

## OPEN CALL FOR THE AFFILIATION OF PIs TO CRETUS

The Centre for Cross-disciplinary Research in Environmental Technologies (CRETUS) has been recently created by the University of Santiago de Compostela (USC) as part of the network of its singular research centres, which are driven by excellence science and the provision of new knowledge and technological advanced for relevant societal and economic challenges. The mission in CRETUS is to foster strategic research plans on the *conception, development and evaluation of environmental technologies under a circular economy approach*. This is achieved through the development of economically, socially and environmentally sustainable processes under a multi-disciplinary frame, for the treatment and recovery of resources from wastes, wastewater, soil and gaseous emissions.

The Centre is open to researchers that work on relevant environmental issues, from different perspectives and thematic areas, such as Biology, Chemical Engineering, Chemistry, Economics, Environmental Law, Physics and Social Psychology applied to environmental issues. The opportunity at CRETUS is to integrate these capacities to address more ambitious environmental challenges under a holistic perspective, including: a) DIAGNOSIS – Evaluating, measuring and understanding their dimension; b) TECHNOLOGIES AND METHODOLOGIES – Conceiving proper scientific-technological solutions for preventing or treating environmental pollution, proposing new processes, tools and methodologies and; c) IMPACTS – Assessing the proposed solutions under an environmental, economic and social impact. The development of such strategy requires the promotion of collaborative and multi-disciplinary projects, in order to synergistically advance towards competitive and high-quality research.

## RESEARCH AGENDA

CRETUS is open to a broad range of scientific and technological activities with an environmental scope, including: Advanced Wastewater Treatment and Resource Recovery; Soil Remediation and Monitoring; Waste Valorisation and Treatment, including Biorefinery for value added by-products; Biodiversity Monitoring; Data Management and Modelling; Advanced Chemical and Biological Analysis of Environmental matrixes; Circular Economy; Environmental and Risk Assessment; Social Perception and Engagement; Environmental Law and Policy Guidance.

The research agenda is structured in the following 5 areas: 1) Water cycle management; 2) Sustainable management of soils; 3) Waste management and valorisation; 4) Air pollution monitoring and control and 5) Sustainable production - Environmental, economic, social and legal assessment of innovative processes and production models.

As an example, but not limited to, some of the research topics that are of interest in the research agenda are presented below.

### 1) Water cycle management

CRETUS has a technological orientation and is interested in the development of advanced processes for the treatment and post-treatment of wastewater. The target can be the removal of nutrients and/or emerging pollutants, as well as the recovery of resources (including water for reuse). Related to diagnosis, capabilities in analysis of biological diversity, ecotoxicology and chemical/biological quality of continental and marine waters are welcome. Skills related to the modelling, optimization and control of processes are of interest at different scales. This can include mechanistic and empiric models simulating from unit technologies up to an integrated water cycle.

## *2) Sustainable management of soils*

Research interests include the analysis and treatment of polluted soils with processes based on the use of enzymes, phytoremediation or technosols. The study of the behaviour and evolution of soils under different environmental conditions and influenced by extreme events (e.g., fire, global warming, etc.) is included, based biogeochemistry skills. This can be complemented with studies on sustainable land planning based on the suitability of soil properties for different environmental purposes. The knowledge advances on the nexus between water-soil- vegetation- climate qualities are important to understand global environmental problems (e.g., soils as terrestrial carbon sink; effects derived from the use of biofertilizers, etc.).

## *3) Waste management and valorisation*

Innovation on technologies that facilitate the transition from a lineal towards a circular economy model in any productive sector that generates important amounts of wastes is targeted. Zero-waste pollution and biorefinery concepts can be applied to wastewater and waste treatment in a wide range of chemical and biological processes: the recovery of biopolymers (PHB), the selective VFA production, yielding sugar from lignocellulosics, the extraction of added-value products from natural compounds, the production of organic fertilizers, etc.

## *4) Air pollution monitoring and control*

This comprises the development of new technologies for the monitoring of air quality based on biological or physico-chemical processes (e.g., mosses for air quality biomonitoring; waveguide slot linear array antennas to monitor particulate matter pollution). Furthermore, the development of models with different approaches is included in this area. This includes the atmospheric modelling of pollutants that allows analysing the geographic impact of certain industrial and urban activities. Climatic models provide a broader perspective on how extreme events, such as fires, floods or global warming, cause important environmental damage.

## *5) Sustainable production*

Innovation in CRETUS is committed with moving towards circular economy models and sustainable development. Sustainability is targeted in both, productive and waste/wastewater management processes. Strategies for the design of clean productive processes, aligned with eco-innovation and eco-design principles should be proposed. The new waste and wastewater treatment technologies conceived need to be assessed in terms of environmental and economic sustainability. Life Cycle Assessment, Life Cycle Costing and Risk Assessment are methodologies that could be used to evaluate such impacts.

CRETUS goes even one step further in assessing the impacts of the developed processes, by studying the applicable social and legal barriers. Actions to foster innovation include social engagement activities, as well as the generation of new business models and policies.

## **GOVERNANCE**

The Centre follows the principles of. 1) Competitive selection of the PIs and continuous evaluation by an External Scientific Advisory Board; 2) Strategic planning and monitoring; 3) Governance structure based on Scientific directorship and Knowledge, Talent and Innovation committees; 4) Professional management of the Center's R&D activity.

## AFFILIATION PROCESS OF PIs TO CRETUS

Researchers who intend to be appointed as Principal Investigators (PIs) in CRETUS should meet standards of excellence and scientific competence that will lead the Center at the forefront in the field of environmental science and technology.

**Strong commitment with leadership in research projects at national and international level, as well as a high scientific or technological impact,** are the key factors to push such a singular research strategy forward.

Researchers aiming at applying for membership should demonstrate that their activity is aligned with the CRETUS research agenda and strategy.

Researchers who aspire to be affiliated to CRETUS are **permanent staff of the USC holding positions of Professor or Associate Professor**, who prove compliance with indicators classified into 3 major scientific criteria: **Excellence, Contributions and Leadership**, for a time horizon of 2015-2020.

If you perform research in line with the CRETUS agenda and you are convinced that performing collaborative activities in a multidisciplinary team can enhance your professional development, please fill in the **expression of interest** enclosed below. Additionally, a **summarized CV** has to be enclosed in the application.

**EXPRESSION OF INTEREST to become a member of the CRETUS Centre**

***Cross-disciplinary Research in Environmental Technologies***

**NAME:**

**AFFILIATION (Department and Faculty):**

**CURRENT POSITION:**

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**I. Scientific background**

(Summary of research outputs, max. 300 words. Please focus on the items that will be evaluated according to annex I.)

**II. Alignment with the CRETUS Research Agenda**

(Short description on how your research helps to develop the agenda of the Centre, max. 300 words)

**III. Project**

(Short description of the research project/s that you would develop at the Centre, max. 300 words)

## ANNEX I. Criteria for the affiliation of PIs to CRETUS

The indicators are classified into 3 major scientific criteria: **Excellence, Contributions and Leadership, corresponding to the period 2015-2020**. For each of the 3 main criteria, at least one item must be clearly demonstrated.

However, considering the distinctive feature of CRETUS as a multidisciplinary pole of attraction for researchers from experimental/engineering sciences (e.g., chemistry, physics, biology, chemical engineering) and social sciences (e.g., psychology, economics, law), it is necessary to adapt the requirements to consistently evaluate different academic profiles. In particular, for Social Science researchers, the fulfilment of criteria 1.1 and 1.2 does not apply because the publication impact indicators specified are mainly based on SCI journals, and the scientific dissemination of Social Science researchers does not always strictly fit this pattern.

### *1.- Scientific Excellence*

- 1.1. A Field-Weighted Citation Impact (FWCI) of at least 1.2 must be accredited.
- 1.2. Research papers should preferably be published in high impact journals within their respective thematic areas. This can be demonstrated with a minimum of 65% of papers in journals positioned in the first quartile (Q1) or 35% in the first decile (D1).
- 1.3. Any other quantifiable indicator for non-SCI publications aiming at evaluating scientific excellence, namely for Social Science researchers.

### *2.- Scientific contributions.*

- 2.1. The publication of at least 15 papers must be undertaken including those in SCI journals or international book chapters.
- 2.2. Be author or editor of at least 1 book issued by a prestigious publisher in the respective fields of research.

### *3. Scientific leadership and Technology transfer.*

- 3.1 Be PI of an international research project (note that international refers to the evaluation and consortia, not to the funding agency) or 2 national research projects funded by competitive calls (projects related to the purchase of infrastructure or regional funding of strategic group activities are excluded).
- 3.2 A significant transfer of knowledge to the social and/or productive areas must be accredited (e.g., relevant contracts with companies, patent licensing, creation of spin-offs, ...).
- 3.3 Be supervisor of two Doctoral Theses during the period of reference.

Please, note that those researchers who are not recommended for affiliation may be listed as Collaborating Researcher within the PI group with whom they are conducting research.