



The School of Mathematics at the University of Bristol invites applications for one or more Research Fellowships in Data Science, in association with the Heilbronn Institute for Mathematical Research (HIMR). Heilbronn Research Fellows divide their time equally between their own research and the classified research programme of the Heilbronn Institute.

The area of the Fellowships includes any foundational methodology supporting the exploitation of large-scale, dynamic, and/or complex data. Candidates must demonstrate prior evidence of relevant accomplishments and/or an outstanding research track-record in a mathematical discipline (including Mathematical Physics or Theoretical Computer Science) supported by clearly laid-out plans to transition into Data Science.

HIMR and the [Alan Turing Institute](#) have a partnership agreement which permits Heilbronn Research Fellows to carry out some of their personal research as part of the Turing Institute's research programme. The University of Bristol is a partner of the Alan Turing Institute in its university network.

Due to the nature of the Heilbronn Institute's work, Fellows are required to obtain and maintain a national security clearance. UK resident UK nationals will normally be able to meet this condition: other potential applicants should consult the Heilbronn Manager, [himr-recruitment@bristol.ac.uk](mailto:himr-recruitment@bristol.ac.uk) about eligibility before applying.

These positions are funded through the UKRI/EPSC 'Additional Funding Programme for Mathematical Sciences'. For more information about the Heilbronn Institute, see <https://heilbronn.ac.uk/>

The salary range for this Fellowship is £39,745-£44,737 depending on previous experience. There is a salary supplement of £3.5K pa, in recognition of the distinctive nature of these Fellowships. Payment of this supplement is conditional on a PhD thesis having been accepted in final form. In addition, there is a fund of at least £2.5K pa towards research expenses.

The Fellowship will be for three years, with a preferred start date of 1 October 2023, though another date may be possible by prior agreement.

The School of Mathematics is a supporter of the LMS Good Practice Scheme aimed at advancing women's careers in mathematics and we particularly welcome applications from women and other under-represented groups. For more information, please see <https://heilbronn.ac.uk/diversity/>

Candidates must apply via the online University of Bristol recruitment site, <http://www.bristol.ac.uk/jobs/find/> and search by the job number or with the keyword Heilbronn Research Fellowship. Candidates need to include their CV and a statement of proposed research (no more than one side of A4) including, if appropriate, details of their plans to transition to Data Science. They should also ask three referees to email references to: [himr-recruitment@bristol.ac.uk](mailto:himr-recruitment@bristol.ac.uk) prior to

the closing date. It is the candidate's responsibility to ensure that the reference letters are received prior to the closing date.

Informal enquiries about the research environment can be made to the Director of the Institute of Statistical Science, Professor Oliver Johnson, at [O.Johnson@bristol.ac.uk](mailto:O.Johnson@bristol.ac.uk)

We anticipate holding interviews on Friday the 20<sup>th</sup> of January 2023.

**The application deadline is 11.59pm GMT, Sunday November 13<sup>th</sup> 2022.**



Heilbronn  
Institute for  
Mathematical  
Research



University of  
BRISTOL



Engineering and  
Physical Sciences  
Research Council

## Data Science Heilbronn Research Fellowships

### 1. JOB DESCRIPTION

**Faculty / School or Division:** Faculty of Science, School of Mathematics

**Faculty/School or Division Address:** Fry Building, Woodland Road, Bristol,  
BS8 1UG

<b>Job Family:</b>	Research and Teaching		
<b>Grade/Pathway</b>	J/Pathway 2c	<b>Salary range:</b>	£39,745-£44,737 pa
<b>Hours of work:</b>	100% time	<b>Contract type:</b>	Fixed-term for 3 years
<b>Work pattern:</b>	Mon-Fri	<b>Vacancy Reference Number:</b>	

#### 1.1 Main Job Purpose

The School of Mathematics at the University of Bristol invites applications for one or more Research Fellowships in Data Science, in association with the Heilbronn Institute for Mathematical Research (HIMR). Heilbronn Research Fellows divide their time equally between their own research and the classified research programme of the Heilbronn Institute. The area of the Fellowships includes any foundational methodology supporting the exploitation of large-scale, dynamic, and/or complex data. Candidates must demonstrate prior evidence of relevant accomplishments and/or an outstanding research track-record in a mathematical discipline (including Mathematical Physics or Theoretical Computer Science) supported by clearly laid-out plans to transition into Data Science.

#### The Heilbronn Institute for Mathematical Research (HIMR)

HIMR was established by the UK Government Communications Headquarters (GCHQ) to conduct research in areas of mathematics including but not restricted to Algebra, Algebraic Geometry, Combinatorics, Computational Statistics, Data Science, Number Theory, Probability, and Quantum Computing. These areas are interpreted broadly: Research Fellows have previously been appointed with backgrounds in most areas of Pure Mathematics and Statistics, and several areas of Mathematical/Theoretical Physics.

The Heilbronn Institute is a national research institute, with some of the leading mathematicians in the UK working in a highly stimulating research environment. It partners in various activities with the Alan Turing Institute, the Clay Mathematics Institute, the Isaac Newton Institute, and

the International Centre for Mathematical Sciences. For more information about the [Heilbronn Institute](#), including its [workshops and conferences](#), [papers written](#) by its members, and current [fellows](#), please see our website at <http://heilbronn.ac.uk>. These posts are funded through the UKRI/EPSRC '[Additional Funding Programme for Mathematical Sciences](#)'.

The Institute's research programme is divided equally into 'internal' research on behalf of GCHQ, and 'external' research in areas of the Fellows' choice. The external research may be in any area of mathematics and can be published in the usual way.

At any one time the Heilbronn Institute typically has over 70 members. These range from distinguished senior visiting academics to postdoctoral researchers holding Heilbronn Research Fellowships. Currently, around 50 Research Fellows are supported, for between one and seven years, and we currently support over 55 PhD students. Since it was established in 2005, over 200 mathematicians have been members of the Institute, including over 100 Research Fellows.

HIMR and the [Alan Turing Institute](#) have a partnership arrangement which permits Heilbronn Research Fellow to carry out some of their external research as part of the Turing Institute's research programme. The University of Bristol is a partner of the Alan Turing Institute in its university network.

The Chair of HIMR, who is responsible for the external research and associated activities is Professor Geoffrey Grimmett FRS. Dr Michael Groves, the Head of HIMR, is responsible for the internal research programme. The Associate Chair of HIMR is Professor Francesco Mezzadri, who is responsible for the Heilbronn Institute's activities and Fellows at the University of Bristol.

## **Research Environment**

You will join a cohort of around 50 Heilbronn Research Fellows that includes some of the leading early-career mathematicians in the UK.

The School of Mathematics provides an excellent mentoring programme and a series of regular career-development events designed specifically for Heilbronn Research Fellows, to support them through their transition to an established and independent research career. Indeed, many former fellows have gone on to permanent academic appointments in leading universities, and embark on successful careers in industry and government.

The School of Mathematics also runs several active seminar series across all areas of Pure Mathematics as well as Probability, Statistics, Mathematical Physics and Quantum Computing. In partnership with the [Jean Golding Institute](#), HIMR runs the Bristol Data Science Seminar, which features leading speakers from academia and industry. The School also hosts a Heilbronn Data Science Visitor Programme, which attracts some of the world's leading data scientists to Bristol for extended research visits. HIMR also supports a large number of conferences, workshops and other research events across the UK, including an Annual Conference. For more information, please see our events page: <https://heilbronn.ac.uk/events/>

The School of Mathematics at the University of Bristol is delighted and proud to have been ranked 4th in the UK for Mathematical Sciences research based on independent analysis by

Times Higher Education. Our REF results highlight that 98% of our Mathematical Sciences research is either 'world leading' or 'internationally excellent' in terms of originality, significance, and rigour, with 70% of our submission given the highest score available. In recent years, the School's [Institute of Statistical Science](#) hired two Heilbronn Chairs in Data Science, [Professor Anthony Lee](#) and [Professor Nick Whiteley](#).

The School is host to [COMPASS](#), a new EPSRC Centre for Doctoral Training in Computational Statistics, which will train 11+ PhD students per year across a broad range of statistical science. Teaching and project supervision opportunities at all levels are possible, with faculty support.

The internal research programme is determined by the Head of HIMR in conjunction with GCHQ. Fellows are presented with a range of challenging problems and are given the facilities and support to contribute to one or more problems, frequently in a collaborative effort as a member of a team.

### **Facilities and Research Support**

Excellent facilities are provided for both the external and the internal research. Fellows will have access to the University's Advanced Computing Research Centre which operates a number of different [High Performance Computing](#) systems. In addition to work space at the Institute, Fellows also have desks in the School of Mathematics, which they can access 24/7. The University of Bristol invested £33M to transform the Grade II listed Fry Building, which has been the new home for the School of Mathematics since 2019.

Fellows work flexible hours, and have some freedom in allocating their time between internal and external research.

The Chair holds a generous budget for research activities such as travel and organising workshops and visits by collaborators to the University of Bristol. Fellows may expect research expenses of up to £2.5K pa and are able to bid for further sums from the Chair's fund for special projects. They may also bid for external funding.

### **Terms and Conditions**

Terms and conditions of employment for Research Fellows will be based on those applicable to fixed-term externally-funded researchers in the University of Bristol.

The salary range is £39,745-£44,737, depending on experience, plus a salary supplement of £3.5K pa in recognition of the distinctive nature of these Fellowships. Payment of this supplement is conditional on a PhD thesis having been accepted in final form.

### **Intellectual Property Rights**

The Institute acquires all IPR in the internal research. Rights in the external research are subject to the normal arrangements between the University of Bristol and its employees, subject to GCHQ acquiring a royalty-free license on any exploitable invention.

## Security

Some of the Institute's work is highly confidential and subject to formal security procedures. All the internal research must be carried out within the Institute and not discussed elsewhere, even in general terms, without explicit GCHQ permission. Fellows need to acquire, and continue to maintain, a national security clearance (Developed Vetting) from GCHQ; they are subject to provisions of the Official Secrets Act including restrictions on travel to certain countries. UK resident UK nationals will normally be able to meet this condition. Non-UK citizens and UK citizens who are not UK residents should contact the Heilbronn Manager, [hmr-recruitment@bristol.ac.uk](mailto:hmr-recruitment@bristol.ac.uk) about eligibility before applying. Information on the process can be found on the UK Government security vetting website:

<https://www.gov.uk/government/publications/united-kingdom-security-vetting-clearance-levels/national-security-vetting-clearance-levels#developed-vetting-dv>

The University and the Heilbronn Institute reserve the right to terminate the fellowship in the event of refusal or loss of security clearance.

## Informal Enquiries

Candidates interested in learning more about these Fellowships may contact the Director of the Institute of Statistical Science, Professor Oliver Johnson, at [O.Johnson@bristol.ac.uk](mailto:O.Johnson@bristol.ac.uk)

### 1.2 Main Statement of Responsibilities

#### Research Responsibilities

- Please refer to main job purpose above.

#### Administration Responsibilities

- Please refer to main job purpose above.

#### Teaching Responsibilities

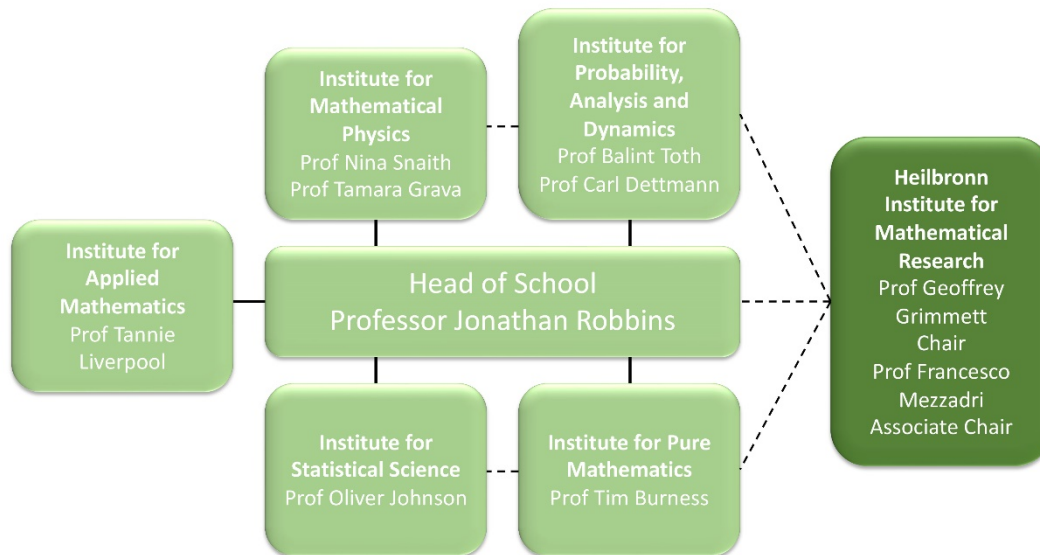
As this role is a Pathway 2 (Research) role, there are no formally specified teaching duties required of the role-holder. However, other commitments permitting, the role-holder may be given development opportunities to undertake activities such as teaching on undergraduate programmes and/or supervising final year projects, as appropriate.

### 1.3 Relationships

**Line manager:** Professor Francesco Mezzadri

**Line manager to (where appropriate):** n/a

## Organisation Chart



### 1.4 Job Hazards/Safety Critical Duties (Pre-employment health screening)

NOT APPLICABLE

## 2. PERSON SPECIFICATION

### 2.1 Relevant Experience, Skills and Knowledge

#### **Essential**

- Experience of independent research in any methodology supporting the exploitation of large-scale, dynamic and/or complex data, or an outstanding track record of research in a statistical or mathematical discipline (including Mathematical Physics and Theoretical Computer Science) supported by clearly laid out plans to transition into Data Science.
- A publication record commensurate with career stage.
- Self-motivation, initiative, and organisational skills in planning and carrying out research.

### 2.2 Relevant Qualifications

#### **Essential**

PhD or equivalent doctoral qualification in a relevant subject by the time you start this

fellowship, or very close to completion.

## 2.3 Communication and Interpersonal Skills

### ***Essential***

- Excellent written and oral communication skills in English.

## 2.4 Additional Criteria

### ***Essential***

- Fellows need to acquire, and continue to qualify for, a national security clearance ('Developed Vetting') from GCHQ. UK resident UK nationals can typically can achieve this, otherwise please contact [himr-recruitment@bristol.ac.uk](mailto:himr-recruitment@bristol.ac.uk) before applying.

## CAREER PATHWAY AND OTHER RELEVANT INFORMATION

### 1. Career Pathways

All members of academic staff have a clear career pathway involving a series of levels with distinct role profiles, each with its unique requirements. Each profile sets out what is expected of an academic at the particular level. The role profiles also set out a collection of competencies expected for each level. Progression or promotion to the next level will occur after these competencies have been attained and where a role at the higher level is available.

The academic pathways are as follows:

**Career Pathway One** - academic roles that combine teaching, research and administrative duties.

**Career Pathway Two** - academic roles focusing on research and associated administrative duties.

**Career Pathway Three** – academic roles focusing on teaching and associated administrative pathways

This post is located on Pathway Two. Role Summaries setting out what is expected of an academic at each particular profile level on pathway two can be found below. Please note that an appointment may be made at any level of the pathway.

A schematic diagram of the career pathways can be found at <http://www.bristol.ac.uk/hr/grading/academic/>.

For Pathway Two roles, progression to the next level will only occur where a role has been identified as being eligible for progression, having reached the relevant point on the salary scale



and after the relevant competencies have been attained. A progressable role is a role at Level b or Level c that has been determined as being eligible for progression by the Head of Department, based on departmental needs, priorities and funds. Individuals in progressable roles at Level b or Level c are expected to develop their skills, knowledge and experience in order to ultimately progress to Level c or Level d, as applicable. A non-progressable role is one either at Level a (which are not subject to formal progression arrangements, although there may be opportunities to develop into a Level b role, based on departmental needs, priorities and funds), or at Level b or c for which the Head of Department has identified an ongoing need at that particular level. Movement to Level e will be by promotion only.

## **Role Summaries**

### **Research Associate (Level a)**

Role holders at this level are concerned with *assisting* an individual research leader or team to conduct a particular study (or group of studies). They will generally be involved in data generation and/or collection using standard and well-defined methods developed by others. They will be working under close supervision by, and direction from, a more senior researcher, who will be ultimately responsible for the project. This may be the entry level for some staff who are expected to train and/or develop to take on more senior researcher roles. Role holders will be provided with academic and pastoral support within the department (including counselling on realistic career opportunities) and training will be available designed to develop their competences and to prepare them to take on more responsibilities associated with a higher grade.

### **Senior Research Associate (Level b)**

Role holders at this level will be experienced and professional researchers (or have considerable professional experience) and will be specialists in a particular area or methodology, drawing upon knowledge gained from postgraduate research and/or working within a Level a role. They will be *associated* with a particular project (or projects) and will contribute ideas, and/or enhancement of techniques or methodologies. They will be expected to do some writing for dissemination outside the Department. They will still be working under supervision, but will be expected to take significant initiatives in their work and consult with the Principal Investigator over the details of the project. They may, where practical, contribute to the department's teaching, through supervision of projects, overseeing practical classes, or taking small group classes. They will be provided with academic and pastoral support within the department and training will be available designed to develop their competences (including counselling on realistic career opportunities) and prepare them to take on more responsibilities associated with a higher grade.

### **Research Fellow (Level c)**

Role holders at this level will have substantial experience of research (normally not less than six years). They will initiate and take responsibility for some research projects and may be Principal Investigators or, where a Research Council does not permit this, act as though they were Principal Investigators. They will be involved in administration relevant to their projects (e.g. helping to prepare bids for research funding), managing other researchers and monitoring research budgets. They will be expected to be undertaking research individually and/or collectively and to be advancing the state of knowledge and understanding within their particular area of expertise. They will be publishing regularly in high quality outlets. They are

likely to provide some teaching support for the department (consonant with the terms of their funding). They will be expected to be establishing a growing reputation within their particular research field and academic discipline and to be developing and demonstrating intellectual independence.

**Senior Research Fellow (Level d)**

Role holders at this level will have extensive experience in research and research management. They will normally be Principal Investigators, leading collaborative research bids and research teams, or driving forward innovative research themselves. They will be involved in scholastic projects (e.g. editing journals and academic books), and be making a significant leadership and/or management contribution within their department or the wider university, to be participating in national/international academic networks and conferences. They may be transferring their knowledge through some teaching and/or supervision to undergraduate or graduate students (consonant with the terms of their funding). Role holders at this level will be independent researchers and will have an established national and growing international reputation within their academic discipline generally and research field in particular.

**Professorial Research Fellow (Level e)**

Role holders at this level will have very extensive experience of research leadership and related management/administration. They will enjoy a wide recognition for their expertise within the academic community internationally (as evidenced by conference invitations, journal editorships, office holding in specialist groupings, associations with appropriate Research Councils etc.). They will have made recognised and significant contributions to the developing knowledge and understanding of their research area. They will already have responsibilities for the creation, initiation, development and overall management of significant research programmes. They will 'profess' their discipline within the Department, as appropriate and consonant with the terms of their funding. They may also carry significant leadership roles within the Faculty or University.