IMUS PROGRAM PI3 (Introduction to Research)

CALL 2020-21 (Summer 2021)

1. Aim

The IMUS Program PI3 (Programa IMUS de Iniciación a la Investigación, IMUS Program for Introduction to Research) aims to promote the research career in Mathematics among students in their last two years of BSc or MSc studies (grado o máster), linking them with research lines and researchers of IMUS.

IMUS will select the participants among the applications received. The participants, students in any university, will attend to training activities and will prepare a research work under the supervision of a researcher from IMUS. The list of researchers and research topics offered is presented in Annex 1.

Overall, IMUS will devote up to 5.000€ for the expenses associated with the Program.

2. Training Program

The Program PI3 will take place in Summer 2021 at IMUS, Seville. In case COVID crisis does not allow this activity to be on-site, it will be carried out in remote format. The training activities of the Program will be:

- *IMUS Seminar "Introduction to Research"*: The last week of June 2021 the students will attend to courses and conferences lectured by researchers at IMUS. If COVID crisis allows this activity to be on-site, IMUS will cover lodging and lunches of the participants.
- *Training and research Project in Mathematics*: In July and August 2021, under the guidance of the tutor, the student will prepare a research report. If COVID crisis allows this activity to be on-site, IMUS will cover lodging of the participants in July.
- *IMUS Workshop "Introduction to Research"*: The second week of September 2021 the students will present orally their reports. If COVID crisis allows this activity to be on-site, IMUS will cover the lodging and lunches of the participants.

Under exceptional and well motivated circumstances, IMUS will also cover travel expenses of students selected.

3. Applications

Applicants should send to admin2-imus[at]us.es the following:

a. Application form, downloadable from https://www.imus.us.es/es/fellowships. A prioritized list of tutors and research lines from the Annex must be included.
b. Curriculum Vitae, in English or Spanish, of no more than two pages.

c. Motivation letter, in English or Spanish.
d. Recommendation letter.
e. Copy of Passport or Spanish ID.
f. Official academic certification.

Applications deadline: **May 15, 2021**.

4. Selection criteria.

The Scientific Committee of IMUS will evaluate applications with the following criteria:

a. Academic records: up to 7,5 points. For students enrolled in a different Bachelor or Master program not specific in Mathematics, the Scientific Committee will also consider the mathematical content of such studies.
b. Other merits credited: up to 2,5 points.

5. Publication of results.

The final decision (students selected, allocation to researchers and research lines) will be published in the web page of IMUS not later than the 1st of June 2021.

Seville, 15th of April 2021

Emilio Carrizosa
Director of IMUS

ANNEX 1 – RESEARCH LINES AND TUTORS

CODE	TUTOR	RESEARCH LINE
L01	Inmaculada Barranco Chamorro	Bayesian inference techniques in Monte Carlo methods
L02	Inmaculada Barranco Chamorro	Algorithms and applications in statistical data mining
L03	Emilio Carrizosa	Fairness in Machine Learning
L04	Francisco J. Castro Jiménez	Groebner's bases for rings of linear differential operators and applications
L05	Alberto Castaño Domínguez	Picard-Fuchs equations of families of varieties
L06	Tomás Chacón Rebollo	Reduced order modelling
L07	Jesús Cuevas Maraver	Non-linear Differential Equations. Aplications to Physics and Biology
L08	José Miguel Díaz Báñez	Trayectory Optimization for autonomous drones
L09	Raúl Manuel Falcón Ganfornina	Modelling, analysis and optimization of social networks and communicationn systems via combinatorial design
L10	Isabel Fernández Delgado	Minimal and Constant Mean Curvature Surfaces
L11	Enrique D. Fernández Nieto	State reconstruction techniques with applications to hyperbolic systems
L12	Rocío González Díaz	TDA for neural networks
L13	Rocío González Díaz	TDA for time series
L14	Francisco Guillén González	Can Finite Elements schemes approximate the interaction of living beings with chemical signals?
L15	Mª Dolores Jiménez Gamero	New tests for the Poisson law
L16	Mª Dolores Jiménez Gamero	Large contingency tables
L17	Fernando Muro Jiménez	Algebraic topology
L18	Luis Narváez Macarro	Rings of differential operators in Algebraic Geometry and Singularity Theory
L19	Miguel Ángel Olalla Acosta	Resolution of singularities
L20	José Ramón Portillo Fernández	Graph Theory applied to Experimental Sciences.
L21	Pepa Ramirez Cobo	Modelización estocástica mediante procesos BMAP. Stochastic modelling via BMAP processes
L22	Pepa Ramirez Cobo	Predictive models in Social Sciences
L23	María Ángeles Rodríguez Bellido	Differential models to understand Covid-19
L24	Antonio Rojas León	Zeta functions and arithmetic of varieties over finite fields
L25	Manuel Jesús Soto Prieto	Resolution of singularities
L26	José María Tornero Sánchez	Resolution of singularities
L27	Rafael Villa Caro	Convex Geometry
L28	Desamparados Fernández y José Antonio Vilches	Topología combinatorial y discreta: enfoque teórico y aplicaciones
L29	Genaro López Acedo	Pursuit-Evasion Games and Metric Fixed Point Theory