Deutsche Forschungsgemeinschaft (German Research Foundation)
Information for Researchers

Call for Proposals

No. 30 **16 May 2019**

Priority Programme "Random Geometric Systems" (SPP 2265)

In March 2019 the Senate of the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) established the Priority Programme "Random Geometric Systems" (SPP 2265). The programme is designed to run for six years. The present call invites proposals for the first three-year funding period (starting in mid-2020).

Phenomena that emerge from an interaction between random influences and geometric properties are ubiquitous and extremely diverse. They appear in physics (e.g., condensation or crystallisation in interacting random particle models for equilibrium situations), materials science (e.g., electrical conducting properties in metals with impurities), in telecommunication (e.g., connectivity in spatial multi-hop ad-hoc communication networks), and elsewhere. The origins and the mechanisms that lead to the phenomena are often deeply hidden. Bringing them to the surface often requires serious research activities, many of which have to be theoretical by the nature of the problem.

This Priority Programme is devoted to the mathematical analysis of effects and phenomena that emerge from an interplay between randomness and geometry. Many questions of intrinsic mathematical interest will be studied. Disciplines like physics, materials science and telecommunication will be crucial sources of problems, applications, motivations, models and solutions. The main focus will lie on the development of new and the refinement of existing methods, and on the creation and analysis of new random spatial models.

Goals comprise the rigorous description and analysis of emergence of macroscopic phenomena like condensation, percolation, crystallisation; geometric functionals of random structures like Minkowski functionals and tensors, and cluster counts; new limiting geometries; geometric systems driven by correlated spatial randomness; metastability in spatial processes away from equilibrium; effects arising from kinetic or geometric constraints; new applied spatial random models. The Priority Programme is expected to push forward substantial developments into various timely directions, like time-dependent random media, continuous-space modelling, long-range dependence of interactions, description of entire geometries instead of characteristic quantities, or the introduction of spatiality into mean-field models.

The research of this Priority Programme will mostly evolve around the following main areas: random point processes, random fields, percolation in the continuum, random geometric graphs, energy-based random point configurations, stochastic processes and dynamics in random media. Establishing cross-connections will be highly welcome.

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Analytical work shall be dominant in this Priority Programme. Important impulses and progress will also come from the field of mathematical statistics; mathematical work that leads to the development of statistical tools for the analysis of geometric data will be welcome to the Priority Programme. Furthermore, also numerical and modelling work as well as a systematic transfer of questions from the applied sciences into mathematics will substantially contribute to the success of the programme.

Proposals must be written in English and submitted to the DFG by **11 November 2019.** Please note that proposals can only be submitted, starting 1 October 2019, via elan, the DFG's electronic proposal processing system. To enter a new project within the existing Priority Programme, go to Proposal Submission – New Project/Draft Proposal – Priority Programmes and select "SPP 2265" from the current list of calls.

In preparing your proposal, please review the programme guidelines (form 50.05, section B) and follow the proposal preparation instructions (form 54.01). These forms can either be downloaded from our website or accessed through the elan portal. In addition to submitting your proposal through elan, please send an electronic copy to the programme coordinator.

Applicants must be registered in elan prior to submitting a proposal to the DFG. If you have not yet registered, please note that you should do so by **4 November 2019** to submit a proposal under this call. You will normally receive confirmation of your registration by the next working day. Note that you will be asked to select the appropriate Priority Programme call during both the registration and the proposal submission process.

The review process includes a review colloquium with the presence of the applicants and the reviewers. This meeting will probably take place in the second half of March 2020. The precise date and location, as well as all other relevant updates, will be published on the Priority Programme's homepage in due course.

Further Information

More information on the Priority Programme is available under:
http://spp2265.wias-berlin.de

The elan system can be accessed at:
https://elan.dfg.de/en

DFG forms 50.05 and 54.01 can be downloaded at:
www.dfg.de/formulare/50_05
www.dfg.de/formulare/54_01

For scientific enquiries, please contact the Priority Programme coordinator:
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Questions on the DFG proposal submission and review process can be directed to:
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