

Job Description

Assistant Professor; Associate Professor in Data-Intensive Physics and AI

[Imperial College London](#) seeks an Assistant Professor or Associate Professor in Data-Intensive Physics and AI to join the Department of Physics within the Faculty of Natural Sciences.

We are Imperial – a world-leading university for science, technology, engineering, medicine and business (STEMB), where scientific imagination leads to world-changing impact.

As a global top ten university in London, we use science to try to understand more of the universe and improve the lives of more people in it. Across our nine campuses and throughout our Imperial Global network, our 22,000 students, 8,000 staff, and partners work together on scientific discovery, innovation and entrepreneurship. Their work navigates some of the world's toughest challenges in global health, climate change, AI, business leadership and more.

Founded in 1907, Imperial's future builds on a distinguished past, having pioneered penicillin, holography and fibre optics. Today, Imperial combines exceptional teaching, world-class facilities and a habit of interdisciplinary practice to unlock scientific imagination.

Imperial has four academic faculties – [Engineering](#), [Medicine](#), [Natural Sciences](#) and [the Imperial College Business School](#), as well as a significant number of [interdisciplinary research centres](#) focusing on challenging world problems.

Imperial has a leadership model comprising the [President, Professor Hugh Brady](#), and the [Provost and Deputy President, Professor Peter Haynes](#)

Please refer to [further particulars](#) for more information about Imperial.

1. The Post

Job Title:	Assistant Professor/Associate Professor in Data-Intensive Physics and AI
Department/Division	Physics
Faculty:	Natural Sciences
Campus location:	South Kensington
Job Family/Level:	Academic Job Family, Assistant Professor/Associate Professor
Accountable to:	Head of Department
Responsible to:	Head of Department
Key working relationship (Internal):	Other academics, college support staff and students
Key working relationship (external):	Academic staff from other Universities, collaborators, funders' representatives and industry and network partners
Working hours:	As reasonably necessary but normally not less than 35 hours per week
Contract type:	Full-time, Open ended

2. Background of the post

Many areas of physics rely on experiments, observatories, missions and simulations that produce data at rapidly growing scale and complexity. Drawing reliable physical conclusions from these data, and developing the machine learning, AI and statistical methods needed to do so, are becoming central to research across the Department. Cross-disciplinary connections to AI and data science, together with significant investment in research computing, make this a strategic priority.

The post holder will establish an internationally excellent, physics-driven research programme with a twin scientific mandate. They will develop new strategies for analysis, inference and data mining from challenging physics datasets, while also advancing the machine learning and AI methods these analyses demand. Areas may include inference and discovery in large, heterogeneous or high-dimensional datasets, simulation-based inference, inverse problems and surrogate modelling, fast and resource-efficient machine learning for real-time analysis and control, and physics-informed or generative AI. These examples describe the breadth of the role and do not prescribe particular tools or physics subfields.

The appointment is department-wide and may be grounded in any area of physics. Data-intensive methods and machine learning are used across all five Research Communities, and the post is intended to connect related methodological challenges across them while allowing the successful candidate to retain a deep scientific identity in one or more areas. The Department is investing in AI infrastructure and has been bringing together its significant computing resources and expertise by setting up a new Computing Centre. Together with Imperial's Research Computing Service and national facilities, the Centre will support data-intensive research across the Department, and the successful candidate will draw on these resources in developing their research programme and play a leading role in growing this activity.

The post holder will contribute to teaching at undergraduate and postgraduate levels, including the MRes in Machine Learning and Big Data in the Physical Sciences, and will support proposals for CDT, Doctoral Focal Awards and related doctoral training initiatives, contributing to their delivery where funded. The appointment will strengthen the Department's capacity to secure research funding, develop international partnerships and respond to future opportunities in data-intensive physics.

3. Information about the Faculty of Natural Sciences

We are Imperial's world-changing natural sciences faculty, where scientific imagination reveals our world and shapes its future.

The [Faculty of Natural Sciences](#) enjoys an outstanding reputation for high-quality research and education. Employing over 1,200 staff, with approximately 4,600 students and with a research income in excess of £70 million, it is home to the departments of [Chemistry](#), [Mathematics](#), [Physics](#), [Life Sciences](#), as well as the [Centre for Environmental Policy](#) and the [Grantham Institute – Climate Change and the Environment](#).

Imperial offers significant opportunities for cross-disciplinary collaborations and, in pursuing a truly multidisciplinary approach, the Faculty addresses some of the world's most challenging problems. Research and education take place in a diverse and stimulating academic environment, located across three campuses: South Kensington (central London), White City (west London) and Silwood Park (near Ascot in Berkshire).

The Faculty is led by the Dean, [Professor Richard Craster](#), and is committed to continuing to attract and develop the highest quality students and staff for its successful undergraduate and postgraduate courses. The Faculty's academics are highly regarded for their commitment to research-led learning and teaching and the volume and quality of their research. Cross-Imperial interdisciplinary and inter-Faculty activities flourish, and enormous mutual benefit is gained from national and international alliances and collaborations with industry and with other institutions and organisations.

Further information about the Faculty's structure and activities can be found on [Faculty of Natural Sciences website](#).

4. The Department of Physics

The Department is led by Professor [Stefan Söldner-Rembold](#) and has been at the forefront of Physics since its foundation over 150 years ago. The Department can trace its roots at South Kensington back to 1872 and was one of the founding pillars of the newly established Imperial College of Science and Technology in 1907. We aim to inspire world-class science in fundamental theory and experimentation while providing high-quality teaching and education at undergraduate and postgraduate levels. The Department of Physics is an Athena Silver SWAN Award winner reflecting our commitment to building a supportive, inclusive and highly motivated community.

4.1 Staffing and size of the Department

There are ~400 members of staff including 120 academics, 169 fellows and postdocs, and 100 research, teaching and operations specialist and professional support staff. We have about 1000 undergraduate students, 150 postgraduates (taught) and 250 PhD students.

4.2 Research

The aim of the Department is world class science in fundamental theory, experimentation, leadership of large international projects, applications in advanced technology and development of specialist infrastructure and facilities. We are an internationally renowned Physics department, which enables us to create groups of international standing, and with sufficient scale and critical mass, that they influence the research agenda and attract the world's top researchers. Our research portfolio covers the full range of theoretical and experimental physics, allowing us to respond rapidly to opportunities and initiatives.

The Department is structured into five Research Communities that drive new research directions: Light, Matter, Physics of Particles, Physics of the Universe, and Space, Plasma and Climate. Staff can associate with multiple Communities, providing the flexibility needed to tackle multidisciplinary challenges.

4.3 Education

Undergraduates can take a variety of three and four-year programmes leading to a BSc or MSci award in either Physics or Physics with Theoretical Physics. We are currently introducing a new Physics with Astrophysics degree programme. Our MSci programme also offers a year abroad.

We offer several Masters' programmes in Physics, Machine Learning and Big Data, Soft Electronic Materials, Quantum Fields and Fundamental Forces (QFFF), and Optics and Photonics. Further details on all our Undergraduate and Graduate degrees are available on the Department's Undergraduate Student web pages: [Study | Faculty of Natural Sciences | Imperial College London](#)

4.4 Relationship with other departments and faculties

We hold grants jointly with all departments in the Faculty of Natural Sciences and all Faculties at Imperial. Many of our collaborations are supported through leadership and involvement in Imperial College Global Challenge Institutes and Imperial College Centres and Networks of Excellence. Details of these can be found at: [Multidisciplinary networks, centres and institutes | Imperial College London](#)

5. The Post – Key Result Areas, Main Duties and Responsibilities

5.1 Research

- To establish and lead an internationally excellent, physics-driven research programme in data-intensive physics and AI.
- To develop new strategies for analysis, inference and data mining from challenging physics datasets, while advancing the machine learning and AI methods required by the science.

- To supervise, train and mentor research staff and students at the highest scientifically rigorous levels.
- To obtain funds and research grants and to encourage and guide junior research staff to do the same.
- To manage research projects.
- To write reports for research sponsors and to take part in Audit.
- To publish high-quality research in peer reviewed journals.
- To attend and present work at national and international conferences.
- To develop contacts with other research organisations, both academic and commercial.
- To collaborate with researchers across the Department's five Research Communities and contribute to a coherent department-wide programme in data-intensive physics.
- To play a role in the national and international research community and learned societies.
- To attend and contribute to research and administrative meetings within the Department as and when requested.
- To work with colleagues through the developing Physics Computing Centre, Imperial's Research Computing Service and other relevant facilities to strengthen data-intensive research across the Department.

5.2 Education - Teaching and Training

- To teach and examine courses at all levels – undergraduate, masters and higher research degrees – through lectures, seminars, tutorials, course work and personal supervision.
- To plan and review own approach to teaching.
- To act as a coach and role model through excellent practice and mentoring of colleagues.
- To supervise PhD candidates.
- To provide pastoral support for students.
- To contribute to the MRes in Machine Learning and Big Data in the Physical Sciences and to relevant undergraduate and postgraduate curriculum development.
- To help develop proposals for CDT, Doctoral Focal Awards and related doctoral training initiatives, and to contribute to their delivery where funded.
- To contribute to the enhancement of high-quality teaching in data-intensive physics, machine learning and AI.
- To act as an external examiner for postgraduate students.
- To work with national bodies on curriculum development and quality assurance.

5.3 Strategy and Business Planning

- To participate in the business planning and objective setting process for the academic team and the departments
- To make a significant contribution to building and establishing links between the appropriate departments and colleagues in other parts of Faculty and wider Imperial.
- To play an active part in the strategic planning of financial, staff and research resources.
- To represent the Department, Faculty and Imperial at external meetings, as appropriate.

5.4 Leadership and Team Working

- To demonstrate excellent leadership skills with regard to individual performance, academic teams, the department, Faculty, Imperial, and when participating in national/international initiatives.
- To work collaboratively with all members of the multi-disciplinary team and wider university as required.

- To resolve conflict and difficult situations through negotiation and discussion, involving appropriate parties.
- To adhere to Imperial's guidelines on leave including reporting absence.

5.5 Management and Administrative duties

- To play an active part in or contribute to the management of financial, staff and research resources, in line with Imperial policy and procedure.
- To play a supportive role in unit administration, as appropriate.
- To undertake appropriate administrative tasks in support of the department's teaching and research activities.
- To attend relevant academic or management committees.
- To comply with Imperial and departmental policies.
- To undertake other appropriate administrative duties commensurate with the grade of the post.

5.6 Staff Management

- To take responsibility for the appointment, management and development of Imperial staff, in line with university's policies and procedures.
- To participate in team objective setting as part of the annual job planning cycle.
- To be responsible for the annual review conversation (ARC) with staff who report to the post holder.

6. Annual Review Conversation (ARC) and Mentoring

Annual Review Conversation (ARC)

[The Annual Review Conversation \(ARC\)](#) is an opportunity for staff to have a discussion with their line manager, focusing on everything they need to thrive at work. Building on regular one-to-one meetings, ARC aims to recognise ongoing contributions and plan for the future based on individual and departmental needs and aspirations. Staff are required to participate in these schemes when requested to do so by the Dean of the Faculty or Heads of Departments. ARCs are conducted annually, in conjunction with the line manager.

Mentoring

Imperial will provide a mentor to the appointee through our Mentoring at Imperial scheme.

[Mentoring at Imperial | Administration and support services | Imperial College London](#)

Imperial's mentoring scheme, available to all our job families and Faculties, is a widely used development tool that enhances effectiveness, confidence, and career advancement. Mentoring is based on a trusting, mutually respectful relationship where one colleague supports another's development with their expertise and knowledge. Most mentoring occurs between senior and junior colleagues, although peer mentoring is also possible. Through confidential one-to-one conversations, mentees are encouraged and challenged to achieve their potential and aspirations.

7. Workplace Environment and Inclusivity

The post holder will have office facilities, and access to administrative support at South Kensington campus.

All members of our community are expected to follow the [Imperial Values & Behaviours framework](#). Our values are:

- Respect
- Collaboration
- Excellence
- Integrity
- Innovation

Employees are also required to comply with all Imperial policies and regulations paying special attention to:

- Overseas working
- External interests
- Smoke-free policy
- Probation periods

All employees must undertake specific training and assume responsibility for safety-relevant to specific roles, as set out on [Imperial's Website Health and Safety Structure and Responsibilities](#) page.

Imperial is a proud signatory to the [San-Francisco Declaration on Research Assessment \(DORA\)](#), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see [About Imperial research | Research | Imperial College London](#)

Imperial believes that the use of animals in research is vital to improve human and animal health and welfare. Animals may only be used in research programmes where their use is shown to be necessary for developing new treatments and making medical advances. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in the our care are treated with full respect, and that all staff involved with this work show due consideration at every level: Find out more about [animal research](#) at Imperial

Culture and inclusion

Our values are not just a statement on our webpage, they are the fuel behind our commitment towards equality of opportunity, to eliminating discrimination and to creating an inclusive working environment for all.

We therefore encourage candidates to apply irrespective of age, disability, marriage or civil partnership status, pregnancy or maternity, race, religion and belief, gender reassignment, sex, or sexual orientation.

Imperial has a Race Equality Charter [action plan](#) in place after receiving the bronze award in November 2021. We are also a [Disability Confident Leader](#) and [Stonewall Diversity Champion](#).

All staff members are encouraged to engage with our staff networks, including:

- [Imperial As One](#) for Black, Asian and Minority Ethnic staff and allies
- [Able@Imperial](#) for staff with disabilities and allies
- [Imperial Pride](#) for LGBTQ+ staff and allies

Our other networks include the [Black Postdoctoral Network](#), [Parents](#), and [Carers'](#) networks.

Imperial has [family leave policies](#) which are available to staff irrespective of gender identity, sexual orientation, gender expression, biological sex, or transitioning. There is also a [flexible working policy](#).

The [Inclusion team](#) help embed inclusion throughout the employee lifecycle, provide specialist expertise on complex inclusion matters, and support the development of inclusive policies, practices and frameworks.

8. Person Specification

Applicants will be assessed against the following person specifications, taking into account the level of the position for which they are applying:

E – Essential: Requirements without which the job could not be done.

D – Desirable: Requirements that would enable the candidate to perform the job well.

Requirements – Assistant Professor	Essential (E) and Desirable (D)
Education	
PhD in Physics or related field or equivalent	E
Knowledge and Experience	
An independent research programme of international quality that addresses clearly defined questions in physics, evidenced by high-quality publications in peer-reviewed journals (commensurate with career stage)	E
Demonstrated experience in research using large or complex datasets, simulations or data streams in physics, or a track record of developing original AI or machine learning methods for physics analysis and inference	E
Original methodological contributions to data-intensive science, machine learning or AI, evidenced by published research and not limited to the application of existing tools	E
Evidence that ideas and methods transfer between datasets, simulations, experiments or physics settings	E
Experience of, or clear potential for, teaching and supervision at undergraduate or postgraduate level, commensurate with career stage	E
Experience of preparing research funding applications, commensurate with career stage	E

Requirements – Assistant Professor	Essential (E) and Desirable (D)
Skills and Abilities	
Ability to communicate complex ideas clearly and effectively	E
A high level of analytical capability	E
Potential to collaborate with researchers across the Department and contribute to a department-wide programme	E
Clear potential to develop an international reputation in data-intensive physics	E
Ability to lead, motivate and develop colleagues and students, appropriate to career stage	E
Good organisational and research-management skills	E
Commitment to high-quality teaching and supervision of students	E
Experience of developing or deploying methods on accelerated or heterogeneous computing platforms, including GPUs, FPGAs or other specialised hardware, for real-time or large-scale physics applications	D

Requirements – Associate Professor	Essential (E) and Desirable (D)
Education	
PhD in Physics or related field or equivalent	E
Knowledge and Experience	
An established profile and emerging international recognition in data-intensive physics, grounded in clearly defined physics questions	E
Sustained success in securing external research funding	E
Demonstrated experience in research using large or complex datasets, simulations or data streams in physics, or a track record of developing original AI or machine learning methods for physics analysis and inference	E
Original methodological contributions to data-intensive science, machine learning or AI, evidenced by published research and not limited to the application of existing tools	E
Evidence that ideas and methods transfer between datasets, simulations, experiments or physics settings	E
Independent scientific leadership, including experience of leading a team of researchers	E
Experience of teaching and curriculum development at undergraduate and postgraduate levels	E
Experience of supervising PhD candidates and mentoring junior researchers	E
Evidence of management and administration experience	E
Skills and Abilities	
Ability to communicate complex ideas clearly and effectively	E
A high level of analytical capability	E
Ability to make a significant contribution to departmental leadership and management	E

Requirements – Associate Professor	Essential (E) and Desirable (D)
Proven skills in leading, motivating, developing and managing the performance of colleagues	E
Ability to collaborate with researchers across the Department and contribute to a department-wide programme	E
Commitment to high-quality teaching and supervision of students	E
Good organisational and research-management skills	E
Ability to build and sustain effective working relationships, both internally and externally	E
Experience of developing or deploying methods on accelerated or heterogeneous computing platforms, including GPUs, FPGAs or other specialised hardware, for real-time or large-scale physics applications	D

Personal attributes for all levels	Essential (E) and Desirable (D)
A willingness to undertake any necessary training and development activities for the role	E
The understanding and vision required to contribute to the setting and delivery of strategic goals.	E
A willingness to engage in collaborative research	E
A commitment to high quality teaching and fostering a positive learning environment for students	E
A commitment to work as part of a team in assisting the smooth running of the Department and its research and teaching programmes	E
A personal commitment to Imperial's vision and values, including high quality teaching and research.	E
Supportive and tolerant	E
A willingness to undertake any necessary training and development activities for the role	E

9. Salary and Conditions of Service

A full set of terms and conditions will be given to the successful candidate, together with the Imperial's most important policies, which affect staff. The principal terms and conditions are as follow:

Assistant Professor

The post will be at the **Assistant Professor level** of the **Academic Job Family** and the associated salary range is available at: <https://www.imperial.ac.uk/human-resources/pay-and-pensions/salaries/academic/>

Incremental progression and any performance payments will be in accordance with procedures governing Assistant Professor level in the Academic Job Family. Annual increment date is 1 October up to the maximum of the standard salary scale. For those starting between 2 April – 30

September, subject to satisfactory performance, the first increment will be on the first of the month after six months in post.

Annual cost of living increases will be determined by Imperial College through its local collective bargaining machinery.

Associate Professor

The post will be at the **Associate Professor level** of the **Academic Job Family** and the associated salary is available at: <https://www.imperial.ac.uk/human-resources/pay-and-pensions/salaries/academic/>

Any salary increases or performance payments will be determined in accordance with procedures which govern senior academic staff.

Annual cost of living increases will be determined by Imperial College through its local collective bargaining machinery.

Salaries are payable on the 24th day of each month (the exception being December) by transfer to a bank or building society account. Deductions in respect of income tax and National Insurance contributions will be made from salaries at the statutory rates.

Academic staff normally take annual leave during Imperial vacations and by arrangement with the Head of Department in the light of academic and departmental requirements. Annual leave entitlement is 43 days for full time staff (pro rata entitlement for part time staff). This is inclusive of 8 days for Public holidays and a total of 8 [University closure days](#) each year when the Imperial is closed over Easter and Christmas.

At the beginning of the leave year staff will be required to allocate the appropriate number of days of their mandatory leave entitlement to cover the closure days and Public holidays that fall within that leave year. For part-time staff the allocation should cover their normal working days that fall upon a closure day, bank or public holiday during that leave year.

The occupational pension scheme is the [Universities Superannuation Scheme \(USS\)](#). Staff members who are already members of the Federated Superannuation System for Universities (FSSU) or the National Health Service Superannuation Scheme (NHSPS) may, if they are still eligible, retain their membership in these schemes.

Unless stated otherwise in the offer of employment, or agreed by the head of department, the appointment may be terminated by either side by giving a minimum of three months' notice in writing. For academic members of staff who wish to give notice of their intention to resign from Imperial the last day of service should fall on one of the following dates: 31 December; 31 March; 30 June or 30 September or at the end of a term by agreement with the Head of Department.

All staff have a probationary period of six months, with the exception of Assistant Professors who normally serve three years.

Staff on a fixed term contract receive notice of the ending of their employment within that contract. No further contractual notice will be given unless the contract is to terminate prior to the end date specified in the offer of employment. In these circumstances the notice from the university would be as above.

Total Remuneration Package

Our [Total Remuneration Package \(TRP\)](#) includes our sector-leading package of pay, pensions and recognition as well as our range of benefits.

We have many initiatives to support staff in their personal life ([flexible working](#), [private health insurance](#), [staff networks](#), [support for staff](#), [childcare](#) and [carers](#)

[Benefits](#) to support an active lifestyle and health initiatives, such as the [cycle to work scheme](#), and access to onsite [leisure facilities](#).

Childcare

Our staff have access to the [Early Years Education Centre](#) (EYEC) which is the Imperial's 'Outstanding' Ofsted-rated nursery, located at the South Kensington Campus. We also have other [affiliated nurseries](#) located at other campuses.

Imperial offers [support with EYEC fees](#) in the form of a salary sacrifice scheme enabling parents to pay fees before tax and national insurance contributions are taken.

10. Applications

Our preferred method of application is online, on our website at the following link: [Imperial Career's site](#) (select "Job Search"). Please apply online, uploading any relevant supporting documents such as a cover letter, full CV, which should include:

- degrees (including universities and dates);
- past and present posts, list of publications;
- brief description of current and future research plans;
- teaching statement and evidence of teaching scores;
- information on research grants and contracts which have been obtained, student supervision, etc;
- information regarding public engagement undertaken with research activities. Examples include: participating in festivals, working with cultural venues; creating opportunities for the public to inform research; researchers and the public working together to inform policy; citizen researchers and web based experiments, public debates, etc.

All candidates will be contacted after the shortlisting is completed.