

## Expression of Interest

### Contact Person/Scientist in Charge

- **Name and surname:** Joaquin Silvestre Albero
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### Universidad de Alicante

### Department / Institute / Centre

- **Name of institution:** Advanced Materials Laboratory, Inorganic Chemistry Department
- **Address:** Carretera Alicante - San Vicente
- **Province:** Alicante

### Research Area

- Chemistry (CHE)

### Brief description of the institution:

The University of Alicante (UA) was created in 1979. Today it educates and trains more than 36.000 students -2.500 of them are international students - and offers more than 80 undergraduate and 96 postgraduate programmes: consequently it is proportionally one of the fastest growing universities in Spain. The UA houses 227 research groups in Social and Legal Sciences, Experimental Sciences, Technological Sciences, Human Sciences, Education and Health Sciences and 15 Research Institutes (Water & Environment, Materials, Electrochemistry, Biodiversity, Chemical Processes and Organic Synthesis, and Modern Languages, among others). Thus, the UA employs over 2.400 researchers/ professors and has a complex management /administration structure of 1.300 people, which involves an annual budget of 175 million Euros.

UA is a young and dynamic university with vast experience in implementing EU funded projects in different programmes and areas, with presence in more than 60 countries worldwide. In the last 10 years, UA has successfully acted as coordinator of many Tempus, Alfa, Edulink projects involving Third Countries and Lifelong Learning and Framework Programme (FP, DG Research) Projects. Moreover, the participation in FP has been increasing in the last years, taking part in 25 5th FP, 26 6th FP, 45 7th FP projects (13 of them coordinated by UA), and 6 in H2020.

It is worth underline the big effort performed by UA in order to meet the commitment with the principles set out in the European Charter for Researchers and in the Code of Conduct for the Recruitment of Researcher

### **Brief description of the Centre/Research Group:**

The LMA group at the University of Alicante has more than 40 years of experience in the synthesis and characterisation of nanoporous materials. All this research has been reflected in more than 400 publications in international journals.

The research interest of the host group (Prof. Joaquín Silvestre-Albero) is directed towards the design of new porous materials and the understanding of their structural/adsorption performance under operando conditions. These include the evaluation of structural phenomena such as gate-opening, breathing ability, etc. The understanding of these processes is crucial to understand their subsequent performance in gas/liquid adsorption/separation processes. Furthermore, the host group also works in the evaluation of these nanoporous 3D systems for drug delivery and advanced nucleation processes.

This research is reflected in more than 140 publications in high-impact factor journals such as Nature Materials, Nature Communications, etc. The research group has its own facilities for the synthesis of nanoporous materials, and their subsequent evaluation in gas adsorption at atmospheric and high-pressure, immersion calorimetry, liquid-phase adsorption/delivery, etc. In addition, the group has access to the general equipments of the University, including XPS, Raman, TEM, SEM, etc. Last but not least, the group is frequent user of neutron and synchrotron large facilities required to complement the characterisation processes described above. The host group is actually participating in different national and international project (actually is coordinator of the H2020-NanoMed project), and also in industrial projects.

<https://web.ua.es/es/laa/>

### **Project description:**

The potential candidate will participate in the synthesis and characterisation of nanoporous materials (carbon materials, zeolites and MOFs) and their application in industrial relevant processes. Among the different applications to be evaluated, gas/liquid adsorption/delivery are the most widely investigated by the host group (e.g., methane storage, CO<sub>2</sub> capture, hydrocarbon adsorption/separation, drug delivery, etc.). The main goal of the host group is the understanding of the adsorption performance under operando conditions, including structural phenomena upon an external stimulus. To this end, the use of large facilities (neutron scattering and synchrotron XRD) is of paramount importance to complement the conventional lab scale experiments. The combination of these techniques allows understanding the adsorption/separation process from the molecular scale (including molecular dynamics) to the macroscopic performance under real industrial conditions.

### **Applications**

CV and Letter of motivation  
Deadline 01 September, 2019