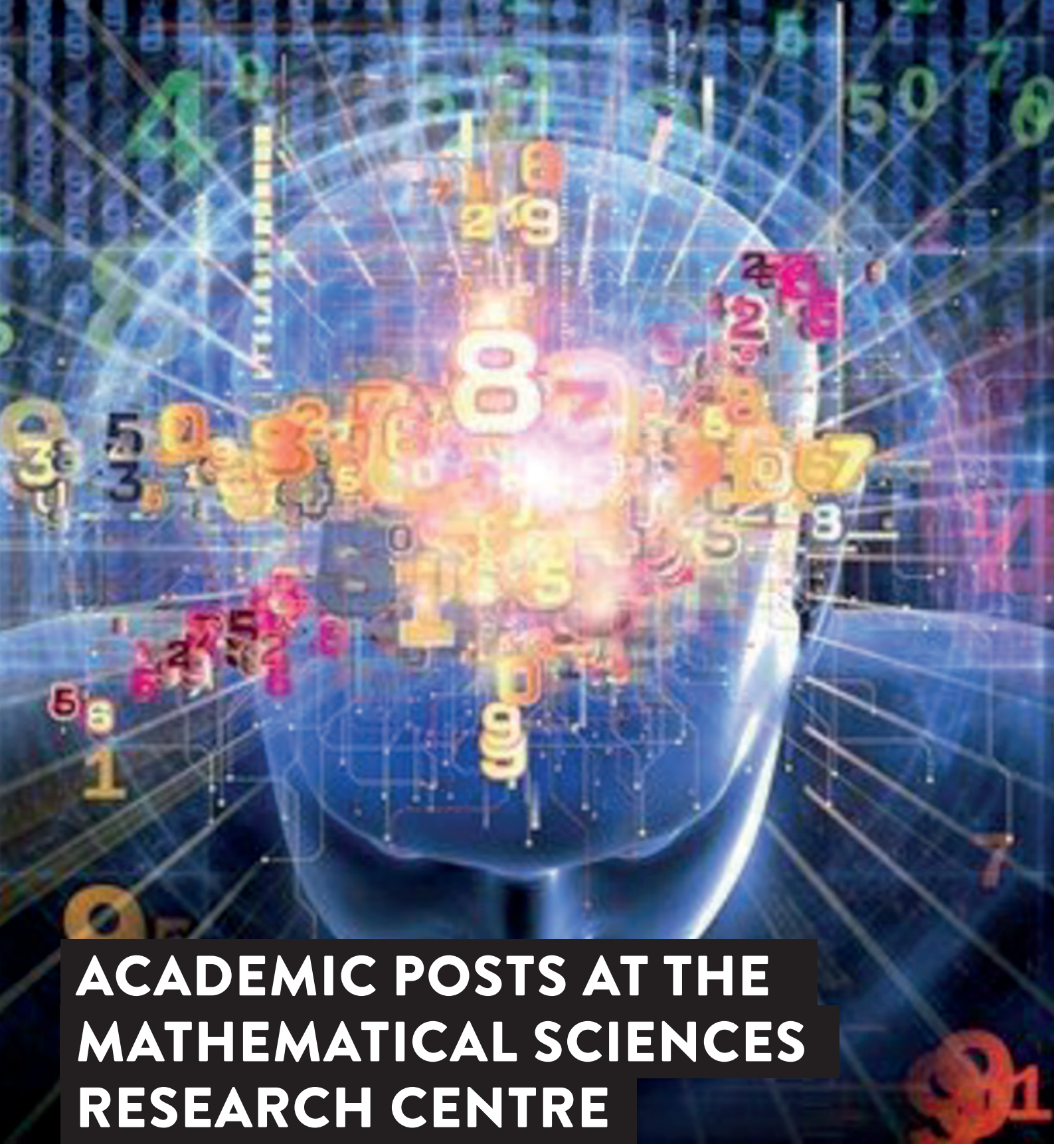


ACADEMIC POSTS AT THE MATHEMATICAL SCIENCES RESEARCH CENTRE

QUEEN'S UNIVERSITY BELFAST

SCHOOL OF MATHEMATICS AND PHYSICS

RUSSELL
INTERNATIONAL
EXCELLENCE
GROUP

Athena
SWAN
Silver Award



Welcome

As Vice-Chancellor of Queen's University Belfast, I am delighted you are interested in applying for a Data Analytics Lectureship..

Queen's is an exciting place. A place that delivers both local and international impact. This makes us a global top 200 university, based in Belfast, a modern capital city known for its welcome and accessibility, as well as being a vibrant hub for the creative and tech sectors. It is a great place to live and work. We are immensely proud of what our city and our university will offer you.

The University is on a transformational journey towards achieving the strategic ambitions contained within the Corporate Plan 2016-21. This Plan provides a roadmap for Queen's to achieve this ambition, building on its reputation as an internationally recognised university, conducting leading edge education and research, focused on the needs of society.

If you share our vision and have the experience, skills and passion we are looking for, I encourage you to apply and to join us on our exciting journey.

Professor Ian Greer
President and Vice-Chancellor

Professor Ian Greer
President and Vice-Chancellor

The comfort and security of our modern world is provided by amazing advances in science and technology, focused on improving our lives.

The Faculty of Engineering and Physical Sciences spans disciplines that impact on lives today and will shape our future. Our international mix of staff and students make up a vibrant community that is home to some of the most innovative and globally significant research and teaching.

It works where industry and research meet, providing the platform to spin out research into commercial opportunities and engage with industry on cutting-edge research with real world projects such as the work with Wrightbus to produce the cleanest hybrid bus technology that powers the London Route master, or the pioneering work in The Institute of Electronics, Communications and Information Technology, securing our digital future through their Centre for Secure Information Technologies.

With strength in both fundamental and applicable disciplines, the Faculty brings together diverse topics to create a dynamic multidisciplinary setting for students and academics to thrive. Underpinning our research is the drive to solve the big challenges that society faces. Whether it is understanding the human brain's perception to aid Parkinson's sufferers, or clean energy production through CenTACat, our research is leading the world in an environment rooted in the ideals of Athena SWAN where we actively promote gender equality.

We have now established a Centre for Mathematical Sciences and are building an Institutional Wide Maths Academy which will transform education and research in mathematical sciences. The Maths Academy is a high profile key element of the Faculty strategy and an excellent opportunity to ensure Mathematics in education and research is at the forefront of our activities.

The leadership provided by our academics creates opportunities for all students to satisfy their ambitions through taught and research programmes. Come and join us, and help change the world!

Professor Mark Price
Faculty Pro-Vice-Chancellor
Faculty of Engineering and Physical Sciences

Mark Price




Head of the School of Mathematics and Physics

As a Head of the School of Mathematics and Physics, I am delighted that you are interested in one of the posts in Mathematical Sciences with us at Queen's.

Mathematics – a core subject lying at the heart of human progress – underpins education and research across our School. This importance is recognised by the investment that identifies Mathematics as a priority area to undergo a substantial expansion in the Faculty.

Our School is a long established joint School that brings Mathematics and Physics together and there is considerable cross fertilisation with staff involved in physics research, active in applied mathematics teaching.

We now seek to build on our strengths in a number of fields within Mathematical Sciences with three strategic appointments in Data Analytics, who will expand the existing expertise in the field, and a further appointment in Foundations of Data Science. to be held jointly with the Institute of Electronics, Communications and Information Technologies.

The recent establishment of a Faculty-wide Mathematics Academy places research and education in Mathematics high on the University's agenda, and will provide exciting opportunities for interdisciplinary collaboration with colleagues within and outside Queen's.

The School has a commitment of becoming an academic home to researchers with a highly diverse cultural and professional background. It takes pride in its equal opportunity provision and in its work towards gender equality. This is demonstrated by

the fact that Mathematics at Queen's was the first in the discipline to be granted a silver Athena SWAN award. We very much look forward to continuing to expand our reputation of an internationally leading academic discipline in a dynamic and vibrant research environment.

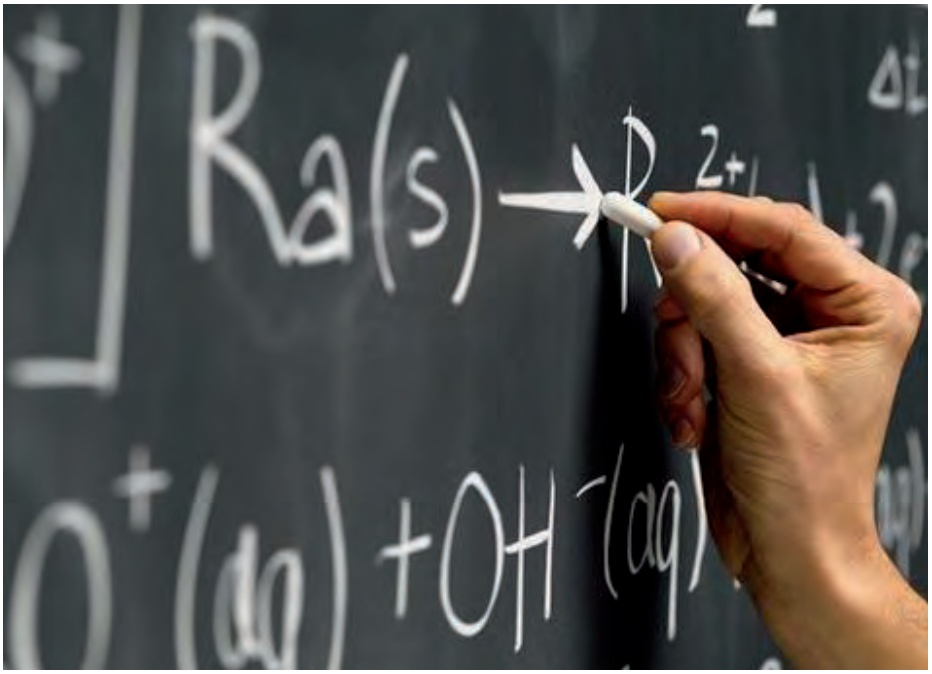
Professor Robert Bowman
Head of the School of Mathematics and Physics

Robert Bowman

Introduction

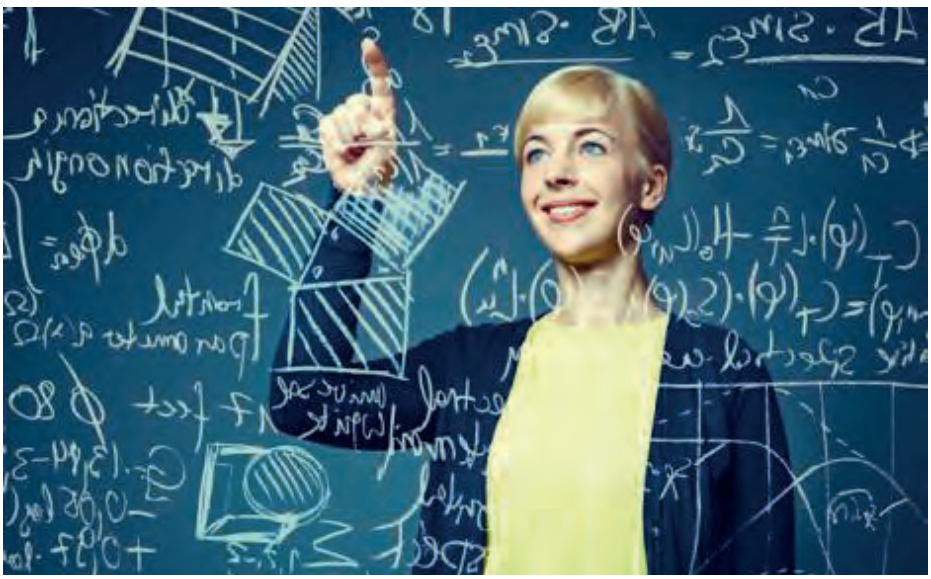
The School of Mathematics and Physics brings together 60 academic staff members, including 18 professors. The School provides a number of undergraduate programmes, including a very popular BSc and MSci in Mathematics, Statistics and Operational Research, MSci degrees in Mathematics, and Theoretical Physics, and a BSc degree in Mathematics with Finance. It supports a variety of joint pathways with other Schools, including the School of Electronics, Electrical Engineering and Computer Science and the Queen's Management School. The School has approximately 710 registered undergraduate students and currently hosts 175 PhD students. It plans to open a new BSc Degree in Data Science in the near future.

In 2017, the School introduced a new MSc in Data Analytics which is proving highly successful, meeting the needs of industry and demand for graduates in this particular area.



Teaching

As a core subject, Mathematics has been continuously taught at Queen's since the University was founded in 1845. Among its alumni have been highly influential figures in the research world, including the renowned scientists Joseph Larmor and John Bell. Through its vibrant programme, which responds to the modern educational developments in the subject and the demands of the economy, the Mathematics teaching department at Queen's is able to attract high quality, motivated students in all of its pathways. The School takes pride in its direct and spontaneous contact with students, well-thought through pastoring mechanisms, and flexible learning environment which, starting with the basics of Analysis, Linear Algebra and Probability, leads the learners through all fundamental subjects in both Pure and Applied Mathematics, equipping them with valuable computing skills, and reaching up to the contemporary developments in the discipline in the final MSci year. Many of our students are inspired to take the exciting path of mathematical research, and are well-regarded and appreciated across the UK. Our graduates are sought after in the industry sector, where their analytic, modelling, statistical and computing skills are highly valued.



The commitment of the University to a high-quality teaching and learning in Mathematical Sciences is evidenced by the multimillion investment in a new *Mathematics and Physics Teaching Centre* which opened its doors in September 2016. Equipped with state-of- the-art lecturing facilities, it caters for a high-profile teaching experience in a modern environment. The McClay library, located just opposite the Centre on the central campus, offers an exceptional learning atmosphere and avails of a large collection and access to the latest publications in the subject. MSci students enjoy individual desk space and computing facilities, located in the Research Centre in which they are undertaking their MSci.

Links with the wider mathematics community flourish and we have close engagement




with a large number of employers who are regularly involved in events that we co-ordinate and who have strong engagement with our MSc degree in *Data Analytics*.

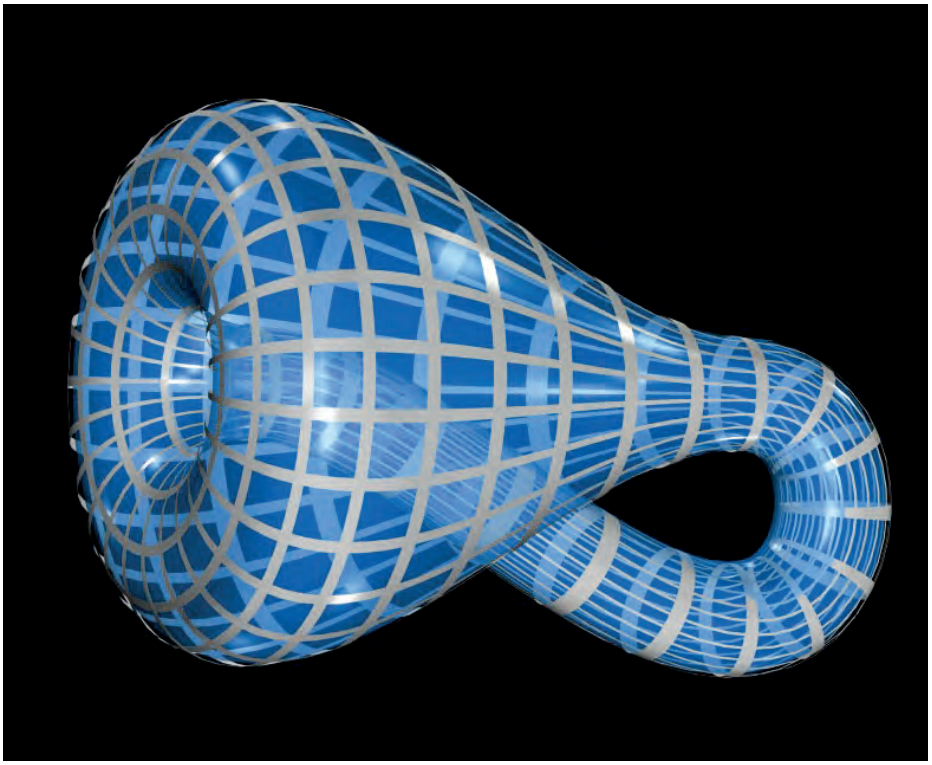
Research

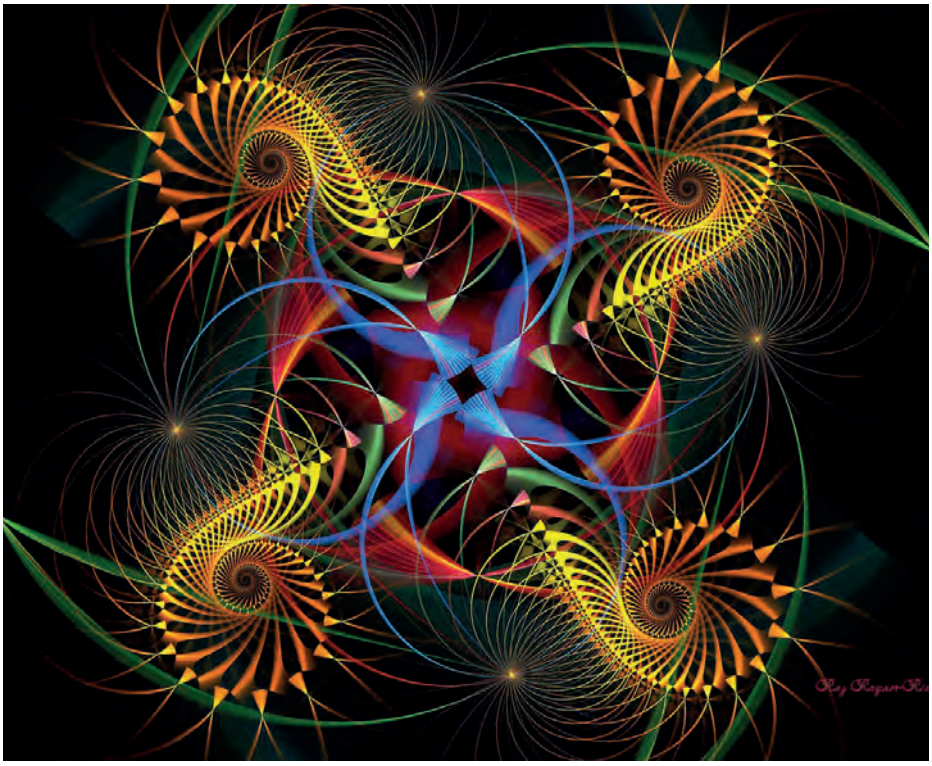
The School of Mathematics and Physics hosts six research centres. Focussed research is pursued in the following fields:

- Mathematics, represented by the Mathematical Sciences Research Centre;
- Theoretical Physics, which includes the Centre for Theoretical Atomic, Molecular and Optical Physics (CTAMOP) and the Atomistic Simulation Centre (ASC);
- Experimental Physics, which includes the Centre for Nano-structured Media (CNM) and the Centre for Plasma Physics (CPP);
- Astrophysics, represented by the Astrophysics Research Centre (ARC

Research in Mathematics is grouped around the following main themes:

- *Mathematical Analysis*: the main focus is in the areas of Functional Analysis and Operator Theory, including Operator Algebras, Banach Algebras, Linear Dynamics, Abstract Harmonic Analysis, Spectral Theory and applications to Mathematical Physics;
- *Algebra, Topology and Applictaions*: the main topics include Homotopy Theory, Model Categories, Theory of Linear Preservers, Banach Lattices, General Topology and Topological Data Analysis;
- *Data Analysis and Applied Statistics:* research directions include Survival Analysis, Bayesian Modelling, Data Mining, Markov Modelling, Stochastic Models, Longitudinal modelling, and real-time analytics.
- *Operational Research and Optimisation*: represented directions comprise continuous, discrete and stochastic optimisation.





Our World-Class Academic Community

Queen's University's recruitment campaign for world-class academics offers a unique opportunity to join a leading university at one of the most exciting time in its history as it moves towards its goal to become a Global Top 100 university.

Queen's nurtures an academic environment which greatly values its scholars and researchers. It provides the highest rewards, professionally and financially, as well as the potential to play an academic leadership role in the higher education sector and in the wider community.

In the following profiles, several members of staff of Mathematical Science Research Centre share their experience as members of the University's family.

Dr David Barnes
Lecturer in Pure Mathematics

I obtained my PhD in 2008, then travelled to Germany and Canada for postdoctoral research positions. I returned to the UK in 2010 for an EPSRC postdoctoral research fellowship and joined Queen's as a lecturer in 2013. I work in algebraic topology, specifically homotopy theory that is usually either stable or has topological groups acting on the objects involved. Some of my research tends towards the more algebraic and categorical end of algebraic topology, such as finding nice categorical models for equivariant cohomology theories and their monoidal structure.

The School of Mathematics and Physics at Queen's has been very supportive of my research and has encouraged me to have numerous research visitors and overseas research trips. A fair balance between teaching and research is important to the department and I feel that I have a good work-life balance. I enjoy living in Belfast and I am still discovering new and exciting things to do in the city four years after moving here.

Dr Ying-Fen Lin
Lecturer in Pure Mathematics

I completed my PhD degree in Taiwan in the area of Linear Preservers – an exciting field of research that studies linear mappings which preserve specific properties of objects, with importance in both Pure and Applied Mathematics. After spending a year in Edmonton, Canada, as a Pacific Institute Postdoctoral Fellow, I returned in Taiwan and had a permanent academic post in Hualien. I like seeing how expertise in one area can be linked to and useful in another – so my research has expanded considerably in terms of breadth in the past years, and now I am also working on problems in Abstract Harmonic Analysis and Operator Algebra Theory. Since joining Queen's in 2013, I have continuously received support and encouragement from the department which has allowed me to build up new collaborations both nationally and internationally and to strengthen my research profile. The School is truly multinational, there are staff members and students from different cultures and backgrounds, which creates a very welcoming and warm atmosphere.

Professor Adele Marshall
Co-director of the Mathematical Sciences Research Centre

I completed my PhD in 2001 developing statistical survival models in healthcare that utilize machine learning to predict patient outcome. Having gained lecturing experience during my PhD which I completed part-time, I moved to Queen's in 2001 to take up a position as a Lecturer in Statistics and have remained there since. Queen's has presented me with many opportunities including the building of my own research group in Statistics and Operational Research which successfully went on to be established as the Centre for Statistical Science and Operational Research (CenSSOR) for whichI was Director of Research for 12 years. In 2017, a new transformation commenced and is currently underway with the recruitment of new colleagues in Data Analytics and Foundations in Data Science bringing together all areas of the discipline into the Mathematical Sciences Research Centre. I went on to develop a new MSc programme in Data Analytics which had its first cohort of graduates in December 2017, and which is an integral park of the MSRC going forward, with members of Faculty collaborating together in its delivery. As part of the MSc, employer engagement is key, which is one key theme of the Mathematics Academy, for which I am Director.

Dr Salisou Moutari

Senior Lecturer in Applied Mathematics

Prior to joining Queen's in 2008, I was a post-doctoral research fellow in Germany. My main research interests included mathematical modelling, numerical simulation and optimisation. The research environment at Queen's university in general and in the School of Mathematics and Physics in particular, enables opportunities for both specialised and multidisciplinary collaborative research with local colleagues and international partners. With my research interests in Applied Mathematics and Operational Research, such enjoyable research environment, together with the excellent research and teaching facilities as well as the wide range of support available within the school, have been instrumental in the development of my academic career.

Professor Ivan Todorov
Co-director of the Mathematical Sciences Research Centre

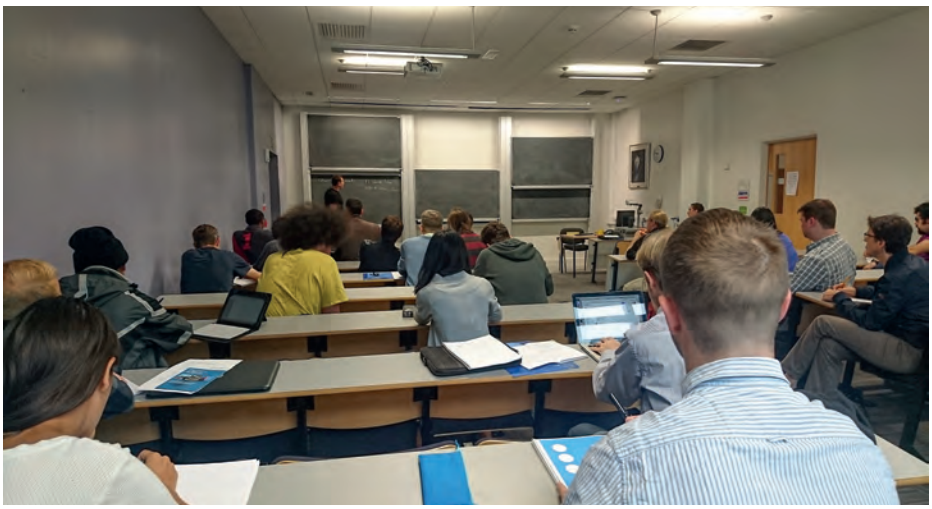
I obtained a PhD degree in 1999 from the University of Athens, Greece, in the area of Operator Algebras. After a couple of years as a Visiting Assistant Professor at the University of the Aegean,I took up a post at the Pure Mathematics Research Centre (PMRC) at Queen's, and have been based at Belfast since then. I work in Abstract Harmonic Analysis, and in Functional Analysis and its interactions with Quantum Information Theory and Graph Theory. I have held visiting positions at the Fields Institute for Research in Mathematical Sciences (Toronto) and the Isaac Newton Institute for Mathematical Sciences (Cambridge), and have been involved in interdisciplinary research that seeks to make advances in questions in Quantum Physics using operator theoretic tools. I was a Director of PMRC since 2011 until the recent formation of the Mathematical Sciences Research Centre – a new exciting step towards enhanced research diversity through the addition of new and vibrant areas to our research portfolio. Queen's has offered an amazing academic journey, and the current expansion of Data Science will add to the many opportunities for interaction I have found very inspiring during the course of my career.

Dr Florian Pausinger

I obtained my PhD at IST Austria which is close to Vienna and joined Queen's as a lecturer in 2017 after I was a postdoctoral researcher in Munich for two years. I am interested in the basic question of how to distribute points in a uniform manner in squares, on spheres or on more complicated shapes. Such point sets are widely used in numerical integration (so called quasi-Monte Carlo integration). Apart from that I work on problems in computational topology. I particularly enjoy interdisciplinary projects with other scientists (such as biologists) in which the aim is to get geometric and topological information about real world objects from digital images.

The School of Mathematics and Physics and in particular its staff from all over the world gave me a warm welcome and helped me to settle in. I enjoy the inspiring and supportive research environment as well as the natural beauty surrounding Belfast.

Professor Andreas Winter (UAB) delivers a lecture at the LMS-CMI Research School on "Combinatorics and Operators in Quantum Information Theory", September 2016.



Professor Andreas Winter (UAB) delivers a lecture at the LMS-CMI Research School on "Combinatorics and Operators in Quantum Information Theory", September 2016

The Mathematical Sciences Research Centre

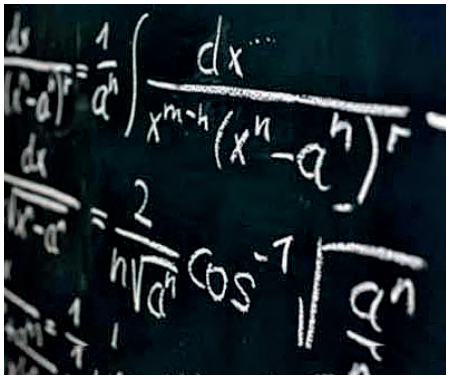
The Mathematical Sciences Research Centre (MSRC) is a new research centre within the School of Mathematics and Physics established in January 2017. It brings together researchers from the former Pure Mathematics Research Centre (PMRC), the former Centre for Statistical Science and Operational Research (CenSSOR) and recent appointments in Applied Mathematics and Data Analytics.

A number of areas are currently represented at MSRC:

The Centre hosts one of the largest groups in Functional Analysis and Operator Theory in the UK, possessing a high-level expertise in Operator Algebras, Abstract Harmonic Analysis, Banach Algebras, Linear Dynamics, Hyperciclicity, Spectral Theory and Mathematical Physics. Recently, connections between Operator Theoryand Quantum Information Theory have been explored by members of the Centre, celebrated through an LMS-CMI Research *School on Combinatorics and operatorsin Quantum Information Theory*, hostedby Queen's in September 2016. The Centre has a vibrant group in Algebra and Topology, with specialism in Homotopy Theory, Model Categories, Combinatorial Topology, Combinatorial Algebra, Linear Preservers and Topological Data Analysis. Recently joined members offer expertise in Dynamical Systems, PDE's and applications of biology. MSRC currently has a very active group working in Applied Statistics and Operational Research who specialise in Survival Analysis, Data Mining, Markov Modeling, Stochastic Models, Longitudinal modelling and real-time analytics. The research is applied to a wide range of sectors in healthcare and medical research, in crime, policing, education, infrastructure modelling and most recently in manufacturing. Researchers collaborate with Industry and currently have a number of Knowledge Transfer Partnerships with local companies.

The Centre receives funding from all of the major national funding bodies: The *Engineering and Physical Sciences Research Council, the Royal Society, the London Mathematical Society, the Economic and Social Research Council, the Nuffield Foundation and the Heilbronn Institute*, as well as the regional economic development agency in Northern Ireland, Invest NI and Strategic Investment Board in Northern Ireland.

The Centre maintains a number of interdisciplinary research links. Together with the School of Mechanical and Aerospace Engineering and the School of Psychology, it participates in multi-disciplinary examination of Design Space; with the School of Electronics, Electrical Engineering and Computer Science it pursues links between Representation Theory and Robotics, and has projects working on deep learning approaches in analytics. Members of MSRC collaborate with researchers in the School of Social Sciences, Education and Social Work, and the School of History, Anthropology,



Philosophy and Politics as part of the Q-Step initiative and work closely with colleagues in the School of Medicine, Dentistry and Biomedical Sciences, School of Education, School of Biological Sciences, School of Sociology, Social Policy and Social Work , as part of the highly successful Centre of Excellence in Public Health which also has affiliated academic staff and students from the School of Planning, Architecture and Civil Engineering and the Gibson Institute.

The Centre supports a vibrant PhD programme, and currently hosts over 15 research students. It is very well-connected internationally: the net of collaborators covers most European countries, as well as Australia, Canada, China, Taiwan and the USA, among others. It regularly hosts international conferences: just in the past four years, there have been 17 such events organised by its members. Many of those events have been supported by prestigious grants from the London Mathematical Society and supported by professional bodies such as the Institute of Electronic and Electrical Engineering (IEEE). The Centre is an institutional member of the North British Functional Analysis Seminar, and the Cumberland Initiative and has repeatedly hosted their meetings. The research life is enriched through an intensive visitors' programme: in the past four years, over 70 external visits have been hosted at the Centre, and many of the visitors have contributed to the Centre's weekly colloquia and seminars.

Research discussions between visitors of the department.

Research discussions between visitors of the department.

Info on Strategic Investment in Mathematics

Strategic Investment in Data Science.

The institutional Vision 2020 has set the milestones of an exciting journey for Queen's staff for the years ahead. The newly structured Faculty of Engineering and Physical Sciences has contributed to wider links among Queen's researchers. The Faculty's strategic plan has recognised the importance of Mathematics in

this endeavour and in that respect has undertaken an investment in a further three posts in Data Analytics and one in Foundations of Data Science.

The new appointment in Foundations of Data Science is joint with the Institute of Electronics, Communications and Information Technologies (ECIT), and will enhance the theoretical capability in this area, collaborating with researchers from ECIT and delivering education at the School of Mathematics and Physics. The new staff members in Data Analytics will expand the existing expertise in the field, attributing to the core for a future development of the research in this direction, and will be submitted to the REF unit of assessment in Mathematical Sciences. They will develop new links with the existing areas of Mathematics research at Queen's and provide key expertise within the Faculty through its Mathematics Academy.



The Queen's Experience: Vision for the Future


The McClay Library at Queen's

Queen's University Belfast is a leading university in the UK and Ireland, which combines an international reputation for excellence in research and education with a leadership role in the community it serves. The University's proud academic tradition stretches back over 160 years. Today, Queen's influence far transcends its geographical location. As a Russell Group University it is a global force in research. The results of the most recent national Research Assessment Exercise (RAE) identified areas of world-class research across all academic disciplines at Queen's. This excellent outcome reinforced Queen's position as a university leading the way in areas central to society's future, including engineering, medicine, the humanities and the professions.

Queen's is now on a transformational journey towards a Global Top 100 University. The global dimension is crucial to its future success. Queen's already places Northern Ireland firmly on the world stage. Its researchers work closely with universities around the world and the University is committed to enhancing these links still further. Among its dynamic partnerships are academic links with leading institutions in India, Malaysia, China, North America, Japan and Australia.

Queen's students are its lifeblood, and the University is committed to ensuring that they have the best learning experience possible. As the tangible benefits of a multi-million investment in staff, students and infrastructure come to life, this is truer than ever.

Major projects include the magnificent new £50 million Library which opened for business in summer 2009. This landmark building is one of the finest university libraries in the world, housing 1.2 million volumes and 2,000 reader places.

The development of the Elms Student Village, and extensive refurbishment of the Students' Union, has helped to create one of the best student campuses in the United Kingdom and Ireland. And the excellence of the University's state-of-the-art Physical Education Centre, one of the best university sports facilities in these islands, is underlined by its selection as a training camp for Olympic athletes in the 2012 London Games.


The McClay Library at Queen's

The International Postgraduate Student Centre, the restoration of the Grade B listed Riddel Hall and adjoining extensions which are home to the Management School and the William J. Clinton Leadership Institute, the Graduate School, formerly the Grade B listed Lynn Building, the redevelopment of the former Library Tower into the new School of Law and social hub, and the refurbishment of the Bernard Crossland Computer Science Building.

The Ashby Building, home to the School of Mechanical and Aerospace Engineering

The campus is also home to the Queen's Film Theatre, the only art cinema in Northern Ireland, and the Naughton art gallery, which enrich the lives of Queen's staff, students and the wider community.

The University's greatest strengths have always been its staff and students who together make up an exceptional learning community.

From Nobel prize winners to medical pioneers, and from political and business leaders to leading figures in science and the arts, the Queen's family has made its mark in the professions, in business and in civic and political life throughout the world.

Queen's Students' Union

The Naughton Gallery at Queen's

Queen's PEC

Queen's University Lanyon Building

Queen's and Northern Ireland

Northern Ireland provides a high quality of life in a welcoming environment, and the University plays a pivotal role in its social, economic and cultural development.

This role has been recognised by the Sunday Times, which described Queen's as "a casebook study of how a university can help drive the regeneration of the city and region in which it is located".

One of the core values at the heart of Queen's mission is the desire to make a contribution to the community it serves.

With more than 17,000 students, over 3,500 staff, and an annual turnover of some £315 million, Queen's is an important institution.

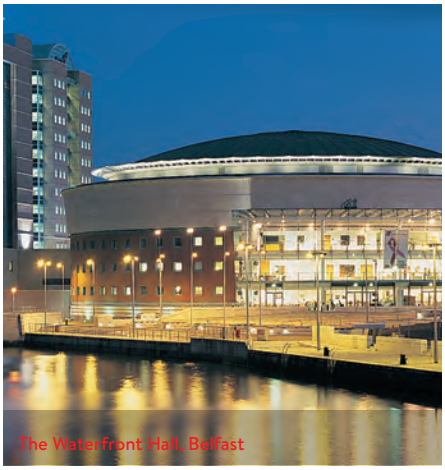
It produces the region's professionals and many of its civic and political leaders. It plays a key role in promoting community relations, both by leadership and example. It is one of the most inclusive universities in the United Kingdom, and it is an active patron of the arts.

There is another, much more material dimension to Queen's contribution to the community – as one of the most dynamic forces in creating jobs and wealth for Northern Ireland. The University is the UK's leading higher education institution in terms of the annual turnover of its spin-out businesses and it contributes to economic development through cutting-edge research, access to technology and consultancy and networking activities.

Queen's is located in Belfast, the capital of Northern Ireland, one of the world's most welcoming and fulfilling places in which to live and work. The city offers the highest number of restaurants per head in the UK, a thriving arts scene, an excellent shopping experience and an astonishing array of entertainment and cultural venues, from The SSE Arena to the Waterfront Hall to the Grand Opera House.

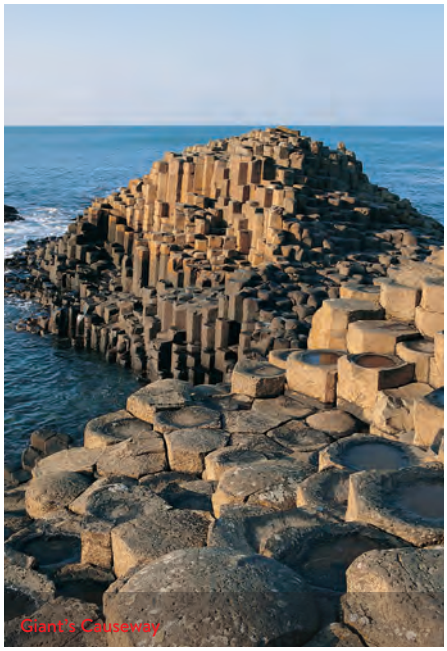
Northern Ireland's stunning scenery becomes apparent only a few short miles outside the city centre. Indeed, one 19th century travel writer once dubbed the city a 'northern Rio'. Although only the size of Yorkshire or Connecticut, Northern Ireland has an astonishing variety of landscapes, cultural and leisure opportunities, a fascinating history and has made a contribution to the world out of all proportion to its compact size.


Harmony Statue, Belfast


The Waterfront Hall, Belfast


The Grand Opera House, Belfast


Whitepark Bay


Giant's Causeway

Within 50 miles of the Queen's campus you can climb a wild mountain, plunge into Atlantic surf, travel through mystical glens, visit some of the best golf courses in the world, indulge in superb fishing and water sports, and enjoy a cordon bleu meal in a Michelin-starred restaurant.

Northern Ireland is, as one local author suggests, 'a great country, pretending to be small'.

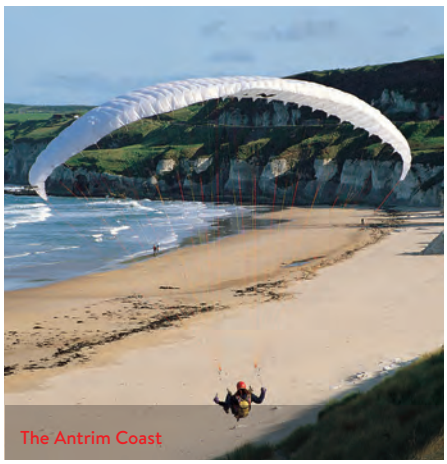
One of the key benefits of this small corner of the world is its high standard of living. The country's education system has long been recognised as among the best in Europe. Nearly a fifth of public expenditure is spent on education which means that students are educated in some of the best schools in the UK for very little cost to their parents. Northern Ireland consistently out-performs all other UK regions in academic qualifications.

The region also offers a world-class healthcare service, a range of affordable and desirable property, and has a crime rate less than half the UK average. Belfast has been rated as one of the safest cities in the UK.

Travelling to and from Northern Ireland is both easy and economical. Most major British cities are within an hour's flying time from Belfast's two splendid airports which are both quickly accessible from the University area. These airports offer flights to many locations in Ireland and mainland Europe, as well as several direct services to North America. Dublin is a quick two hour train journey from Belfast and there are regular ferry services to Scotland and England.

Northern Ireland has undergone a transformation in recent years, as it looks towards a new era of economic prosperity and cultural development which celebrates the innovation and creativity of its people. Queen's University is central to this process.


Marble Arch Caves


The Antrim Coast

Strategic Investment in Mathematics

The institutional Vision 2020 has set the milestones of an exciting journey for Queen's staff for the years ahead. The newly structured Faculty of Engineering and Physical Sciences has contributed to wider links among Queen's researchers. The Faculty's strategic plan has recognised the importance of Mathematics in this endeavour and in that respect has undertaken an investment in a further two academic posts in Applied Mathematics and one in Data Science.

The new appointment in Data Science is joint with the Institute of Electronics, Communications and Information Technologies (ECIT), and will enhance the theoretical capability in this area, collaborating closely with researchers from ECIT and delivering education at the School of Mathematics and Physics. The new staff members in Applied Mathematics will expand the existing expertise in the field, attributing to the core for a future development of the research in this direction. They will develop new links with the existing areas of Mathematics research at Queen's and provide key expertise within the Faculty through its Mathematics Academy.

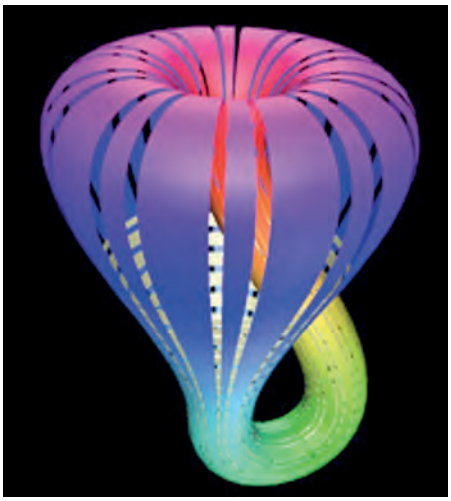
Post-specific Information

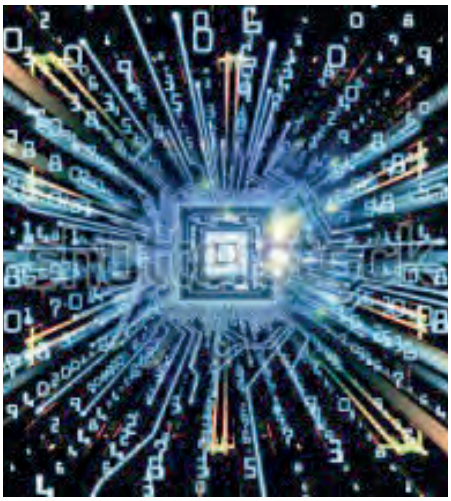
Details of the posts

The successful candidates will join a dynamic research environment at an exciting time to further develop mathematics research and education within the School of Mathematics and Physics at Queen's University Belfast. The successful candidates will be ambitious and research-driven, and will be willing to play a role in the future development of the Mathematical Sciences Research Centre. They will provide leadership in the shaping of capability in Applied Mathematics and Data Science in collaboration with academics within the University and beyond. They will plan research/scholarly activities of outstanding quality and international repute, and will work to create a strong profile for major funding bids in order to develop mathematical sciences research and advance the reputation of the School and the University.

The posts in Applied Mathematics will enhance the newly formed group in the area. The successful candidates will contribute to the curriculum development and to the establishment of new interdisciplinary links both within and outside the University. Priority will be given to the areas of Discrete Applied Mathematics, or PDE's and Dynamical Systems, but strong candidates from all subfields of Applied Mathematics are encouraged to apply.

The post in Data Science will expand the currently represented research in this field. They will become an Academic Fellow of the Institute of Electronics, Communication and Information Technology (ECIT) at Queen's University Belfast. Preference may be given to candidates specialising in Network Science, Machine Learning or Combinatorial Optimisation, but strong candidates from all fields of Data Sciences will be considered and are encouraged to apply.





JOB TITLE: Academic positions in Data Analytics

Lecturer/Senior Lecturer/Reader in Data Analytics (Posts available x 3 with potential for a Reader)

JOB PURPOSE:

To develop and teach across a range of Data Analytics and Statistics modules at both undergraduate and postgraduate level in the School of Mathematics and Physics, making a strong contribution to the School's administration and outreach activity. To develop an ambitious research profile in Data Analytics and play a role in the future development of the Mathematical Sciences Research Centre providing a crucial input in shaping the capability in Data Analytics in the University.

Candidates at Reader level are expected to demonstrate an internationally excellent research standing and ability to lead distinctive research initiatives.

MAIN ACTIVITIES/ RESPONSIBILITIES:

1. Education

(40%-60% of time spent)

- To deliver teaching and assessment activities across a variety of Data Analytics/Statistics modules, including lectures, setting/marking coursework and delivering lab practicals to undergraduates and postgraduates.
- To supervise undergraduate and postgraduate taught students in practical and project-based work including Final Year Projects and Post Graduate placement dissertations.
- To contribute to the development of new teaching delivery methods, including but not limited to new blended learning and research-led teaching methods.
- To undertake initiatives to improve the overall student experience, by new methods of assessment, feedback, and student engagement.
- To lead major elements of programme development, including new course structures and curricula (Senior Lecturer/Reader).
- To manage major teaching administrative functions such as accreditation and quality enhancement (Senior Lecturer/ Reader).

2. Research

(20%-30% of time spent)

- To lead and undertake research in Data Analytics that is of internationally quality in terms of originality, significance and rigour. To develop and maintain an excellent international research profile, evidenced by relevant measures of esteem and peer reviews of research output quality and impact (Senior Lecturer/Reader).
- To regularly publish research in top tier international peer reviewed journals or prestigious conferences in Data Analytics or closely related fields, commensurate with career stage, leading to a REF return in Mathematical Sciences.
- Develop links both internally and externally to identify and develop research of a societal impact.
- To secure appropriate external funding through research applications and, for Senior Lecturer and Reader grades, develop and lead larger, income-generating collaborative and interdisciplinary research projects, working as part of a team.
- To engage in knowledge transfer and innovation activity and to demonstrate tangible research impact (Senior Lecturer/Reader) or potential for research impact, beyond the academic discipline (e.g. economic or societal impact).
- To attract and supervise post-graduate research students and post-doctoral researchers
- Lead an active team of high quality post-graduate research students and post-doctoral researchers. (Senior Lecturer/ Reader) or demonstrate ability to engage and work with post-graduate or post-doctoral researchers (Lecturer).

3. Leadership and Administration

(10%-20% of time spent)

- To actively engage with and contribute to the full range of student recruitment activities such as Open Days and taster events.
- Contribute to the School's outreach strategy by designing or delivering Community outreach programmes and developing external links, both nationally and internationally.
- To participate in relevant committees at the School, Institute, Faculty and University level.
- To carry out designated School educational and research related administrative duties including, for example, committee work, working group leadership or course administration.
- To contribute to senior management activities by taking on appropriate roles such as Director of Education, Director of Research, Director of Internationalisation, Module/Year/ Programme Co-ordinator or other recognised official University roles (Senior Lecturer/Reader).
- To act as mentor or appraiser to colleagues advising on their personal development and ensuring that they are meeting the standards required (Senior Lecturer/Reader).



EMPLOYEE SPECIFICATION – Lecturer/Senior Lecturer/Reader in Data Analytics

School **Mathematics and Physics** **Ref No.**

		ESSENTIAL	DESIRABLE	HOW IDENTIFIED (e.g. Application/ CV, interview, presentation etc.)
1.	**Education and Qualifications**	Hold or be about to obtain a PhD in, Statistics or Data Analytics or closely related discipline	Membership or Senior Membership of learned societies such as RSS and/or IEEE PGCHET or equivalent teaching qualification or membership of professional teaching body e.g. HEA	CV
2.	**Experience**			
	Education	Evidence of sustained high quality lecturing at undergraduate or postgraduate commensurate with career stage, including project supervision, assessment and feedback experience, in one or more of the following curriculum areas: • Data analytics, • Statistics Experience using Data Analytics and Statistical packages and programming languages such as R, or Python	Strong teaching evaluations or peer reviews of teaching in one or more of the following curriculum areas: • Data analytics, • Statistics Proven ability to provide strategic academic leadership programme development and teaching	
	Research	Record of publication of internationally excellent research outputs in Data Analytics (commensurate with career stage) Evidence of conference presentations of research at International conferences Strong track record of earning research income as Principal Investigator (Senior Lecturer / Reader), or evidence of potential to secure research income (Lecturer) Evidence of independent contribution in research projects and outputs and potential to establish an independent research program (Lecturer) Ability to form and manage a sizeable research group, including a track record of post-graduate student and post-doctoral staff supervision (Senior Lecturer / Reader) An internationally excellent research standing and ability to lead distinctive research initiatives (Reader)	Successful supervision of PhD or Masters students (Lecturer) Plenary or invited talks at international conferences Evidence of scholarly activity, e.g. editorial board membership, papers reviews etc.	
	Academic Leadership **(Senior Lecturer / Reader)**	A strong track record of leadership, demonstrated as evidence of major initiatives that significantly improved education, research or administrative processes		CV, Interview

		ESSENTIAL	DESIRABLE	HOW IDENTIFIED (e.g. Application/ CV, interview, presentation etc.)
		Evidence of independent contribution in research projects and outputs and potential to establish an independent research program (Lecturer) Ability to form and manage a sizeable research group, including a track record of post-graduate student and post-doctoral staff supervision (Senior Lecturer / Reader) An internationally excellent research standing and ability to lead distinctive research initiatives (Reader)		
	Academic Leadership **(Senior Lecturer / Reader)**	A strong track record of leadership, demonstrated as evidence of major initiatives that significantly improved education, research or administrative processes		CV, Interview
	Societal and Economic Impact	A record of collaboration with and links to industry, or other activities aiming at achieving broader societal and economic impact Evidence of social engagement and outreach activities	Measurable societal and economic impact such as contribution to industry roadmaps and technology transfer to industry, with associated evidence	CV, Interview
3.	**Personal Qualities**	Ability to communicate complex information effectively. Ability to communicate effectively in English, both orally and in writing.		Interview

COMPLETED BY: ..... DATE: .....

AGREED BY: Catherine McGuiness DATE: 28/1/19 (Personnel Department)

JOB TITLE: READER in Foundations of Data Science GRADE: Ac4

JOB PURPOSE:

To undertake research in the Foundations of Data Science, in line with University's research strategy, to teach at undergraduate and/or postgraduate level, and to contribute to the School administration/outreach activity. The successful candidate will be a member of the Mathematical Sciences Research Centre and will be eligible to become an Associate Member of the Institute of Electronics, Communications and Information Technology (ECIT), strengthening ECIT's theoretical base in Data Science.

MAIN ACTIVITIES/ RESPONSIBILITIES:

The following describes the type of work that is typically required of academic staff at this level. It is not expected that anyone carries out all the activities mentioned below and some carry out additional duties

1. Education

(30%-40% of time spent)

- Develop the teaching activities of the School by pursuing new and innovative teaching approaches taking the responsibility for the quality of course units and delivering a range of teaching and assessment activities in Mathematics/Statistics/Data Science, including lectures, tutorials and setting/ marking coursework, as assigned by Head of the School of Mathematics and Physics.
- Contribute to the enhancement of quality teaching within the subject, school or faculty, ensuring that course design and delivery comply with the appropriate benchmarks and regulations.
- Develop and advise others on learning and teaching tasks and methods.
- Provide leadership in the design of innovative teaching programmes, as appropriate.
- Act as internal examiner for undergraduate and postgraduate students.
- Be involved in strategic planning for the School/work unit and may contribute to the University's strategic planning process.
- Communicate complex and conceptual ideas to students as well as to peers using high level skills and a range of media.

2. Research

(40%-50% of time spent)

- Conduct research in the Foundations of Data Science, sustaining a personal research plan by managing and undertaking research activities leading to a REF return in Mathematical Sciences.
- Strengthen the theoretical capability of ECIT, developing links with its members, leading to potential joint research projects. Qualified candidates will be eligible to become ECIT Associate Members.
- Sustain an extensive research track record of international excellence/ leadership by publishing regularly in high quality refereed journals and presenting at international conferences.
- Develop innovative research proposals and lead funding bids.
- Direct, coach and develop research staff, where appropriate.
- Act as referee and contribute to peer assessment of research.

3. Leadership and Administration

(10%-20% of time spent)

- Contribute significantly to the development and running of the School/ area by taking on appropriate school co-ordinating roles. Such duties may include, for example, Advisor of Studies, QAA Aspect Co-ordinator, Module/ Year/Programme Co-ordinator or other recognised official University roles.
- Contribute significantly to the knowledge transfer and the impact agenda of the University by engaging with relevant non-academic partners.
- Act as mentor or appraiser to colleagues, including Teaching Assistants, advising on their personal development and ensuring that that they are meeting the standards required.
- Provide pastoral care for students within own area to ensure, as far as practicable, that relevant issues are dealt with in a timely, sympathetic and effective manner.
- May sit on major University committees.
- Contribute to the School's outreach strategy by designing or delivering Community outreach programmes and developing external links.
- Plan and deliver research, teaching and consultancy or similar programmes and ensure that resources are available.
- Contribute to the management of quality, audit and other external assessments.
- Provide academic leadership to those working within programme areas, as course leader or equivalent, by for example co-ordinating the work of others to ensure that courses are delivered effectively or organising the work of a team by agreeing objectives and work plans.
- Develop and manage staff and resources, in support of major research, teaching and administrative activities.
- Contribute to the overall management of the School/work unit, in areas such as budget planning.
- Be involved in strategic planning for the School/work unit and may contribute to the University's strategic planning process.
- Act as mentor for students in capacity of personal tutor.
- Lead and develop internal networks for example by participating in University committee/s.
- Lead and develop links with external networks, for example, with external examiners and assessors.
- Develop links with external contacts such as other educational bodies, employers, and professional bodies to foster collaboration.

EMPLOYEE SPECIFICATION – Lecturer/Senior Lecturer/Reader in Data Analytics

School **Mathematics and Physics** **Ref No.**

		ESSENTIAL	DESIRABLE	HOW IDENTIFIED (e.g. Application/ CV, interview, presentation etc.)
1.	**Education and Qualifications**	PhD in the Foundations of Data Science	PhD in Combinatorial Optimisation, Machine Learning or Applied Graph Theory. Background in Theoretical Computer Science Completed PGCHET or an equivalent teaching qualification	CV
2.	**Experience**			
	Education	Evidence of sustained high quality lecturing in Mathematics, Statistics and/or Data Science at undergraduate or postgraduate level through the medium of English Ability to provide strategic academic leadership in programme development and teaching	Experience in design of new and innovative modules/pathways or assessment methods	CV, Interview
	Research	A distinguished record of research publications of international excellence, commensurate with past research career, in the Foundations of Data Science, REF returnable at international level Demonstrated record of attracting and obtaining substantial, peer reviewed, research income A record of successful supervision of PhD students Evidence of ability to strengthen the international excellence in research at the School of Mathematics and Physics and to develop collaborative networks Commitment to strengthening the theoretical base of Data Science in the Institute of Electronics, Communication and Information Technology at Queen's University Belfast A clear vision on future research and development plans and how they would benefit the School Evidence of ability to provide strategic academic leadership in research Experience in successful team management including supervising research students and/or postdoctoral researchers Evidence of international esteem Plenary or invited talks at major international conferences	A distinguished record of research publications of international excellence in Combinatorial Optimisation, Machine Learning or Applied Graph Theory A track record of interdisciplinary research/collaboration A track record of research with the potential to lead to societal or economic impact Successful supervision of postdoctoral researchers	
	Academic Leadership **(Senior Lecturer / Reader)**	A strong track record of leadership, demonstrated as evidence of major initiatives that significantly improved education, research or administrative processes Contribution to a wider range of administrative tasks	Contribution to a wide range of community outreach programmes/ initiatives in designing and delivering innovative new programmes.	CV, Interview




		ESSENTIAL	DESIRABLE	HOW IDENTIFIED (e.g. Application/ CV, interview, presentation etc.)
	Societal and Economic Impact	Willingness to provide/develop a significant contribution to societal and economic impact.	Measurable societal and economic impact such as contribution to industry roadmaps and technology transfer to industry, with associated evidence Evidence of social engagement and outreach activities	CV, Interview
3.	**Personal Qualities**	Evidence of ability to communicate and present academic material clearly and effectively High level of analytical capability Ability to provide effective leadership Understanding of resource management processes and skills to apply them effectively Willingness to travel to conferences and other scientific events	Proven skills in coaching and developing others in best practice techniques	Interview

COMPLETED BY: ..... DATE: .....

AGREED BY: Catherine McGuiness DATE: 28/1/19 (Personnel Department)

JOB TITLE: LECTURER in Foundations of Data Science GRADE Ac2/Ac3

JOB PURPOSE:

To undertake research in the Foundations of Data Science, in line with University's research strategy, to teach at undergraduate and/or postgraduate level, and to contribute to the School administration/outreach activity. The successful candidate will be a member of the Mathematical Sciences Research Centre and will be eligible to become an Associate Member of the Institute of Electronics, Communications and Information Technology (ECIT), strengthening ECIT's theoretical base in Data Science.

MAIN ACTIVITIES/ RESPONSIBILITIES:

The following describes the type of work that is typically required of academic staff at this level. It is not expected that anyone carries out all the activities mentioned below and some carry out additional duties

1. Education

(30%-40% of time spent)

- Develop teaching methods, design course units and deliver teaching and assessment activities in Mathematics/ Data Science, including lectures, tutorials and coursework, as assigned by the Head of the School of Mathematics and Physics.
- Develop approaches to teaching and learning, which are appropriate for the subject area; reflect developing practice.
- Contribute to the enhancement of quality teaching within the subject, school or faculty.
- Develop and advise others on learning and teaching tasks and methods.
- Contribute to the design of innovative teaching programmes.
- Design/update modules in line with School's teaching strategy.
- Communicate complex and conceptual ideas to students as well as to peers using high level skills and a range of media.

2. Research

(40%-50% of time spent)

- Conduct research in the Foundations of Data Science, sustaining a personal research plan by managing and undertaking research activities leading to a REF return in Mathematical Sciences.
- Strengthen the theoretical capability of ECIT, developing links with its members, leading to potential joint research projects. Qualified candidates will be eligible to become ECIT Associate Members.
- Sustain a high quality publication record by publishing in refereed journals and presenting at conferences to assist individual research and so that the School's research profile is enhanced.
- Develop research proposals and funding bids, in collaboration with others as appropriate.
- Direct, coach and develop research staff, where appropriate.
- Ensure that research projects are completed on time and within budget.
- Prepare research proposals for submission for external funding.
- Plan for and set research objectives over a number of years.

3. Leadership and Administration

(10%-20% of time spent)

- Contribute to the School's outreach strategy by developing external links.
- Develop links with relevant industries or external bodies to encourage technology transfer opportunities and create opportunities for future research projects.
- Provide pastoral care for students within own area to ensure, as far as practicable, that all relevant issues are dealt with in a timely, sympathetic and effective manner.
- Carry out designated School functions, including, for example, participation in committee work, assisting in the process of admissions, preparation of submission for teaching quality assessment or the REF.
- As module leader, co-ordinate with others (such as support staff or academic colleagues) to ensure student needs and expectations are met.
- Plan for the use of teaching and research resources as appropriate.
- If appropriate, supervise the work of others, for example in research teams and projects.
- Manage own teaching, research and administrative demands under general supervision of Head.
- Assist in the development of skills and competence in others (for example through the supervision of research students).
- If appropriate, manage use of resources for research and teaching.
- Participate in judgements regarding the use of resources within their research project/school.
- Act as mentor for students in capacity of personal tutor.
- Member of the School Board and Examination Board and such committees relevant to their administrative duties.
- Participate in and develop networks, for example to identify sources of funding, contribute to student recruitment, act as website editor, secure student placements, market the institution, facilitate outreach work, generate income, obtain consultancy projects, or build relationships for future activities.

EMPLOYEE SPECIFICATION – Lecturer/Senior Lecturer/Reader in Data Analytics

School **Mathematics and Physics** **Ref No.**

		ESSENTIAL	DESIRABLE	HOW IDENTIFIED (e.g. Application/ CV, interview, presentation etc.)
1.	**Education and Qualifications**	Hold a PhD in Foundations of Data Science	PhD in Combinatorial Optimisation, theoretical Machine Learning or Applied Graph Theory. Background in Theoretical Computer Science Completed PGCHET or an equivalent teaching qualification	CV
2.	**Experience**			
	Education	Evidence of potential to deliver high quality teaching in Mathematics, Statistics and/or Data Science at undergraduate or postgraduate level through the medium of English	Experience of teaching Mathematics in tertiary level education Evidence of good teaching evaluations Experience in design of new modules and/or assessment methods	CV, Interview
	Research	A strong record of publications, commensurate with career stage, in the Foundations of Data Science in peer reviewed/refereed journals that are REF returnable within the Mathematical Sciences Unit of Assessment Commitment to applying for and obtaining peer reviewed research income from research councils and other relevant funding bodies Willingness to supervise research students and postdoctoral researchers Commitment to strengthening the international excellence in research at the School of Mathematics and Physics and to developing collaborative networks Commitment to strengthening the theoretical base of Data Science in the Institute of Electronics, Communication and Information Technology at Queen's University Belfast A clear vision on future research and development plans and how they would benefit the School Evidence for developing and maintaining an independent research programme Evidence of scholarly activity, e.g. conference presentations, book or papers reviews High level of analytical capability	A record of publications in Combinatorial Optimisation, Machine Learning or Applied Graph Theory. A record of successful grant applications Successful supervision of PhD or Masters students Evidence of successful research collaboration, participation in collaborative networks or research teams Plenary or invited talks at international conferences	
	Academic Leadership **(Senior Lecturer / Reader)**		Contribution to a wider range of administrative tasks. Contribution to a wider range of community/outreach activities	CV, Interview




		ESSENTIAL	DESIRABLE	HOW IDENTIFIED (e.g. Application/ CV, interview, presentation etc.)
	Societal and Economic Impact		Evidence of measurable societal and economic impact such as contribution to industry roadmaps and technology transfer to industry Evidence of social engagement and outreach activities	CV, Interview
3.	**Personal Qualities**	Ability to communicate complex information effectively. Ability to communicate effectively in English, both orally and in writing Demonstrable intellectual ability and good time management Willingness to travel to conferences and other scientific events		Interview

COMPLETED BY: ..... DATE: .....

AGREED BY: Catherine McGuiness DATE: 28/1/19 (Personnel Department)