LaCaixa 2020 PhD Position @BCAM

**Project title / Job position title:**

Analysis of PDEs

**Research Project / Research Group Description.** max. 2.000 characters

<table>
<thead>
<tr>
<th>PhD position in Analysis of PDEs.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective:</strong> We explore and exploit the deep connections between Partial Differential Equations, Harmonic Analysis, and Applied Mathematics so as to describe the most diverse phenomena.</td>
</tr>
<tr>
<td><strong>Applications:</strong> The understanding of the fundamental principles that control relevant phenomena in physics and biology could eventually become of use for scientists working on those fields. We also expect to apply the efficient algorithms developed by our numerical simulations in real life problems.</td>
</tr>
</tbody>
</table>

**Specific project thesis:**

  - **Inverse problems.** Advisor: P. Caro. Description: The goal of inverse problems is to determine the coefficients of an equation given some admissible knowledge of its solutions. The resolution of these problems requires tools that from analysis.
- **Harmonic Analysis and Quantum Mechanics.** Advisor: C. Pérez. Description: The goal is to study spectral properties of Schrödinger-type operators in connection with Poincaré-Sobolev type inequalities in the context of fractional derivatives using methods from to Harmonic Analysis.
- **Non classical Littlewood-Paley inequalities.** Advisors: I. Parissis and L. Roncal. Summary: It is proposed the study of "non-classical" Littlewood-Paley inequalities, in the spirit of Rubio de Francia. The objective is to study such frequency decompositions when the sets of the collection of frequency projections are not Littlewood-Paley.
- **Mathematical Design of Complex Materials.** Advisor: A. Zarnescu. Some of the most spectacular and useful advances in the recent years technology are based on the use of novel materials with complicated microstructure. Despite the impressive technological applications these materials are very poorly understood at a basic, fundamental level. The research student will form part of a group aiming to contribute to this understanding of the new materials and their design, using rigorous mathematics.
**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 **Analysis of PDEs** research area at BCAM.

The candidate must have solid knowledge and experience.

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 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**

![INPhINIT Application System screenshot](image1)

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

![Application Form Screenshot](image2)