Postdoctoral Research Associate in Mathematics

Applied Mathematics and Mathematical Physics Section, Department of Mathematics

Faculty of Natural Sciences

South Kensington Campus

Salary Range: £36,800- £44,220 per annum

Fixed Term for 18 Months

Start date: 1 November 2018

Applications are invited for Research Associate position in the Department of Mathematics at Imperial College London. The position is funded through the EPSRC Standard Grant "Modelling sperm-mucus interactions across scales". We are seeking a highly skilled and enthusiastic individual with expertise in multi-scale partial differential equations, coarse-graining of microscopic models and/or numerical modelling of problems arising in physics, biology or social sciences. The project is a joint effort between Dr Eric E Keaveny, Senior Lecturer in Applied Mathematics, and Professor Pierre Degond, Chair in Applied Mathematics, to apply advanced mathematical modelling and computational techniques to understand the motion of sperm cells through the heterogeneous environments they encounter during mammalian reproduction

The post holder will work as part of a multi-disciplinary team to address key questions on the interaction between sperm and mucus and will join a collective effort to better understand some fundamental determinants of reproductive success. He/she will develop state-of-the-art methodologies originating from the rapidly growing field of active particle systems modelling and that build on kinetic theory and multiscale numerical methods. The project brings the teams of Dr Keaveny and Pr. Degond, which consist of several PhD students and Research Associates each, together with Professor William V Holt, who was formerly Head of Reproductive Biology at the Institute of Zoology of the Zoological Society of London and Dr Mathew Tomlinson. who is Consultant Scientist and the Head of the Andrology Laboratory at Nottingham University Hospital. This project is part of an informal international network of collaborators involving mathematicians and fluid dynamicists, specialists of suspensions of actively swimming particles. The post holder's work will consist of mathematically deriving and numerically implementing macroscopic descriptions of the sperm particles, of the mucus, and of their interactions. The models will be derived by coarse-graining the particle models used in Dr Keaveny's team. The numerical results will be assessed by comparisons between the models and calibrated on data. They will be used to explore how pathologies may be linked to modified mobility in mucus.

This post is an exciting opportunity to expand on significant recent methodological advances in kinetic theory and active particle systems modelling, to build collaborations within an international, multi-disciplinary and world-leading team, and to shape a cutting-edge research project between mathematics, fluid mechanics, biology and clinics.

It is essential that you have:

The successful candidate must hold a PhD (or equivalent) level of professional qualifications in Mathematics, Physics, Computer Science or Engineering or closely related discipline.

Experience and knowledge:

- Desire to develop and apply methods of kinetic theory and multiscale numerical methods to questions of substantive importance to the modelling of sperm-mucus interaction.
- Excellent track record in carrying out original research of high quality at the interface between mathematics and biology or an equivalent application field.
- Strong programming skills, especially software development for microscopic and macroscopic models of large particle systems.

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Skills and abilities:

- Ability to work and communicate effectively in a multi-disciplinary team.
- Ability to carry out original research and publish in high impact journals.
- Ability to exercise initiative and judgment in carrying out research tasks.
- Ability to prioritise own work in response to deadlines.
- Ability to identify, develop and apply new concepts, techniques and methods.
- Creative approach to problem-solving.
- Ability to organise and prioritise own work with minimal supervision.
- Ability to keep accurate records of research results and activity.
- Excellent written communication skills and the ability to write scientifically, clearly and succinctly for publication.
- Ability to present research with authority and coherence.
- Basic UNIX/LINUX, text processing, program and data handling skills.
- Be willing to travel and present research outcomes of the project in international conferences and workshops.

Please complete and upload an application form as directed, also providing a CV and a list of publications.

For any specific queries regarding the post please contact Professor Pierre Degond p.degond@imperial.ac.uk and / or Dr Eric Keaveny e.keaveny@imperial.ac.uk

Should you have any queries about the application process please contact Ms Mona El-Khatib, (m.el-khatib@imperial.ac.uk).

For technical issues when applying online please email recruitment@imperial.ac.uk.

*Candidates who have not yet been officially awarded their PhD will be appointed as Postdoctoral Research Assistant within the salary range £32,380 - £34,040 per annum.

Closing Date: 28 May 2018