

1. Interested institution:

Universitat Politècnica de Catalunya · BarcelonaTech (UPC)

C. Jordi Girona, 31
08034 – Barcelona
Espanya

<http://www.upc.edu>

2. Brief Description of the Institution

The **Universitat Politècnica de Catalunya · BarcelonaTech (UPC)** is a public institution dedicated to higher education and research, specialised in the fields of **engineering, architecture and science**.

In a highly creative context, the UPC's research, teaching and management projects are based on the principles of **freedom, justice, democracy, solidarity, cooperation, sustainability, efficiency, transparency and social responsibility**. They also reflect the **University's commitment to the environment and to change**.

With a focus on intellectual rigour, critical thinking, a cross-disciplinary approach to knowledge, educational innovation and entrepreneurship, the UPC produces competent professionals with the skills they need to tackle present and future challenges.

The activity that goes on at UPC campuses and schools has made the University a benchmark institution. The University harnesses the potential of basic and applied research, and transfers technology and knowledge to society. These actions make the UPC—in partnership with industry—an **agent and driver of economic and social change**.

The UPC puts its scientific and technological infrastructure at the service of research groups and centres, researchers and students, professionals, companies and institutions.

As a leading member of international networks of excellence, the UPC has a privileged relationship with global scientific and educational organisations. As a result, the University is at an advantage when it comes to **attracting international talent**.

3. Please tick the areas of research (as established in Marie Skłodowska Curie Actions)

- | | |
|---|---|
| <input type="checkbox"/> Chemistry (CHE) | <input type="checkbox"/> Environmental Sciences and Geology (ENV) |
| <input type="checkbox"/> Social Sciences and Humanities (SOC) | <input type="checkbox"/> Life Sciences (LIF) |
| <input type="checkbox"/> Economic Sciences (ECO) | <input type="checkbox"/> Mathematics (MAT) |
| <input checked="" type="checkbox"/> Information Science and Engineering (ENG) | <input type="checkbox"/> Physics (PHY) |

4. Research / Project Description

As a continuation of its activities, the Fuel Cells Group of the Institut de Robòtica i Informàtica Industrial presents this project aimed at the improvement of PEM fuel cell based systems.

The main current topic of the Fuel Cell Group is to obtain PEM fuel cell based systems that operate in optimal and lasting conditions. Being the Fuel Cells Group within the Automatic Control department, its contributions are mainly in the fields of dynamic modeling and control. Models and controllers developed by the group have been tested through simulation, but also implemented and validated experimentally. This is done in the group's Fuel Cells Laboratory, equipped with five workstations. The scope of the studied systems goes from single cells to complete generation systems, and considered applications are either automotive or stationary.

As deeper knowledge has been acquired about fuel cells, new control objectives have been proposed. However, we think that operation can still be improved to increase efficiency and durability and the plans of the group are to keep on designing model based controllers that take into consideration all relevant physical phenomena and their interaction. Therefore, the objective of this project is to design and implement new controllers that take into account chemical, electrochemical, transport and thermal aspects of PEMFC.

What we expect from the applicant doctor is a deep knowledge of the phenomena inside a PEM fuel cell that helps to better understand the different effects on efficiency and degradation. The project will be developed in collaboration with the hosting group and according to three main stages. First, obtaining detailed models which describe these phenomena in order to determine new control objectives for the improvement of the fuel cell based systems performance. The second step will be the design and implementation of new control schemes, and finally, the third step will consist of the controller experimental validation.

<http://www.iri.upc.edu>

http://www.iri.upc.edu/research/automatic_control

“EXPRESSION OF INTEREST” FOR HOSTING MARIE S. CURIE FELLOWS IN SPANISH INSTITUTIONS (CALL MSCA IF 2015)

5. *Who can apply?*

At the deadline for the submission of proposals (10/09/2015), researchers (*):

- shall be in possession of a doctoral degree or have at least four years of full-time equivalent research experience.
- must not have resided or carried out their main activities in the country of Spain for more than 12 months in the 3 years immediately prior to the abovementioned deadline.

6. *Contact person*

Ramon Costa Castelló; e-mail address: ramon.costa@upc.edu
Maria Serra Prat; e-mail address: maserra@iri.upc.edu

7. *Applications: documents to be submitted and deadlines*

CV with scientific references
Motivation letter

Please note that:

- Deadline of the next call for proposals for Marie Skłodowska – Curie Individual Fellowships is **September, 10th 2015**.
- Oficina Europea is only responsible for the display of the expressions of interests received by the institutions; further contact and information requests will take place directly between the host institutions and the interested researchers.

(*) Further details on the Call and additional eligibility criteria can be found at the [Participants' Portal](#)