JOB DESCRIPTION

Assistant Professor in Computational Physics
School of Physical Sciences
Faculty of Science & Health
36 Month Fixed Term Contract

Dublin City University

Dublin City University (DCU) is a leading innovative European University. It is proud to be one of the world's leading Young Universities and is among the world's top 2% globally. DCU is known as Ireland's University of Impact, with a mission to 'transform lives and societies' and focuses on addressing global challenges in collaboration with key national and international partners and stakeholders.

DCU has over 20,000 students in five faculties spread across three academic campuses in the Glasnevin-Drumcondra area of North Dublin. Thanks to its innovative approach to teaching and learning, the University offers a 'transformative student experience' that helps to develop highly sought-after graduates. DCU is currently No. 1 in Ireland for Graduate Employment Rate, and for graduate income (CSO).

DCU is a research-intensive University and is home to a number of SFI-funded Research Centres. The University participates in a range of European and international research partnerships. DCU is also the leading Irish university in the area of technology transfer as reflected by licensing of intellectual property.

As a 'People First' institution, DCU is committed to Equality, Diversity and Inclusion - a University that helps staff and students to thrive. The University is a leader in terms of its work to increase access to education, and is placed in the world's Top 10 for reducing inequalities in the Times Higher Education Impact Rankings.

School of Physical Sciences

The School of Physical Sciences www.dcu.ie/physics at Dublin City University has a high standing within Ireland and internationally, for both its teaching and research activities. There are more than fifty researchers within the School's research groups including postgraduate students, postdoctoral researchers, research officers, and administrators. Physics research at DCU covers **data analytics and modelling, astrophysics, biomedical physics, physics education, plasma and laser-plasma physics, materials and nanotechnology** as its main priority areas. Researchers in the School lead and contribute to several research centres, including, four National Research Centres – National Centre

for Plasma Science and Technology (NCPST), National Centre for Sensor Research (NCSR), INSIGHT and ADAPT, and University Approved Centres - Centre for Astrophysics & Relativity (CfAR), Centre for Advancement of STEM Teaching and Learning (CASTeL), and the Water Institute. The School has been awarded substantial research funding and programme grants from national funding agencies, including Science Foundation Ireland, Irish Research Council, Enterprise Ireland, Sustainable Energy Authority of Ireland, Higher Education Authority PRTLI programme, and European Erasmus+ and Framework Programmes.

DCU School of Physical Sciences offers several undergraduate degree programmes, featuring unique blends of physics fundamentals with modern applications: BSc in Applied Physics, BSc in Physics with Biomedical Sciences, BSc in Physics with Data Analytics and BSc in Physics with Astronomy, all of which are entered via a Physics General Entry common first year. A hands-on approach to physics teaching is favoured with an emphasis on the development of experimental and data analytical skills as well as mathematical, computational, and reasoning skills. These programmes are delivered through novel and innovative curricula, in partnership with other Schools across the university and industry collaborators. In addition, the school makes important contributions to the curriculum and teaching of the BSc in Science Education programmes and the BSc in Environmental Science and Technology. At postgraduate level, the DCU School of Physical Sciences offers the Professional Diploma in Teaching Physics and the MSc in Astrophysics & Relativity (jointly with the School of Mathematical Sciences). In keeping with its Strategic Plan, the School is modernising our physics programmes available to students through a new innovative curriculum project in partnership with key industry collaborators and other Schools across the university.

Relationships

The position will report to the Head of School and work closely with other colleagues, the Teaching Convenor/Research Convenor, Associate Dean of Teaching and Learning and industry partners. Building positive relationships with professional support staff, technical and pedagogy specialists and engagement with key stakeholders within and outside DCU is a key aspect of this role.

The Role

The appointee will be expected to assist the school in implementing an innovative curriculum project, specifically:

- developing and delivering the new bachelors programme/specialism Physics with Data Analytics, ensuring an industry engaged, research-led approach, assisted by the integration of challenge-based learning, digital tools and hybrid delivery.
- designing and teaching a 3rd and 4th year modules/projects and on practical machine learning in the context of physics (numerical modelling, computational physics, astrophysics, condensed matter physics).
- broader implementation of digitalisation of teaching, learning and assessments into all programmes in the school, for example in the use of virtual experiments.
- embedding and assessing transversal skills within physics curriculum, and
- engaging with university-wide elements of DCU Futures, including cross faculty assistance, project evaluation and reporting.

The role includes teaching, supervision of laboratory sessions, student mentoring and supervision of taught projects and research.

The role will encompass activities across the three domains, as follows:

Teaching and Learning

The appointee will be expected to contribute directly to undergraduate and postgraduate degree programmes and to prepare, deliver and assess a range of core subjects in a manner consistent with DCU's high academic standards and in a hybrid environment which involves both campus, and elements of remote delivery. The appointee would also be expected to undertake various administrative duties and assist the school to deliver on the innovative DCU curriculum project. The total teaching hours and responsibilities will be defined by the Head of School in line with the school's normal workload allocation. Teaching extends to assisting innovation in curricula development.

Typical activities include:

● Teaching of physics lecture modules (including at advanced undergraduate and postgraduate level).

● Coordination of undergraduate physics laboratories, and contribution to the development of undergraduate physics laboratory activities.

● Contributing to the design and development of new programmes/modules.

● Developing and delivering new or reconceptualised modules and resources specifically in the field of machine learning with focus on its use in physics.

● Designing and assessing examinations and other types of coursework.

● Using a wide range of teaching and assessment methodologies which foster a deep approach to learning and equips students with the skills and attributes needed to be lifelong learners including challenge-based learning, concentrated and immersive learning experiences, and virtualised experiments.

● Co-designing with other academics and industry partners a suite of tools and initiatives that assists the transversal skills pathway and embedding transversal skills development, diagnostics and assessments into new and existing programmes

● Supervising laboratory sessions, student mentoring, final year project supervision.

● Proactive engagement with the renewal of existing courses and programmes.

● Engagement with professional development for teaching particularly in that related to the approaches embedded in the project.

Research and Scholarship

The appointee will be expected to engage strongly with research activities and have the desire and capability to work effectively with other DCU and international colleagues. The appointee will direct an energetic and vibrant programme of research activities in applications of data science and/or machine learning to theoretical and/or experimental problems in material science, condensed matter

physics, biomedical or plasma physics. The appointee will be expected to attract associated research funding, including recruiting, and supervising postgraduate research students. We are seeking a candidate with a genuinely broad vision who will develop new research directions, underpinning final year modules and projects related to the new degree programme(s) or specialism.

Contribution to the School, Faculty, University and Profession

Examples include:

● Engagement with planning, quality review and improvement processes, and external programme accreditations.

● Involvement with appropriate professional bodies and associated initiatives.

● Development and delivery of the international activities of the School including international travel to do so.

● Adoption of some administrative functions related to the activities of the School, the Faculty, and the wider University. Such duties will be defined by the Head of School and may include some of the following: degree programme coordination; participation in committees; visits to students on industrial placement within the DCU INTRA programme; student recruitment.

Applicant Requirements

● Applicants must have the ability to teach a broad range of physics, mathematics and programming at honours undergraduate physics level and at postgraduate level in their area of specialisation and contribute to the future development of the school's teaching.

● Applicants must hold an honours degree in physics, applied physics or equivalent, and hold a PhD in physics or cognate area.

● Applicants would ideally have a minimum of three years' relevant Postdoctoral experience and a demonstrable track record of high quality and original research, as evidenced by regular publication in high impact physics journals, a significant citation rate, presentations at top international conferences and the ability to attract research funding.

● Applicants must have demonstrated teaching experience in the delivery of undergraduate lectures, projects and laboratory physics, ideally including experience in embedding computational physics problems into the curriculum, innovative pedagogies and/or assessments, international and/or online or technology-assisted teaching.

● Applications are specifically invited from those with strong research credentials and publication record

● Applicants must demonstrate excellent communication and interpersonal skills consistent with the highest quality of teaching and learning, as well as evidence of successful teamwork and a collegial approach.

Essential Training

The postholder will be required to undertake the following mandatory compliance training: Orientation, Health & Safety and Data Protection (GDPR). Other training may need to be undertaken when required.