

# CATALOGUE

# Technological Experimental Sciences



Universidad  
de Alcalá



Comunidad  
de Madrid

Dirección General de Investigación  
e Innovación Tecnológica

CONSEJERÍA DE CIENCIA,  
UNIVERSIDADES E INNOVACIÓN



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Listado grupos de investigación UAH

# Technological and experimental Sciences

- SPACE AND ASTROPARTICLE
- EVOLUTIONARY BIOACOUSTICS AND PALEOANTHROLOGY
- ECO-FUTURING, DESIGN LAB FOR THE GREEN CITY
- FOREST ECOLOGY AND RESTORATION
- CLIMATE PHYSICS
- PHOTONICS ENGINEERING
- SPACE RESEARCH
- DEVELOPMENT OF COMPLEX SOFTWARE
- ENVIRONMENT AND BIOPRODUCTS
- SPACE WEATHER
- ARQUICLECTURAL HERITAGE AND SUSTAINABLE ARCHITECTURE
- RADIATION AND SENSING
- MECHANICAL, ELECTRICAL AND THERMAL TECHNOLOGIES
- ENVIRONMENTAL REMOTE SENSING
- SYMBOLIC AND NUMERIC ALGORITHMS AND APPLICATIONS TO CURVES AND SURFACES



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## SPACE WEATHER

Code  
569

### SWE

#### RESEARCH AREA

Ciencias Tecnológicas  
Ciencias Experimentales

#### COORDINATOR

Consuelo Cid Tortuero

#### KEY WORDS

Meteorología espacial,  
Heliofísica, Interacción  
Sol-Tierra, Física solar,  
Indices geomagnéticos,  
Tormenta geomagnética

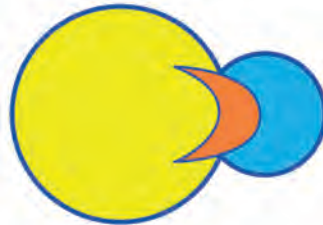
#### AIM

- Compañías eléctricas
- Compañías de comunicaciones
- Administración central (Protección civil, Infraestructuras críticas)

#### CONTACT



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Madrid



**SWE** GROUP  
SPACE WEATHER

## ABOUT US

La investigación de la actividad solar y su influencia en el entorno terrestre, así como el desarrollo de productos de monitorización y predicción.

## RESEARCH LINES

- Heliofísica. Interacción Sol-Tierra
- Meteorología espacial

## OFFERED SERVICES

- Asesoramiento sobre meteorología espacial
- Soluciones técnicas para los sectores afectados

## MARKETABLE RESULTS





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## SYMBOLIC AND NUMERIC ALGORITHMS AND APPLICATIONS TO CURVES AND SURFACES

Código  
683

### ASYNACS

#### RESEARCH AREA

Experimental Sciences  
Technological Sciences

#### COORDINATOR

Sonia Pérez Díaz

#### KEYWORDS

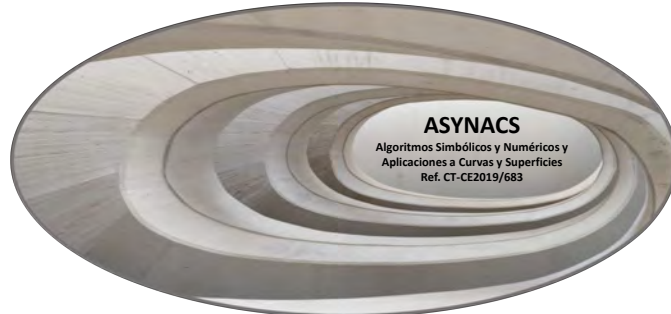
Algorithms,  
Symbolic,  
Numerical,  
Geometry,  
Algebra,  
Interpolation,  
Geometric design

#### CONTACT



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#### OBJETCT/AIM

The fundamental objective of the group is the study of mathematical problems from a symbolic or a numerical-symbolic algorithmic approach, with special emphasis on geometric issues as well as their applications. It is also an objective of the group to create a link between teachers in the Mathematics department that allows knowing what research is being done and fosters mutual collaboration as well as giving visibility to that research in as many forums as possible (departmental, university, academic, scientific).

#### LINES OF RESEARCH

- Numerical linear algebra
- Algorithms for curves and surfaces and applications
- Applications in Computer Aided Geometric Design (CAGD)
- Development of approximate algorithms
- Development of numerical algorithms
- Development of symbolic algorithms
- Effective algebraic geometry
- Interpolation
- Curve and surface theory

#### SERVICES OFFERED

- Development of mathematical and algorithmic foundations as well as implementations in mathematical software

#### MARKETABLE RESULTS





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## ARCHITECTURAL HERITAGE AND SUSTAINABLE ARCHITECTURE

Code  
689

**SBH**

### RESEARCH AREA

Experimental Sciences  
Technological Sciences

### COORDINATOR

Pilar Chías Navarro

### KEY WORDS

Passivhaus, Hospital  
projects, Impact  
assessment, Efficient  
Architecture

### AIM

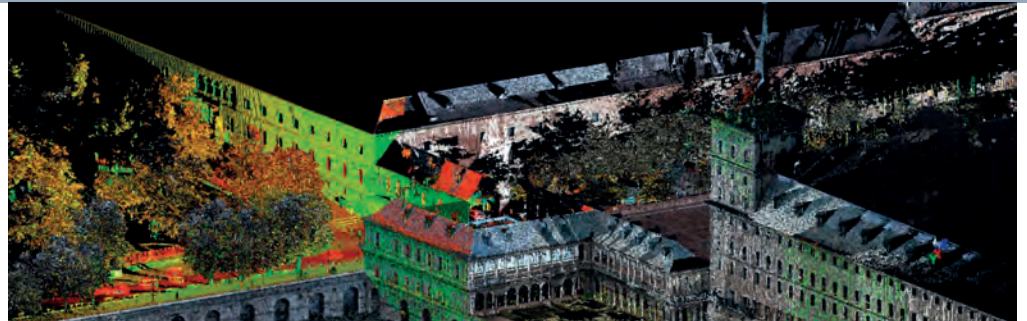
- Public administrations and private entities related to the Heritage or health

### CONTACT



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## ABOUT US

We are a transdisciplinary research team, having achieved for more than two decades a high performance development in the fields of Cultural Heritage documentation and renovation, and of Passivhaus design and project. The study of ancient constructions and historic landscapes, as well as the design of healthcare buildings are among our key strengths. Our researches are financed both by public-sector customers in competitive calls, and by private clients.

## RESEARCH LINES

- Intervention in the Built Heritage
- Sustainable and efficient construction and management
- Sustainable urban design

## OFFERED SERVICES

- Environmental impact assessment
- Sustainable Hospital and Healthcare facilities projects
- Sustainable urban design
- Built Heritage documentation and assessment
- Efficient building renovation and management (BIM)
- Territorial and landscape studies and design projects
- Passivhaus building projects

## MARKETABLE RESULTS





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## PHOTONICS ENGINEERING

Code  
695

## GRIFO

### RESEARCH AREA

Experimental Sciences,  
Technological Sciences

### COORDINATOR

Miguel González Herráez

### AIM

- Structural health sensors for civil works.
- Design and optimization of semiconductor devices for solar energy.
- SPR-based chemical sensors.
- Plastic fiber sensors for ionizing radiation detection.
- Long-range sensors for seismic studies
- Thermometers high sensitivity and scope

### CONTACT



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## ABOUT US

The Photonic Engineering Group carries out its research in the following lines: Fiber optic sensors. Development and implementation of fiber optic sensors applied to the detection of polluting substances, based on the spectral interrogation of in-line transducers with resonant coupling of surface plasmons. Control of the speed of light. Control of the information propagation speed in fiber optic systems, compatible with optical information storage and computing systems. For this, non-linear optics techniques such as Stimulated Brillouin Scattering are used for the development of completely optical communication networks. Optical properties of semiconductors. Theoretical study of the light-semiconductor interaction (linear and non-linear behavior). Deposition of metals and semiconductors via magnetron sputtering. Design, optical and electrical characterization of devices based on III-nitride semiconductors for their application in optical communications and photodetectors. Solar cell development.

## RESEARCH LINES

- Controlling the speed of light
- Thin sheets and ceramics
- Multiferroic materials for energy harvesting systems
- Optical properties of semiconductors
- Fiber optic sensors
- Nanostructured surfaces for solar cell optimization
- III-V semiconductor devices for solar energy applications

## OFFERED SERVICES

- Design, manufacture and characterization of sensors based on different optical transduction methods, using plasmonics concepts applied to the identification and measurement of contaminant concentration
- Use of non-linear techniques for the development of distributed sensors of physical parameters
- Thin film deposition by magnetron RF and DC sputtering
- Material simulation with the finite element method
- Design and characterization of materials and devices based on III-nitride semiconductors"

## MARKETABLE RESULTS





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## RADIATION AND SENSING

Code  
828

**RSG**

### RESEARCH AREA

Technological Sciences  
Experimental Sciences

### COORDINATOR

Pablo Luis López Espí

### KEY WORDS

Microwave, Antennas,  
Sensing, Electromagnetic  
pollution

### AIM

- ICT companies involved in the development of new antennas, microwave devices and sensors
- Companies and Administrations interested in the application of ICT to the improvement of medical image diagnosis
- Companies and Administrations involved in electromagnetic pollution measurement and control

### CONTACT



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## ABOUT US

Radiation and sensing research group is focused on the design of antennas, microwave devices and sensors. Our group has wide experience in electromagnetic simulation and modern optimization techniques in CST and HFSS for more than 15 years. We have design, prototype manufacturing and measurement capabilities for PCB up to 20 GHz. We have also experience in surface measurement systems using laser techniques. We have been involved in electromagnetic pollution measurement for more than 20 years.

## RESEARCH LINES

- Design, optimization and characterization of RF and microwave devices and antennas
- Information and communications technology (ICT) applied to the design of low cost measurement devices and systems
- Electromagnetic Pollution measurement and research
- Image techniques applied to diagnosis assistance and segmentation.
- Energy harvesting and autonomous sensing systems

## OFFERED SERVICES

- Design of RF and microwaves devices and antennas
- Design of low cost sensing devices
- Measurement of electromagnetic pollution
- Application of image processing techniques to medical diagnosis and classification

## MARKETABLE RESULTS

