Collaborative Doctoral Awards Studentship Competition (Project-led)

Project Title:	Placing Astronomy: Landscape, Space and Science at Armagh Observatory, 1790-1916
Project Summary:	The project aims to investigate the historical geographies of astronomy at Armagh Observatory, which is the oldest continuously-active astronomical research institution in the British Isles. The importance of place and landscape to the science conducted at the Observatory is evidenced by its position in the wider regional landscape, the situation of several historic astronomical instruments, and its ecclesiastical and civic connections to the City of Armagh. The student, based partly at the Observatory and partly at QUB Geography Department, will be in a unique position to re-appraise the Observatory's scientific heritage at an important time in its contemporary development.
Institution:	Queen's University Belfast
Partner Organisation:	Armagh Observatory and Planetarium
Primary AHRC Subject Area:	Cultural and Museum Studies: Cultural Geography
Creative Practice Component:	None

For further information and to submit an expression of interest, please contact:			
Lead Supervisor:	Dr Oliver Dunnett	**Email:**	o.dunnett@qub.ac.uk
EXPRESSIONS OF INTEREST MUST BE RECEIVED NO LATER THAN:		**Monday 16th March 2020 at 4pm.**	

Project Description:

Aim of the Project

This collaboration presents an exceptional opportunity for a doctoral student to investigate the historical geographies of astronomy at Armagh Observatory, the oldest continuously-active astronomical research institution in the British Isles. The Observatory is home to a scientific heritage that has been intimately connected to a sense of place and landscape, yet one that has been largely overlooked in terms of its historical and geographical significance. This project will address these issues by placing the student at the heart of the Observatory to study its past spaces of science.

Institutional Context

Founded by Archbishop Richard Robinson in 1790, at the height of the Age of Enlightenment, Armagh Observatory is housed in a Grade A-listed heritage building, and is surrounded by 11 hectares of landscaped parkland. The significance of place and landscape to Armagh Observatory's scientific heritage is evidenced by the precise context of its location, with line-of-sight connections to three historic meridian markers on the outskirts of Armagh, its strong civic and ecclesiastical connections to the City of Armagh, and its dual historical use as a domestic home for astronomers as well as a place of scientific research. The Observatory houses several unique instruments that remain in the places in which they were used to conduct pioneering astronomical measurements, such as the Troughton Equatorial Telescope, which is the oldest

telescope in the world that remains in its original setting, the Grubb 15-inch Equatorial Reflector Telescope, which was the first of its kind, and the Earnshaw Transit Clock, which was believed to be the most accurate clock in the world in its day. The study encompasses the careers of the first four Directors of the Observatory, who along with their colleagues pioneered modern scientific understandings of the Universe, most significantly in the publication of globally-authoritative catalogues of stars and nebulae in 1859, 1888, 1895 and 1908. The Observatory is now part of Armagh Observatory and Planetarium (AOP), one of Northern Ireland's leading research, educational and heritage institutions. AOP is currently preparing plans to secure its cultural and scientific heritage, which include designs for a new archive building and landscaping works, alongside plans to have Armagh designated as a 'Dark Sky City'.

Research Context and Objectives

Aside from a brief institutional history (Bailey, 2011), the legacy of Armagh Observatory as a scientific space remains poorly documented in arts and humanities research. Geographical approaches to the history of science have been pioneered by scholars interested in the ways in which scientific practice has been contingent on spaces such as laboratories, museums and botanical gardens (Livingstone 2003, Naylor 2005, Johnson 2011). Armagh Observatory's setting as part of an ancient cosmic landscape, in the ecclesiastical capital of Ireland, and at the nexus of a modern landscape of scientific observation and interpretation, presents particular opportunities for broadening this field of enquiry, taking into account new scholarly directions in cultural and historical geographies of landscape, histories of observatory science, and cosmography (Edensor and Lorimer 2015, Aubin 2015, Dunnett et al 2017). Key research questions will include:

- How were new scientific concepts about the Earth and the Universe theorised, tested and negotiated in the spaces of Armagh Observatory?
- How have the historic landscapes of the Armagh region influenced the development of scientific activity at the Observatory?
- Who were the key actors in the making of this space, and what networks did they establish with a wider community of astronomical research?
- What has been the relationship between religious space and scientific space at Armagh Observatory?
- What has been the significance of site-specific instrumentation to the conduct of astronomy at Armagh Observatory?

Research Methods and Sources

A combination of archival research, interpretation of historic instruments and landscapes, and analysis of written and visual sources will be central to understanding Armagh Observatory's historic development. AOP owns a substantial record of original archival material dating back to the eighteenth century, including correspondence, buildings records and specifications for scientific instruments. These will be examined to interpret the Observatory's scientific and spatial histories, including the development of key buildings and the landscapes to which they were connected. Analysis of historic telescopes, globes, clocks and other instruments in situ will be essential to understanding past interactions between scientific practice, place and landscape. Supplementary material, including landscape paintings, historic maps of the region, and local newspaper reports, are held at AOP, the Public Record Office of Northern Ireland (Belfast), and QUB Geography Department (Belfast), and will be the basis for further analysis in support of the core research questions.

SUPERVISION AND EXTERNAL ADVISORS

First Supervisor:	Dr. Oliver Dunnett	School/Department:	Department of Geography, Queen's University Belfast
Second Supervisor:	Prof. Michael Burton	School/Department:	Armagh Observatory and Planetarium
Additional Advisor:	Prof. Nuala Johnson	Organisation/Institution:	Department of Geography, Queen's University Belfast

The first supervisor, Dr. Oliver Dunnett, is a cultural and historical geographer and Lecturer in Human Geography at Queen's University Belfast. He has published articles relevant to the project in leading geography journals, including on geographies of outer space (*Progress in Human Geography*, 2019) and astronomical landscapes in Britain (*cultural geographies*, 2015), while a book on twentieth century British cultures of outer space is forthcoming (Routledge, 2020). He has taught at undergraduate and postgraduate levels on topics including cultural geographies of landscape, historical geographies of science, and geographies of popular culture. He has supervised two doctoral students to completion, on

'Geographies of Astronomical Expeditions in the Early Twentieth Century' (R. Mawhinney, 2019) and 'Modernization, Genealogy and Landscape Change in South Korea' (W. Song, 2017), as well as two masters-level dissertations and over thirty undergraduate dissertations. His expertise in landscape, place and the historical geography of space science will be central to the supervision of the selected research student.

The second supervisor, Professor Michael Burton, is the Director of Armagh Observatory and Planetarium and one of the world's leading researchers in astronomy, specialising in studying how stars are formed in the interstellar medium. He has contributed to over two hundred refereed scientific journal articles, including in *Nature* (1993), and the leading astronomical journals *Monthly Notices of the Royal Astronomical Society*, *Astrophysical Journal* and *Astronomy & Astrophysics*. He was previously Director of Teaching at the School of Physics, University of New South Wales, and is the President of the largest Division (Facilities, Technology, Data Science) of the International Astronomical Union. He has supervised seventeen PhD students. His career has involved periods at several other historic observatories (including the Royal Greenwich Observatory and Royal Observatory Edinburgh), in addition to modern observatories in Australia, Hawaii, Chile and with NASA. His knowledge of the astronomical techniques and related scientific processes that were carried out at Armagh Observatory, and oversight of the Armagh Observatory and Planetarium complex, will be an essential part of the supervision process. His PhD thesis was based on an interstellar object called 'IC443' that was recorded in the 1895 Catalogue at Armagh Observatory.

The third supervisor, Professor Nuala Johnson, is a historical and political geographer and Professor of Geography at Queen's University Belfast. Her recent publications have focused on topics including natural history expeditions in early-twentieth-century Burma (*Transactions IBG*, 2017), Irish artists' depictions of the First World War (Routledge, 2016), and representations of maritime heritage in Belfast's Titanic Quarter (*Historical Geography*, 2014). She has published books including *Nature Displaced, Nature Displayed: Order and Beauty in Botanical Gardens* (IB Tauris, 2004) and *Ireland, the Great War and the Geography of Remembrance* (Cambridge University Press, 2003). She has supervised six doctoral students to completion in the areas of historical, cultural and political geographies, and her expertise in historical geographies of science and landscape in Britain and Ireland will be important in supporting the selected research student.

RESEARCH ENVIRONMENT

Queen's University Belfast has an internationally-recognised profile for research in historical geography, and in particular historical geographies of science. This has been evidenced through the work of Professor David Livingstone CBE on the spatiality of scientific culture and intellectual history, Professor Nuala Johnson on the historical geographies of botanical science, memorialisation and landscape, Professor Keith Lilley on historic maps, landscapes and built environments, Dr. Diarmid Finnegan on the historical geographies of the life and earth sciences, and Dr. Oliver Dunnett on historical and cultural geographies of outer space, including astronomy and space science. As well as joining this group of scholars in historical geography, the student will become part of the School of Natural and Built Environment's 'Culture and Society' Research Cluster, which includes researchers from human geography, planning, archaeology and architecture, and organises research activities throughout the academic year.

Armagh Observatory is an active research institution, with researchers undertaking work across a variety of astronomical themes. Research fields include the Sun (Prof. G. Doyle), Solar System bodies (Dr. A. Christou & S. Bagnulo), stellar evolution (Prof. S. Jeffery, Drs J. Vinke & G. Ramsay), star formation (Prof. M. Burton) and galaxy evolution (Dr. M. Sarzi). Doctoral students come under the supervision of QUB academics and AOP researchers, accredited mostly by QUB, as well as by other universities in England and the Republic of Ireland. Armagh Planetarium receives c.50,000 visitors per year and conducts education programmes to c.30,000 children at pre-school, primary and secondary levels. The Education and Research teams work together on many outreach activities to the public, ensuring that these are informed by scientific knowledge and the results of current research. Particularly notable is that Armagh Observatory's historic telescopes remain in situ within an organisation still actively carrying out research, so that the stories of scientific discovery can still be seen in the place where they were carried out, and where discovery still continues today.

In terms of the wider postgraduate and scholarly community, the selected student will join a group of (at present) twenty-one doctoral research students working across physical, human and environmental geography at QUB, and ten doctoral research students in astronomy at Armagh Observatory. The student will also become a member of the QUB Graduate

School, which offers a world-class intellectual and social hub that connects students from all disciplines to one another, and to mentors, leaders, and employers within the university and beyond. Additional scholarly activities in which the student will be expected to participate include a year-long Geography seminar series, and the Astrophysics Research Centre's seminar series, both of which attract a wide range of home and visiting scholars to showcase their work. The student will also be encouraged to participate in wider regional and national research communities, such as the AHRC Northern Bridge DTP Consortium, the Irish Network for Nineteenth-Century Studies, and the Historical Geography Research Group of the RGS-IBG.