

Job Opportunity in Mathematics

Postdoctoral positions at the University of São Paulo

contact email: malex@ime.usp.br

The Geometry Research Group of the Institute of Mathematics and Statistics of the University of São Paulo (IME-USP) invites applications for a postdoctoral position associated to the Thematic Project “Algebraic, topological and analytical techniques in Differential Geometry and Geometric Analysis” (FAPESP 2016/23746-6), to work on Variational Calculus and Geometric Analysis. The position is for 13 months (possibly extendable for 9 months, more details below). We are looking for candidates with strong research potential in the field of the proposed project. The funding is provided by FAPESP, the research funding agency of the state of São Paulo (<http://www.fapesp.br>).

- **Project:** From Geometric Analysis to Bifurcation.
- **Supervisor:** Prof. Dr. Marcos Martins Alexandrino da Silva.
- **Project abstract:** We seek to extend the application of the techniques of closed minimal surfaces to the case where they are noncompact and have a boundary, and to explore bifurcation phenomena related to these surfaces in homogeneous 3-manifolds. More specifically, we intend to address the following topics: possible elaboration of a survey about homological systoles in Riemannian manifolds, with the proposal of problems that involve ambients with group actions and generalised geometries, such as Randers metrics (Finsler); to explicitly control the topology of noncompact minimal surfaces with boundary and low index in some 3-dimensional ambients; and to apply bifurcation techniques to prove the abundancy of minimal tori in Berger spheres which are noncongruent to the Clifford torus.

1 Job description

The position is to develop the proposed project, which includes the scientific research, article publications, participation in conferences and workshops and possibly supervision of students. The complete project can be requested via the email malex@ime.usp.br.

2 Work environment

The selected candidate will work at the Institute of Mathematics and Statistics (IME) of the University of São Paulo (www.ime.usp.br), one of the main Brazilian research centers in Mathematics, under the supervision of Prof. Dr. Marcos Martins Alexandrino da Silva (www.ime.usp.br/malex/).

- **Adress:** Instituto de Matemática e Estatística da Universidade de São Paulo, Rua do Matão, 1010, Vila Universitária, São Paulo - SP, CEP 05508-090.

3 Candidate requirements and obligations

Applicants should have a Ph.D. degree in the field of Differential Geometry by the start date of the scholarship, obtained no longer than seven year ago. Preference will be given to candidates with previous experience in the field of the project.

The fellowship requires full-time dedication to the research project and the approved applicant may not hold any other formal or informal employment, nor receive other fellowships from other entities. The fellowship holder must submit technical reports of the development of the project within the stipulated time frames. The holder is also not to be absent from the institution, except to carry out field research or a research placement, for a limited time.

4 Duration and monthly stipend

The position is for 13 months. There is the possibility of renewing the fellowship for 9 months, up to a total of 22 months, upon conditions that include the recommendation of the supervisor based on the academic performance of the candidate and availability of funds at the time. The position includes monthly stipend and research contingency funds. The stipend of the FAPESP postdoctoral fellowship is R\$ 7.373,10. The research contingency funds are intended for use in the activities developed by the fellowship holder, strictly related to the research project during the term of the fellowship, and its usage should be reported. These funds are equivalent to 10% of the annual value of the fellowship. See <http://www.fapesp.br/270> for more details.

5 Application instructions

To apply, the candidate should submit to malex@ime.usp.br the following documents:

- Cover letter.
- Updated CV and Lattes curriculum (<http://lattes.cnpq.br/>).
- If the candidate is a foreigner, a copy of the permanent or temporary visa compatible with the proposed activity.
- Copy of Ph.D. certificate.
- Two letters of recommendation.

6 Schedule

- **Application deadline:** April 8th, 2021
- **Announcement of the result:** The selected candidate will be notified via email.
- The fellowship implementation will follow the rules of FAPESP Postdoctoral Fellowship Program (<http://www.fapesp.br/270>).

Regarding the development of the project, it is expected that the first 1 ~ 3 be dedicated to the collection of the relevant bibliography, development of the survey and integration of the candidate to the research group at IME, including participation in online seminars and talks. The following months should be dedicated to the problem of controlling the topology of noncompact minimal surfaces with boundary and the application of bifurcation techniques to analyse the (possible) abundancy of minimal tori in Berger spheres which are noncongruent to the Clifford torus.