Research Associate in H-mode Pedestal Physics

Physics

Closing date: 7 August 2019
Interview date: To be confirmed
Vacancy reference: 7817
INTRODUCTION

We are seeking a highly motivated Research Associate to work with Dr Phil Snyder and Dr Thomas Osborne (General Atomics), Dr David Dickinson and Professor Howard Wilson (University of York) in the field of H-mode pedestal physics on the MAST-U tokamak at the Culham Centre for Fusion Energy (CCFE) in Abingdon, UK. The work will be based in the UK, between CCFE and the University of York.

This project is a collaboration between General Atomics, the University of York, and the Culham Centre for Fusion Energy (CCFE). The aim is to extend the EPED model of the H-mode pedestal to low aspect ratio devices, and then to use this improved understanding to achieve high performance H-mode pedestals in the MAST-U spherical tokamak, including regimes such as Super H-mode and QH-mode.

The successful candidate will work as part of a team to develop the low-n version of the EPED pedestal model, and validate this model against MAST and MAST-U data. Once validated, a database of results will be built and used to to train an existing fast neural-network version of EPED. This fast analysis tool will be used for standard analysis and planning of experiments. You will work with York, GA and CCFE staff to plan, carry out, and analyse experiments on MAST-U to optimise performance and access regimes such as Super-H mode and QH-mode. You will also be involved in work to understand the effect of divertor closure on the H-mode pedestal structure, and will work under the direction of Dr Orso Meneghini to develop and incorporate the H-mode pedestal analysis tools, including a kinetic EFIT tool, into the OMFIT framework at MAST-U.

The Department of Physics is at the forefront of pioneering global research and technological advancement in our world leading research centres, focused around biophysics, condensed matter physics, nuclear physics, and plasma physics and fusion energy at the York Plasma Institute. This is combined with a commitment to teaching and outstanding student satisfaction.

As a Department we strive to provide a working environment which allows all staff and students to contribute fully, to flourish, and to excel. We aim to ensure that there is a supportive and egalitarian culture at all levels and across all staff groups. We promote good practice and a strong culture of equality in higher education, and are proud of our Juno Champion Award and Athena SWAN Silver Award. Further information can be found within this brief and on our website: [www.york.ac.uk/physics](http://www.york.ac.uk/physics)
Main purpose of the role

- To conduct research under the supervision of senior colleagues and to contribute to the production of research
- To assist in the identification and development of potential areas of research and the development of proposals for independent or collaborative research projects

Key responsibilities

(Role holders will be required to undertake some or all of the duties below)

- To conduct individual and collaborative research projects, duties to include: analysis and interpretation of research data; use of appropriate research techniques and methods; writing up of research results and dissemination through publications, seminar and conference presentations and public engagement and outreach activities; contributing to the identification of possible new areas of research
- To contribute to the preparation of research proposals and applications to external bodies
- To undertake appropriate organisational and administrative activities connected to the research project, including conference organisation, and the development of promotional or educational material including website maintenance and development
- To develop and initiate collaborative working internally and externally, duties to include: the building of internal contacts and participation in internal networks; collaboration with colleagues on joint projects as required; participation in and identification of external networks in order to share information and identify potential opportunities for collaboration and possible sources of funding; attendance at and contribution to relevant meetings
- To provide guidance to other staff and students, as required, as well as coordinating the work of small research teams
- To assist with undergraduate teaching in own area of expertise.

JOB DESCRIPTION

At a glance

Salary £32,236—£39,609 a year / Grade 6

Hours of work 37 hours a week / Full Time

Contract type Fixed Term / 12 months with the possibility to extend until June 2021

Based at University Campus West and the Culham Centre for Fusion Energy (CCFE)
# PERSON SPECIFICATION

## Qualifications

<table>
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<tr>
<th>Essential / Desirable</th>
<th>Qualifications</th>
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<tbody>
<tr>
<td>Essential</td>
<td>First degree in Physics, Mathematics or Engineering</td>
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<tr>
<td>Essential</td>
<td>PhD in Plasma Physics or equivalent experience</td>
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## Knowledge

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<th>Essential / Desirable</th>
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<tr>
<td>Essential</td>
<td>Knowledge in plasma physics to engage in high quality research</td>
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<td>Essential</td>
<td>Knowledge of a range of research techniques and methodologies</td>
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<td>Essential</td>
<td>Has research expertise in an area that will complement and enhance the department's research strategy and goals</td>
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<td>Desirable</td>
<td>Knowledge of one or more programming language for data analysis such as Python, IDL or Matlab.</td>
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<tr>
<td>Desirable</td>
<td>Knowledge of plasma phenomena and theory relevant to the H-mode pedestal in tokamaks</td>
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<td>Desirable</td>
<td>Knowledge of Fortran 90</td>
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## Skills, abilities and competencies

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<tr>
<td>Essential</td>
<td>Highly developed communication skills to engage effectively with a wide ranging audience, both orally and in writing, using a range of media</td>
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<td>Essential</td>
<td>Ability to write up research work for publication in high profile journals and engage in public dissemination</td>
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<td>Essential</td>
<td>Ability to develop research objectives, projects and proposals for own and joint research, with the assistance of a mentor if required</td>
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<td>Essential</td>
<td>Competency to conduct individual and collaborative research projects</td>
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<td>Essential</td>
<td>Ability to identify sources of funding and contribute to the process of securing funds, with collaborators if required</td>
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<td>Essential</td>
<td>Competency to make presentations at conferences or exhibit work in other appropriate events</td>
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<td>Desirable</td>
<td>Ability to work effectively with high performance computer systems</td>
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## PERSON SPECIFICATION

### Experience

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<tr>
<td>Experience of carrying out both independent and collaborative research</td>
<td>Essential</td>
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<td>Experience of writing up research work for publication</td>
<td>Essential</td>
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<td>Ability to work as part of a team and also to work independently using own initiative</td>
<td>Essential</td>
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<td>Experience of carrying out experiments on large plasma devices</td>
<td>Desirable</td>
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<td>Experience of applying computational tools and comparing to experimental data</td>
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### Personal attributes

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<th>Essential/Desirable</th>
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<tr>
<td>Attention to detail and commitment to high quality</td>
<td>Essential</td>
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<tr>
<td>Collaborative ethos</td>
<td>Essential</td>
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<td>Interest in and enthusiasm for the subject matter of the project(s)</td>
<td>Essential</td>
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<td>Positive attitude to colleagues and students</td>
<td>Essential</td>
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<td>Willingness to work proactively with colleagues in other work areas/institutions</td>
<td>Essential</td>
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<td>Ability to plan and prioritise own work in order to meet deadlines, including using initiative to plan research programmes</td>
<td>Essential</td>
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<td>Commitment to personal development and updating of knowledge and skills</td>
<td>Essential</td>
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THE DEPARTMENT

The Department of Physics

The Department of Physics: [http://www.york.ac.uk/physics](http://www.york.ac.uk/physics) is a department at the forefront of pioneering global research and technological advancement in our world leading research centres, focused around biophysics, condensed matter physics, nuclear physics, and plasma physics and fusion energy at the York Plasma Institute.

The Department has a lively and expanding research programme, and the research interests span a wide range, within both physics and the interactions of physics with other disciplines. We have benefited from substantial investment in these research groups, to help them play a leading role on the national and international stage, collaborating with major research institutions and industries. The research groups have international recognition, and each group regularly publishes papers in major journals and presents papers at international conferences.

The Department has many collaborations with other research groups in the UK and abroad, and contacts with industrial researchers. The Department also leads several inter-departmental ventures, including the Biological Physical Sciences Institute (BPSI), the York Quantum Technologies Centre (YQTC) and the EPSRC Quantum Communications Hub. There has been significant major investment in laboratories and facilities including the York-JEOL Nanocentre and the York Plasma Institute, and we have excellent mechanical, computing and electronic workshop facilities, which support our research and teaching activities.

We have developed a range of undergraduate and postgraduate programmes that provide all our students with the skills to succeed in careers across a broad range of scientific, technological, and related disciplines, and provide opportunities for students to spend a year at one of a number of overseas universities or in industry as an integral part of their degree programme. The Department offers both three year BSc and four year MPhys degree programmes in Physics, Theoretical Physics and Physics with Astrophysics; and joint degree programmes in Maths and Physics and Physics with Philosophy. For postgraduates it offers a taught MSc in Fusion Energy, an MSc by Research and PhD degrees, including leading the EPSRC Centre for Doctoral Training in the Science and Technology of Fusion Energy.

The Department has 58 academic staff members (including teaching-only staff) and amongst our academic staff we have Fellows of the Royal Society and the Institute of Physics, many national and international prize winners, contributing to a dynamic and thriving department. We have over 40 research staff, an increasing number of visiting researchers, and 40 support staff (technical and administrative). The student population comprises around 450 undergraduates and 120 postgraduates (mostly PhD).

The Department of Physics operates a set of family-friendly
THE DEPARTMENT

policies and welcomes applications that are made on a part-time and job share basis, and we will do our best to accommodate such requests where possible. Staff working patterns are flexible and a formal flexitime system is also in operation. We provide support and advice for staff taking maternity, paternity, adoption and parental leave, and the University has a nursery and a Child Care voucher scheme.

The Department provides support for all categories of staff in their applications for promotion, role reviews, awards, prizes and rewarding excellence nominations. Staff are encouraged to attend training events and take up opportunities for professional development including those offered by the award-winning University Learning and Development Team: https://www.york.ac.uk/admin/hr/browse/learning-and-development. The Department is committed to establishing a culture of environmental good practice and all staff are asked to go about their duties in a resource efficient way and minimise impacts to the environment wherever possible.

The Department strives to address diversity inequalities to ensure that there is a culture that supports equality and encourages better representation throughout the Department. The Department of Physics fully endorses and adheres to the University’s policies on equality of opportunity, and support for staff at all stages of their career is recognised as being extremely important. In recognition of our commitment to equality the Department has been awarded both Athena Swan Silver (the Athena SWAN Charter recognises and celebrates good employment practice for women working in science, engineering and technology (SET) in higher education and research) and Champion status within the Institute of Physics’ Juno programme (the intention of which is to recognise and reward departments that can demonstrate they have taken action to address the under-representation of women in university physics and to encourage better practice for both women and men). We have a well-established Equality Committee in the department which regularly reviews working practices and policies. Further information about the department is available at: http://www.york.ac.uk/physics

The York Plasma Institute

The York Plasma Institute brings together plasma scientists across a broad range of areas, with applications to magnetic and inertial confinement fusion, industry and medicine. The institute has many close collaborations with other research groups in the UK and internationally as well as active collaborations with industry. Alongside staff, the York Plasma Institute provides a base for students on our dedicated Fusion Energy MSc and a substantial number of PhD students working in the area of plasma science and technology, leading to a vibrant and stimulating atmosphere.

Further information about YPI is available at: http://www.york.ac.uk/physics/ypi
THE UNIVERSITY

Founded on principles of excellence, equality and opportunity for all, the University of York opened in 1963 with just 230 students. In 2019 it is the home of more than 18,000 students across more than 30 academic departments and research centres. Since opening over fifty years ago, we have become one of the world's leading universities and a member of the prestigious Russell Group.

We are consistently recognised as one of the leading Higher Education Institutes and one of just six post-war universities to have appeared in the world top 100. We were rated 22nd in the 2019 Times & Sunday Times league table. The University of York has won six Times Higher Education (THE) Awards and five Queen's Anniversary Prizes.

The University is proud of its association with Athena SWAN, holding multiple awards in support of gender equality, representation and success for all, with gold awards for Chemistry and Biology and a University-wide bronze award.

Of 154 universities that took part in the Research Excellence Framework (REF) in 2014, The University of York ranked 14th overall and 10th for the impact of our research. The University is consistently in the top ten UK research universities and attracts over £60m a year of funding from research alone.

Our vision is to make the University of York a world leader in the creation of knowledge through fundamental and applied research, the sharing of knowledge by teaching students from varied backgrounds and the application of knowledge for the health, prosperity and well-being of people and society.
Attractive workplace

Centred around the picturesque village of Heslington on the edge of the city of York, our colleges are set in an attractive landscaped campus. York enjoys a safe, friendly atmosphere with facilities including bars, shops, theatres and concert halls all within easy walking distance.

The University has undergone an unprecedented period of expansion and renewal since 2000. We have invested in twenty new buildings on the original campus and have completed the first and second phases of a £750m campus expansion. Our investment in new colleges, teaching and learning spaces, laboratories, research facilities and a new sports village mean there has never been a better time to join us.

During this period of change we’ve worked hard to retain our friendly, informal and collegiate atmosphere, which is important to our core values of inclusivity and interdisciplinarity.

We have a thriving international community and are committed to providing staff moving to York with as much support as possible through our Relocation Package and Welcome Officers.

The University is committed to promoting a diverse and inclusive community - a place where we can all be ourselves and succeed on merit. We offer a range of family friendly, inclusive employment policies, flexible working arrangements, staff engagement forums, campus facilities and services to support staff from different backgrounds.

For further information please visit our employee benefit pages.
THE CITY AND THE REGION

The City of York

Internationally acclaimed for its rich heritage and historic architecture, York's bustling streets are filled with visitors from all over the world. Within its medieval walls you will find the iconic gothic Minster, Clifford's Tower and the Shambles - just a few of the many attractions.

But York isn’t just a great place to visit - it’s also a great place to live and work. While nourishing a vibrant cosmopolitan atmosphere, York still maintains the friendly sense of community unique to a small city.

Visit www.visityork.org for more information on the city of York

Shopping, culture and entertainment

York boasts specialist and unique boutiques but also all the high street stores on its busy shopping streets. Alongside them you will find cinemas, theatres, an opera house, art galleries, a vast range of restaurants, live music venues and clubs. York is particularly renowned for its multitude of pubs and bars, from the modern to the medieval.

Housing and schools

Whether you choose to live close to the city, in one of the surrounding villages or further afield, you will find a wide range of housing within comfortable distance of York and the University. For families, the area has a range of excellent schools both in the state and independent sector.

Great location

York is one of Britain’s best-connected cities. Halfway between London and Edinburgh on the East Coast mainline, on intercity trains you can reach London King’s Cross in less than two hours and Edinburgh in two and a half hours. York is also well served by road links, and it is easily accessible from the A1, M1 and the M62.

For those travelling from overseas, Manchester Airport is two hours away and Heathrow Airport just three and a half. Flights from nearby Leeds Bradford Airport provide easy access to mainland Europe. By Eurostar from London St Pancras, Paris is just over six hours away.

Yorkshire

The Lonely Planet guide recently declared Yorkshire the third best region in the world to visit. There is something to cater to every taste, whether it be the rugged landscapes of the Moors or the Dales, the picturesque seaside towns of Scarborough and Robin Hoods Bay, the gothic architecture of Whitby or the vibrancy of cosmopolitan Leeds.
Apply online
- Go to https://jobs.york.ac.uk
- Find this job using reference 7817
- Complete the online application form

You will need to submit your completed application by midnight (local UK time) on 7 August 2019

What will I need?
You will need to upload:
- your CV
- a letter describing how you meet the requirements of the job

You will also need details of 2 referees.

Help and assistance
Direct any informal queries to
ypi-reception@york.ac.uk

If you have any questions about your application, contact the HR Services team:

recruitment@york.ac.uk
+44 (0)1904 324835