LINE**

Wireless communications revolution commanded by 5G, 6G and further standards is pushing technology towards higher operation bands such as millimeter-waves and terahertz, to comply with the broad required bandwidths. Fully metallic devices are preferable, as dielectric losses become very high at these frequencies deterring the overall performance.

Antennas are one of the key elements for reliable wireless communications. Fully metallic, planar and high-gain solutions can be achieved by using corrugated plates with a central radiating element. These are generically called Bull's-Eye antennas and were originally developed by our group. A control on the radiation characteristics can be achieved by modulating periodically the surface reactance. We propose here the exploration of Bull's-Eye structures with different radiation performance by modulating the reactance with short-period corrugations or metallic pins to get high-gain antennas at millimeter-waves and terahertz frequencies.



**RESEARCH GROUP NAME:**

Antenna Group

**COORDINATOR:**

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

- Antennas



- Metamaterials and periodic structures
  - THz technology and applications
  - Quantum technologies
  - Sensing
  - Thermal emission
  - Microfabrication
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  - Asociación de la Industria Navarra, AIN (Pilar Herrera, [pherrera@ain.es](mailto:pherrera@ain.es))
- 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&idoma=es&tipo=actGrupo>

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

Use of CST Studio Suite full wave simulator. Experience in modelling of millimeter wave and Terahertz devices.