

## AWARDS AND PRIZES

# RAS Awards 2006

Each year the RAS recognizes outstanding achievement in astronomy and geophysics by the award of medals and prizes. Candidates are nominated by Fellows and the awards made by a committee of Fellows, ensuring that these scientists have earned the respect and admiration of their peers in the research community.

## THE GOLD MEDAL

### Prof. J L Culhane



Len Culhane's PhD work involved the first direct demonstration, with the proportional counter spectrometer on the UK/US Ariel-I launched in 1962, that the Sun's X-ray spectrum hardened during solar flares and was due to emission from high-temperature (~10 million K) gas. His career since then has centred on solar work, devising and using X-ray and EUV spectrometers on NASA's SMM and Spacelab-2 and on Japan's Yohkoh mission. He has served on several UK Research Council and European Space Agency committees and as a member of PPARC Council. Prof. Culhane has supervised and inspired many PhD students – some of whom are leading lights in astronomy today. He developed and expanded the Mullard Space Science Laboratory under his leadership. He was deputy director for eight years and director for 20 years. The laboratory is now a separate department at UCL (Department of Space and Climate Physics) with about 150 staff and has been involved in 35 space missions and more than 200 rocket flights. He has published more than 180 refereed papers, and written a book on X-ray astronomy. He is a Fellow of the Royal Society (1985), an Honorary Doctor of Science at Wroclaw University in Poland (1994), a Foreign Member of the Norwegian Academy of Science (1996), an elected member of Academia Europa (2001).

## THE GOLD MEDAL

### Prof. Nigel Weiss



**Nigel Weiss is a world leader in studies of solar convection and solar magnetohydrodynamics, carried out by a combination of mathematical analysis and skilled use of the computer.**

In early work of lasting influence, he analysed the process of magnetic flux expulsion by inexorable eddies, with the consequent concentration of the field into rope-like structures from which the fluid motion is largely excluded, now a recognized feature of the solar granulation and supergranulation. Over the years, he has remained at the forefront of research on convection and magnetoconvection, extending his studies (and those of his students) to include dynamical effects and compressibility.

He has an outstanding reputation as a communicator of deep physical concepts, which have arisen from a long-term step-by-step understanding of the highly complex and subtle interaction between magnetic fields and plasmas, and have been stimulated by observations. He has supervised a series of excellent students and played an important role in serving the scientific community. He was elected an FRS in 1992 and President of the RAS 2000–2002.

Nigel Weiss is an outstanding recipient of the RAS Gold Medal (G) for his pioneering work in developing our understanding of convection, magnetoconvection and sunspots, for his stature as a communicator and his role and example in inspiring many of us.

## THE EDDINGTON MEDAL

### Prof. Igor Novikov



**Igor Novikov is one of the world's greatest astrophysicists, famous for work in collaboration with Zeldovich and for great developments in relativistic astrophysics, cosmology and general relativity over more than 40 years.**

He co-authored the two most influential advanced texts on relativistic astrophysics and cosmology, and he has played an important role in leading research in Moscow, from where most of the best ideas in cosmology emanated in the period 1964–1980, and then in Copenhagen, where he is now Director of the Theoretical Astrophysics Center. He remains an active contributor to the study of the microwave background, large-scale structure and general relativity. He is also an experienced popularizer of his subject and a skilled lecturer who is able to reduce complicated technical ideas to their simplest terms. Novikov's work is unusual in its combination of physical insight and mathematical expertise.

Novikov's work is extraordinarily broad and significant. He has worked with success in almost every area of relativistic astrophysics and cosmology. The leadership provided by Novikov to teams of astrophysicists in different countries is exemplary and he is regarded very positively by young researchers. His life has been dedicated to astrophysics.

## THE PRICE MEDAL

### Prof. Andrew Jackson



**Andrew Jackson is awarded the Price Medal for his outstanding contributions to geomagnetism, particularly by compiling historical geomagnetic field observations from the last 400 years and for his compelling work on interpreting the geomagnetic secular variation.**

His work is characterized by intellectual rigour, whether that be searching all possible archives for the data, analysing those data paying careful attention to the sources of uncertainty and how they should be treated, interpreting the results, or undertaking theoretical developments.

His thorough investigation has unearthed more than 8000 new observations from the 17th century alone, and his new model – widely used throughout the geomagnetic and palaeomagnetic community – runs for four centuries from 1590. An example of the use of historical models is Andy's own demonstration that core–mantle coupling can explain the observed decadal time-scale changes in the length-of-day over the past century or so, based on a time-dependent model of the flow at the core surface inferred from a secular variation model.

Andy has devoted significant amounts of time to community service, notably membership of the team that led to ESA adopting the SWARM mission, and media and public understanding of science work, where he uses people's interest in navigation and the early explorers to show how magnetic data can further our understanding of the generation of the Earth's magnetic field.

## AWARDS AND PRIZES

### FOWLER PRIZE FOR GEOPHYSICS Dr Duncan Mackay



Duncan Mackay is one of the best of the new generation of young solar-system physicists in Europe. He already has an outstanding international reputation and is developing into one of the leaders in the field. His early research concerned the magnetic structure of prominences on the Sun. Since then, he has branched out in several directions to focus on key topics in solar coronal physics, notably in coronal heating, the solar cycle and coronal mass ejections, producing landmark papers on each of these important topics. A major emphasis of Duncan's research has been an in-depth comparison between theory and observations. Duncan Mackay is an outstanding communicator with a real desire to teach and inspire students.

### FOWLER PRIZE FOR ASTRONOMY Dr Graham Smith

This award is made in recognition of Graham Smith's early-career achievements in advancing our understanding of the distribution of dark matter in galaxy clusters, and the impact of his work on attempts to measure the dark energy of the universe.

Until recently many observations of galaxy clusters, especially at X-ray wavelengths, were interpreted as evidence for the majority (~70%) of massive galaxy clusters being simple, relaxed, self-similar systems. Dr Smith's results are overturning this paradigm. A key advantage of Dr Smith's approach to this problem is the application of gravitational lensing to study large samples of clusters. His gravitational lensing studies of massive clusters indicate that most of these systems have a complicated (often multi-modal) distribution of dark matter, and therefore are neither simple nor relaxed.

### AWARD FOR SERVICE Prof. M Aftab Khan



Aftab Khan's career, from entering geophysics at the University of Birmingham in 1953 to a professorship and present status of Emeritus Professor at the University of Leicester, has been singularly devoted to the promotion and promulgation of his science to all facets of our society: schools, business, media, adult education, amateur and professional societies, governments and the developing world. His audience ranges from questioning school-children to industrial chiefs and the presidents of nations.

Aftab Khan has been Council Member and Vice-President of the RAS, Associate and Managing Editor of *Geophysical Journal International*, President of the Joint Association for Geophysics, Chairman of the NERC Geophysical Equipment Pool Management Committee, Member of the Royal Society Explosion Seismology Working Group and of the Earth Resources Committee, a regional advisor of the American Geophysical Union, Co-leader of the IGCP Project on the Geodynamics of Continental Rifts and Chairman of the Board of the School of Cosmic Physics of the Dublin Institute of Advanced Studies. Throughout his career he has always been keen to assist in the development of educational systems in the developing world, in particular in Kenya, but most recently in his native Trinidad, where he has been heavily involved in the development of petroleum geoscience teaching.

Aftab Khan has been a stalwart servant of UK geophysics for more than 50 years. His many friends and colleagues across the world know that his love of the science has engaged their own. His production of the RAS and Geological Society report into UK geophysics education has involved promotion of the science to government, the press and industry.

### HAROLD JEFFREYS LECTURE Prof. Alan Hood



The Harold Jeffreys Lecture for 2007 will be given by Prof. Alan Hood of the University of St Andrews, in the field of theoretical solar physics.

### GEORGE DARWIN LECTURE Prof. Reinhardt Genzel

The George Darwin Lecture 2007 will be given by Prof. Reinhardt Genzel, Max Planck Institute for Extraterrestrial Physics, Garching, Germany, on a topic related to his extensive galactic work.

Note that the Harold Jeffreys Lecture and the George Darwin Lecture will be given as part of the regular RAS monthly meetings on Friday afternoons, in the A&G meetings that follow Specialist Discussion Meetings. All are welcome to come and hear these distinguished lecturers. There is no fee for attendance at the A&G meetings – just turn up at Burlington House. The dates on which these lectures will be given will be announced on the RAS meetings web pages ([www.ras.org.uk](http://www.ras.org.uk)) as part of the programme for each A&G Meeting.

### ELECTED TO ASSOCIATESHIPS New Associates



- Prof. Marcel Goossens (above), Chairman of the Centre for Plasma Astrophysics in Leuven.
- Dr Laike Asfaw, Director of the Geophysical and Astronomical Observatory in Addis Ababa.
- Dr Brian Boyle, Director of the Australia Telescope National Facility.



- Dr James Klimchuk (above), President of Commission 10 (Solar Activity) of the IAU.
- Prof. Virpi Niemela, Emeritus Professor at La Plata, Chile.
- Prof. Roberto Terlevich, Instituto Nacional de Astrofísica Óptica y Electrónica, Mexico.

## Robert Massey: RAS Policy Development Officer

Throughout its history, the RAS has worked to advance astronomy and geophysics. Now the Society is set to raise its profile with policy-makers, becoming a stronger advocate for our science in the corridors of power. As the new RAS Policy Development Officer, I'm there to see that this happens. The time when the science community could be relaxed about its relationship with government has passed. Like other learned societies, the RAS is lobbying senior civil servants, ministers and MPs to make sure its voice is heard. But to be effective, the Society has to assemble convincing evidence and genuinely represent its membership.

It's now recognized that the RAS needs to work more closely with its Fellows. As well as professional scientists, our membership includes teachers, amateur astronomers, journalists and even two MPs. Reaching out to such a large group has not been straightforward in the past and as a consequence extensive discussions in committees were not always shared more widely. To begin to remedy this, draft policy papers will now be placed on the RAS website for comment



Robert Massey: raising the RAS profile.

– there will also be an electronic voting system so we can gauge opinion more easily.

There are plenty of issues for the Society to grapple with over the next few years. A few of these are: the imminent Comprehensive Spending Review; addressing the shortage of undergraduates (pure physics enrolment is static and just a few tens of students now study geophysics at first degree level); the potential reforms to our degree system that may flow from the Bologna Process; ensuring

that subscriptions to ESO and ESA do not compromise basic research elsewhere; and the ongoing debate on human space exploration. Harder to predict is the impact of a new prime minister and the change of emphasis that will follow.

To make a serious contribution the RAS will need to commission and carry out research work. For example, a large number of reports on space and astronomy education assume this science draws students to study Science, Technology, Engineering and Mathematics (the so-called STEM subjects). Although virtually all of us accept this viewpoint, it is mostly based on anecdotal and fragmented evidence. The Society now proposes to conduct a longitudinal study to see whether this is really the case. If so, we will have a powerful tool for influencing government in the future.

It would be unrealistic to claim that the RAS could be as powerful a voice as, say, the CBI or the public service unions. But a Society of more than 3000 members should be highly influential – at the very least we need to ensure that astronomy and geophysics receive the attention they deserve.

## NEWS IN BRIEF

### RAS images on-line

Some of the RAS Library Photographic Archives are now available through the Science Photo Library. The SPL is making high-quality images available by exclusive licence for reproduction in specific projects, while the copyright and intellectual rights in the images remain with the RAS. Discounts are available for academic and educational works and for preferred clients. The images include portraits of distinguished astronomers and historical instruments.

<http://www.sciencephoto.com>

### Blue skies research

The RAS President Michael Rowan-Robinson welcomed government commitment to blue skies research in December's Pre-Budget Report. The report stresses that "resource allocation should continue to be strongly focused on excellence in research, including curiosity-driven, user-focused, and collaborative research" – good news for astronomy and geophysics.

## New Fellows

The following were elected to Fellowship of the Society on 7 December 2006:

Ioannis Bagetakos, Science & Tech. Research Institute, University of Hertfordshire.  
Deborah Baker, Fetcham, Surrey.  
Jose Barros-Pinto, London.  
Dr George Beckmann, Hampton, Middlesex.  
Peter Bouldes, Harston, Cambridge.  
Simon Briggs, Lowestoft, Suffolk.  
Teeraparb Chantavat, Oxford University.  
Cristina Chifor, Wolfson College, Cambridge.  
Kay Clarke, Dept of Physics & Astronomy, University of Leicester.  
Alison Craigon, Bishopbriggs, Glasgow.  
Paul Cunlon, Dublin, Eire.  
Jemma Davidson, PSSRI, The Open University, Milton Keynes.  
Joseph Deeks, PSSRI, The Open University, Milton Keynes.  
Roger Duthie, Woodside, Blairgowrie.  
Celine Eminian, Physics & Astronomy, University of Sussex, Brighton.  
Dr Rhodri Evans, Dept of Sport & Science, The University of Glamorgan.  
Catarina Fernandes, PSSRI, The Open University, Milton Keynes.  
Shakeel Fernandes, Physics & Astronomy, University of Sussex, Brighton.  
Sunil Godhania, Willesden Green, London.  
Paul Goodall, New College, Oxford University.  
Caroline Graham, School of Geosciences, University of Edinburgh.  
Edmund Henley, Wandsworth, London.

Dr Rainer Hollerbach, Dept of Applied Mathematics, University of Leeds.  
Georgios Ioannidis, Borehamwood, Herts.  
Dr Adrian Jannetta, Morpeth, Northumberland.  
Noe Kains, School of Physics & Astronomy, University of St Andrews.  
Dr James Kelly, Brockley, London.  
Dominic Keogh, Benfleet, Essex.  
Fiona Kirton, Glasgow.  
Matthew Lake, London.  
Dr Karl Lyons, Wigan, Lancashire.  
Dr John Magorrian, Rudolf Peierce Centre for Theoretical Physics, Oxford.  
Adam Masters, Epsom Surrey.  
Aaron McCall, Isle of Dogs, London.  
Euan Monaghan, Grange-over-Sands, Cumbria.  
Andrew Morris, PSSRI, The Open University, Milton Keynes.  
Prof. James Neff, Dept of Physics & Astronomy, College of Charleston USA.  
Mitesh Patel, Fulham, London.  
Dr Scott Pearce, Ballabeg, Isle of Man.  
Jaz Pearson, Longridge, Lancashire.  
Sebastian Perez, St John's College, Oxford University.  
Laura Pickard, Holmbury St Mary, Dorking, Surrey.  
James Schofield, Hazlemere, Bucks.  
Thomas Scott, London.  
Keith Smith, School of Chemistry, University of Nottingham.  
Robert Steppe, Pall Mall, London.  
Lynsey Thornton, Falkirk.  
Magda Vasta, Dept of Physics & Astronomy, University College London.  
Ingo Waldmann, London.  
Ho-Ching Yiu, Physics and Astronomy Dept, University College London.



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