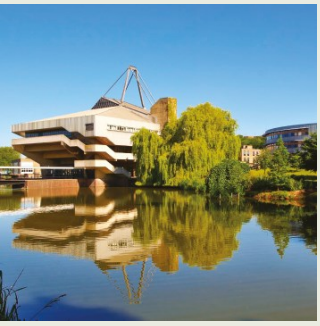
UNIVERSITY of York

Reader / Lecturer / Senior Lecturer in Tokamak Physics

Department of Physics

Closing date: Friday, 19 June 2015

Interview date: Tuesday, 21 July 2015



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INTRODUCTION

The UK fusion programme is entering an exciting new era, with major upgrades to its MAST tokamak and hosting JET where there are new opportunities offered by the ITER-Like Wall project and heating system upgrades. This post has been created within the York Plasma Institute (YPI) within the Department of Physics of the University of York to lead a world-class research programme within the area of fusion energy. Working in collaboration with scientists in the UK and internationally, the successful candidate will be interested in addressing key issues for ITER and DEMO, at the same time helping to train the next generation of fusion scientists and engineers.

We have a particular interest in exhaust physics, exploiting the ITER-Like Wall on JET, the Super-X divertor on the upgraded MAST tokamak, as well as other European (TCV, ASDEX-Upgrade, W-7X) and international tokamaks. However, strong candidates in other areas of Plasma Physics applicable to tokamak exhaust physics will also be considered. Beneficial synergies with the other YPI plasma research strands would be valuable.

The appointment is likely to be at the Lecturer level, but in the case of a truly outstanding application we will consider an appointment at Senior Lecturer/ Readership level.

Professor Sarah Thompson,
Head of Physics

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JOB DESCRIPTION

At a glance

Salary	Grade 7—£37,394—£45,954 a year Grade 8—£47,328—£58,172 a year
Hours of work	37 per week
Contract type	Open
Based at	York Plasma Institute, Department of Physics

Main purpose of the role

- To develop research objectives, projects and proposals and carry out individual or collaborative research projects
- To lead on and/or contribute to the production of research outputs and research outcomes
- To design, develop and deliver teaching across a wide range of modules and/or within a particular programme or subject area
- To undertake effectively a range of administrative and managerial responsibilities

Key responsibilities

Research and Scholarship

- To develop and promote the research activities of the department by developing a personal research plan independently and/or in collaboration with others as part of a larger research team
- To plan, manage and undertake research activities in accordance with a specific project plan, and to manage and guide the work of staff and research students on own specialist area
- To develop innovative research proposals, identify and obtaining external sources of funding
- To publish original research in appropriate journals or other relevant media as appropriate and attend international conferences for the purpose of disseminating research results or for personal development

Teaching and Promotion of Learning

- To develop innovative teaching materials, techniques and module design and take responsibility for the quality of the provision
- To plan, deliver and critically review a range of teaching and assessment activities
- To undertake academic supervision of students (including research students) and act as a research supervisor within own specialist subject area'
- To set and mark practical sessions, supervisions, fieldwork and examinations and provide constructive feedback to students
- To identify areas where current teaching provision is in need of revision or improvement and propose and implement improvements

Management and Administration

- To undertake the duties of a Programme Director and Module Co-ordinator and be responsible for the design, development and management of departmental teaching modules
- To contribute to the recruitment and selection of research and teaching staff
- To contribute to the administration and management of the department
- To advise, supervise and give guidance to other departmental staff as appropriate
- To develop and build internal and external contacts

JOB DESCRIPTION

The role is to develop a world-class research programme in experimental tokamak physics that will advance the international progress towards commercial fusion power, aligning with the UK strategy on fusion. There will likely be strong collaborations with Culham Centre for Fusion Energy, as well as across Europe and internationally. It is likely that the successful applicant will play leading roles in experiments on both the UK's spherical tokamak, MAST-Upgrade, and the flagship EU tokamak facilities at JET. Both of these are sited at Culham Science Centre, which is 200 miles from York. While visits for experiments will often be necessary, we also have at York a Remote Tokamak Control Room which is often used to lead and participate in experiments when travel to the tokamak is not possible. This also eases collaborations in Europe (TCV, ASDEX-Upgrade) and internationally, which are strongly encouraged as well. Our goal is to build on the key role that YPI plays in the UK and EU fusion programme.

We have a particular interest in receiving applications in the area of tokamak divertor and Scrape-off layer physics, including plasma-material interaction. That area involves Professors Kieran Gibson and Bruce Lipschultz along with Dr. Ben Dudson. Experimental backgrounds are preferred but it would be desirable for you to have experience in utilising theory and modelling approaches to interpret and predict experimental results. Those with a background in other areas of plasma physics with skills/knowledge applicable to tokamak physics are welcome if there is a demonstrated outstanding track record in research, particularly if their knowledge can be extended to exhaust physics. Thus the over -riding criterion is that the candidate be able to demonstrate their scientific achievements through a strong publication record and proven research capability.

The role requires the successful candidate to create a sustainable fusion research environment that exploits synergies with the existing activities at the York Plasma Institute. Attracting research funding through grant proposals and supervising research students and post-doctoral researchers is a very important part of this.

You will be expected to participate in teaching, contributing to existing core physics modules and to other relevant undergraduate, Masters-level and graduate modules, depending on your specific areas of expertise. You should also have the ability to teach advanced plasma physics concepts utilising elements of core physics undergraduate teaching modules including, for example, classical mechanics, thermodynamics, statistical mechanics and electromagnetism.

Most academic staff also contribute to the efficient management of the Department's activities, and you would be expected to make an appropriate contribution.

Your teaching and administrative load will initially be low so that you have an opportunity to establish your research programme. It will build to a full load, commensurate with other faculty members of the Physics Department over a 2-3 year timescale.

PERSON SPECIFICATION

	Essential	Desirable
Qualifications		
PhD in plasma physics, or equivalent experience	☒	☐
Appropriate academic professional and teaching qualifications or a willingness to complete the Post-graduate Certificate in Academic Practice	☒	☐
Knowledge		
Specialist knowledge in plasma physics	☒	☐
Knowledge of a range of relevant research techniques and methodologies	☒	☐
Appropriate knowledge of IT as applied to data acquisition and analysis	☒	☐
Has research expertise in an area that will complement and enhance the York Plasma Institute's research strategy and goals	☒	☐
Knowledge of a range of teaching techniques to enthuse and engage students	☐	☒
Cutting edge research expertise in experimental tokamak science which complements existing capability at the York Plasma Institute.	☐	☒
Knowledge of divertor and scrape-off layer physics, including plasma-material interaction	☐	☒
Skills, abilities and competencies		
Ability to develop research objectives, projects and proposals	☒	☐
Well-developed analytical skills	☒	☐
Highly developed oral and written communication skills, including ability to write and/or contribute to publications and/or to disseminate research findings using other appropriate media	☒	☐
Ability to deliver presentations at conferences or exhibit work at other appropriate events internally and externally	☒	☐
Ability to extend, transform, and apply knowledge from scholarship	☒	☐
Ability to design teaching material and deliver either across a range of modules or within a subject area.	☒	☐
Ability to supervise the work of others, for example in research teams or projects or as an MSc PhD or postdoctoral supervisor	☒	☐
Ability to define and execute a programme of world-class research essential	☒	☐
Evidence of international collaboration	☐	☒

PERSON SPECIFICATION

	Essential	Desirable
Experience		
Proven ability to contribute to high quality research which is publicly evidenced	☒	☐
Experience of taking responsibility for teaching and learning at undergraduate and ideally postgraduate level	☐	☒
Evidence of successful course planning, design and delivery across a range of modules, with exemplification of teaching materials	☐	☒
Evidence of dissemination of research findings which may include: the presentation of papers at conferences and workshops; participation in public engagement events to disseminate research; the publishing of chapters in text books; the publishing of papers; articles or reviews in academic journals or elsewhere; the construction of websites	☒	☐
A proven track record in an area of plasma physics relevant to tokamak exhaust physics	☒	☐
Significant presentations at major international conferences (preferably invited)	☒	☐
Research in tokamak plasma physics relevant to divertor and scrape-off layer physics in tokamaks	☐	☒
Experience in formulating and leading experiments	☒	☐
A role in supervising post-graduate students	☐	☒
Primary research area in plasma physics applicable to tokamak exhaust plasma	☒	☐
Personal attributes		
Show attention to detail and commitment to high quality	☒	☐
Display creativity, initiative and judgement in applying appropriate approaches to teaching, learning support and scholarly activities	☒	☐
Positive attitude to colleagues and students	☒	☐
Willingness to work proactively with colleagues in other work areas/institutions	☒	☐
Ability to plan and prioritise own work in order to meet deadlines	☒	☐
Show commitment to the department/university outside of their chosen field, for example undertaking management and administration duties	☒	☐
Collaborative ethos	☒	☐
Commitment to personal development and updating of knowledge and skills	☒	☐
Self-motivated, pro-active and innovative	☒	☐

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PERSON SPECIFICATION

READER / SENIOR LECTURER— NEEDS TO REFLECT BOTH

	Essential	Desirable
Qualifications		
PhD in plasma physics, or equivalent experience	☒	☐
Appropriate academic professional and teaching qualifications or a willingness to complete the Post-graduate Certificate in Academic Practice	☒	☐
Membership of professional societies	☐	☒
Knowledge		
Cutting edge research expertise in experimental tokamak science which complements existing capability at York.	☒	☐
Knowledge relevant to contributing to our postgraduate taught modules.	☒	☐
Knowledge sufficient to play a leading role in our core undergraduate physics taught programme.	☒	☐
Knowledge of divertor and scrape-off layer physics, including plasma-material interaction.	☐	☒
Skills, abilities and competencies		
Ability to define and lead a programme of world-class research	☒	☐
Ability to define and lead a research group	☒	☐
Ability to lead national and international collaborations	☒	☐
Strong oral and written communication skills in English	☒	☐
Ability to engage in and take responsibility for teaching and learning at University level	☒	☐
International track record in research that will support strong research grant proposals and attract research funding.	☒	☐
Evidence of peer review activities	☒	☐
Evidence of teaching ability, including course preparation and delivery	☐	☒
Experience		
A proven track record in an area of experimental tokamak physics.	☒	☐
Strong publication record in leading peer-reviewed journals	☒	☐
Significant presentations at major international conferences, with some invited.	☒	☐
Experience of collaborations on international fusion devices.	☒	☐
Research in divertor and scrape-off layer physics in tokamaks	☐	☒
Leading a research programme	☐	☒
A role in supervising postgraduate students	☐	☒
Teaching at undergraduate or postgraduate level	☐	☒

PERSON SPECIFICATION

	Essential	Desirable
Personal attributes		
Driven by research and teaching	☒	☐
Attention to detail and commitment to high quality	☒	☐
Self-motivated, pro-active and innovative	☒	☐
A desire to enthuse and train the next generation of fusion energy scientists.	☒	☐
A willingness to take the lead in research.	☒	☐

THE DEPARTMENT

The Department of Physics at York has 46 academic staff members, more than 40 postdoctoral Research Fellows and visitors, and 35 support staff. The student population comprises around 475 undergraduates and 110 postgraduates (mostly PhD). The department has expanded considerably in the last five years, with both staff and student numbers increasing significantly, accompanied by an on-going rise in research funding.

The Department has a lively and expanding research programme in several areas of physics, organised within three large research areas: Condensed Matter Physics, Nuclear Physics and Plasma Physics and Fusion. The Department leads several inter-departmental ventures, including the Biological Physical Sciences Institute (BPSI), the York Quantum Technologies Centre (YQTC) and the recently established EPSRC Quantum Communications Hub. There has been significant major investment in laboratories and facilities including the York-JEOL Nanocentre and the York Plasma Institute. There are excellent mechanical, computing and electronic workshop facilities, which support our research and teaching activities.

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 of Physics fully endorses and adheres to the University's policies on equality of opportunity, and in particular:

- has flexible working arrangements which exceed those stipulated by the University;
- has demonstrated commitment to the University's policy on job sharing;
- has been awarded both Athena Swan Silver 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.

Further information about the department is available at: http://www.york.ac.uk/physics

THE DEPARTMENT

The York Plasma Institute

The York Plasma Institute (YPI) was formally opened by the UK Government's Chief Scientific Advisor, Professor Sir John Beddington in October, 2012. It houses the Plasma Physics and Fusion Research Group, which presently has fifteen academic staff members. The Research Group is divided into three strands of activity:

Magnetic Confinement Fusion: Coordinated by Professor Howard Wilson, with Professor Kieran Gibson, Professor Bruce Lipschultz, Dr Roddy Vann and Dr Ben Dudson, the research focuses mainly on experimental and theoretical tokamak plasma physics. We collaborate closely with Culham Centre for Fusion Energy, with experiments on both MAST-Upgrade and JET as well as internationally on tokamaks including TCV, ASDEX-Upgrade, C-Mod, NSTX, DIII-D and KSTAR.

Low Temperature Plasmas: Coordinated by Professor Timo Gans, with Dr Deborah O'Connell, Dr Erik Wagenaars and Dr. James Dedrick, the research focuses on basic plasma physics and also technological/biomedical applications of plasmas, with a number of strong industrial collaborators including Intel. Research impacts a diverse range of sectors including advanced manufacturing, healthcare and plasma thrusters.

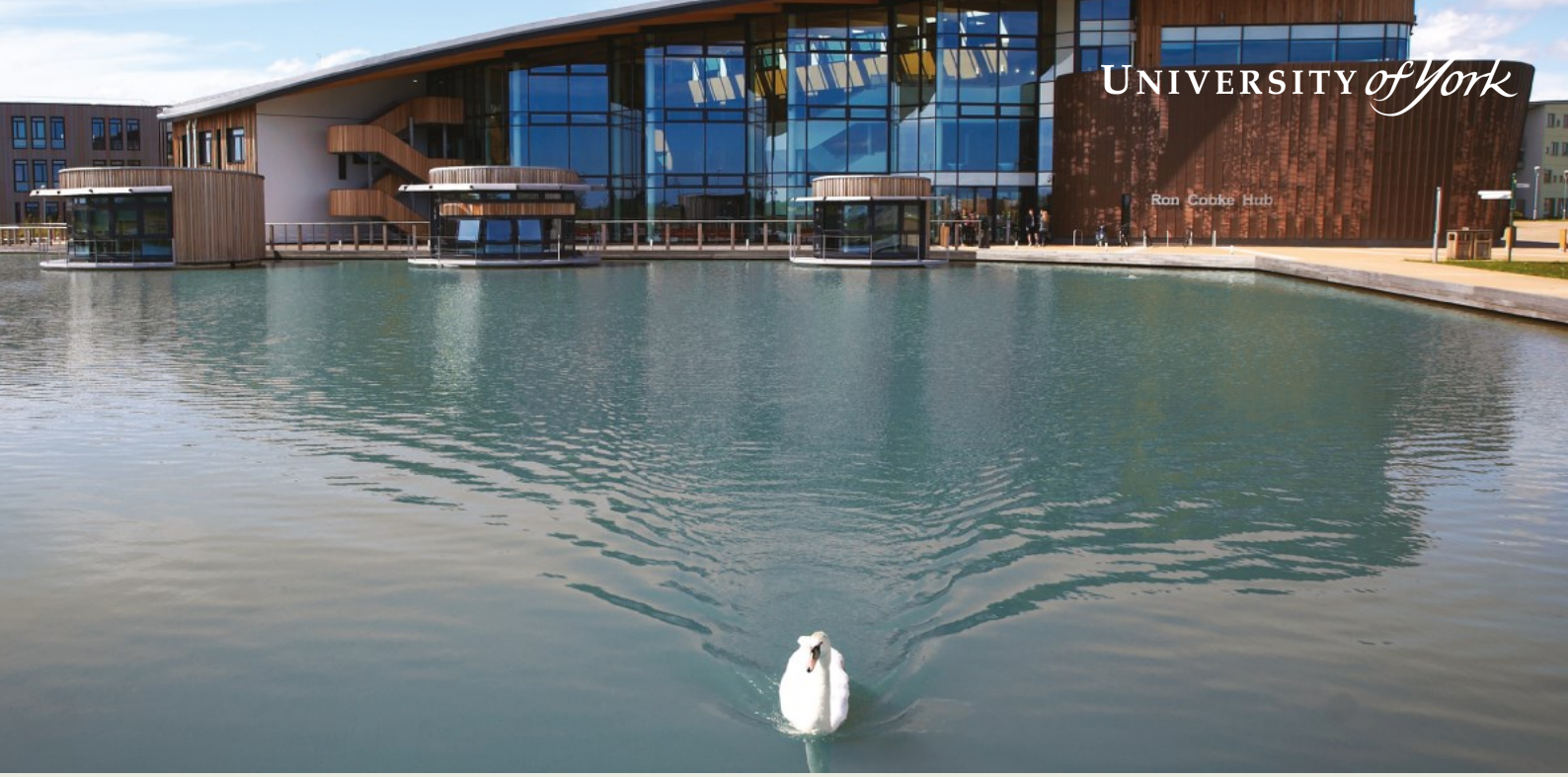
Laser-Plasma Interactions: Coordinated by Professor Greg Tallents, with Professor Geoff Pert, FRS (Emeritus), Professor Nigel Woolsey, Dr Andy Higginbotham, Dr Chris Murphy, Dr John Pasley and Dr Chris Ridgers, the research focuses on experiment and simulation of high energy density physics, inertial fusion energy and laboratory astrophysics, typically working on international laser facilities such as those of the Central Laser Facility at Rutherford Appleton Laboratory, as well as internationally including NIF.

The YPI Laboratories house most of our research equipment, including: magnetic confinement laboratory (housing a linear plasma device), laser-plasma interaction laboratory, biomedical laboratory, plasma processing laboratory (housing an Intel plasma reactor), spectroscopy laboratory (with ultra-fast imaging capability) and atmospheric pressure plasma laboratory. In addition, we have a Remote Tokamak Control Room and a computer cluster.

YPI has a dedicated Experimental Research Officer, two Administrators and an Industry Manager, Dr Kate Lancaster. Kate's role is to help industry engage with ITER (a role funded by Culham Centre for Fusion Energy) and develop university-industry collaborations in research and education. In addition Dr. Peter Hill is our Computational Physics Research Officer and Departmental Computing Officer at YPI

YPI leads the EPSRC Centre for Doctoral Training in the Science and Technology of Fusion Energy in collaboration with the Universities of Durham, Liverpool, Manchester and Oxford and with world-class research institutes, including Culham Centre for Fusion Energy, Central Laser Facility, National Nuclear Laboratory, AWE, as well as industry. This £8.7M PhD training programme funds 77 PhD students in the plasma and materials sciences over 5 intakes (2014-1018).

We also teach a one-year Masters programme: our MSc in Fusion Energy, with typically 15 students per year enrolled. Both of these programmes span inertial and magnetic confinement fusion.



THE UNIVERSITY

Founded on principles of excellence, equality and opportunity for all, the University of York opened in 1963 with just 230 students. In 2015 it is the centre for almost 16,000 students across over 30 academic departments and research centres. In just over 50 years we have become one of the world's leading universities and a member of the prestigious Russell Group.

Academic excellence

The University has consistently been recognised as one of the leading Higher Education Institutes and is one of just six post-war universities which appear in the world top 100 (2013-14) and 11th in the Times & Sunday Times league table (2014). The University of York has won six Times Higher Education (THE) Awards and five Queen's Anniversary Prizes.

We are proud of our association with Athena SWAN in support of women in science, with gold awards for both Chemistry and Biology and a University-wide bronze award.

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.

Out of 154 universities that took part in the Research Excellence Framework (REF 2014), The University of York ranks 14th overall and 10th on 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.

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. With a compact and easy to get around design, York enjoys a safe, friendly atmosphere. The campus offers a wealth of facilities, which includes 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 space, 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 all staff moving to York with as much support as possible through our Relocation Package and Welcome Officers.

The University aims to offer a nurturing and supportive environment as an employer. Flexible working hours, nursery facilities, childcare vouchers, cycle to work scheme, generous holidays and an attractive pension scheme all make the University of York one of the region's leading employers.

For further information please visit Rewards Extra

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.

HOW TO APPLY

Apply online

- Go to https://jobs.york.ac.uk
- Find this job using reference 4220
- Complete the online application form

You will need to submit your completed application by midnight (GMT) on Friday, 19 June 2015

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 3 referees.

Help and assistance

Direct any informal queries to bruce.lipschultz@york.ac.uk

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

recruitment@york.ac.uk

+44 (0)1904 324835