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# Research Associate

Faculty of Science,  
Department of Physics and  
Astronomy

THE SUNDAY TIMES

**100**

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ORGANISATIONS

TO WORK FOR

**2018**

## Overview

### ATLAS at the University of Sheffield

The University of Sheffield is a founder member of the international ATLAS collaboration working on the CERN Large Hadron Collider. The University of Sheffield ATLAS group consists of 5 academics (Professor Davide Costanzo, Professor Dan Tovey, Dr Trevor Vickey, Dr Christos Anastopoulos and Dr Kristin Lohwasser), 4 Research Fellows, 10 Research Associates, 3 engineers and 14 PhD students. Group members have played key roles in the successful construction, commissioning and operation of the ATLAS Semi-Conductor Tracker detector and have made major contributions to the development and operation of the ATLAS software and computing infrastructure. The group is also very active in the R&D and the construction of a new all-silicon ATLAS Inner Tracker for the LHC high-luminosity upgrade.

The main focus of the group is now physics analysis of ATLAS data. Our particular strengths lie in measurements Higgs boson properties, searches for additional Higgs bosons, searches for SUSY particles, as well as measurements of SM di-boson processes sensitive to new physics. Professor Tovey has been ATLAS (Deputy) Physics Coordinator in 2015-17. Professor Costanzo has been the ATLAS (Deputy) Computing Coordinator in 2017-19. Current members have also held convenorships for a number of ATLAS Higgs channel-specific working groups (Dr Anastopoulos, Dr Lohwasser and Dr Vickey for Higgs decays to ZZ(4l), WW and tau-tau, respectively). In recent years, Sheffield group members have also taken on the roles of ATLAS electron/photon working group convenor, Data Quality convenor, and two convenors of the central ATLAS SUSY working group. The group operates a Tier-2 LHC Computing Grid node and maintains extensive local Tier-3 and desktop computing facilities in support of physics analysis.

The ATLAS group is a component of the University of Sheffield Particle Physics and Particle Astrophysics (PPPA) group. The PPPA group also pursues an active research programme in neutrino physics (T2K, DUNE and HyperK), accelerator physics (MICE) and particle astrophysics (Advanced LIGO and LUX-ZEPLIN).

Further details of the group's research activities can be found at [www.hep.shef.ac.uk/research/atlas/](http://www.hep.shef.ac.uk/research/atlas/)

## Person Specification

You should provide evidence in your application that you meet the following criteria. We will use a range of selection methods to measure your abilities in these areas including reviewing your online application, seeking references, inviting shortlisted candidates to interview and other forms of assessment action relevant to the post.

Criteria		Essential	Desirable
1.	Hold a PhD (or be close to completion) in particle physics or a related discipline or have the equivalent experience.	X	
2.	Experience of particle physics data analysis.	X	
3.	Experience of using and writing C++ and/or Python code.	X	
4.	Experience of using ROOT.	X	
5.	Experience of using the Athena software framework.		X
6.	Experience with precision measurements of the 125 GeV Higgs.		X

7.	Experience with searches for additional Higgs bosons.		X
8.	Experience with searches for di-Higgs boson production.		X
9.	Experience with hadronic tau lepton identification.	X	
10.	Experience with machine learning tools such as TensorFlow and/or Keras.		X
11.	Experience with silicon detector construction, testing and operation.		X
12.	Effective communication skills, both written and verbal, report writing skills and experience of delivering presentations.	X	
13.	Excellent team working and interpersonal skills.	X	
14.	Ability to develop creative approaches to problem solving.	X	
15.	Ability to analyse and solve problems with an appreciation of longer-term implications.	X	
16.	Experience of developing and maintaining a network of contacts throughout own work area.	X	
17.	Experience of adapting own skills to new circumstances.	X	
18.	Ability to work independently to achieve specific goals within tight deadlines.	X	

## About the Team

The Department of Physics and Astronomy is composed of 45 academic staff and research fellows, over 50 research associates, 9 technical staff, and in excess of 400 undergraduate and over 90 postgraduate students. It has active research programmes in soft matter physics, semiconductor physics, astrophysics, high-energy particle physics and biological physics. All of these groups contribute to a dynamic research environment.

The Department has seen very significant strategic development in recent years. There has also been a large increase in grant income, which has quadrupled since 2000. Undergraduate and postgraduate numbers continue to rise. These factors together give the department a very strong foundation. In the 2014 REF, the department had over 90% of its research graded as either world leading or internationally excellent, putting it among the top 10 in the UK.

Further information about the Department of Physics and Astronomy, and the Faculty of Science research facilities is available at [www.shef.ac.uk/physics](http://www.shef.ac.uk/physics)

We are proud to be a department where all staff, regardless of gender, race, sexual orientation, age, religious belief and disability, work in a supporting environment where they can reach their full potential. Through the University the Department offers a wide range of family friendly policies; including maternity, paternity and adoption leave and flexible working. Details of these are available via [www.sheffield.ac.uk/hr/guidance](http://www.sheffield.ac.uk/hr/guidance) but if you wish to discuss these or other policies you are welcome to contact our Deputy Departmental Manager Ms Angie Rollinson [a.rollinson@sheffield.ac.uk](mailto:a.rollinson@sheffield.ac.uk). Any enquiries will be treated confidentially.

## Job Description

The ATLAS group is seeking an enthusiastic Research Associate to lead group activities in the area of Higgs physics with tau leptons.

They will be expected to develop and maintain a high profile by contributing effectively to the activities of the group, in particular in the areas of precision measurements on the 125 GeV Higgs

boson, searches for di-Higgs production, and searches with tau leptons for additional Higgs bosons predicted by many Beyond the Standard Model theories. In addition, they will get the opportunity to supervise PhD students working on the same projects. A limited amount of service work for the collaboration, preferably in areas related to the research project, should be undertaken (for example in the area of hadronic tau identification). It may also be possible to get involved in the silicon micro-strip detector module construction effort taking place in our Class 100 clean room on campus, which is part of the ATLAS Phase-II ITk tracking detector upgrade.

## Main Duties and Responsibilities

- Contribute to the area of precision measurements on the 125 GeV Higgs boson in final states involving tau leptons, di-Higgs searches, and/or BSM Higgs searches with tau leptons using ATLAS data, and supervise PhD students working in these areas.
- Contribute effectively to ATLAS Higgs and/or HDBS (Higgs and Di-boson Searches) working group activities by giving regular talks on own work and that of others at working group and other ATLAS meetings.
- Write ATLAS internal notes and external publications.
- Undertake ATLAS service work and operation tasks as required by ATLAS and as directed by the University of Sheffield ATLAS group leader.
- Prepare papers for journals/presentations in-house, in-collaboration or at national/international conferences or seminars to disseminate research findings.
- Write supporting documents to contribute to and support the work of the research group, for example reports, interim reports and grant applications. Carry out administrative roles as required; as secretary to research group meetings, etc.
- Read academic papers, journals and textbooks to keep abreast of developments.
- Plan for specific aspects of research programmes.
- If given a particular hypothesis to examine, plan for own contribution up to three months ahead, incorporating issues such as the availability of resources, deadlines, project milestones and overall research aims.
- Coordinate and liaise with other members of the research group over work progress. Supervise research team/activities if required.
- Continuously monitor and check results. The unpredictability of research means that daily planning needs to accommodate new developments.
- Plan several months in advance to meet deadlines for journal publications and to prepare presentations and papers for collaboration meetings and conferences.
- As a member of staff you will be encouraged to make ethical decisions in your role, embedding the University sustainability strategy into your working activities wherever possible.
- Any other duties, commensurate with the grade of the post.

## Reward Package

**Terms and conditions of employment:** Will be those for Grade 7 staff.

**Salary for this grade:** £31,866 - £33,797 per annum.

**This post is fixed-term** until 30 September 2022.

**This post is full-time:**

This role has been identified as a full-time post, but we are committed to exploring flexible working opportunities with our staff which benefit both the individual and the University (See [www.sheffield.ac.uk/hr/guidance/flexible/arrangements](http://www.sheffield.ac.uk/hr/guidance/flexible/arrangements)). Therefore, we would consider flexible delivery of the role subject to meeting the business needs of the post. If you wish to explore flexible working opportunities in relation to this post, we encourage you to call or email the departmental contact listed below.

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If you join the University you will have access to a Total Reward Package that includes a competitive salary, a generous Pension Scheme and annual leave entitlement, as well as access to a range of learning and development courses to support your personal and professional development. You will have access to your own personalised portal where you can also access a comprehensive selection of benefits and offers to suit your changing lifestyle needs, for example financial wellbeing, travel options, shopping and cinema discounts.



To find out more visit [www.sheffield.ac.uk/hr/thedeal](http://www.sheffield.ac.uk/hr/thedeal)

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The University is committed to tackling the global climate emergency. Our sustainability strategy forms an integral part of all we do. We strive to embed this in all areas of university life, from our students' education, the globally impacting international research we contribute, to campus life.



We aim to empower staff to work sustainably by giving them the knowledge to make ethical decisions at work and home. Staff have the opportunity to be involved in impactful sustainability projects through the nationally recognised Green Impact scheme.

Staff have access to excellent green benefits including the cycle to work scheme with discounts and free secure bike storage, as well as many greener choices across campus.

If you have an interest in this area, the university will strive to passionately support you in these commitments. Check out [www.sheffield.ac.uk/sustainability](http://www.sheffield.ac.uk/sustainability) for more information.

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We are committed to making the University a remarkable place to work and we support this through a number of sector leading services such as Juice.

Our innovative Health and Wellbeing service, Juice, encourages and supports staff to maintain their own positive health and wellbeing through a broad range of inclusive services and activities.



To find out more visit [www.sheffield.ac.uk/juice](http://www.sheffield.ac.uk/juice)

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Our leadership development has been designed to ensure that our leaders have the knowledge, skills and behaviours needed by the University.

To find out more visit [www.sheffield.ac.uk/hr/sld/impact](http://www.sheffield.ac.uk/hr/sld/impact)

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Inclusion at Sheffield is everyone's responsibility. Our vision is to build a University community that actively attracts, engages and develops talented individuals from many different backgrounds.



We are proud of our award-winning equality, diversity and inclusion action, and 90% of staff tell us they are treated with fairness and respect (staff survey 2018). We continue working to create a fully inclusive environment where everyone can flourish.

To find out more visit [www.sheffield.ac.uk/inclusion](http://www.sheffield.ac.uk/inclusion)

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We are the only university to feature in the Sunday Times 100 Best Not-for-Profit organisations to work for 2018. In our staff survey (2018) 92% of staff said they were proud to work for the University and 83% of our staff would recommend the University as an excellent place to work. To find out more about what it's like to work here visit [remarkable.group.shef.ac.uk](http://remarkable.group.shef.ac.uk)

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## Selection – Next Steps

**Closing date:** For details of the closing date please view this post on our web pages at [www.sheffield.ac.uk/jobs](http://www.sheffield.ac.uk/jobs)

Following the closing date, we will contact you by email to let you know whether or not you have been shortlisted to participate in the next stage of the selection process. Please note that due to the large number of applications that we receive, it may take up to two working weeks following the closing date before the recruiting department will be able to contact you.

For more information on our application and recruitment processes visit [www.sheffield.ac.uk/jobs/info](http://www.sheffield.ac.uk/jobs/info)

## Informal enquiries

For informal enquiries about this job and the recruiting department, contact: Dr Trevor Vickey on [t.vickey@sheffield.ac.uk](mailto:t.vickey@sheffield.ac.uk) or on 0114 222 3509.

For administration queries and details on the application process, contact the lead recruiter: Angie Rollinson on [a.rollinson@sheffield.ac.uk](mailto:a.rollinson@sheffield.ac.uk) or on 0114 222 4360.

For all online application system queries and support, visit: [www.sheffield.ac.uk/jobs/applying](http://www.sheffield.ac.uk/jobs/applying)

## Creating a remarkable place to work

We build teams of people from different heritages and lifestyles from across the world, whose talent and contributions complement each other to greatest effect. We believe diversity in all its forms delivers greater impact through research, teaching and student experience.

We are consistently ranked in the top 100 of the world's universities, but there's so much more to us

than that. By joining the University, you will be joining award-winning teams and departments who are all working together to make the University of Sheffield a remarkable place to work.

The Faculty of Science is committed to building outstanding teams of people from different heritages and lifestyles whose talent and contributions complement each other. We believe diversity in all its forms delivers greater impact through research, teaching and student experience. We are open to exploring flexible delivery of the role, subject to business needs. There is scope to discuss this prior to formal interview along with any other accommodation you may need to fulfil your full potential and drive excellence in the role. We particularly welcome applications from currently under-represented groups including women, people with disabilities and those from minority ethnic backgrounds.

Learn more [here](#).



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