

DOCTORAL INPhINIT FELLOWSHIPS PROGRAMME – INCOMING FRAME
INFORMATION CALL 2022

PhD POSITION OFFER FORM

Position

1. Project Title/ Job Position title: **Analysis of PDEs**
 2. Area of Knowledge: **Physical Sciences, Mathematics and Engineering**
 3. Group of disciplines: **Theoretical and Applied Mathematics, Computer Sciences**
 4. Research project/ Research Group description (max. 2.000 characters)
- **Objective:** Explore and exploit the connections between PDES, Harmonic Analysis and Applied Mathematics and use them to understand phenomena in physics and biology.

Specific project thesis:

- **Inverse problems.** Advisor: **P. Caro**. The main goal of inverse problems is to determine the physical properties of a medium using non-invasive data. The resolution of these theoretical problems is motivated by practical applications
- **Interplays between probability and dispersive PDEs.** Advisor: **R. Lucà**. Many problems in PDEs are attacked introducing suitable probability on the solutions space. We are interested in the implementation of this statistical approach to the study of large time behavior and pointwise convergence of dispersive PDEs
- **Uncertainty principles in the Heisenberg group.** Advisor: **L. Roncal**. It is proposed the study of dynamical uncertainty principles in the Heisenberg and Schrödinger pictures. Such results have implications in the understanding of Heisenberg canonical permutation relations in partial differential equations
- **Harmonic Analysis and Quantum Mechanics.** Advisor: **C. Pérez**. 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 Harmonic Analysis
- **Harmonic Analysis and Differential Equations: New Challenges.** Advisor: **L. Vega**. Recently we have found a connection between a classic analytical object attributed to Riemann and the evolution of vortex filaments. This connection proposes many questions at the analytical, geometric, and physical level that we plan to answer
- **Mathematical Design of Complex Materials.** Advisor: **A. Zarnescu**. Spectacular recent advances are based on novel materials with complicated microstructure. Despite the technological applications, these materials are poorly understood at a fundamental level. The goal is to contribute to this understanding, using rigorous mathematics

5. 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> 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>; 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.

Group Leader

1. Title: Prof.
2. Full name: Luis Vega
3. Email: lvega@bcamath.org
4. Research project/ Research Group website (Url):
<http://www.bcamath.org/en/research/lines/area/APDE>
5. Website description: Website of the APDE group

Additional website (optional, max. 5 websites)

- Bilbao Analysis and PDEs: <https://sites.google.com/view/apdebilbao/home>
- Linear and Non-Linear Waves: <http://www.bcamath.org/en/research/lines/WAVE>
- Applied Analysis: <http://www.bcamath.org/en/research/lines/AA>
- Harmonic Analysis: <http://www.bcamath.org/en/research/lines/HA>

INPhINIT Offer, eligibility requirements, evaluation and selection process

Incoming:

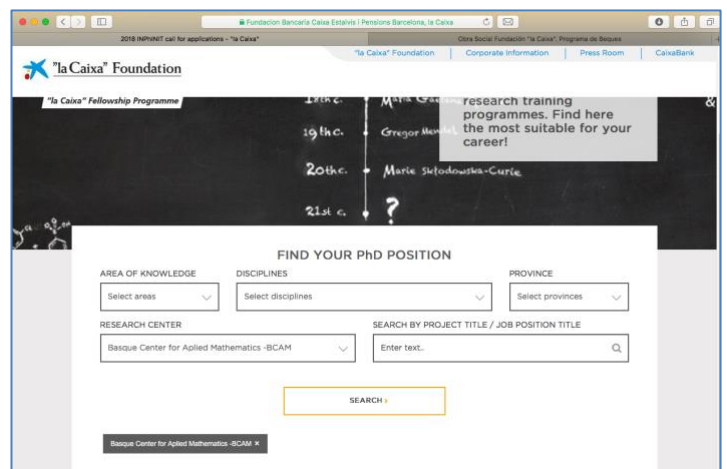
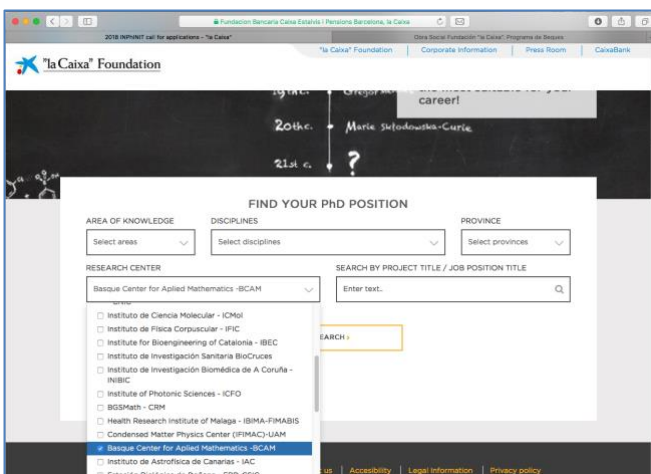
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Retaining:

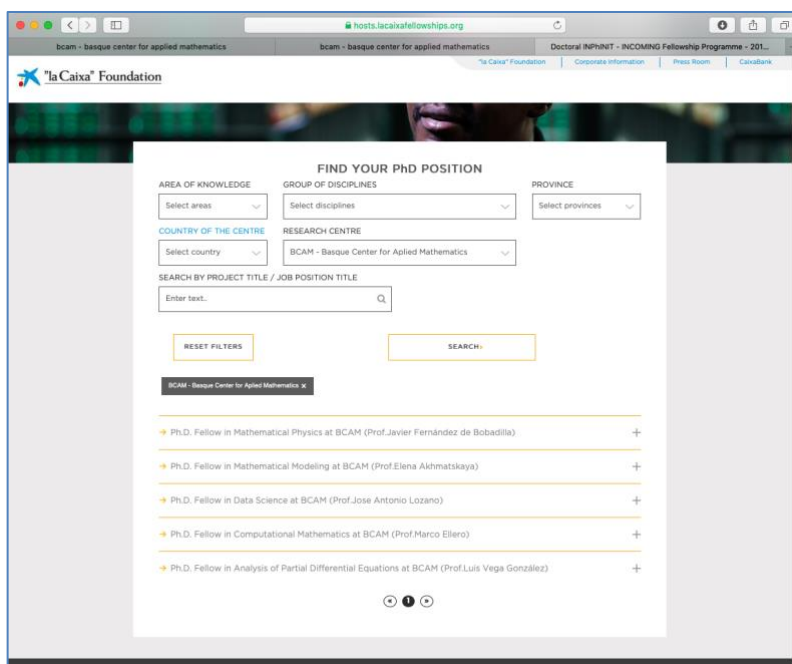
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How to Apply:

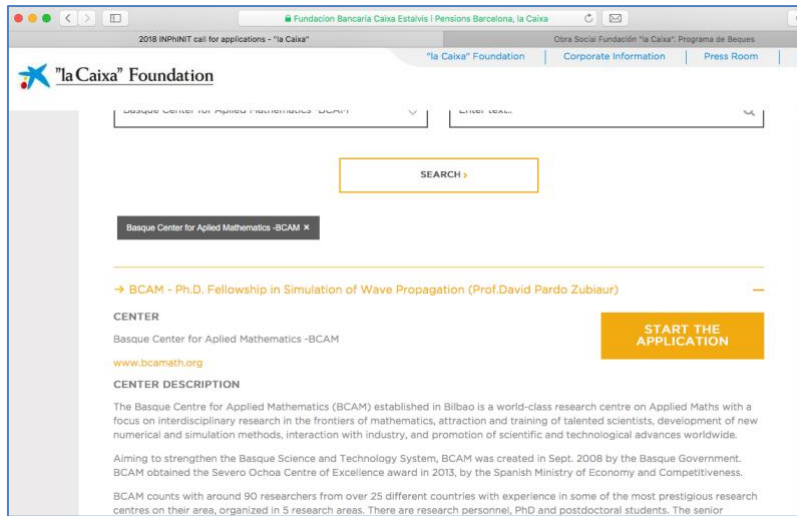
1. Click in <https://hosts.lacaixafellowships.org/finder>, click in RESEARCH CENTRE and choose "Basque Center for Applied Mathematics - BCAM"



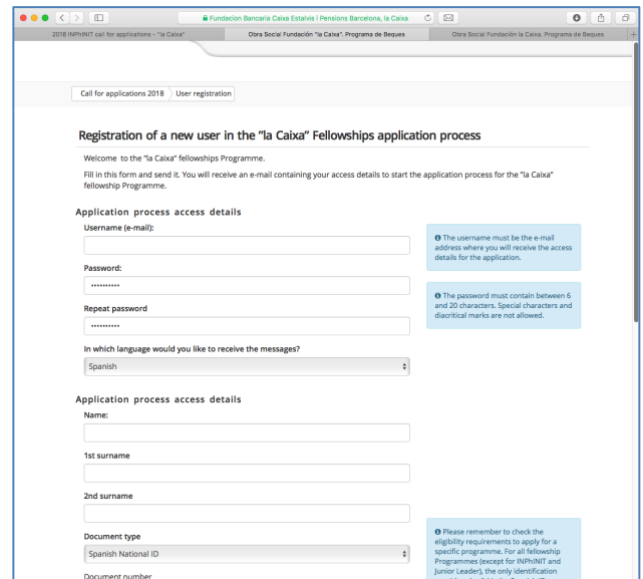
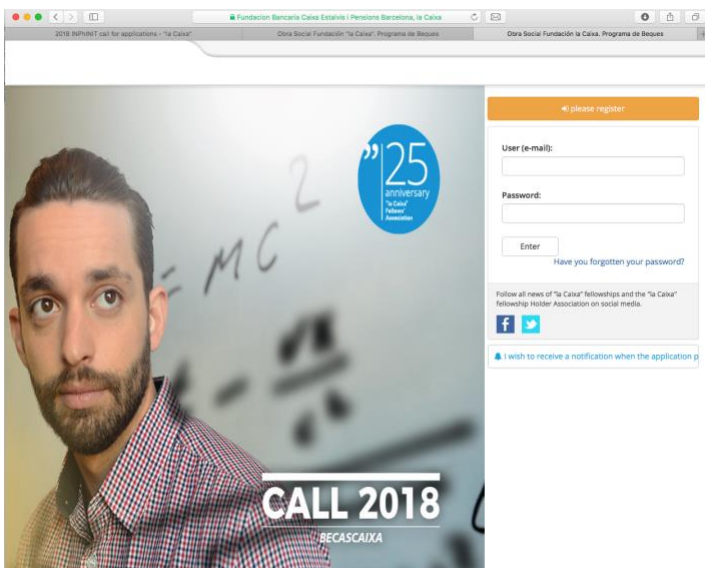
2. Click in "SEARCH" and the displayable will list the positions offered



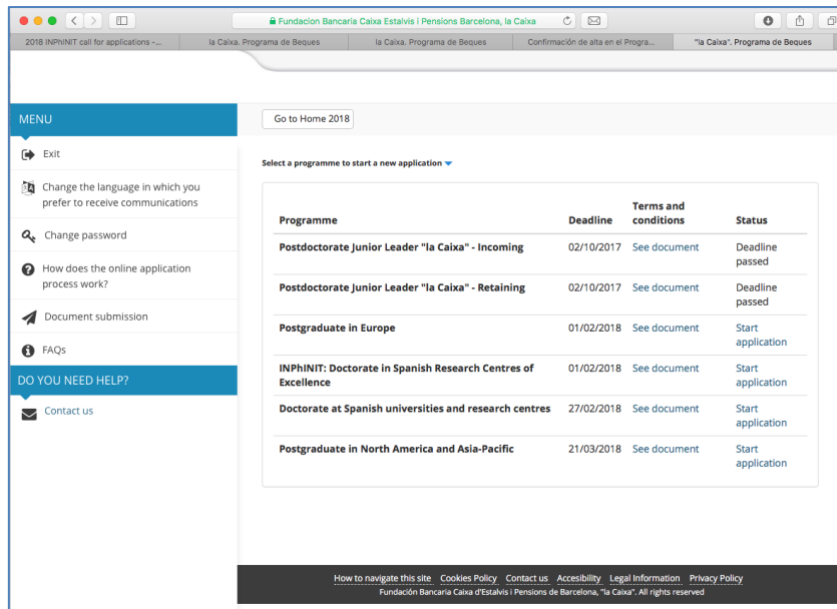
3. Click in the selected PhD Offer and click in "START THE APPLICATION"



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.



- 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.



- 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.

