THE ROYAL SOCIETY
CELEBRATING 350 YEARS

350th Anniversary Local Heroes - Application form

Deadline: 2 July 2008

(Please keep the application to no more than three sides of A4)

Name and address of project leader

Professor J.D. Jackson, Simon Building, University of Manchester, Oxford Road, Manchester, M13 9PL, UK

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Name (s) of participating institutions

JRUL, UoM

Title of activity

(please keep to no more than 12 words as it will be used in publicity material)

'Order in Turbulent Motion - Contributions of the Manchester Engineer/Scientist, Osborne Reynolds FRS'

Proposed activity *(350 words maximum)*

Objective(s)

The aim is to publicise the pioneering contributions to the understanding of turbulent fluid motion made in Manchester by Osborne Reynolds. This will be done by means of an illustrated public lecture incorporating video-recorded working experiments and a DVD presentation. Although Reynolds' work is widely known in scientific circles it is largely unknown to the public. Most people have heard about turbulence and even experienced it during air travel but few are aware of its relevance to other matters which affect our everyday lives. Thus, the main objective of the planned activity is to bring about a wider appreciation of the importance of his work.

Description

The lecture will be prepared by Professor Jackson, and delivered by him at the University of Manchester and other local venues (colleges and schools). Derek Jackson read Engineering at Manchester University and later became Professor of Engineering there. Throughout his career he has worked on fluid mechanics, heat transfer and thermal power (subject areas in which Reynolds was particularly active). Professor Jackson's interest in the life and work of Osborne Reynolds dates back to 1968 when he organised an international symposium in Manchester to celebrate the centenary of Reynolds' appointment to the Chair of Engineering at Owens College.

Professor Jackson's involvement in the Centenary Symposium stimulated him to start collecting biographical and technical information about Reynolds. Consequently, when in 1994 he gave the Introductory Lecture at a symposium held in Manchester to celebrate the centenary of the publication of Reynolds' definitive paper on turbulent flow, he was also able to mount an exhibition on the life and work of Osborne Reynolds. This not only included display material but also working experiments. It remained in place for a number of years. However, because of pressure on space the decision was eventually taken to dismantle it. Fortunately, before this was implemented, Professor Jackson was able to make video recordings of the working experiments and this material will be used in the production of the illustrated lecture and DVD presentation.

Target audiences

Sixth formers, college and university students, teachers, lecturers, members of local societies and members of the public.

Hero(es) being celebrated and their involvement in your area *(250 words maximum)*

The distinguished Victorian engineer/scientist Osborne Reynolds was born on 23 August 1842. His father was a mathematician and Reynolds' early education was undertaken mainly at home. The young Osborne Reynolds showed an early aptitude for mechanics. At the age of 19, he entered the workshop of Edward Hayes of Stony Stratford as a resident trainee/apprentice and remained there for over a year. He then went to Cambridge University to study mathematics. On graduating in 1867 he was immediately elected to a Fellowship at Queens' College and then entered the office of a civil engineer in London, John Lawson. In 1868 he was appointed to the newly instituted Chair of Engineering at Owens College Manchester and remained there until retiring in 1905. During that time he not only exerted a significant influence on the Manchester community by educating a stream of engineering students and providing a source of engineering expertise which benefited local industry but also carried out wide-ranging original researches into a variety of problems which led to the publication of numerous papers of outstanding importance. His work changed the way in which turbulent flows were viewed and had a major influence on engineering fluid mechanics.

Osborne Reynolds was elected a Fellow of The Royal Society in 1877 and received the Royal Medal in 1888. He regularly lectured to the Manchester Literary and Philosophical Society, was elected its President in 1888 and received the Dalton Medal in 1903. Thus, this grant application could be of direct interest to that society.

Timing and duration of proposed activity *(100 words maximum)*

The planned lectures will take place between 1st December 2009 and 31st March 2010 at times and venues to be arranged. One venue could be, the John Rylands University Library at the University of Manchester where a suitable room is available. The activity will be of duration about two hours (including time for questions and discussion after the lecture and for viewing the display posters and the DVD presentation). Similar illustrated lectures will be offered elsewhere. The work of Osborne Reynolds is of widespread interest to engineers and scientists around the world.

Costings

(please provide details of how the grant will be spent)

The grant will be spent partly on 'bought in' assistance needed to prepare the illustrated lecture. This will be computer - based and will have movie sections showing working experiments incorporated into it. These will be taken from the video material shot by Professor Jackson several years ago when the 1994 Centenary Exhibition was still in place. Money will also be spent on making the DVD package from the video material and on producing display posters made from archiveal material saved from the Centenary Exhibition. Professor Jackson will not charge for the cost of his time and effort. Bought in assistance in connection with producing the illustrated computer-based lecture and the edited DVD package will cost about £1,650 and £550, respectively. Production of material for the portable poster displays will cost about £300. The total amount requested is £2,500.

Evaluation *(250 words maximum)*

Records will be kept of attendance at the lectures. An evaluation of the activity will be possible using the responses which those who attend will be asked to make on questionnaires issued to them on the occasion of each lecture. The Royal Society will be provided with copies of the illustrated lecture, the poster displays and the DVD package for evaluation. The level of interest in the project will be apparent from the 'take up' of the lectures by schools and colleges and from the attendance. The degree of success will be measured by the responses on the questionnaires completed by those attending. The 'take up' of similar illustrated lectures which are to be offered to learned societies and universities elsewhere in the UK and abroad will be a further indication of the success of the project.

Relevant publications, papers, lectures and seminars by the project leader, Professor Derek Jackson:

D.M. McDowell and J.D. Jackson (Editors), 'Osborne Reynolds and Engineering Science Today', Centenary Symposium book, published by Manchester University Press, 1970
J.D. Jackson, 'The life and work of Osborne Reynolds', Opening Lecture, Reynolds Centenary Symposium held at UMIST, Manchester, 1995
J.D. Jackson. 'Osborne Reynolds: scientist, engineer and pioneer', Proceedings of the Royal Society, London Series A, Vol. 1, pp 49-86, 451, 1995
J.D. Jackson, 'Osborne Reynolds – Scientist, Engineer and Pioneer', Lecture to the Newcomen Society, Manchester, 5 December 1995
J.D. Jackson, 'The life and work of Osborne Reynolds', Seminar at Stanford University, USA, 1998
J.D. Jackson, 'The Reynolds number – A product of experiment and theory', Opening Lecture, 4th European Thermal Sciences Conference, Birmingham, 29-31 March 2004
J.D. Jackson, 'The pioneering contributions of Osborne Reynolds to turbulent convective heat transfer', Lecture to the UK Heat Transfer Society, London, 15 February 2005
J.D. Jackson, 'The life and work of Osborne Reynolds', Invited Lecture, 4th Osborne Reynolds Colloquium, Imperial College, London, 11 April, 2006
J.D. Jackson and B.E. Launder, 'Osborne Reynolds and the publication of his Phil Trans Roy Soc papers on turbulent flow', Annual Review of Fluid Mechanics, Vol. 9, pp19-35, 2007
J.D. Jackson, 'The Reynolds number – A fundamental unifying parameter in fluid mechanics based on physical insight and experiment', Lecture at Tsinghua University, Beijing, China, 18 April 2008

Where to send your application

Please email this completed form to localheroes@royalsociety.org by 6pm BST, 2 July 2008