

THE UNIVERSITY OF MANCHESTER
PARTICULARS OF APPOINTMENT
FACULTY OF SCIENCE & ENGINEERING
SCHOOL OF NATURAL SCIENCES
DEPARTMENT OF PHYSICS & ASTRONOMY
RESEARCH ASSOCIATE IN MICROFLUIDICS
VACANCY REF: SAE-016741

Salary: £32,816 to £40,322 per annum, depending on relevant experience

Hours: 1 FTE

Duration: Fixed term from 1st September 2021 until 31st December 2022 (with potential for extension)

Location: Oxford Road, Manchester

Responsible to: Prof. Anne Juel and Dr Igor Chernyavsky

Enquiries about the vacancy, shortlisting and interviews:

Contact: Prof Anne Juel

Email: Anne.Juel@manchester.ac.uk

Contact: Dr Igor Chernyavsky

Email: Igor.Chernyavsky@manchester.ac.uk

Background

This position is focused on experimental microfluidics and haemodynamics of the human placenta. The position is supported by the EPSRC grant "Novel Models for Haemodynamics and Transport in Complex Media: Towards Precision Healthcare for Placental Disorders".

The University of Manchester is the largest single-site university in the UK and has produced more than 20 Nobel Laureates. The Manchester Centre for Nonlinear Dynamics (MCND) uses a unique combined approach of theoretical modelling, computation and detailed quantitative experimental investigations, making it ideally placed to study the micro-rheology of complex systems.

You will join a rapidly expanding effort in biomechanics within the MCND and Department of Mathematics, working directly with Professor Anne Juel and Dr Igor Chernyavsky, as a part of a

vibrant experimental group. The project benefits from close collaboration with clinicians from the School of Medicine and engineers from the University of Edinburgh and McMaster University. Please see more details on <https://bit.ly/2P1y81Y>.

Overall Purpose of the Job

The overall aim of this project is to characterise the rheology of blood in complex geometries, such as in the human placenta, a unique and critically important interface between the maternal and fetal circulations. The project lies at the interface between experimental biomimetic microfluidics, computational and mathematical modelling, informed by spatial statistics and image analysis of human placental tissue.

Key Responsibilities, Accountabilities or Duties

The range of duties will include:

- Continually update knowledge and understanding in relevant field or specialism.
- Use research resources and laboratories as appropriate.
- Develop and conduct individual and collaborative research objectives, with guidance if required.
- Interact closely with other members of the research team and contribute to supervising a PhD student.
- Write up research work for publication in high impact journals and contribute to annual project reports.
- Present the results of the research at meetings, seminars and conferences.
- Take part in research outreach activities and communicate effectively to a varied audience.
- Be aware of the risks in the work environment and their potential impact on their own work and that of others.

Post holders are also required to familiarise themselves with the University's Equality, Diversity & Inclusion and Social Responsibility policies and to actively support these wherever possible.

PERSON SPECIFICATION

Essential Knowledge, Skills and Experience:

- Have a good first degree (or equivalent) in physics, mathematics, or relevant aspects of engineering.
- Have, or be about to obtain, a PhD or equivalent in relevant area of physics, engineering, applied mathematics, or a closely related field.
- Possess specialist knowledge and have experimental experience in at least one of the following areas: fluid mechanics of suspensions; microfluidics of physiological flows, or multiphase porous media flows.
- Have expertise in experimental data and image analysis.
- Have strong journal publication record, appropriate for the career stage, in an area relevant to the project.

- Have an enthusiasm for research at the interface of physics and biological sciences.
- Excellent written and oral communication skills.
- Excellent time management and organisational skills.
- Ability to work independently and as part of a team.
- Ability to liaise confidently and effectively with a range of individuals across different disciplines.
- Willingness to learn and develop.

Desirable Knowledge, Skills, Experience and Qualifications:

- Familiarity with the physiology of blood flow and microcirculation.
- Experience of working with droplets and capsules in microfluidic systems.
- Experience of collaboration with mathematical modellers and researchers from life sciences.

EMPLOYER PROFILE

The University of Manchester

The University of Manchester (www.manchester.ac.uk) enjoys a global reputation for its research and its innovative approach to learning, with an on-going £1 billion investment in facilities, staff and buildings. This builds on our tradition of success that stretches back over 180 years. The birth of the modern computer, the splitting of the atom, the founding principles of modern economics, the discovery of graphene, and the birthplace of chemical engineering – these and many more world changing innovations have their roots at our University. We are at the forefront of the search for solutions to some of the world's most pressing problems, boasting strong collaborative links with industry and public services.

Manchester has the largest student community in the UK, with more than 28000 undergraduates and 11000 postgraduates attracted by the high international standing of the academic staff, by the superb research and teaching facilities, and by the cultural assets both of the university and the city of Manchester itself. For further information, please consult www.manchester.ac.uk.

Faculty of Science and Engineering

The Faculty of Science and Engineering is one of the largest in the UK with over 10,000 students, 2,000 staff and strategic links with over 300 industrial companies. We are leading research efforts in energy, nuclear science and technology, computer science, atmospheric science, bioscience and biotechnology, photon science and photonic materials, imaging and visualisation, security, and advanced materials, attracting an annual income of over £200 million. Founded in 1824, we have a history of breaking new ground in science and engineering. Rutherford began his work here on splitting the atom and later received the Nobel prize in 1908 for his work on radioactivity. The 'Baby', the world's first stored-program computer, and Manchester Mark 1 came into being here. It is the birthplace of Chemical Engineering. The world's first steerable radio telescope at Jodrell Bank was built here by Bernard Lovell. Since 1906, when former student Joseph Thomson won the Nobel prize for physics, the University has produced more than 20 Nobel Laureates, the most recent of which were Professor Andre Geim

and Professor Konstantin Novoselov in 2010 - for their pioneering work with the world's thinnest material, graphene.

Department of Physics and Astronomy

The Department of Physics and Astronomy is one of five Departments in the School of Natural Sciences which is in the Faculty of Science and Engineering. There are 95 academic staff in the Department with expertise in areas such as condensed matter physics (which includes Prof. Andre Geim and Prof. Konstantin Novoselov who won the 2010 Nobel Prize in Physics for their work on graphene), atomic physics, liquid crystal physics, biological physics, accelerator physics, nuclear physics, particle physics, astrophysics, astronomy, cosmology, complexity and theoretical physics. Jodrell Bank Observatory (part of Jodrell Bank Centre for Astrophysics) also forms part of our Department. We have approximately 150 research staff, 250 PGR students and 1200 UG/PG students.

The Department has ranked in the top fifteen in the Academic Ranking of World Universities for Physics since 2011. In the Research Excellence Framework (REF) 2014 the Department was in the top three institutions for its proportion of "world-leading" components and was first for non-academic impact.

The Department values teaching highly and scored 90% in the 2019 National Student Survey. The Department has the largest undergraduate intake of any Physics department in the UK. Student cohorts are around 1120 and 100 for undergraduate and postgraduate taught programmes respectively. Taught postgraduate courses include Masters programmes in Photon Science, Nuclear Science and Technology, and Radio Imaging and Sensing.

P&A research is based in four topical divisions: Accelerator, Nuclear and Particle Physics; Condensed Matter (which includes Prof. Andre Geim and Prof. Konstantin Novoselov who won the 2010 Nobel Prize in Physics for their work on graphene); and Jodrell Bank Centre for Astrophysics. The Department operates the world-renowned Jodrell Bank Observatory (JBO). The Jodrell Bank site also provides the permanent home for the international headquarters of the Square Kilometre Array (SKA) Organisation. The Department is deeply involved in the £61 million National Graphene Institute (NGI), opened in 2015. The NGI building has 7350 m² research space over five floors and includes 1500m² of cleanrooms, lab facilities, office space and seminar rooms.

The Department of Physics and Astronomy is committed to promoting Equality, Diversity, Inclusion and Access through contributing to the University's social responsibility agenda, demonstrating a commitment to its policies, activities and delivery of initiatives including the Athena SWAN charter for promoting women's careers in STEMM subjects (science, technology, engineering, mathematics and medicine) in higher education. The Department has held JUNO Champion status since 2016 for its commitment to achieving gender equality which positively promotes inclusivity for all.

Further information on the Department of Physics and Astronomy can be found at www.physics.manchester.ac.uk.