

PhD research lines open to CSC scholarship applicants under cooperative agreement*

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* If you are unable to find what you are looking for on this list, please contact us at incoming.asia@upm.es. We will be happy to assist you.

Agroengineering

1) [Circular economy transition with socio-civic commitment](#)

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2) [Storage and discharge of bulk solids in bins and hoppers](#)

Supervisor: Álvaro Ramírez Gómez
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Biotechnology and bioinformatics

1) [Evolution-proof engineering approaches for plant-associated bacteria](#)

Supervisor: Alejandro Couce & Emilia López-Solanilla
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2) [Engineering eukaryotic consortia for coordinated processing in biotechnological applications](#)

Supervisor: Krzysztof Wabnik
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3) [Molecular bases of primary and secondary meristems differentiation in response to the environment](#)

Supervisor: Mariano Perales & Daniel Conde
Email: Mariano.perales@upm.es; daniel.conde@upm.es

4) [Integrative analysis of the mode of action of fungal endophytes in crops](#)

Supervisor: Soledad Sacristán
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Computational systems biology and genomics

1) [Evolution-proof engineering approaches for plant-associated bacteria](#)

Supervisor: Alejandro Couce & Emilia López-Solanilla
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2) [Genomic assisted breeding applied to a wheat breeding program](#)

Supervisor: Julio Isidro y Sánchez
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3) [Catalogue and effect of wild introgression in the tomato genome](#)

Supervisor: José M. Jiménez-Gómez
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4) [Engineering eukaryotic consortia for coordinated processing in biotechnological applications](#)

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5) [Molecular bases of primary and secondary meristems differentiation in response to the environment](#)

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Interactions of plants with environment

1) [Plant responses to nutrient limitation](#)

Supervisor: Joaquín Medina

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2) [Determinants of plant virus seed transmission](#)

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3) [Engineering eukaryotic consortia for coordinated processing in biotechnological applications](#)

Supervisor: Krzysztof Wabnik

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4) [Associations of symbiotic bacteria with plants](#)

Supervisor: Luis Rey

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5) [Understanding the effects of environmental conditions on plant-pest interactions](#)

Supervisor: Manuel Martínez Muñoz

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6) [Molecular bases of primary and secondary meristems differentiation in response to the environment](#)

Supervisor: Mariano Perales & Daniel Conde

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7) [Optimized rhizosphere microbial communities for enhanced plant productivity and stress resilience](#)

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8) [Integrative analysis of the mode of action of fungal endophytes in crops](#)

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9) [Translation regulation in model plants](#)

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Plant development

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- 2) [Molecular bases of primary and secondary meristems differentiation in response to the environment](#)
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Applied Mathematics

- 1) [Design of geometric integrators via retraction maps](#)
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- 2) [Molecular Simulation of Self and Directed Organization of Complex Systems based on Polymers](#)
Supervisor: Nikolaos Karagiannis
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- 3) [Aerodynamic and aeroacoustic optimization of critical parts of high-speed trains](#)
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- 4) [Mathematical models in epidemiology and eco-epidemiology](#)
Supervisor: Luis Sanz Lorenzo
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- 5) [Engineering eukaryotic consortia for coordinated processing in biotechnological applications](#)
Supervisor: Krzysztof Wabnik
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- 6) [High multiplicity for superlinear indefinite problems](#)
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- 7) [Inverse problems](#)
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- 8) [Dynamics of cosmological models](#)
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- 9) [Numerical approximation and control for systems governed by partial differential equations](#)
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- 10) [Solving Combinatorial Problems through Reinforcement Learning](#)
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Biomedical Engineering

- 1) [Mobile Robotics for Gait Analysis](#)
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- 2) [Intelligent therapeutic exergames](#)
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- 3) [Artificial intelligence and signal/image processing for biomedical and health applications](#)
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- 4) [Artificial intelligence and signal/image processing for the evaluation of neurodegenerative disorders](#)
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- 6) [Complexity analysis of biomedical signals](#)
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- 7) [Radar technology for monitoring biomedical signs in biomedical and health applications](#)
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- 8) [Microfluidics-based devices for mechanical characterization of living cells and biological applications](#)
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- 9) [Computational biomechanics of cardiovascular tissue and blood flow](#)
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- 10) [Human digital markers for improving the interaction between humans and machines](#)
Supervisor: Cecilia E. García
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- 11) [Development of low-cost device technology for monitoring human joint movements for sports and rehabilitation applications](#)
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- 12) [Theoretical prediction of liquid-liquid phase separation in protein solutions and prevention of ageing in condensates](#)
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- 13) [Meshfree computational biomechanics](#)
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- 14) [Engineering eukaryotic consortia for coordinated processing in biotechnological applications](#)
Supervisor: Krzysztof Wabnik
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- 15) [Laser bioprinting for tissue engineering](#)
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- 17) [Surgical Training and Image Guided Surgery](#)
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- 18) [New advances in biomedical images processing for clinical decision support systems](#)
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- 19) [Neurorehabilitation and Brain Health Engineering](#)
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Chemical Engineering

- 1) [Wastewater treatment by advanced oxidation processes: photocatalysis and electrochemical oxidation](#)
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- 2) [Numerical simulation of air quality and interactions with climate](#)
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- 5) [Synthetic light harvesting materials towards direct hydrogen production from solar energy](#)
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- 6) [Valorization of olive oil industry wastes towards green hydrogen production](#)
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- 7) [Development of advanced electrochemical dual function materials for \$CO_2\$ capture, storage and conversion into methanol](#)
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- 8) [Sustainable nanocellulose production and application](#)
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- 9) [Nanomaterials with photocatalytic and electrocatalytic activity for water treatment](#)
Supervisor: Verónica Blanco Gutiérrez
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- 10) [Development and assessment of wastewater treatment strategies coupling advanced oxidation processes to bio-based treatment technologies](#)
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- 11) [Design and evaluation of urban rainwater management and treatment strategies](#)
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- 12) [Waste valorization for environmental purposes](#)
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- 13) [Intensification and evaluation of novel UV-C-based advanced technologies for water treatment](#)
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Civil Engineering and Architecture

- 1) [Dynamics of railway bridges under high speed traffic](#)
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- 2) [Computational biomechanics of cardiovascular tissue and blood flow](#)
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- 4) [Modelling and Meshfree Computation of Geophysical Mass Flows](#)
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- 5) [Geomechanics of carbon dioxide underground storage: numerical approach](#)
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- 7) [Thermodynamically consistent integration methods for dynamical \(thermo-\) elastoplastic problems](#)
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Electrical & Electronic Engineering

- 1) [Infrared and THz photonics: plasmonic and phononic metamaterials and sensor development](#)
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- 2) [Magnetic-free isolated power converters](#)
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Environmental Engineering & Energy

- 1) [Wastewater treatment by advanced oxidation processes: photocatalysis and electrochemical oxidation](#)
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- 3) [Soiling effect on solar panels, consequences in the energy production, and application to agrivoltaic systems](#)
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- 4) [Studies for the optimization of the photovoltaic power system of a grain mill](#)
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- 5) [Numerical simulation of air quality and interactions with climate](#)
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- 6) [Offshore Wind Energy. Floating structures: mooring line studies](#)
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- 7) [Offshore Wind Energy. Analysis of different types of fixed foundations](#)
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- 8) [Offshore Wind Energy. Scour protection and design expressions in monopiles foundations](#)
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- 9) [Development of additive manufacturing applications based on Laser Induced Forward Transfer processes](#)
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- 10) [Magnetic-field-stimulated concept to improve the photocatalytic and photoelectrocatalytic performance of \$N_2/NO_3^-\$ fixation towards \$NH_3\$ production](#)
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- 20) [Design and evaluation of urban rainwater management and treatment strategies](#)
Supervisor: Antonio Gascó & Daphne Hermosilla
Email: antonio.gasco@upm.es; daphne.hermosilla@upm.es
- 21) [Fluvial Landscape Impacts: Balancing Effects on Riparian Landscapes and Hydro-Electricity Production](#)
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22) [Intensification and evaluation of novel UV-C-based advanced technologies for water treatment](#)

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ICTs

Artificial intelligence and cognitive technologies

1) [Mobile robotics for gait analysis](#)

Supervisor: Alberto Brunete

Email: alberto.brunete@upm.es

2) [Drone autonomy in hazardous industrial environments](#)

Supervisor: Pascual Campoy

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3) [Intelligent therapeutic exergames](#)

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4) [Artificial intelligence and signal/image processing for biomedical and health applications](#)

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5) [Artificial intelligence and signal/image processing for the evaluation of neurodegenerative disorders](#)

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6) [Artificial intelligence and image processing for the evaluation of COVID-19 disease](#)

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7) [Complexity analysis of biomedical signals](#)

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8) [Radar technology for monitoring biomedical signs in biomedical and health applications](#)

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9) [Ontology certification](#)

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- 10) [Quality assessment of knowledge graphs](#)
Supervisor: Raúl García
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- 11) [Ontology-based policy interoperability](#)
Supervisor: Raúl García
Email: rgarcia@fi.upm.es
- 12) [Affective Computing for People-Centric IoT](#)
Supervisor: Andrés Otero
Email: joseandres.otero@upm.es
- 13) [Neuroevolutionary Algorithms and Neuromorphic Architectures](#)
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Email: joseandres.otero@upm.es
- 14) [Predictive and progression models for the diagnosis of neurodegenerative diseases](#)
Supervisor: Carlos Platero Dueñas
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- 15) [Computational Statistics and Stochastic Modelling](#)
Supervisor: José Mira & Javier Cara
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Electronic engineering and telecommunications technologies

- 1) [Future railway mobile communications system \(FRMCS\)](#)
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- 2) [Short-Range Wireless Communications \(SRWC\)](#)
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Contact: antonio.perez@upm.es; 微信: panyuan-2013
- 3) [Communications and Positioning in 5G Networks](#)
Supervisor: Supervisor: Antonio Pérez Yuste
Contact: antonio.perez@upm.es; 微信: panyuan-2013
- 4) [Spintronic nanodevices based on strain induced movement of magnetic domain walls in ferrimagnetic materials](#)
Supervisor: José Luis Prieto Martín
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- 5) [Development and implementation of Decode&Forward \(D&F\) Relay Node \(Layer 2\) using FPGAs in mmWaves](#)
Supervisor: José Ignacio Alonso Montes
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- 6) [Integrated Access Backhaul \(IAB\) Networks: Implementation of Small Cell in mmWaves using a SDR Platform](#)
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- 7) [2D & Graphene Solar Cells for Green Energy](#)
Supervisor: Javier Martínez Rodrigo
Email: javier.martinez@upm.es
- 8) [2D & Graphene Supercapacitors for Green Energy](#)
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- 9) [Nanomanipulation of nanomaterials with atomic force microscope \(AFM\) and scanning electron microscope \(SEM\)](#)
Supervisor: Javier Martínez Rodrigo
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- 10) [Acquisition and modelling of Nuclear Magnetic Resonance Dispersion Spectra](#)
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- 11) [Selective area growth by MBE of non-polar InGaN for optoelectronic applications](#)
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- 12) [Ultraviolet LEDs based on non-polar AlGaIn grown by MBE](#)
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- 13) [Straintronics and Piezotronics in 2D Materials using Surface Acoustic Waves](#)
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Human-computer interacion

- 1) [Human digital markers for improving the interaction between humans and machines](#)
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Internet of Things (IoT)

- 1) [Edge-Cloud Orchestration and Collaborative Resource Management in Internet of Things](#)
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Open Hardware and Novel Processing Architectures

- 1) [RISC-V based Adaptable Systems-on-a-Chip](#)
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2) [Reconfigurable Domain-Specific Processor Architectures](#)

Supervisor: Alfonso Rodríguez

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Software engineering and applications software

1) [Lifespan estimation of insulation systems used in electrical assets](#)

Supervisor: Ricardo Albarracín

Email: ricardo.albarracin@upm.es

2) [Intelligent therapeutic exergames](#)

Supervisor: Martina Eckert

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Email: felipe.gabaldon@upm.es

4) [Solving Combinatorial Problems though Reinforcement Learning](#)

Supervisor: Álvaro García

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Spintronics

1) [Designing magnetic nanowires for racetrack storage device](#)

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Industrial Management

1) [Flexible manufacturing systems optimization](#)

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2) [Solving Combinatorial Problems though Reinforcement Learning](#)

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3) [Computational Statistics and Stochastic Modelling](#)

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4) [Societal transitions and systemic innovations](#)

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Materials Engineering

- 1) [Lifespan estimation of insulation systems used in electrical assets](#)
Supervisor: Ricardo Albarracín
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- 1) [Infrared and THz photonics: plasmonic and phononic metamaterials and sensor development](#)
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- 3) [Microfluidics-based devices for mechanical characterization of living cells and biological applications](#)
Supervisor: Gustavo R. Plaza
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- 4) [Metasurfaces based on bidimensional materials](#)
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- 5) [2D & Graphene Solar Cells for Green Energy](#)
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- 6) [2D & Graphene Supercapacitors for Green Energy](#)
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- 7) [Nanomanipulation of nanomaterials with atomic force microscope \(AFM\) and scanning electron microscope \(SEM\)](#)
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- 8) [Molecular Simulation of Self and Directed Organization of Complex Systems based on Polymers](#)
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- 9) [Designing magnetic nanowires for racetrack storage device](#)
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- 10) [Theoretical prediction of liquid-liquid phase separation in protein solutions and prevention of ageing in condensates](#)
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- 11) [Laser Post-Processing of Metal Parts Produced by Additive Manufacturing](#)
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- 12) [Magnetic-field-stimulated concept to improve the photocatalytic and photoelectrocatalytic performance of \$N_2/NO_3^-\$ fixation towards \$NH_3\$ production](#)
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- 14) [Valorization of olive oil industry wastes towards green hydrogen production](#)
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Email: aj.dossantos@upm.es
- 15) [Laser processing of materials for energy storage](#)
Supervisor: Carlos Molpeceres
Email: carlos.molpeceres@upm.es
- 16) [Development of advanced electrochemical dual function materials for \$CO_2\$ capture, storage and conversion into methanol](#)
Supervisor: Ángel Caravaca
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- 17) [Nanomaterials with photocatalytic and electrocatalytic activity for water treatment](#)
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- 18) [Selective area growth by MBE of non-polar InGaN for optoelectronic applications](#)
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- 19) [Ultraviolet LEDs based on non-polar AlGaIn grown by MBE](#)
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- 20) [Ultracold atomic gases](#)
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- 21) [Geometry of atomic and molecular systems](#)
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Mechanical Engineering

- 1) [Microfluidics-based devices for mechanical characterization of living cells and biological applications](#)
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- 2) [Storage and discharge of bulk solids in bins and hoppers](#)
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Mechatronics

- 1) [Mobile Robotics for Gait Analysis](#)
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- 2) [Drone autonomy in hazardous industrial environments](#)
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Operations Research and Operations Management

- 1) [Behavioural Operations Research](#)
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- 2) [Mathematical Programming and Simulation in Production and Logistics](#)
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- 3) [Mathematical Programming and Simulation in Production and Logistics](#)
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- 4) [Solving Combinatorial Problems through Reinforcement Learning](#)
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- 5) [Implementation of transport algorithms in FlexSim simulation software](#)
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Physics

- 1) [Designing magnetic nanowires for racetrack storage device](#)
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Raw Materials

- 1) [Advanced hydrometallurgical processes for the recovery of metals from refractory sulphides and wastes](#)
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Sport Sciences

- 1) [Intelligent therapeutic exergames](#)
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- 2) [Models of social projection of physical and sports activities, education through sport \(school and after-school programs\), evaluation in physical education](#)
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- 3) [The role of maturation in youth sport: the concept of bio-banding](#)
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- 4) [Acute effects and chronical adaptations to physical activity in women with multiple sclerosis throughout the menstrual cycle](#)
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- 5) [Influence of apnea duration during underwater swimming on the perceptive, biomechanical and physiological parameters of elite swimmers. Effect of moderate hypoxia. \(U-SWIM\)](#)
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- 7) [Football performance](#)
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- 8) [Psychological and motivational processes within the physical education setting](#)
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- 9) [Individualized physical activity](#)
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- 10) [Coach leadership](#)
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Transportation Engineering

- 1) [Sustainability impact assessment of micro mobility systems](#)
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- 2) [Impact of the growth of e-commerce on urban mobility patterns](#)
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- 3) [Channel Modeling Propagation inside of Wagon Railways, Buses and Cars in Millimeter Bands](#)
Supervisor: José Ignacio Alonso Montes.
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- 4) [Developments of 5G Systems in Millimeter Bands in Railways Scenarios: Application to Channel Modeling Propagation and Virtual Coupling](#)
Supervisor: José Ignacio Alonso Montes.
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- 5) [Aerodynamic and aeroacoustic optimization of critical parts of high-speed trains](#)
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