

21st March 2023

Dear Colleagues,

We are excited to announce the **5th BCAM–UPV/EHU summer school on harmonic analysis and PDEs: sphere packing**, which will take place from the 19th to the 23rd of June of 2023 at **BCAM** - Basque Center for Applied Mathematics, at **Alameda de Mazarredo 14**, and at the **University of the Basque Country (UPV/EHU) - Leioa Campus**, in Bilbao, Spain.

The web page of the school can be found at: <https://sites.google.com/view/hapde2023/home>

The purpose of this summer school is to introduce its participants (undergraduate and graduate students, and possibly early post-doctoral researchers, with a **strong preference to early PhD students**) to current topics of research that lie at the interface of harmonic analysis and partial differential equations.

This year's summer school aims to cover topics that are considered fundamental in the theory of sphere packing. Three experts on the topic will deliver mini-courses and coordinate corresponding working groups, according to the goals of the school:

1. **Felipe Gonçalves** (IMPA - Instituto de Matemática Pura e Aplicada) will be in charge of the course: **Sign uncertainty, interpolation and quasicrystals**.
2. **Philippe Moustrou** (Université Toulouse Jean Jaurès, Institut de Mathématiques de Toulouse) will be responsible for the course: **Optimization methods for sphere packing problems**.
3. **Danylo Radchenko** (Laboratoire Paul Painlevé, University of Lille) will coordinate the course: **Modular forms and their applications to sphere packings**.

Application. The number of participants cannot exceed 24 and priority will be given to **early PhD students**. For this reason we kindly ask you, if interested, to apply for participation by following the corresponding link

<https://sites.google.com/view/hapde2023/application>

There will be no registration fee for the participants of the summer school (up to a maximum of 24 participants). However, since we only have a limited number of places we kindly ask you, if interested, to apply for participation by following the link above.

We will award ten (10) fellowships for participating students, which will cover the accommodation in Bilbao during the summer school and two meals per day. The **deadline** for applying for participation to the summer school, and also for applying for a fellowship, is the **17th of April, 2023**. We kindly ask the participants that are interested in applying for a fellowship to indicate so in the application form linked above. You will then be prompted to upload your **CV** and **letter of motivation**.

Your letter should **also include the name and email address of a contact person**, for example PhD advisor or similar, together with a **ranking of the topics 1–3 of the summer school in order of preference**; the topics and their descriptions are posted on the website of the summer school:

<https://sites.google.com/view/hapde2023/structureprogram/topics>

We stress that **the funded fellows will have to participate to all the teaching activities of the summer school** and will have to be **present in Bilbao from Monday morning until Friday afternoon** of the week of the summer school.

The participants of the summer school (funded and non-funded ones) will be selected before April 17th, 2023. The selected participants will be assigned a topic and will receive material consisting of research papers and/or notes by the lecturers.

Structure of the summer school. The first two days of the summer school (i.e. Monday and Tuesday) will consist of lectures (each lecturer will give four 50-minute lectures) and introductory meetings for the student groups; these activities will take place at **BCAM**. The lecturers have also proposed special topics among which each student has to choose two possible topics. The topics are posted here

<https://sites.google.com/view/hapde2023/structureprogram/topics>

According to these choices we will form working groups each of which will consist of no more than 4 students. On Wednesday and Thursday, each group will study one of the suggested topics with the help of the corresponding lecturer. The groupwork sessions will take place at the University of the Basque Country (UPV/EHU), at the **Leioa Campus**.

On Friday 23rd of June, 2023, there will be a presentation of the subtopics studied by the different groups; these presentations will take place at **BCAM**. The style of the presentation (for example blackboard, beamer presentation, poster, combination of the above) will be decided at a later stage.

Kind Regards,

The Organizing/Scientific Committee

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Odysseas Bakas (BCAM)

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