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The project Integrating Spectral and Geometric data on Moduli Spaces (**InSpeGMoS**) has been awarded an **Advanced ERC Grant** by the European Commission. This funding will allow to hire several PhDs and in particular applications are open for a PhD scholarship for 2023/26. The selected student will join the Institut de Recherche Mathématique Avancée (IRMA, Université de Strasbourg), in the Analysis group. Applications should be sent to the PI at the email address anantharaman@math.unistra.fr with the subject *InSpegMos PhD*, by July 2, 2023. Interviews of the short-listed applicants will take place in July, and will come out with a ranking. The first ranked applicant will be contacted with a post-doc offer soon after.

- **Research topics:** InSpeGMoS is focussed on the geometry and spectrum of random objects (specifically, hyperbolic surfaces and discrete graphs). The central object of study is the Weil-Petersson measure on the moduli space of compact hyperbolic surfaces. The overall goal is to develop new integration techniques that will allow to study geometric and spectral data of random hyperbolic surfaces, with an aim to establishing limit theorems. The project involves various branches of mathematics (geometry, probability, analysis, spectral theory…) We welcome applicants with various backgrounds, provided they are willing to learn other topics. We will particularly appreciate applicants with a strong background in hyperbolic geometry / spectral theory, spectral geometry / limit theorems in probability, concentration of measure phenomena in large dimensions. Details on the research program of the project can be found on https://irma.math.unistra.fr/~anantharaman/inspegmos.html

- **Proposed title for PhD project** : <u>Concentration of measure phenomena for large graphs or large surfaces</u>. The goal will be to establish and use concentration of measure phenomena, to show that certain fundamental geometric or spectral quantities are concentrated near their expected value, for classes of random graphs or random surfaces. The choice to work with random graphs or surfaces will depend, among others, on the candidate's background (probabilist or geometer). We will be particularly interested in establishing concentration of measure for : eigenvalues of the laplacian on large graphs or large surfaces, as well as their Cheeger constants.

- **Duration:** the initial doctoral contract will be established for a first period of 36 months, starting in the fall 2023 (no earlier than September 1st). Extensions for an additional 6 or 12 month period will be possible, but not systematic.

- **Eligibility**: holding a Master's diploma in Mathematics at the starting date of the contract, obtained no more than 3 years before.

- **Salary:** salary will follow the national recommendations in France for young researchers. The gross monthly salary will be of approximately 3100 euros (i.e. before social contribution and income tax).

- **Teaching duties:** the position comes with no teaching load. The doctoral student can apply for teaching assignments, if approved by the employer. Such a teaching is paid extra and is fully optional. Classes are usually given in French.

- **Research funds**: the successful applicant will be entitled to use 4000 euros/years for visits, invitations, and research-related expenses.

- **Application:** please send by email a CV (2 p. max.), an academic transcript for the L3, M1 and M2 level (partial transcript if the full transcript for 2023 is not available), and a cover letter. The cover letter should contain the contact details of three scholars for reference purposes.