



UNIVERSITY: Public University of Navarre (UPNA)

WIT PROGRAMME'S RESEARCH LINE NAME:

Magnetic sensors for automotive and mechatronic applications

DOCTORAL PROGRAMME: Doctorate in Science and Industrial Technologies

<https://www.unavarra.es/escuela-doctorado/doctorate-programs/current-plan/science/doctorate-in-science-and-industrial-technologies?languageId=1>

COMPLETE DESCRIPTION OF THE LINE

In this line, the development of low-cost magnetic sensors for automotive and mechatronic applications is proposed; among these, non-contact position sensors for the determination of mechanical properties without wear or friction, such as linear position, angle of rotation or angular velocity. In addition, other sensors will be considered as guidance sensors (Earth's magnetic field), liquid level sensors or magnetoelastic sensors for the determination of deformations, defects and stresses. Particularly, low-cost sensors based on soft magnetic materials will be evaluated, both obtained by thin film and rapid cooling fabrication techniques.

One of the main problems related to the extensive implementation of sensor networks is their autonomous power supply, avoiding wiring or battery replacement. Thus, given the proposed application fields, the recovery of vibrational mechanical energy (energy harvesters) will be also developed. In this field, electromagnetic harvesters based on magnetoelastic materials stand out, especially in the recovery of low frequency vibrational energy ($f < 20$ Hz).



RESEARCH GROUP NAME:

Physical properties and applications of materials (Propiedades físicas y aplicaciones de materiales)

COORDINATOR:

- Last and first name; link to the “Portal of scientific production”:

Gómez Polo, Cristina

https://academicos.unavarra.es/CawDOS//jsf/seleccionActividades/seleccionActividades.jsf?id_pers=1783&idioma=es&elmeucv=N

- Department: Science Department and Institute for Advanced Materials and Mathematics (INAMAT²)
- Email: gpolo@unavarra.es
- Telephone number: +34-948169576

MEMBERS OF THE LINE RESEARCH:

Cristina Gómez Polo

José Ignacio Pérez de Landazábal

Juan Jesús Beato López

Eneko Garaio Urabaien

ANOTHER RESEARCH LINES OF THE GROUP: list of them

Other research lines within the WIT Fellowship Programme in progress in the group:

- Development and manufacturing of multi-source energy harvesting systems



- Additive manufacturing and 3D printing for the automotive industry
- Development of advanced materials and technologies for energy production

- Entities involved in research lines and contact person:
 - ✓ Academic entities:
 - Prof. Evangelos Hristoforou
National Technical University of Athens. School of Electrical and Computer Engineering

 - Dr. Paola Tiberto
Istituto Nazionale di Ricerca Metrologica (INRIM), Torino, Italy

 - Dra. Nicoleta Lupu
National Institute of R&D for Technical Physics, Iasi, Romania

 - ✓ Industrial entities
 - Joint supervision of doctoral thesis with international universities or non academic institutions:

National Technical University of Athens

 - Brief group overview

The group “Physical properties and applications of materials” belongs to the Science Department and the research Institute for Advanced Materials and Mathematics (INAMAT²) of the Public University of Navarra, UPNA.



The main research lines are devoted to the development of high-quality basic research on the physical properties of new advanced materials and their application in different technological sectors. This activity is developed by a mixture of experienced seniors and young researchers, sharing a multidisciplinary environment with other research groups of different areas (chemistry, engineering and mathematics).

The main information about the research activities of the group are available at: <http://www.unavarra.es/propiedades-aplicaciones-materiales>.

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

<https://academicos.unavarra.es/CawDOS/jsf/seleccionPersonalEstamento/seleccionPersonal.jsf>

REQUIREMENTS:

Academic requirements: Engineering, Physics