

PhD hosting offer for 2023 FPU grants program at SpecLab-CSIC

The Environmental Remote Sensing and Spectroscopy Laboratory (SpecLab) of the Spanish National Research Council (CSIC) is looking for M.Sc. students and graduates interested in performing Ph.D. on the topic of remote sensing and vegetation properties and biodiversity (see details below)

Please, send your CV and a short motivation letter to mpilar.martin@csic.es and javier.pacheco@csic.es

Submission deadline: 15/02/2024

HOST and PROGRAMME

Host group: Environmental Remote Sensing and Spectroscopy Laboratory (SpecLab), Spanish National Research Council (Albasanz 26-28, 28037 Madrid)

- Website: <https://speclab.csic.es>

Thesis co-supervisors: M. Pilar Martín and Javier Pacheco (SpecLab-CSIC), Rosario González (INIA-CSIC)

Funding: 2023 FPU programme, Spanish Ministry of Science and Innovation

- Website: <https://www.universidades.gob.es/ayudas-para-la-formacion-de-profesorado-universitario-fpu-2023/>

Duration: 4 years (except if it is a candidate person with a disability, in which case the grant may last for six years, in accordance with article 21 c) of Law 14/2011, of June 1, on Science, Technology, and Innovation)

Ph.D. PROJECT

Title / Subject: Exploring the links between spectral and functional diversity to monitor ecosystem functioning in semi-arid grasslands

Research Field: Environmental remote sensing

Keywords: Biodiversity, grassland, proximal sensing, satellite, ecosystem functioning

Subject:

The Ph.D. project will build on the research project Diverspec-TGA: Emerging trends in adaptive management of tree-grass agroecosystems: exploring the links between spectral and functional diversity to monitor ecosystem functioning.

Biodiversity is crucial to ecosystem function, influencing productivity and resilience to disturbance. With the advent of new missions, biodiversity has become a hot topic since these could enable cost-efficient monitoring that supports decision-making and conservation. Remote sensing is developing new ways to quantify and monitor plant biodiversity from space. However, there are still relevant knowledge gaps in this emerging field that a Ph.D. project could tackle.

SpecLab-CSIC, in collaboration with INIA and other national and international research institutions, has led innovative remote sensing science in the context of Mediterranean savannas or *dehesas* since 2009. The laboratory combines field and drone measurements, remote sensing data, radiative transfer models, and statistical approaches to improve the characterization of *dehesas*' vegetation properties, functions, and diversity from space.

Plant properties and biodiversity quantification in *dehesa* ecosystems are particularly challenging due to spatial heterogeneity, high grass species richness, and vegetation structure. The Ph.D. project would advance knowledge in this topic while providing the candidate with a deep understanding and experience in measuring, processing, and modeling. The project develop within an international context that would enlarge the candidate's network and future opportunities.

The candidate is expected to (i) conduct fieldwork in SpecLab study sites in Spain, including proximal sensing and canopy/soil analyses, (ii) analyze proximal (field/drone/airborne) and satellite spectral information, and (iii) develop new methods to quantify *dehesas* vegetation biodiversity.

APPLICANT PROFILE

We seek a highly motivated Ph.D. student interested in working in an interdisciplinary context.

Candidates must fulfill the requirements of the FPU grants programme (see <https://www.universidades.gob.es/ayudas-para-la-formacion-de-profesorado-universitario-fpu-2023/>).

The candidates should also:

- Have a good academic record
- Demonstrate English oral and written communication skills
- Be willing and able to participate in fieldwork campaigns and laboratory analyses
- Have a background or knowledge in plant sciences and a strong interest in remote sensing
- Non-Spanish-speaking candidates are expected to acquire basic Spanish communication skills within the first few months after starting the position.
- Programming skills with high-level languages (Python, Matlab, R, etc.) will be additionally valued.