IC2021_11 POSTDOCTORAL FELLOWSHIP IN SPECIAL FUNCTIONS AND RANDOM WALKS

Company Description

BCAM is the Research Center on Applied Mathematics created with the support of the Basque Government and the University of the Basque Country, which aims to strengthen the Basque science and technology system, by performing interdisciplinary research in the frontiers of mathematics, talented scientists' training and attraction, so the excellence of our results are recognized by the Society.

Information

Deadline: 2022-01-17
Category: Academia
Province: Bizkaia
Country: Basque Country
City: Bilbao

Company

BCAM

Main functions, requisites & benefits

Main functions

"Inside the Generalized Master Equation for the Continuous-Time Random Walk", The proposed research project is focused on the derivation of the Generalized Master Equation (GME) for the Continuous-Time Random Walk (CTRW) as published in literature, e.g., [1,2], and on its specific determination for fractional diffusion [3]. Actually, the GME depends on a kernel function that is explicitly given in terms of the jumps and waiting-times distributions of the CTRW. Surprisingly, a systematic study concerning the features of the CTRW, the kernel of the GME and the resulting walker's distribution is not provided, yet. The aim of the research is to fill this literature gap in the view of the many applications of the CTRW and in particular because of the recent regime-transitions (exponential-to-fractional-to-Gaussian) observed in anomalous diffusion processes. [1] Klafter J and Silbey R 1980 Phys. Rev. Lett. 44 55–58
[2] Klafter J, Blumen A and Shlesinger M F 1987 Phys. Rev. A 35 3081–3085 [3] Hilfer R and Anton L 1995 Phys. Rev. E 51 R848–R851 PI in charge: Gianni Pagnini

Requisites

Applicants must have their PhD completed before the contract starts. Skills: Good interpersonal skills. A proven track record in quality research, as evidenced by research publications in top scientific journals and conferences. Demonstrated ability to work independently and as part of a collaborative research team. Ability to present and publish research outcomes in spoken (talks) and written (papers) form. Ability to effectively communicate and present research ideas to researchers and stakeholders with different backgrounds. Fluency in spoken and written English. Scientific profile: Strong background in special functions and integral transforms. Background in fractional calculus and fractional modelling. Knowledge in statistics and probability. Good programming skills in Mathematica and/or Maple and/or MathLab. Interest and disposition to work in interdisciplinary groups.

Benefits

The gross annual salary of the Fellowship will be 28.000 - 32.000€. It will then be on your own responsibility to make your yearly income declaration at the Bizkaia Treasury Agency. Free access to the Public Health System in Spain is provided to all employees. Contract and offer: 1 year + 1 year.