THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF SCIENCE & ENGINEERING

SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF PHYSICS & ASTRONOMY

PROFESSOR IN THEORETICAL PARTICLE PHYSICS

VACANCY REF: SAE-027456

Salary:	£69,562-£96,224 per annum, dependent on relevant experience
Hours:	Full time (1 FTE)
Duration:	Permanent
Location:	Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:
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The University of Manchester

The University of Manchester (www.manchester.ac.uk) enjoys a global reputation for its research and its innovative approach to learning, with an on-going £1 billion investment in facilities, staff and buildings. This builds on our tradition of success that stretches back 200 years. The birth of the modern computer, the splitting of the atom, the founding principles of modern economics, the discovery of graphene, and the birthplace of chemical engineering – these and many more world changing innovations have their roots at our University. We are at the forefront of the search for solutions to some of the world's most pressing problems, boasting strong collaborative links with industry and public services.

Manchester has the largest student community in the UK, with more than 31000 undergraduates and 15000 postgraduates attracted by the high international standing of the academic staff, by the superb research and teaching facilities, and by the cultural assets both of the university and the city of Manchester itself. For further information, please consult www.manchester.ac.uk.

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The University of Manchester

Faculty of Science and Engineering

The Faculty of Science and Engineering is one of the largest in the UK with over 10,000 students, 2,000 staff and strategic links with over 300 industrial companies. We are leading research efforts in energy, nuclear science and technology, computer science, atmospheric science, bioscience and biotechnology, photon science and photonic materials, imaging and visualisation, security, and advanced materials, attracting an annual income of over £200 million.

Founded in 1824, we have a history of breaking new ground in science and engineering. Rutherford began his work here on splitting the atom and later received the Nobel prize in 1908 for his work on radioactivity. The 'Baby', the world's first stored-program computer, and Manchester Mark 1 came into being here. The world's first steerable radio telescope at Jodrell Bank was built here by Bernard Lovell. Since 1906, when former student J J Thomson won the Nobel prize for physics, the University has produced more than 20 Nobel Laureates, the most recent of which were Professor Andre Geim and Professor Konstantin Novoselov in 2010 - for their pioneering work with graphene.

Department of Physics and Astronomy

The Department of Physics and Astronomy is one of five Departments in the School of Natural Sciences which is in the Faculty of Science and Engineering. There are 95 academic staff in the Department with expertise in areas such as condensed matter physics (which includes Prof. Andre Geim and Prof. Konstantin Novoselov who won the 2010 Nobel Prize in Physics for their work on graphene), atomic physics, liquid crystal physics, biological physics, accelerator physics, nuclear physics, particle physics, astrophysics, astronomy, cosmology, complexity and theoretical physics. Jodrell Bank Observatory (part of Jodrell Bank Centre for Astrophysics) also forms part of our Department. The Cockcroft Institute of Accelerator Technology is a partnership with other universities and the Science and Technology Facilities Council and the department makes major contributions to faculty institutes including the Photon Science Institute and the National Graphene Institute.

The Department is consistently ranked in the top twenty in the Academic Ranking of World Universities for Physics. In the Research Excellence Framework (REF) 2021 the Department was ranked second overall, in the top three institutions for its proportion of "world-leading" components and was first for non-academic impact.

The Department values teaching highly and has the largest undergraduate intake of any physics department in the UK. Taught postgraduate courses include a Masters programmes in Nuclear Science and Technology. We have approximately 250 postgraduate students and 1200 undergraduate students.

P&A research can be divided into three topical areas: Accelerator, Nuclear and Particle Physics; Condensed Matter, Atomic and Biological Physics; Astronomy, Astrophysics and Cosmology. The Department operates the world-renowned Jodrell Bank Observatory (JBO). The Jodrell Bank site also provides the permanent home for the international headquarters of the Square Kilometre Array (SKA) Organisation.

The Department of Physics and Astronomy is committed to promoting Equality, Diversity, Inclusion and Access through contributing to the University's social responsibility agenda, demonstrating a commitment to its policies, activities and delivery of initiatives including the Athena SWAN charter

for promoting women's careers in STEMM subjects (science, technology, engineering, mathematics and medicine) in higher education. The Department has held JUNO Champion status since 2016 for its commitment to achieving gender equality which positively promotes inclusivity for all.

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

Particle Physics Group

The University of Manchester's Particle Physics group supports a broad research programme in both experimental and theoretical particle physics. The group comprises over 20 academic staff, 50 researchers and technicians, and 50 post-graduate students.

Our experimental research spans the energy frontier (ATLAS, FCC), quark flavour (LHCb, BES-III), lepton flavour (g-2, Mu2e), neutrino physics (DUNE, MicroBooNE, SBND, SuperNEMO) and the dark sector (Darkside-50, Darkside-20k, FASER). The group has recently provided the spokespersons of LHCb, DUNE and g-2. We also carry out research into new detector technologies and new data acquisition strategies for future experiments. We host one of the largest and most successful Tier-2 distributed computing centres in the UK.

Our theoretical research includes developing new models to extend the Standard Model of Particle Physics, performing precision quantum chromodynamics calculations, and developing Monte Carlo event generators. We have expertise in Higgs and neutrino physics, studies in CP violation as well as particle cosmology and the study of the early universe.

Overall Purpose of the Job:

The post holder will contribute to leadership in the university in theoretical particle physics, provide internationally-leading contributions to research, contribute to departmental teaching, working collegially with other academics in the School, Faculty and outside.

Potential research areas should be in the broad area of BSM physics phenomenology and may include expertise in collider and/or non-collider phenomenology and astroparticle physics. The ability to lead projects with links to the experimental activities in the group is highly desirable.

Key Responsibilities, Accountabilities or Duties

- Contribute to the strategic development and direction of the particle physics group, including recruitment of academic posts and future tenure-track fellowships.
- Developing and delivering world-leading research, and shaping national and international research directions.
- Publishing in leading journals and presenting at major international conferences.
- Obtaining research funding individually and in collaboration with other academic members of the Department or Faculty, and supporting other academic staff in obtaining grant awards.

- Performing teaching duties (including assessment and tutorials) within the University on undergraduate and postgraduate courses.

- Developing and contributing to continuing professional development courses.

- Reporting to the Head of Department of Physics and Astronomy as a member of academic staff.

- Attending relevant research and teaching committees within the Department and the University.

- Performing administrative and management roles within the Department, Faculty and University as required. Wilingness to take on leadership roles as appropriate.

- Participating in the undergraduate admissions process and outreach activities of the Department.

- Contribute to the social responsibility agenda of the University and demonstrating a commitment to Equality, Diversity and Inclusion policies and activities and support the development and delivery of related initiatives.

Person Specification

Essential Knowledge, Skills and Experience:

- Educated to PhD level with specialisation in theoretical particle physics.

- Excellent track record of publications in the leading journals and in the field of theoretical particle physics including its phenomenology beyond the standard model.

- A commitment to developing and maintaining an original and imaginative programme of research in theoretical particle physics including its phenomenology beyond the standard model.

- Ability to work independently and as part of a team, with demonstrated experience of team leadership.

- Experience of giving high-profile presentations at international conferences.

- High-level recognition within the relevant research community and track record of international academic collaborations.

- Capability for developing and leading new research areas, generating funding streams from research councils and other funding sources.

- Ability to lecture to classes and supervise group and individual projects at PhD, Masters and undergraduate level, with a commitment to delivering high-quality education to students at undergraduate and postgraduate level.

- A strong personal commitment to equality, diversity, inclusion and accessibility.

Desirable Knowledge, Skills, Experience and Qualifications:

- Undertaken significant roles (e.g. funding and review panel membership) for funding agencies, professional bodies or government agencies.