Professor of Digital Engineering
School of Physics, Engineering and Technology

Closing date: 27 February 2022
Interview date: 28 March 2022
Vacancy reference: 10265
INTRODUCTION

The University of York has established the School of Physics, Engineering and Technology that combines its strengths in Electronic Engineering and Physics, and creates opportunities to expand into new areas. This expansion includes a new research and teaching activity in Digital Engineering. The University of York invites applications for a Professor in Digital Engineering to initiate and lead this activity. Up to two associated Lectureship posts will also be created.

The successful applicant will demonstrate a clear vision for Digital Engineering at York, in a strategy that exploits the emerging capabilities of supercomputers and modern approaches to advanced simulation. We are enthusiastic to receive innovative ideas for rapidly establishing a multidisciplinary world-class reputation in this exciting field, which is likely to link to our other research activities such as digital immersive technologies, and our Institute for Safe Autonomy and Digital Creativity Labs. While we will consider all ideas within this field, we are particularly interested in the role that digital engineering can play in accelerating future technologies to market.

These are often delayed due to gaps in data and/or knowledge, creating uncertainty that compromises design and manufacture. Gaps arise due to the inability to recreate representative testing environments for prototypes, such as the core of a fusion reactor, or because the operating environment is uncertain, as for technologies to mitigate the impact of climate change.

An example of the approach is the potential of advanced computing to replace tests of real prototypes in physical environments with virtual components in virtual environments. This then links to concepts such as digital twinning, and requires the need to understand how the reliability and application of such simulations couples to uncertainty quantification and propagation. The implications of digital engineering for regulation, and for understanding the interface between technologies and people are also of interest.

Professor Andy Tyrrell
Head of Department, Electronic Engineering
Main purpose of the role

Professors at York are expected to advance their subject nationally and internationally and to contribute to maintaining the University’s ambition as an international centre of excellence for the relevant subject area through research and publication, teaching, networking and consultancy.

We are seeking applicants with an outstanding research record that is internationally recognised and supported by robust academic and non-academic collaborations, who will excel in all aspects of academic practice and help to rapidly establish the School of Physics, Engineering and Technology as world-class. Successful candidates will (i) undertake world leading research in a discipline of digital engineering, and will engage in wide-ranging collaborations within and beyond the School, including supporting and mentoring early career researchers and postgraduate students; (ii) contribute to the academic leadership of the School and University; (iii) attract external funding to support our research and innovation activities; (iv) with colleagues, support the continued development of teaching programmes in the School; (v) work at a senior level with external organisations to generate the highest research impact and deliver continuing professional development; (vi) engage actively with School and University members to help create a distinctive and positive working environment that emphasises excellence.

While you will be expected to identify and work with a range of external partners, we have an established relationship with the UK Atomic Energy Authority in the area of fusion energy - both in research and education.

Key responsibilities

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

To support the research activities of the School

- To carry out internationally outstanding research, scholarship and innovation
- To disseminate research through monographs, articles in journals of international standing, and other appropriate forms, including national and international conference presentations
- To play a leading role in the School in identifying and securing external funding through research grants and contracts, and in developing collaborative research income-generating activities
- To play a leading role in the translation of research towards and into commercial and/or societal benefit
- To attract and supervise research students, and, as appropriate, post-doctoral researchers and other support staff
- To support, comply with, and contribute fully to research plans and policies of the School and the University
- To support and mentor junior academic colleagues in order to promote quality of teaching and research and their career development

The vision of Digital Engineering at York is expected to include aspects of relevance to the national fusion programme, and is expected to benefit from a package of funding being offered by UKAEA.

In addition to establishing a world-class research portfolio, you will work with colleagues to lead the development a new taught Masters programme which includes Digital Engineering, informed by the research of the School and its collaborators. You will also work with partner universities and research organisations towards a framework and funding to support a coherent doctoral training programme.
JOB DESCRIPTION

To support the teaching objectives of the School

- To design and be responsible for delivery of modules and teaching programmes for undergraduate and graduate students
- To play a leading role in School and cross-departmental curriculum development and quality enhancement
- To coordinate team teaching, as required, including liaison with other staff and with postgraduates who teach
- To design and mark assessments, and give feedback
- To supervise undergraduate and graduate projects and dissertations
- To carry out teaching in Continuing Professional Development
- To undertake pastoral support of students, as a personal supervisor or in another designated role
- To support and promote fully the University and School teaching quality assurance standards and procedures

To contribute to the efficient management and administration of the School

- To make an important contribution to the leadership and management of the School, including supporting early career staff and developing new collaborative initiatives
- To attend School meetings, meetings of the Board of Studies, and other committees and working groups within the School and University
- To carry out relevant professional duties, commensurate with the Professorial grade
- To undertake specific School roles and management functions as may be reasonably required by the Head of School
# PERSON SPECIFICATION

<table>
<thead>
<tr>
<th>Qualifications</th>
<th>Essential / Desirable</th>
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<tbody>
<tr>
<td>PhD in relevant discipline, or equivalent experience</td>
<td>Essential</td>
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<td>Membership of appropriate professional societies (e.g. IET, IMechEng)</td>
<td>Essential</td>
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<tr>
<td>Undergraduate degree in Engineering or a related discipline</td>
<td>Essential</td>
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## Knowledge

Outstanding and internationally recognised knowledge in a field of relevance to the vision for Digital Engineering at York

## Skills, abilities and competencies

| Ability to define, lead, manage and attract funds for internationally excellent research, operating across disciplinary boundaries | Essential             |
| Proven leadership and managerial skills                                       | Essential             |
| Ability to manage and interact with staff and students at all levels and to contribute to broadening the strategic development of the School | Essential             |
| Ability to consistently publish academic work that is recognised as internationally leading | Essential             |
| Ability to work with external and non-academic organisations for research impact and innovation | Essential             |
| Evidence of international collaboration                                       | Essential             |
| Ability to attract research funding to sustain a world-class research group    | Essential             |
| Evidence of peer review activities                                            | Desirable             |

## Experience

| International leader in a major research field, leadership of research group/theme of relevance to the vision of Digital Engineering at York | Essential             |
| Substantial publication record in leading peer-reviewed journals, or equivalent experience | Essential             |
## PERSON SPECIFICATION

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<th>Experience (continued)</th>
<th>Essential / Desirable</th>
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<tr>
<td>Invited presentations at major international conferences, or equivalent experience</td>
<td>Essential</td>
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<td>Effective and sustained involvement in major management duties or positions of responsibility within a department or research unit</td>
<td>Essential</td>
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<td>Success in the commercial exploitation of research</td>
<td>Desirable</td>
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<td>Exceptional achievement in curriculum development, course design and teaching, learning and assessment methods at UG and PG levels and in encouraging student access and engagement</td>
<td>Desirable</td>
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<tr>
<td>Significant and sustained success in accessing research grants and other external funding</td>
<td>Desirable</td>
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<tr>
<td>Success in the commercial exploitation of research</td>
<td>Desirable</td>
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<td>Attraction and effective supervision of postgraduate students</td>
<td>Desirable</td>
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### Personal attributes

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<tr>
<td>Demonstrable capacity for strategic thinking and planning</td>
<td>Essential</td>
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<td>Ability to take a lead in key administration functions within the department</td>
<td>Essential</td>
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<td>Self-motivated, pro-active and innovative</td>
<td>Essential</td>
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<tr>
<td>Clear communicator - written and oral</td>
<td>Essential</td>
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The School of Physics, Engineering and Technology will formally launch from summer 2022, bringing together the combined strengths of our existing Departments of Electronic Engineering and Physics, with new initiatives - especially those that enhance our capability in engineering disciplines.

The present Department of Electronic Engineering has an international reputation for excellence in research and teaching. Our research groups play significant roles on the national and international stage, collaborating with major industries and securing funding from research councils. In the latest Research Excellence Framework assessment (2014), 87% of our work was assessed as world leading or internationally excellent. 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 are proud of our Athena SWAN Bronze Award.

The present 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. 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 are proud of our Athena SWAN Bronze Award.

Turning to the vision for the School of Physics, Engineering and Technology, its research philosophy values and supports blue skies thinking that underpins the individual research ambitions of our staff, while at the same time providing a framework that fosters innovation in goal-driven research to meet some of the grand challenges of society. To enable this, the research structure of the School will be divided into two sets of Themes: Discovery and Translational.

Discovery Themes are the technical topical themes that characterise and underpin our core disciplines of Engineering and Physics. They represent our traditional strengths, with a philosophy of academic freedom and blue skies thinking at their heart. They have a close and direct coupling with our taught undergraduate programmes, and provide a rich, diverse, stimulating environment with strong internal and international collaborations, seeking to enable our research staff and students to realise their individual ambitions.
THE SCHOOL

The precise definition of the themes is still under discussion, but is expected to include the following topical areas:

- Intelligent Systems & Robotics
- Healthcare Engineering
- Communication Technologies
- Condensed Matter & Materials Physics
- Quantum Science & Technologies
- Plasma & Fusion Science and Technology
- Physics of Life
- Nuclear Physics

Translational Themes are new, but build on the solid foundations of the Discovery Themes. They create opportunities to drive our fundamental research activities up the lower ranks of the Technology Readiness Level (TRL) scale towards a level of maturity that provides external stakeholders with the confidence to invest, and so accelerate research discoveries and ideas towards societal, environmental and economic benefit.

The chosen thematic areas and the projects within them are motivated by the pull of society’s grand challenges, and are expected to be highly coordinated, strategic, interdisciplinary projects typically involving strong collaborations across University Departments and Centres, as well as with external stakeholders. The definition of the themes is still under discussion, but is expected to include the following topical areas:

- Healthcare and Bioscience
- Sustainable Energy
- Technologies for Challenging Environments
- Engineering the Virtual World
- Next Generation Devices

The new research area of Digital Engineering is expected to sit within the Theme of Engineering the Virtual World. It will sit alongside other subthemes, such as Interactive & Immersive Technologies and Machine Intelligence.

We provide support for all categories of staff in their applications for promotion, role reviews, awards and prizes and rewarding excellence nominations. We strive to address gender inequalities and ensure that there is a culture that supports equality and encourages better representation throughout the department. Support for women at all stages of their career is recognised as being extremely important.

Further details of the Department can be found on its website: https://www.york.ac.uk/electronic-engineering/
The University

We are a world-class institution, focused on creating an environment of excellence in which all our students, staff and researchers can thrive. Our Research Strategy encompasses our vision that York should provide a home for some of the best research in the world. ([https://www.york.ac.uk/research/](https://www.york.ac.uk/research/))

We are a high-performing member of the Russell Group, ranked 16th in the Guardian’s Best University UK Universities 2021 League Table, and 30th in the Complete University Guide 2020. We have been awarded TEF Gold for our research-led teaching which provides “consistently outstanding outcomes for students from all backgrounds”.

Our Equality, Diversity and Inclusion Strategy speaks to the core of our values. We hold 16 awards from Athena SWAN, recognising the advancement of gender equality: representation, progression and success for all.

At the heart of the region

The University is deeply embedded in the local community of North Yorkshire. Our values and commitment to the public good have never been more important. We are a hub for sharing knowledge, inspiring collaboration and enriching lives.

In 2021 we were shortlisted for Times Higher Education’s University of the Year Award in recognition to the University’s response to the Covid pandemic [The Year We Came Together - Our Covid-19 response](https://www.york.ac.uk/about/mission-strategies/our-covid-19-response/).

Across the University, we are mobilising our knowledge, our people and our resources to tackle the immediate and long-term challenges. The new University Strategy 2030, ([A University for Public Good](https://www.york.ac.uk/about/mission-strategies/our-university-strategy-2030/a-university-for-public-good/)) was launched at the end of 2021, outlining our vision and strategy for the next decade.

Further information on the new strategy can be found on the following webpages; [https://www.york.ac.uk/about/mission-strategies/our-university-strategy-2030/a-university-for-public-good/](https://www.york.ac.uk/about/mission-strategies/our-university-strategy-2030/a-university-for-public-good/)
THE UNIVERSITY

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 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 10265
- Complete the online application form

You will need to submit your completed application by midnight (local UK time) on 27 February 2022.

What will I need?

We will ask you for details of:

- Your CV
- A letter describing how you meet the requirements of the job
- A statement of your research and teaching intentions

You will also need details of three academic referees (one International) and one Employment referee.

Help and assistance

For an informal discussion regarding this post, please contact the Head of Department, Prof Andy Tyrrell (andy.tyrrell@york.ac.uk), or Simone Quinn (simone.quinn@york.ac.uk), if you would like to learn about working at the University of York.

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

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