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HR EXCELLENCE IN RESEARCH

PREDOCTORAL RESEARCHER FOR STOIKOS PROJECT (AN ERC-STARTING GRANT) (ref. 23-050-61825)

CREAF is seeking between 1 and 3 students* for the [STOIKOS](#) project (Elemental ecology: towards an element-based functional ecology, reference: 101076740 — STOIKOS — ERC-2022-STG funded by the *European Research Council*).

*Between 1 and 3 students depending on the suitability of the candidates to the chosen topics and their CVs.

The project aims to investigate whether the elemental composition of organisms relates to ecosystem functioning, and whether ecosystem elemental diversity predicts ecosystem functioning better than traditional metrics of diversity. The candidate will join the Elemental Diversity and Macroecology research team (<https://elemdiv.netlify.app/>), a multidisciplinary working team using observations, experiments and theoretical modelling to answer our scientific questions. The candidate will benefit from the training and career development opportunities offered through our research team and CREAF, exposure to international research and interaction with other national and international collaborators.

This contract is envisaged to start in October/November 2023, but by accepting this offer it will be understood that the candidates agree to request their own financing through predoctoral grants such as FI, FPU or LaCaixa..., and during the period of this contract, which will last for at least 3 years and with a possible 4th year financed in the event that this period is not covered by the predoctoral grant obtained. The salary offered (gross) is established by the *RD EPIF (Real Decreto 103/2019, de 1 de marzo, por el que se aprueba el Estatuto del personal investigador predoctoral en formación)*:

- **1st and 2nd years** (12 months): 56% of €31,520.86* = **€17,651.68 each year.**

- **3rd year** (12 months): 60% of €31,520.86* = **€18,912.51.**

- **4th year** (12 months): 75% of €31,520.86* = **€23,640.65.**

*Salary from Group 1 (M3) of the salary table from the *Convenio colectivo único para el personal laboral de la Administración General del Estado*.

CURRENTLY AVAILABLE RESEARCH LINES (POSITIONS)

All research lines include some tasks that are already defined, and some that are subject to change in accordance with the expertise/interests of the candidate.

1. *Assessing elementome shifts, competition and the role of elemental diversity using experimental microcosms using bryophytes*

This project will perform microcosm experiments using bryophytes in which we will place different species together and on their own, to test whether their elemental composition and functional traits shift when they compete for resources. The PhD will consist of 2 different experiments and the analyses of an already existing database of bryophyte elemental composition in spring ecosystems.



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2. *Establishing the link between organism functioning and elemental composition across and within species*

This project will engage in a large-scale field campaign to sample a wide array of organisms, including trees, shrubs, herbs, bryophytes, lichens and arthropods from which we will analyse their functional traits and elementomes to investigate their correspondence across species. We will also perform experiments to investigate how changes in environmental conditions may induce changes in traits and elementomes in order to study their joint plasticity. This PhD will also collaborate with the [E-TRAITS](#) project.

3. *Beyond natural ecosystems: elementomes, elemental diversity and crop performance*

This project will aim to investigate how integrating the concept of elementomes and elemental diversity in agriculture can help our crops improve their yields, stability and other desirable services (e.g., soil carbon sequestration). The candidate will build a new agricultural dataset including information regarding the elemental composition of crops and measures of performance. They will also analyse an already existing dataset from an agricultural experiment to investigate how the elemental composition of crops determines their traits. The PhD may also be involved in performing one experiment in the field.

4. *Modelling elementomes and elemental diversity effects on ecosystem functioning, niche differentiation and evolution*

This project will build our own theoretical models and use integral projection models based on inventory data in order to investigate ecosystem-level properties derived from the interaction of organisms with different elementomes. Our theoretical models will be used to test i) the effect of biodiversity on ecosystem functioning at different levels of elemental diversity, ii) intra- and interspecific competition and shifts in the elementomes and iii) how functional temporal complexity changes depending on (i) and (ii). The PhD project will be mainly focused on theoretical ecology, but acquiring experimental data will be needed in order to support theoretical models.

5. *Investigating the drivers of destabilisation of natural ecosystems*

Global change is putting all types of ecosystems under increased stress. There is good evidence indicating that increasing stress due to climate change, altering the nutrient cycles and losing biodiversity will reduce the capacity of ecosystems to withstand disturbances, increasing their variability and reducing their resilience. However, whether ecosystems are becoming more unstable due to global change and which are the drivers of ecosystem variability and resilience remain elusive. This PhD project will consist of the analysis of local, regional and global datasets, based on long-term monitoring sites, experiments and remote sensing and other global gridded datasets, in order to answer the question of whether global change is destabilizing terrestrial ecosystems and to investigate the drivers of ecosystem variability and resilience. Similar analyses have been performed in this [Nature](#) paper of the EDM team.



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TASKS

- Coordinate field campaigns across Catalonia, Spain and Europe.
- Compile and analyse big datasets of ecosystem functioning and elemental composition.
- Write scientific articles according to the objectives.
- Contribute to the main objectives of the research team, including field work and projects of other members.

REQUIREMENTS

- BSc and MSc (or equivalent) in Environmental Sciences, Biology, Environmental Biology, Mathematics, Physics or similar.
- Meet the requirements to be accepted for a PhD training program at the [Universitat Autònoma de Barcelona](#) or at the [Universitat de Barcelona](#).
- Experience and interest in ecological research (e.g., BSc or MSc theses).
- Willingness to collaborate in projects from other team members.
- Excellent oral and writing communication skills.
- Advanced knowledge of statistics and programming in R.
- High level of English, both spoken and written. Catalan and Spanish highly recommended.

ASSESSABLE CONDITIONS

- Participation in scientific publications (first-author will be strongly valued).
- Ability to work as a team and independently.
- Mean BSc and MSc score above 8 (out of 10). If you are a non-Spanish student, please, calculate your equivalent grades following the information in these webpages (some only in Spanish, sorry): To do so, please, visit these webpages:
 - o https://universidades.sede.gob.es/pagina/index/directorio/Equivalencia_notas_medias/language/en
 - o <https://www.universidades.gob.es/equivalencia-de-notas-medias-de-estudios-universitarios-realizados-en-centros-extranjeros>
 - o https://www.universidades.gob.es/wp-content/uploads/2023/01/Guia_informativa_Declaracion_Equivalencia_Nota_Media_2022.pdf
 - o https://www.universidades.gob.es/wp-content/uploads/2022/12/ANEXO_II_INSTRUCCIONES.pdf
- Candidates who have a recognized disability and accredited equal to or greater than 33% will be prioritized, as long as the disability is compatible with the proper performance of the job.
- Driving license.
- Availability to travel for field work.
- Recommendation letters.

SELECTION PROCESS AND CRITERIA

1. Applicants will have to submit: **1) their CV in English, 2) a cover letter (maximum 500 words, also in English, specifying which line(s) of research the candidate is interested in), 3) two recommendation letters from professors or researchers and, 4) the questionnaire attached to the offer (filled), to laboral@creaf.uab.cat until **September 30th, 2023**, indicating the reference code of the offer.**
2. **Pre-selection:** determination of compliance with the minimum requirements of the offer.

CREAF. Campus UAB. Edifici C 08193 Cerdanyola del Vallès (Barcelona)

Tel. + 34 93 581 46 72 laboral@creaf.uab.cat www.creaf.cat | blog.creaf.cat



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3. **Selection:** assessment of the preselected candidates by scoring based on objective criteria. The candidates presenting the highest scores will be invited to a physical or remote *interview and a test of general skills and knowledge about the chosen line of research* (depending on the residence of the candidate).
4. Final decision: in case of finding the suitable person, the election will be formally communicated to him/her, and the identification of the chosen person will be published on CREAM job openings section.
5. For informal enquiries, please, contact Dr. Fernández-Martínez: m.fernandez@creaf.uab.cat.

