UNIVERSITY OF BIRMINGHAM

Chair in Silicon Detector Instrumentation for Particle Physics

Information Pack

We advance
We activate
birmingham.ac.uk

Contents

1. About University of Birmingham

In 1900, we were founded on the radical vision of Joseph Chamberlain to provide a university for the people of Birmingham - 'a great school of universal instruction… taking all knowledge in its province'. England's first civic University, we were established as a place where students and staff from all backgrounds are accepted on an equal basis. This philosophy has defined and shaped us as an institution ever since and remains even more important today.

Over the last nearly 125 years, we have grown our civic roots to become a global institution that extends our reach across the world - welcoming the best to Birmingham and taking the best of Birmingham to the world.

Ranked in the top 100 universities globally, we are part of the Russell Group and a founding member of the Universitas 21 global network of research universities. The quality of our research is amongst the best of UK universities, with the 2021 Research Excellence Framework (REF) results ranking us 13th in the UK and 10th in the Russell Group for Grade Point Average.

Combining an original 'redbrick' heritage with an ambitious transformation agenda, we recently opened an international campus in Dubai, alongside offices in India and China. We have invested £1 billion in our facilities and campus over the past ten years, spanning student experience, teaching and learning, and importantly, in world-leading research facilities.

An anchor institution for the UK's diverse, youthful, and dynamic second city, we are one of the region's largest employers. We played a central role in the success of the Birmingham 2022 Commonwealth Games, and value our partnerships with local organisations, including our Civic University Agreement with Birmingham City Council and the West Midlands Combined Authority.

Our **Birmingham 2030 Strategic Framework** sets out our goal to become a top 50 global institution. With world-class research and outstanding global education as our core mission, we will strive to increase the volume and quality of our research to make an even greater difference to the world around us.

2. Our community

We strive to provide a welcoming and inclusive environment for everyone in our community. Our diversity is a major source of strength that underpins the exchange of ideas, innovation and debate at the heart of our academic mission. This is why we want to recruit people from different fields, backgrounds, and from countries around the world.

At Birmingham, we teach and carry out research across the full breadth of academic disciplines. This creates a vibrant community and provides multidisciplinary opportunities for research and education. Our truly international community is made up of more than 8,000 staff, 38,000 students and over 350,000 alumni.

Our student community is not only one of the largest of any UK university - it's also highly diverse. 86% of our home undergraduate students come from state schools. 43% are from black, Asian, or other minority ethnic backgrounds. While 36% are the first generation of their family to attend university.
Our Equality, Diversity & Inclusion Scheme 2021 – 2024 sets out our commitment to:

- Create an inclusive environment: developing a University community where everyone feels welcome, included and empowered to succeed;
- Dismantle barriers: addressing the structural barriers faced by groups within the University in order to create more equitable outcomes;
- Integrate equality, diversity and inclusion: issues and impacts are considered and addressed across our activities.

We hold a Bronze Race Equality Charter Award and a Bronze Athena SWAN Charter Award at an institutional level, with the majority of our Schools holding Bronze or Silver Athena SWAN awards.

Our most recent staff survey shows levels of engagement and pride most employers would be delighted to achieve. Committed to building on this, we have made **'people and culture'** a core pillar of our Birmingham 2030 Strategic Framework.

We also support the career development of our academic staff through our **Birmingham Academic Career Framework** that inspires and develops and maintains an academic culture of intellectual stimulation and high achievement.

3. Research and innovation

We have a global reputation for both high-quality fundamental and translational research.

Our academic community achieves remarkable results and impact. They have been at the heart of some of the greatest scientific discoveries of recent times, from the discovery of the Higgs boson particle, to detecting gravitational waves, and most recently making a major contribution during the Covid-19 pandemic.

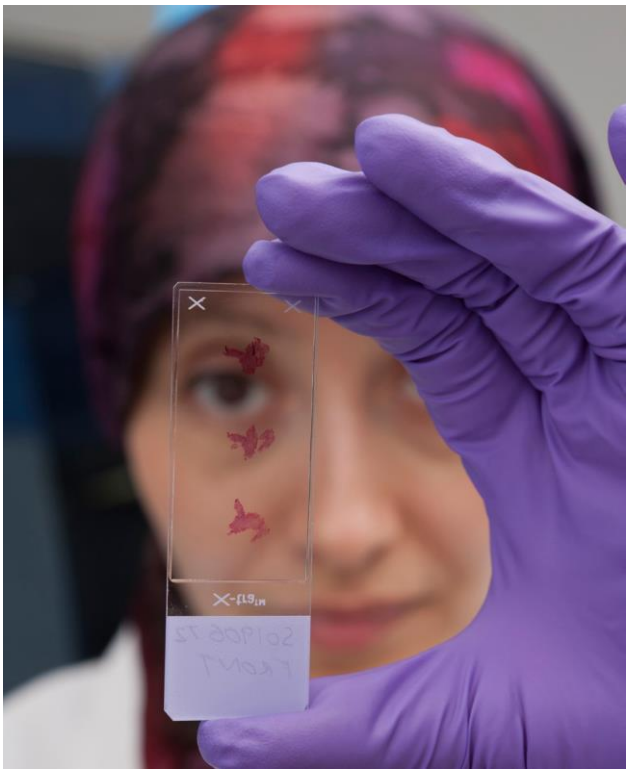
For a UK university, our areas of research excellence stand out as highly comprehensive, with a submission to 28 out of a possible 34 Units of Assessment in REF 2021. Our 13th position in in the subsequent rankings, placed us amongst the UK's best universities. 50% of our research was recognised as world leading, and our 12-place increase was the largest rise achieved by any Russell Group university.

The total value of our research funding has grown, reflecting our continued rise in quality. . We now have a portfolio of over 2,800 live projects with an award value to the University of over £900 million.

Across our campus, stretching into the city beyond, we have built a suite of innovation sites and strategic assets which are helping us to develop and test novel technologies in our areas of technical excellence including, energy, engineering, and life sciences.

Our extensive cultural artefacts and collections, across religion, history and the arts, are helping bind us more closely to our communities. **Read more here about our innovation sites.**

Our strong performance in REF21 underlines the strong collaborations we have, including with industry and the health, education, and cultural sectors. By working in partnership with others in our region and across the world we are delivering solutions to address challenges. To reflect our focus, we have developed five distinctive challenge-led research themes: Global Health, Thriving Planet, Connecting Cultures, Life-Changing Technology, and Fairer World, in which we are now seeking applications from individuals who can make a significant contribution.

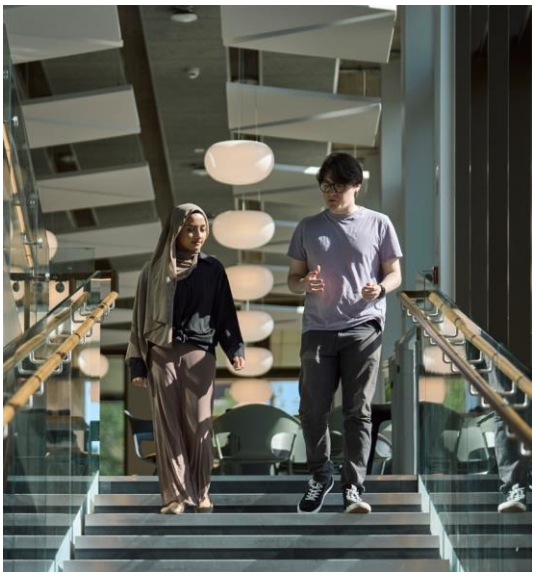


4. Student experience and learning

At Birmingham, our research enhances and reinforces our learning experience. We value and reward teaching quality and have applied what we have learnt from the Covid pandemic to improve our in-person teaching with enhanced digital learning. Our inclusive and intellectually challenging education programmes are underpinned by cutting-edge knowledge and taught by leading researchers to encourage independent thinking and develop the next generation of leaders, innovators and problem-solvers.

We are proud of our high rates of graduate employment. Our students are the third most targeted by the UK's leading employers looking for graduate recruits (High Flyers Graduate Market, 2023). Our students continue to flourish on leaving the University, joining employers such as the NHS, KPMG, Network Rail, Jaguar Land Rover, Arup, Deloitte, and BT.

A distinctive element of student experience is learning within our green campus, which is one of the largest open green spaces of any UK University. Our 672-acre Edgbaston campus includes The Vale student accommodation village, set around a lake in its own beautiful parkland. In recent years, we have made major investments in a new main library, the Collaborative Teaching Laboratory, a Teaching and Learning Building, and sports centre.

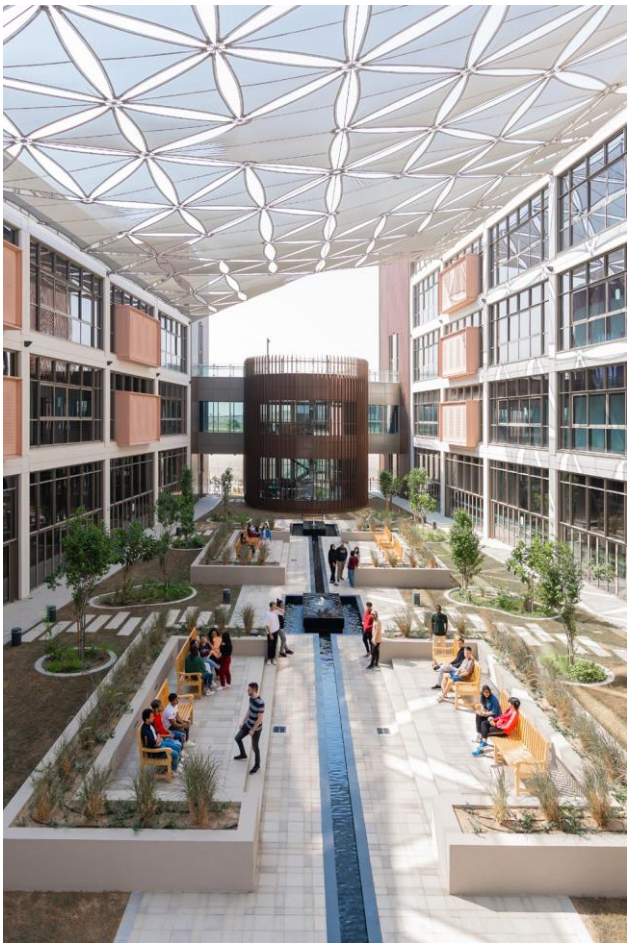


Opened in 2021, our Dubai campus is a permanent academic home for up to 2,900 students, a community for Birmingham alumni in the region and a hub for community outreach and engagement activities.

Our online learning offering also provides students the flexibility to study alongside their current professional and personal commitments. UOB Online offers programmes that have been purpose-built from the ground up to harness the full power of the technologies available, involving everything from cloud-powered collaboration to interactive live lectures.

We now welcome a total student population of over 25,000 undergraduate, 13,000 postgraduate and 2,500 distance learning students. Home to a diverse global community, we have nearly 11,000 international students studying either at Edgbaston, on our distance learning courses or overseas at our Dubai campus or through our partnership with Jinan University.

University of Birmingham Dubai



5. Our global outlook

Our international strategy is focused around attracting the very best global talent to study and work at Birmingham. We also seek to extend our reach and influence, producing the very best impactful research through our global collaboration, contributing to the priority regions where we engage, with regional institutes creating a powerful focus for our engagement.

In North America, our signature partnership with the University of Illinois Urbana-Champaign has grown to over 70 successful faculty-to-faculty links in key academic disciplines thanks to a successful framework for continued collaboration and investment. Our more recent partnership with McMaster University is supporting research in healthy ageing and climate action.

Europe represents a major strand of our global engagement, with an exceptionally strong performance in Horizon Europe grants that we will build post UK association. Signature partnerships include those with Leiden University in the Netherlands and with the Fraunhofer Institute and the Federal Institute for Materials Research and Testing in Germany. More recently, we have launched a #TwinforHope partnership with Ivan Franko National University, Lviv

Our China Institute supports sister-city links with both Guangzhou and Nanjing with developed research platforms in healthcare, advanced manufacturing. through to new energy initiatives and healthcare technology innovation. Our India Institute supports a range of partnerships in India, notably establishing joint postgraduate programmes between IIT Madras and Birmingham, which is the first such education partnership at Masters' level between any IIT and a UK Russell Group University.

Our China Institute supports sister-city links with both Guangzhou and Nanjing

Through purposeful investment in Brazil for over 10 years, we have established research partners in health, nanotechnology, environmental science, transport and energy, leading us to inaugurate a new Brazil Institute in 2023.

Our campus in Dubai has enabled us to establish extensive partnerships in the region, including a long-term agreement with the Roads and Transport Authority (RTA) of Dubai that sees the RTA leasing space at our campus for its Innovation, Research and Development Centre, supporting the next generation of UAE transport engineers.

Our work in Brazil lead to the inauguration of the Brazil Institute in 2023

The India Institute works research areas such as air pollution

6. Our commitment to civic engagement

As the original 'civic' university, we believe in sharing knowledge and making the best education accessible to all in our city. Which is why we are expanding our contribution to the local educational ecosystem and are involved with a diverse range of cultural and widening participation initiatives. Our Civic University Agreement underpins our contribution to the economic, cultural and educational work of our region.

Located at the heart of Birmingham city centre, **The Exchange** uses our research, teaching and local, national and international networks to create a place of curiosity, celebration, collaboration and change. Home to a policy institute and a business incubator for students and graduates, The Exchange provides a base for teaching in leadership, executive education and in-demand skills.

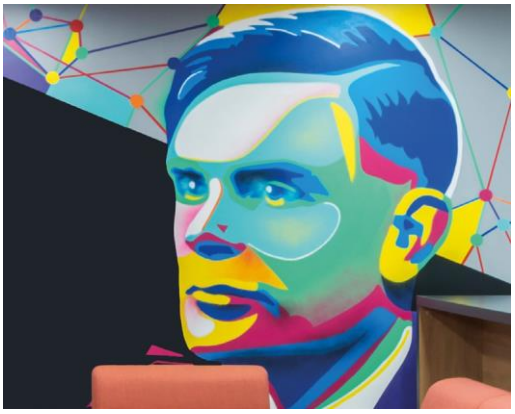
Set to become a world-leading healthcare technologies hub developing and applying leading-edge academic research, Birmingham Health Innovation Campus will open in 2024. Led by Birmingham Health Partners, and located adjacent to both the University and the Queen Elizabeth Hospital, it will offer high quality laboratory, office, incubation and innovation facilities for forward-thinking businesses and will be part of an integrated, physically connected critical cluster of patient-centred health excellence.

The Exchange, Birmingham

The University of Birmingham School is a centre of teacher education in the region. Already one of the most diverse schools in the city, we are proud of the 'Good' rating it secured in its first Ofsted inspection – the best possible rating at this stage in its development.

Our sector-leading widening participation programmes engage with more than 10,000 students in the West Midlands every year. Supporting students from less advantaged backgrounds and non-selective state schools, these programmes significantly increase the chances of them attending a Russell Group university.

Our fundraising and volunteering campaign 'Birmingham In Action' aims to transform lives for our generation and the next by tackling the world's biggest challenges, today. It's one of the largest fundraising campaigns in the modern history of UK higher education and supports some of the most important areas of work in the University, including access to education, youth mental health, cancer, refugees and the environment.



Turing University Network

7. Enjoy living in the UK's most diverse city

Birmingham has experienced a major transformation over the last decade. Home to a vibrant and multicultural community, our city is an exciting place to live, work and visit.

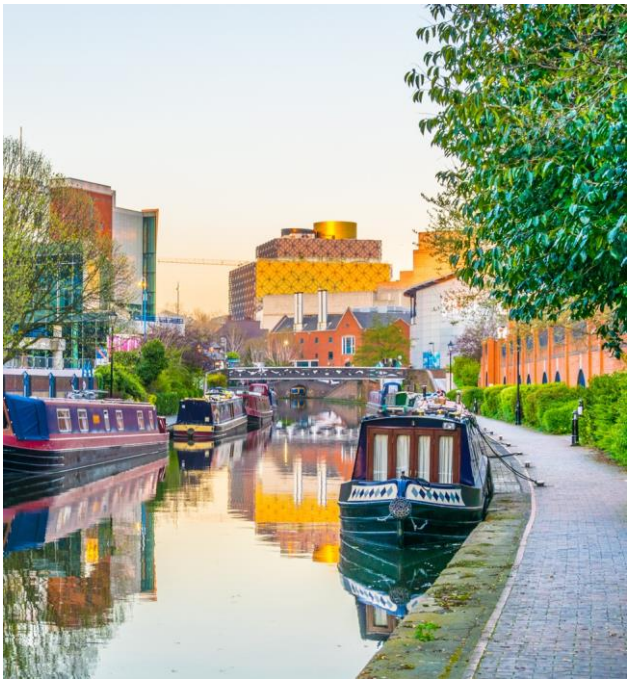
Combining a rich cultural heritage with a contemporary vision, Birmingham has something to offer everyone. The city is home to the internationally renowned Birmingham Royal Ballet and Symphony Hall, one of the world's greatest concert venues, and iconic Bullring, one of Europe's largest dedicated shopping facilities.

The Birmingham 2022 Commonwealth Games was the largest multi-sport event to be held in England in 10 years, and was supported by the most comprehensive University partnerships in the history of the Games. Birmingham also offers international test cricket, Premier League and Championship football, top-class rugby and international championship golf and tennis.

As a diverse, multicultural city, Birmingham is renowned for the breadth of its cuisine and has more Michelin starred restaurants than any other English city outside London. The city is also home to quality schools and a choice of housing, from city centre flats to detached houses in the suburbs.

A recent 'Best Places to live in Britain' report by Sunday Times/Zoopla, put three areas of Birmingham in the top 50 best places to live in Britain, with the suburb of Moseley voted the overall winner.

Further afield, Birmingham is within an hour's drive of Stratford-upon-Avon and London Euston can be reached in as little as 79 minutes, with trains running every 20 minutes. We have our own University train station that connects to Birmingham New Street Station that is used by 50 million passengers every year. Through Birmingham Airport you can also access the world with more than 50 airlines operating scheduled services to 100 destinations across the globe.



8. College and School

The College of Engineering and Physical Sciences is one of the largest groupings in Europe, bringing together physical sciences and engineering into one coherent college. It is tackling some of the biggest challenges facing humankind from climate change and sustainability to staying healthy and tackling disease. We have research institutes and centres spanning diverse areas including energy innovation, quantum technology, railways, healthcare technology, robotics and cyber security. Our research spans the full spectrum from discovery to translational research.
Our vibrant community of over 1,100 academic and professional services staff work collaboratively across a range of disciplines and interdisciplinary fields. We have a rapidly expanding research grant portfolio and steady growth in research awards. Our professional services staff provide valuable expertise, working in partnership with academic colleagues to support research activity and help the College to develop its influence regionally, nationally and globally.
The College is home to well over 7,500 students in Birmingham plus hundreds more on our Dubai campus and at our Joint Institute in China. They study a diverse range of undergraduate, postgraduate taught and research programmes. Our education portfolio is also growing with the introduction of online learning and continuing professional development courses. Academic and professional services colleagues work in partnership to attract high quality students from around the globe and ensure a high-quality experience for our students and their wellbeing, whatever location or method of study they choose.

The School of Physics and Astronomy is one of seven Schools within the College, along with the Schools of Chemical Engineering, Chemistry, Computer Science, Engineering, Mathematics, and Metallurgy & Materials, which affords students, staff and alumni access to learning and career development opportunities which few educational institutions can match. All subjects in the College of Engineering and Physical Sciences have improved their quartile ranking in the Research Excellence Framework 2021.
Beyond the School structure, the College has a huge breadth of research activity and outputs. Our computer scientists are driving forward the University's new Institute for Interdisciplinary Data Science and Artificial Intelligence, a nexus for collaborative research and education. At the Birmingham Energy Institute, we are focused on the global challenge of energy consumption and are creating technology and guiding policy to shape energy solutions. Our robotics experts are working on solutions for decommissioning nuclear waste addressing one of Europe's most complex environmental challenges.

We lead the UK Quantum Technology Research Hub in Sensing, Imaging and Timing which brings together physics and engineering academics. The Hub is playing a major role in influencing government policy, securing public funding to help translate laboratory science into real-world solutions. The work includes ultra-precise sensors that improve health and safety during excavation, optical clocks to improve navigation and communications, and using revolutionary technology for health applications including research into dementia. The Healthcare Technology Institute has researchers from numerous College disciplines working with others to advance new technologies and treatments. They are tackling antibiotic resistance, pioneering techniques for healing without scarring and finding new ways to make early diagnoses.

The College also has a number of state-of-the-art facilities for research and education. The Collaborative Teaching Laboratory represents a new approach to flexible, multi-use, multi-disciplinary lab teaching and is used by engineering and science disciplines. The National Buried Infrastructure Facility is a unique facility for research, education and training. The Birmingham Extreme Robotics lab is Europe's most prominent university lab dedicated to nuclear and other extreme environment applications of advanced robotics and AI.

About the College of Engineering and Physical Sciences - University of Birmingham

The School of Physics and Astronomy is a world-leading physics department, excelling in both research and teaching. The School sits within the College of Engineering and Physical Sciences (EPS) at the University of Birmingham (UoB). EPS is one of five Colleges within the institution. We are a large department, comprising just over 120 academic and research staff (17% female); just under 40 Professional Services staff (44% female); around 170 postgraduate researchers and postgraduate taught students (26% female); and around 625 undergraduates (28% female). The School is spread across five buildings on the main Edgbaston campus. These buildings contain the School's research facilities, lecture theatres, teaching laboratories, undergraduate computing laboratories, and study and social spaces.

Research
The School performs world-leading research covering fundamental physics at large international facilities; pure laboratory-based physics and theoretical breakthroughs; and translation to impact, in collaboration with academic engineering and medical colleagues, and industry. Our research was ranked top in the UK for 4-star-category research, and 4th by GPA, by the Research Excellence Framework 2021.

The portfolio divides into three thematic areas: Astronomy and Experimental Gravity; Particle and Nuclear Physics; and Quantum Matter and Photonics. Each theme covers a range of topics and types of activity, requiring diverse leadership expertise; hence, there is a further natural sub-division into Research Groups, whose leaders interact closely. The Research Group structure is essential to the School, providing a natural "home" and a local community and support structure for all group members. Each group has its own social/communal space.

The School hosts a range of facilities: the Birmingham Instrumentation Laboratory for Particle physics and Applications (BILPA) to expand semiconductor detector systems R&D and production; the new Birmingham High-Flux Accelerator-Driven Neutron Facility (HF-ADNeF) – part of the National Nuclear User Facility funded by the Department for Business Energy and Industrial Strategy and – and the MC40 Cyclotron; and the EPSRC Quantum Technology Hub for Sensors and Timing.

The 2013 Nobel Prize in Physics was awarded to Higgs and Englert for their theoretical prediction of the Higgs boson that was discovered in 2012 with strong involvement of the Birmingham team within the ATLAS experiment. The 2016 Nobel Prize in Physics was awarded to Professor Mike Kosterlitz and Professor David Thouless jointly for their work into the discoveries of the properties of matter, work which started when they were at Birmingham together. The 2017 Prize was awarded for the detection of gravitational waves, in which Birmingham staff played a key role, and led to the establishment of the Birmingham Institute for Gravitational Waves.

Education
The School delivers a number of undergraduate degree programmes: Physics; Physics and Astrophysics; Physics with Particle Physics and Cosmology; Physics with Data Science; Physics with Medical Physics; Theoretical Physics; Theoretical Physics and Applied Mathematics (joint

honours with the School of Mathematics). These are offered at both Bachelors (BSc) and integrated Masters (MSci) levels. All degrees are fully accredited by the Institute of Physics. At postgraduate taught level there are two Master's programmes: the long-standing Physics and Technology of Nuclear Reactors (PTNR), and the Nuclear Decommissioning and Waste Management (NDAWM). There is also a thriving PGR programme. Applications for all these programmes typically exceed 1000 students per year. The School ranks 5th for Physics in the Complete University Guide (2025) and 5th in the Times Good University Guide (2024).

ED&I

The School of Physics and Astronomy is an Institute of Physics Juno Champion since 2014 and holder of the Athena SWAN Silver Award. Both initiatives recognise the School's commitment to promote diversity and equality, and to encourage better practice for all members of the community, whilst also working towards developing an equitable working culture in which all students and staff can achieve their full potential. We welcome applications from all qualified applicants, but applications from traditionally under-represented groups in physics and astronomy, such as women and Black, Asian and Minority Ethnic, are particularly encouraged.

9. Role profile

The School of Physics and Astronomy at the University of Birmingham (UoB) seeks to appoint an experienced and ambitious academic with a specialisation in silicon tracking detectors, to take the role of Director of the Birmingham Instrumentation Laboratory for Particle physics and Applications (BILPA).

The BILPA facility is a 200 m^2 suite of well-equipped clean-rooms, supported by further substantial recently refurbished laboratory space. It's core user team currently includes 2 academics in addition to the appointee, 4 PDRAs, 1 engineer and 4 technicians, with numerous PhD students also engaging. Workstreams include:

- Major construction projects, currently including contributions to the silicon-strip detectors for the ATLAS ITk upgrade at the LHC and recent funding for the MAPS-based silicon vertex tracker for the ePIC detector at the US Electron Ion Collider (EIC).

Strategic R&D into CMOS sensors and 4D tracking technologies for next generation facilities.
- Projects leading to wider societal impact, for example based on the use of particle tracking detectors for imaging and dosimetry in proton cancer therapy.

- Work towards the creation of a unique facility for radiation-hardness characterisation, based on proton, neutron and X-ray beam facilities in Birmingham.

The successful candidate will be expected to teach in our undergraduate degree programmes, and will contribute towards the School's administrative activities. Applicants are expected to demonstrate academic citizenship, develop and maintain mutually respectful and supportive working relationships with staff and students, and ensure their role impacts positively on others.

The Birmingham Particle Physics group currently has 12 academic staff, 21 postdoctoral researchers and engineers, 35 support staff and 22 research students. It attracts funding of around £3M per year. Our present activities include ATLAS and LHCb at the LHC, NA62 on the CERN SPS, the future Brookhaven Electron Ion Collider, as well as non-accelerator interests in direct Dark Matter searches and long-baseline neutrino experiments.

Summary
We are seeking an outstanding candidate who will provide significant strategic leadership which will positively enhance the profile of the institution. The post holder will be expected to have an excellent international reputation, based on an extensive track record of innovative research which has a major quantifiable influence in the subject area. The post holder will also make a significant contribution to teaching and learning, contribute at a high level to leadership and management activity and act as a role model in respect of citizenship.

Research
- Develop, plan and lead research activities/programmes of outstanding quality in the disciplinary area;
- Publish high quality innovative, distinctive and significant outputs which are considered to be world-leading in terms of originality, significance and rigour;
- Regularly contribute to other research-related activities such as conference papers and keynote speaker invitations at conferences;

- Provide leadership on the generation of research income, supporting colleagues to maximise funding opportunities, promoting collaboration with external researchers and organisations;
- Lead the development of strategies, policies and procedures which have a positive and quantifiable impact on equality, diversity and inclusion;
- Maintain a sustained track record of income generation appropriate to the discipline to support own work;
- As appropriate for the discipline, lead a major research group, managing people and resources to deliver an ambitious research vision;
- May lead consultancy projects and/or advise external organisations, based on research and reputation in the subject area;
- Participate actively in the development of the research strategy in the Department/School/College as appropriate;
- Provide outstanding supervision to research students.

Education

- Develop, plan and lead high quality education activities;
- Develop high quality, inclusive and academically challenging practice in research-intensive teaching, learning and assessment;
- Deliver high quality portfolio of innovative, engaging and inspirational teaching which is accessible to all;
- Contribute to curriculum design to ensure the offer is contemporary, inclusive, engaging, international and academically challenging;
- Lead innovative approaches to digital resources/environments and support colleagues to use them in the delivery of teaching, learning and assessment;
- Provide outstanding project/dissertation supervision;
- Develop and lead collaborative working arrangements with colleagues across the Department, School and wider University to deliver outstanding teaching.

Leadership, Management and Citizenship

- Lead and manage major activities in the School/College/University. This may be in relation to one or more of the following:
  - external partnership activities/collaborations;
  - leading a Department or undertaking School/College roles;
  - developing institutional policies and practice;
  - leading activities contributing to a positive and inclusive community spirit across the School/College/University;
  - using position and influence in order to ensure that others engage positively with the University's Strategy;
  - leading, developing and motivating colleagues using mentoring and coaching skills;
  - proactively supporting Equality, Diversity and Inclusion activities.

Person Specification

The post holder will have an outstanding and sustained profile of achievement evidenced by the following:

- PhD or equivalent qualification or an equivalent body of work;
- A substantial record of international quality outputs;
- An excellent and widely recognised reputation amongst peers internationally;
- Proven ability to plan and lead the delivery of research;
- A sustained record of attracting significant funding, as appropriate to the discipline;

- A track record in translating research into impact on other scholars and on the wider community through publication, engagement with policy and practice, consultancy and advisory work;
- A track record of attracting and successfully supervising high quality doctoral students;
- A proven ability to develop and lead the delivery of innovative research-led teaching, learning and assessment;
- A proven ability to lead curriculum design and implementation;
- Willingness to engage in teaching-related CPD;
- Evidence of innovative approaches to digital resources/environments;
- Evidence of high level leadership and management contributions;
- Evidence of high level successful collaborations (whether research, teaching or other);
- Evidence of proactively engaging in citizenship activities;
- Evidence of working with others for the greater good of the academic discipline and institution.

10. More information and how to apply

The University is committed to building a fully inclusive and diverse community, including in its senior leadership. We welcome and encourage applications from all candidates with the qualifications and experience to undertake this role, particularly women, and people from minority ethnic groups.

We are a family friendly employer, focused on supporting staff to develop and grow their career with us. Find out more about our range of My Benefits (sharepoint.com). Flexible arrangements will be considered.

To apply, please submit your application through our jobs website **by 14 October 2024.** Reference Post number: 104285

Please include the following with your completed application form:

- An academic CV, along with a full publication list.
- A statement of future research plans and objectives in the context of the advertised role (max 2 pages).
- A statement on your teaching approach and experience (max 2 pages).

For further information about this post, please contact: Professor Paul Newman (P.R.Newman@bham.ac.uk).

If you are shortlisted, you will have the opportunity to visit the University and the School, in November.

Please note, your application may be shared in confidence with two external assessors (typically professors within a related academic field, but external to the University of Birmingham). Their views may be sought on your suitability for shortlist and they may also be invited to be involved in the interview process. If you have any queries about this, please contact Emma Stanway (College HR Business Partner) on E.Stanway@bham.ac.uk.

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The Lapworth Museum of Geology, University of Birmingham

UNIVERSITY OF BIRMINGHAM