LaCaixa 2020 PhD Position @BCAM

Project title / Job position title:

Computational Mathematics

Research Project / Research Group Description. max. 2,000 characters

PhD position in Computational Mathematics

- **Objective:** To develop new mathematical methods, robust numerical schemes and software to solve complex and large-scale challenging real-life problems on massively parallel computers.
- **Applications:** Characterisation of the Earth’s subsurface composition for CO2-sequestration and oil or gas extraction; CFD applied to biomedicine, meteorology, oceanography, aeronautics, naval architecture, acoustics and turbomachinery.

Specific research PhD project thesis:

- **Deep Learning for the Inversion of Geophysical Measurements.** Advisor: D. Pardo. The student will develop a new generation of high precision inverse algorithms that allow to obtain in real-time the solution of an inverse problem. To achieve this objective, direct geophysical finite element simulation algorithms will be combined with Deep Learning techniques.

- **Lagrangian modelling of viscoelastic fluids.** Advisor: M. Ellero. The accurate simulation of polymeric flow is of paramount importance in many engineering processes including composite-polymer manufacturing, extrusion, micromixing or 3D printing. We will explore new purely Lagrangian viscoelastic models based on integro-differential formulations applied to the Smoothed Particle Hydrodynamics technique.

- **Hydrodynamic interactions and anomalous diffusion: Smoothed Dissipative Particle Dynamics method.** Advisors: M. Ellero and G. Pagnini. In many complex systems, anomalous dynamics is observed and this calls for new stochastic processes for its understanding. SDPD is a novel particle method based on pairwise interactions and it is suitable to simulate fluctuating hydrodynamic regimes in a thermodynamically-consistent way.
## Job Position description. max. 2.000 characters

**BCAM** is a world-class research center in the field of Applied Mathematics located in Bilbao (Spain). It obtained the **Severo Ochoa Center of Excellence award in 2013 and 2018** given by the Spanish Ministry of Science, Innovation and Universities. BCAM is part of the **ERCOM European Research Centers on Mathematics** [http://www.ercom.org](http://www.ercom.org) networks. BCAM has endorsed the **Charter & Code** in 2008 and has been awarded the **HR Excellence in research Logo** in 2016.

The candidate will be part of the **Computational Mathematics** research area at BCAM.

The candidate must have solid knowledge and experience. Moreover, the research requires knowledges in Computational mathematics.

The research environment is international and open to national and international collaborations, the candidate must have willingness to team working and traveling.

**Requirements:**
- Master degree (preferable in Applied Mathematics, Physics, Engineering or Computer Science).
- Applicants must have an excellent academic record.

**Skills:**
- Good communication and interpersonal skills.
- Ability to effectively communicate and present research ideas to researchers with different background (e.g., mathematicians and engineers as well as employs of forest service).
- Ability to clearly present and publish research outcomes in spoken (talks) and written (papers) form.
- Good command of spoken and written English.

Additionally, in terms of **transferable & complementary skills**, BCAM is carrying out the **Action Plan** within Human Resources Strategy for Researchers (HRS4R) BCAM action plan available here [https://bit.ly/2MH1R9S](https://bit.ly/2MH1R9S); so, the fellow will benefit of this training program composed by: **Leadership, Ethic and Research, Effective Communication/Teamwork, Gender Balance, Research Integrity, Citizenship Science, etc.** The fellow will receive all the needed support from BCAM to be fully integrated in the group and in the center.
INPhINIT Offer, eligibility requirements, evaluation and selection process

Incoming: https://obrasociallacaixa.org/en/investigacion-y-becas/programa-de-becas-de-posgrado/inphinit/incoming

Retaining: https://obrasociallacaixa.org/en/investigacion-y-becas/programa-de-becas-de-posgrado/inphinit/retaining

How to Apply

1. Click in https://hosts.lacaixafellowships.org/finder, click in RESEARCH CENTRE and choose “Basque Center for Applied Mathematics - BCAM”

2. Click in “SEARCH” and the displayable will list the positions offered
3. Click in the selected PhD Offer and click in “START THE APPLICATION”

4. The system will open a new window with the application website https://www.lacaixafellowships.org/index.aspx. Click in “Please register” for new applicants.
5. After the registration, the system will send to you the confirmation email and the link to access into the system. Now you are in the position to access into the application system. Please choose **INPhINIT: Doctorate in Spanish Research Centre of Excellence**

6. Now you are in the position to fill the application form, upload the required documents and choose the project thesis. To choose the project thesis, click in “Studies to be Pursued”, choose the centre and the position.