PhD POSITION IN "ALGEBRA AND GEOMETRY: GROUP THEORY" AT THE ICMAT FOR THE INPhINIT PROGRAMME

Job Position title: PhD in Algebra and Geometry: Group Theory

Research project/ group description

ICMAT RESEARCH GROUP A: ALGEBRA AND GEOMETRY

The group conducts research in the areas of abstract algebra, algebraic geometry, differential geometry, and topology. In addition, a number of the themes we study find their motivation in ideas stemming from physics, such as special metrics, gauge theories and their algebro-geometric counterparts.

The main research lines may be grouped into the following general directions:

- **Algebraic Geometry and Mathematical Physics**: The research of this line is devoted to the study of moduli spaces of vector bundles and related objects, and their interplay with various algebraic and geometric structures, involving techniques from algebraic geometry, differential geometry, topology, Lie theory, geometric analysis and theoretical physics.
- **Differential Geometry, Symplectic Geometry and Geometric Mechanics**: The research of this line centers on differential and contact topology, differential and riemannian geometry, geometric mechanics with applications to control theory, dynamical systems and the geometry of PDEs.
- **Group Theory**: This line includes several areas of group theory with applications to other fields, such as ring theory, topology, dynamics, and logic. Connecting threads of this line are the approximation of infinite groups by finite structures, and the study of groups through their actions on non-positively curved spaces.
- **Arithmetic Geometry**: The research in this line is devoted to problems at the core of arithmetic geometry, like the equivariant Tamagawa number conjecture or the development of Arakelov geometry, as well as its interplay with related fields like complex and non-Archimedean analysis, algebraic geometry and even theoretical physics.

The group is formed by the following faculty members:

L. Álvarez-Consul, J. Aramayona, A. Bravo, J. I. Burgos, M. de León, J. F. Fernando, O. García-Prada, T. L. Gómez, L. Guijarro, A. Jaikin, I. Luengo, D. Martín, D. Peralta, F. Presas, P. Tempesta, O. Villamayor.

Job position description

The PhD candidate will be involved in work related to one of the research topics in which the group is particularly active: profinite groups and their representations; applications to geometry and number theory; growth functions associated to infinite groups, l^2-invariants; finite p-groups and global/local properties in finite groups; algorithmic properties of finitely presented groups; formal languages in group theory; groups acting on Gromov hyperbolic spaces; algebro-geometric properties of mapping class groups; structure of right-angled Artin groups; classifying spaces for various "geometric" groups.

The PhD candidate will be appointed a supervisor among the faculty members of the Group, with whom regular meetings will be held. He/she will be expected to participate in the group activities including seminars and conferences, interacting with visitors and international colleagues. ICMAT will also provide counselling to help the PhD candidate develop a successful research career.

Research Group Contact: J. Aramayona (javier.aramayona@icmat.es) and A. Jaikin (andrei.jaikin@uam.es)

Research Group website:

ICMAT RESEARCH GROUP A: ALGEBRA AND GEOMETRY: https://www.icmat.es/researchers/groups/group-a/

Links to the INPhINIT 2022 Incoming Open Call:

Programme description: https://fundacionlacaixa.org/en/educacion-becas/becas-la-caixa/doctorado-inphinit/descripcion-del-programa

Application website: https://candidate.lacaixafellowships.org/login

Programme rules here.

PhD position finder: https://hosts.lacaixafellowships.org/finder