



UNIVERSITY: Public University of Navarre (UPNA)

WIT PROGRAMME'S RESEARCH LINE NAME:

High capacity communications in THz – Gap waveguide 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

Gap waveguide (GW) technology is one of the strongest candidates for guiding waves at high frequencies overcoming the main problems found in standard metallic waveguides. Waves are guided by implementing an artificial high-impedance surface based on a periodic structure of metallic posts (called bed of nails). This fully metallic structure leads to high performing devices operating at millimeter-waves and terahertz, fulfilling the constraints imposed by 5G and future wireless communication systems.

In this revolution of wireless communications and Internet-of-Things, antennas are one of the key elements. In this proposal, we propose the design, manufacturing and characterization of GW antennas operating at frequencies around or above 300 GHz. The design will be based on metalized silicon wafers, with the bed of nails structure fabricated by deep reactive ion etching photolithography. These antennas could be complemented by metamaterial lenses to improve the radiation characteristics.



RESEARCH GROUP NAME:

Antenna Group

COORDINATOR:

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https://academicos.unavarra.es/CawDOS//jsf/seleccionActividades/seleccionActividades.jsf?id_pers=6917&idioma=es&elmeucv=N
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MEMBERS OF THE LINE RESEARCH:

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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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- 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-



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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.