**Doctoral Training Programme in Functional Advanced Materials (DOC-FAM)**

DocFam+ (DOCtoral training programme in Functional Advanced Materials: Towards a Better Future) is a new doctoral programme for the recruitment of 26 excellent doctoral researchers led by the Institute of Materials Science of Barcelona (ICMAB-CSIC).

DocFam+ is a unique interdisciplinary and intersectorial research programme. We offer excellent salaries and international experience through secondments. The complete training programme includes annual workshops, a career development retreat and industry days, among others.

More information: https://docfam.icmab.es/

## Job Title: PhD Student - Synthesis of new porous materials via photocleavage of MOFs and COFs

**Description of the project/group:**

Throughout history, innovations in chemical synthesis have yielded new molecules and materials that were once inaccessible, leading to significant improvements in human life, ranging from simple chemicals to complex functional materials. In this context, our inspiration behind this research project is the desire to demonstrate that a recently developed synthetic method by my research group, based on orthogonal bond cleavage and termed Clip-off Chemistry (currently being developed through an ERC Advanced Grant), can be extended using photocleavage reactions. This extension can be utilized to synthesize new porous materials that are not only novel but would also be very challenging - and in some cases impossible - to synthesize using current methods.

The aim of this project is to expand our synthetic approach to utilize light (photocleavage reactions) for controlling bond cleavage at the molecular scale, enabling the synthesis of a new family of porous organic and metal-organic materials. Subsequently, we will investigate the capacity of these newly synthesized porous materials to adsorb gases (e.g., $CO_2$ and $CH_4$) or eliminate pollutants.

Our Group's research interests are focused on controlling the assembly -Supramolecular Chemistry- of molecules, metal ions and nanoparticles for the creation of functional nanostructured materials -Nanotechnology- with empty spaces; and use them to encapsulate, store, separate, react and deliver molecules of interest. Specifically, our main contributions are in the fields of nanoporous Metal-Organic Frameworks (MOFs), Covalent-Organic Frameworks (COFs), Metal-Organic Polyhedra (MOPs) and Delivery Systems for applications in myriad areas, including Energy, Catalysis, the Environment, Encapsulation, and Life Science. Within the last years, the group has published more than 50 scientific papers in prestigious international journals (Chem. Soc. Rev., Nature Chemistry, Nature Communications, Adv. Mater., JACS, Angew. Chem. Int. Ed., among others).

**Principal responsibilities:**

The **Supramolecular NanoChemistry and Materials Group (NANOUP)** is focused on controlling the assembly -Supramolecular Chemistry- of molecules, metal ions and nanoparticles for the creation of functional nanostructured materials -Nanotechnology- with empty spaces; and use them to encapsulate, store, separate, react and deliver molecules of interest. Specifically, our main contributions are in the fields of nanoporous Metal-Organic Frameworks (MOFs), Covalent-Organic

Frameworks (COFs), Metal-Organic Polyhedra (MOPs) and Delivery Systems for applications in myriad areas, including Energy, Catalysis, the Environment, Encapsulation, and Life Science.

The group is looking for a PhD student to study the synthesis of new porous materials via photocleavage of MOFs and COFs.

During the PhD, the candidate will acquire a great experience in supramolecular and reticular chemistry and nanotechnology (nanochemistry), as well as in the use of a wide range of characterization techniques. The candidate will develop her/his thesis in excellent scientific infrastructures, highly international atmosphere and will count with the expertise of NANOUP team (please, visit our group at www.nanoup.org)

**Education:**

- Bachelor's degree in Chemistry, Nanotechnology or Materials Science.
- Master in Chemistry, Materials Science or Nanotechnology.

**Experience:**

- Organic and/or coordination chemistry.

**Competences:**

- Intrinsic motivation, strong commitment, fluent in English, good communication skills, responsibility, independence.

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