ISSUE 49 WINTER 2015

resource

The Newsletter of Scotland's National Academy

The Order of Merit (OM) is a special honour in the sole gift of the Sovereign and is restricted to a maximum of 24 living recipients. Three of the current recipients were present at the RSE one evening during a busy week in November 2015. Pictured (l–r) are Professor Sir Michael Atiyah, Sir David Attenborough and Professor Sir Roger Penrose. Details of the conference in which they participated, and of other events that week, are available inside.

Also featured in this issue:

Science and the Parliament

Comments on the BBC and GM crops

Stampy delivers the Christmas Lecture

THE ROYAL SOCIETY OF EDINBURGH

One extraordinary week at the RSE

The week beginning 9 November 2015 was an extremely busy one at the RSE, with three prestigious events running during the week and a plenitude of speakers of the highest calibre.

Inspiring Brilliance: Celebrating Maxwell's Genius and Legacy

The James Clerk Maxwell Conference on Monday 9 November celebrated the 150th anniversary of the publication of Maxwell's Equations. As part of the celebrations, a plaque to mark the occasion had been unveiled the previous week by Dr Alasdair Allan MSP, the Minister for Learning, Science and Scotland's Language (pictured right, on left) and Sir Michael Atiyah OM PPRS PPRSE. The plaque is situated in front of the James Clerk Maxwell statue near the RSE, in George Street, Edinburgh.

James Clerk Maxwell ranks alongside Newton and Einstein as one of the world's great physicists. At the conference, eminent speakers gathered to explore the legacy of Maxwell's genius, which continues to impact on many scientific and theological aspects of modern society, from mobile phones and cybernetics to the discovery of the Higgs boson.

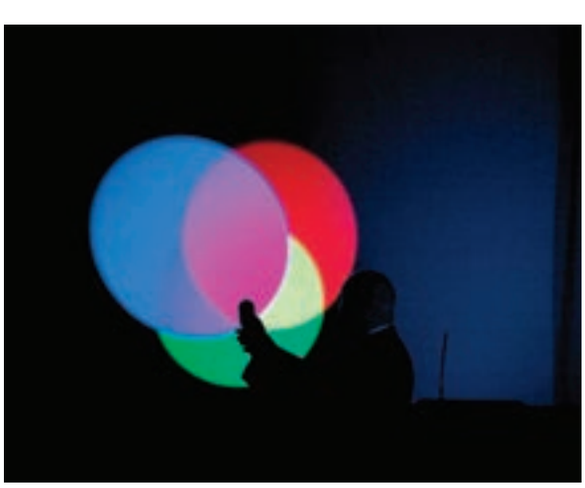
The conference was introduced by David Forfar FRSE, Chairman of the James Clerk Maxwell Foundation, and sessions were chaired by RSE President, Dame Jocelyn Bell Burnell, and Dr James Rautio CEO, President and Founder of Sonnet Software.

Speakers at the conference were: Professor Peter Higgs FRSE; Sir Peter Knight; Sir Michael Atiyah HonFRSE; Professor Malcolm Longair FRSE; Professor Carl Murray; Peter Reid; Professor Harald Haas; Professor Iain MacLeod; Professor Rodolphe Sepulchre; and Professor Jim Al-Khalili.

Before the conference ended, a short extract of a BBC Scotland film about James Clerk Maxwell was shown; this programme was broadcast on BBC 2 Scotland on 3 December 2015. A programme on BBC Radio 4 was also broadcast on Tuesday 1 December on the *Beauty of Equations*, featuring Professor Jim Al-Khalili.

Pictured in front of the statue during a break are (l–r) Professor Jim Al-Khalili, Dame Jocelyn and Professor Peter Higgs.

The conference proved extremely popular and all places were taken up soon after they became available.



Professor Malcolm Longair FRSE illustrates his talk (left) on *The Impact of Maxwell's Work on Colour and Statistical Physics.*

The Science of Beauty

What is common to the experience of beauty derived from sensory sources such as music and visual art and highly cognitive ones such as mathematics, and from moral sources? What is the relationship between aesthetic judgement and aesthetic experience? And what is the grander biological significance of the experience of beauty?

These are the deep questions which were discussed at length by the many distinguished speakers, drawn from the fields of mathematics, physics, philosophy and neuroscience at a two-day Conference which took place on Tuesday and Wednesday 10 and 11 November at the RSE.

Sessions were chaired by: Dame Jocelyn Bell Burnell PRSE; Professor Andrew Ranicki FRSE; Professor Semir Zeki; Professor Richard Morris FRSE; and Sir Michael Atiyah HonFRSE.

The stellar lineup of speakers comprised three Honorary RSE Fellows: Sir Michael Atiyah; Sir David Attenborough; and Professor Robbert Dijkgraaf; as well as Professor Samir Zeki; Professor Beatrice de Gelder; Professor Gordon Graham; Dr Angela Breitenbach; Professor Winfried Menninghaus; Dr Tomohiro Ishizu; Dr Cinzia Di Dio; Professor Michael Trimble; and Sir Roger Penrose.

Dr Angela Breitenbach

Professor Robbert Dijkgraaf

Professor Beatrice de Geler

Professor Sir Michael Atiyah

Professor Andrew Ranicki

Sir David Attenborough

Professor Gordon Graham

Professor Semir Zeki

Professor Winfried Menninghaus

Photographs by Gerardo Jaconelli

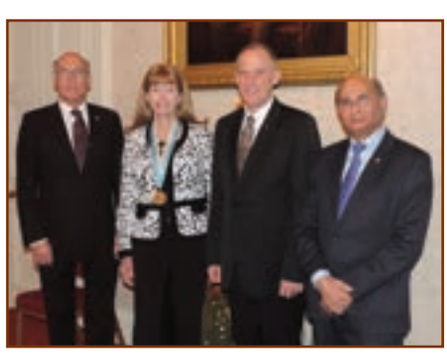
The events on Monday and Thursday of this week were live streamed and videos of most of the talks can now be viewed online at: www.royalsoced.org.uk/1186_November2015.html. Video recordings of some of the talks from the Science of Beauty conference have also been uploaded to the web site and summary reports of all these events will be be available soon.

Our travels through time: envisioning historical waves of technological innovation

On the evening of Thursday 12 November, Professor Lynn Conway, Professor of Electrical Engineering and Computer Science, Emerita, University of Michigan, was presented with the 2015 IEEE/RSE James Clerk Maxwell Medal supported by Cirrus Logic. The Medal was presented to Professor Conway (below) by RSE Vice-President for Physical Sciences, Professor Sir David Wallace, "for contributions to and leadership in design methodology and pedagogy, enabling rapid advances and dissemination of VLSI design tools and systems."

Professor Conway then delivered her lecture, *Our travels through time: envisioning historical waves of technological innovation*, to a spellbound audience.

Professor Conway is pictured below after the lecture, in the RSE James Clerk Maxwell Room, with (l–r) Professor Martin Bastiaans, IEEE Region 8 Director; Professor Barry Shoop, IEEE President-Elect; and Professor Tariq Durrani, RSE Vice-President for International.



Science and the Parliament

Next year's elections in Scotland and the future of science in Scottish business and education formed the heart of debate at the annual *Science and the Parliament* event on 11 November. In the setting of the Our Dynamic Earth science and exhibition centre, the event discussed research and higher education, the relationship between science and society and innovation and the economy, and heard from all the main political parties in Scotland. The event is hosted annually by the Royal Society of Chemistry, in partnership with the Royal Society of Edinburgh.

Keynote speakers included: President of the Royal Society of Chemistry, Professor Dominic Tildesley; RSE Vice-President for Life Sciences, Professor Neva Haites; and Dr Alasdair Allan MSP, the Minister for Learning, Science and Scotland's Language. MSPs from all of the opposition parties also spoke: Kezia Dugdale for Labour; Liz Smith for the Conservatives; Willie Rennie for the Liberal Democrats; and Patrick Harvie for the Greens.

Professor Alan Alexander, RSE General Secretary, chaired the first session. Speakers in the session on Research & Higher Education included Professor Andrew Morris FRSE, Chief Scientific Officer (Health) Scotland, and Professor Julie Fitzpatrick FRSE, Moredun Research Institute Scientific Director and Group CEO.

Alan Alexander

Andrew Morris

Julie Fitzpatrick

Dominic Tildesley

Neva Haites

Alasdair Allan

The conference heard from two school students from Lossiemouth High School, Rhiannon Cleghorn and Rebecca Brown, who had recently completed a visit to Bokomoso School in Botswana to develop a global link between the schools. The link involved senior pupils from Lossiemouth delivering lessons to the pupils in Botswana. Rhiannon and Rebecca decided to use the resources from the Royal Society of Chemistry, 'Water a global experiment' to develop their lesson, which involved investigating Hydrogels. The presentation by the two students was one of the highlights of the day.

Rhiannon Cleghorn and Rebecca Brown (above) and meeting Willie Rennie and Liz Smith (below)

The Royal Society of Chemistry, the Institute of Physics and the Royal Society of Biology annually award prizes to pupils from schools throughout Scotland for high achievement in Higher and Advanced Higher Chemistry, Physics and Biology. The Royal Society of Arts also awards a prize for technological studies. These awards were presented to the pupils by the Cabinet Secretary for Education & Lifelong Learning, Angela Constance MSP. Some of the award winners are pictured below. In addition, the 2015 RSE/BP Hutton Prize in Energy Innovation was presented to Dr Cairong Jiang of the School of Chemistry at the University of St Andrews.

Dr Jiang pictured with her daughter.

Dr Jiang's research into direct carbon fuel cells has led her to develop a practical system of converting the chemical energy of solid carbon into electricity. The system could point the way to clean use of coal, waste and renewable carbon sources at high efficiency. The £10,000 Prize, funded by the BP Trust, is awarded by the Royal Society of Edinburgh to an early-career researcher based in Scotland, who has shown a significant individual contribution to energy innovation through research and knowledge exchange.

Other sessions at the event were chaired by BBC Scotland's Ken MacDonald and Professor Stuart Monro FRSE. Speakers included: Professor Garry Taylor FRSE; Jon Edwards; Professor Steve Yearley FRSE; Dr Stephen Breslin; Professor Bob Tooze FRSE; Professor Tim Bedford FRSE; and Dr Siobhán Jordan.

Science and the Parliament has run annually since 2000 and attracts an audience across the scientific and engineering disciplines, MSPs and other policy makers.

The RSE Comments

BBC Charter Review

In response to a consultation issued by the Department for Culture, Media and Sport, the RSE formed a Working Group, Chaired by Dr John McCormick, to formulate its position on the BBC Charter Review.

The Advice Paper produced by the Working Group concluded that the current model of governance in place at the BBC is unsustainable and has failed to keep pace with the changing devolutionary settlement across the UK. A greater level of accountability to the people of Scotland, Wales and Northern Ireland is needed.

The paper noted the importance of the BBC maintaining the ability to produce high-quality, marketable content and remaining relevant internationally. Unless the broadcaster keeps pace with technological advances, it will fall behind its commercial rivals. This should not be allowed to occur. The BBC must strive for excellence across all of its services and provide inclusive content which takes into account a range of audiences.

Reform of the BBC cannot be delayed until after the next Charter Review, the Working Group concluded. The Charter period should last for between ten and eleven years and before the end of this period, the organisation should have considered, and taken action to implement, a new funding model. Irrespective of the method of funding decided upon, the BBC has a duty to ensure that it remains committed to less popular and more demanding content. Action must also be taken to ensure that low-income households have access to the service.

The Advice Paper noted the regret of the Working Group that the recommendations put forward by Professor Anthony King in his 2008 report are yet to be fully fulfilled. The King Report addressed the weaknesses in BBC news programmes and noted the London-centric tone of much of the broadcasts. A culture change is required across the entire BBC news directorate and a more textured approach to the coverage of domestic policy must be adopted. The Paper recommended that, in order to help achieve the much needed strengthening of the news service for Scotland, integrated international and national television news, edited in Scotland, should be a priority for the BBC. The organisation must also more effectively harness the journalistic resources at its disposal across the entire UK.

The current BBC Charter expires at the end of 2016.

The full Advice Paper can be found on the RSE website at: www.royalsoced.org.uk/cms/files/advice-papers/2015/AP15_21.pdf

GM Crops

In response to the decision made by the Scottish Government to ban the use of European Union-approved genetically modified (GM) crops in Scotland, the RSE published an Advice Paper calling for a rational debate on the issue.

The RSE also joined 31 other learned societies and research institutions in signing an open letter to the Cabinet Secretary for Rural Affairs and the Environment, Richard Lochhead, urging the Scottish Government to reconsider the ban.

The RSE Paper, *The Opportunities for GM and Biotechnology in Scotland*, noted that the concerned response shared across much of the scientific, business and farming communities was elicited for a number of reasons. The announcement by the Scottish Government was made in emotive language likely to fuel negative public perceptions about GM crops and technologies; in addition to assuming a degree of public hostility that is not supported by attitude surveys. Furthermore, the announcement could potentially damage Scotland's ability to attract and retain innovative researchers and disadvantage the growth of important Scottish business. The decision was not taken on the basis of scientific evidence.

As GM is one of a range of innovative biotechnologies which could benefit Scotland economically, there should be an evidence-based public debate across the entire country on its future. The RSE hopes that work such as its Advice Paper can stimulate a debate that is both rational and respectful and addresses the complex issues surrounding genetically modified crops that have proved so divisive.

The civilised debate the RSE proposes should recognise the international context of the ban and address the wide development of GM crops across the globe, based on an increasing knowledge of plant biology and genetics, using cutting-edge and precise techniques. It also should be recognised that Scotland's food and drink sector requires raw materials sourced from overseas, which are unlikely to be GM-free.

The Advice Paper also highlighted the concern expressed by European science advisory bodies, such as the European Academies Science Advisory Council (EASAC), that the EU system of regulation and approval needs to be improved as, in its current form, it mitigates against the development and cultivation of new GM crops which could provide environmental and societal benefits to Member States.

The Scottish Government is strongly encouraged to publish all of the advice, information and evidence that led it to enact the ban on GM crop cultivation and, in the meantime, must continue to support research into related technologies.

The full Advice Paper can be found on the RSE website at: www.royalsoced.org.uk/cms/files/advice-papers/2015/AP15_20.pdf

Events for the Public @ RSE

ENLIGHTENING THE EUROPEAN DEBATE SERIES

The UK has long had an uneasy relationship with Europe and will, before the end of 2017, have a Referendum, in an effort to resolve the matter. Citizens will be asked whether they wish the UK to remain a member of the European Union, or to leave. To inform this, the RSE is holding a series of events aimed at enlightening the European Debate. These will examine the implications for the UK of either decision and consider the key issues, including: fiscal matters and trade; freedom of movement; social Europe; the environment; and the impact on devolved areas such as Scotland.

The Conference launching the series (right) will examine the overall landscape.

Details of future events in the series will be available in due course at: www.royalsoced.org.uk/events/

Tuesday 16 February 2016, 9 am–3.30 pm

LAUNCH CONFERENCE

Understanding European Challenges

Keynote speaker:
Brigid Laffan MRIA
Director and Professor at the Robert Schuman Centre for Advanced Studies and Director of the Global Governance Programme, European University Institute (EUI), Florence

The European Union is facing unprecedented challenges, including the problems of the Euro, the refugee crisis, and turbulence in its neighbourhood.

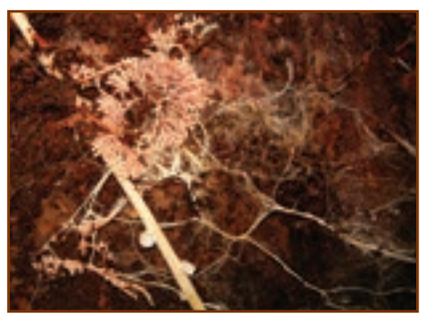
The conference will address these questions and the different possible futures for Europe. It will examine the issues in the relationship between the UK and Europe, and the way they are seen in the nations and regions. It will also look at the alternatives to EU membership, should the UK decide in the coming Referendum that it wishes to withdraw.

Organised in partnership with: The Centre on Constitutional Change; and the Economic and Social Research Council.

Wednesday 24 February 2016 at 6 pm

DISCUSSION FORUM

Life in the Soil: does it matter?



Panel discussion chaired by:
Susan Davies CEO
Scottish Natural Heritage

Speakers include:
Professor Richard Bardgett
Professor of Ecology, University of Manchester;
Professor Colin Campbell
Director of Science Excellence, James Hutton Institute; and
Professor Julie Fitzpatrick FRSE
Scientific Director of the Moredun Research Institute.

Soil has been described as the "poor person's tropical rain forest". Walking through a woodland or a meadow, there are hundreds and possibly thousands of species beneath our feet, but what are they all doing and why are there so many? The evening will focus on the vital roles which these organisms play in maintaining the soil's fertility, the ecosystems services that they perform, the possibility of new pharmaceutical products, and the problems associated with disease transmission.

Supported by the James Hutton Institute, the Moredun Research Institute, the Strategic Research Programme and Scottish Natural Heritage

Thursday 25 February 2016 at 6 pm

PETER WILSON LECTURE

Lost in Translation

Professor Dame Anne Glover FRSE, Vice-Principal External Affairs & Dean for Europe, University of Aberdeen

The world of science is beguilingly simple as we construct hypotheses, test them and then make conclusions relevant to the evidence. This is a continuous process refined over time. Politicians also claim to want evidence to form the basis of their policies; but sometimes the evidence is not consistent with their philosophies, or is at odds with other considerations such as economic factors. How are we then to ensure that politicians and policy makers have access to the best possible advice, when we know that the advice may not be taken? How do we deal with uncertainty in translating that advice to policy makers, and should science advisers be in the business of providing policy options based on the available evidence? The lecture will draw on experience in providing science advice to government and administrations in Scotland and in Europe.

This lecture is organised in partnership with the Scottish Consortium for Rural Research (SCRR).

Friday 26 February 2016 2016 at 6 pm at Greenwood Academy, Irvine

PUBLIC TALK

Scotland Rocks – a Tartan Tour of Planet Earth

Professor Iain Stewart
University of Plymouth and BBC Presenter

Many of the fundamental ideas which underpin our current understanding of how planet Earth works come from the work of Scottish scientists. This talk will explore and celebrate this tartan contribution to modern Earth Science, and examine how many of the contemporary challenges facing society in the 21st Century also root into Scotland's industrious past.

Tuesday 1 March 2016 at 6 pm

LECTURE

Investing in Innovation – Fintech for the Future and Technology for our Times

Anne Richards CBE
Chief Investment Officer and Executive Director of Aberdeen Asset Management

In this lecture, Anne Richards, Chief Investment Officer and Executive Director of Aberdeen Asset Management, will offer her insight into the significance and state of innovation in financial services and in the wider economy in an increasingly competitive environment**.**

Joint Annual Lecture with the Royal Academy of Engineering

RSE Events are open to all and normally free to attend, but registration is required. To register, please contact the Events Team – 0131 240 2780 – events@royalsoced.org.uk or go online at: www.royalsoced.org.uk
Some events may carry a charge – please check individual details.

Many RSE events run to full capacity. If you book a place at any event but are unable to attend, it would be appreciated if you could inform the Events Team so that your place can be reallocated.

Fellows in Action

The late Professor John O Forfar BSc MBChB MD FRSE (1916–2013), has recently been honoured by the Dutch.

Captain Forfar RAMC, as he was during World War II, was the medical officer of 47 Royal Marine Commando and repeatedly went forward under intense enemy fire to rescue those of his colleagues who had been badly injured by enemy fire during the liberation of Walcheren, Holland, in November 1944. For his bravery under enemy fire, John Forfar was awarded the Military Cross. In his memory, and that of all the troops of 47 Royal Marine Commando, the Dutch have named a street in Walcheren after him, *John O. Forfarstraat* (image of street sign above).

Sadly, Professor Forfar died two years ago, so his son, David Oldroyd Forfar, also an FRSE, was proud to unveil the street name. He was accompanied by six remaining veterans who had served in 47 Royal Marine Commando and fought in the successful liberation of Walcheren, along with several Dutch dignitaries.

As 47 Royal Marine Commando had also liberated Port-en-Bessin in France as part of D-Day, and John Forfar was mentioned in despatches during that liberation, an alley in France was also named after him, *Allée Professeur John Forfar;* but that was earlier and during his lifetime (street sign pictured left).

Professor Forfar was Professor of Child Life and Health at the University of Edinburgh from 1964 to 1982, President of the British Paediatric Assoication from 1985 to 1988 and instrumental in founding the Royal College of Paediatrics and Child Health.

The story of 47 Royal Marine Commando is told in the book written by Professor Forfar, *From Omaha to the Scheldt*.

Professor Forfar's son, David, (below) is a consulting actuary and a Fellow of the Institute and Faculty of Actuaries (IFoA). He is currently Chairman of the James Clerk Maxwell Foundation.

Fellow wins award for political prediction

John Curtice, Professor of Politics at the University of Strathclyde's School of Government and Public Policy has won an award for successfully predicting the outcome of the General Election in the UK.

Professor Curtice received the Political Studies Communicator Award at the Political Studies Association's (PSA) annual ceremony in London for his accurate polling of May's election.

As President of the British Polling Council, Professor Curtice led the team of electoral experts who have produced the exit poll on General Election nights in the UK for the past 23 years.

The PSA panellists who picked Professor Curtice said "He was chosen for his important positive contribution to the study of elections and public opinion and the skill with which he communicates his insights to the public through regular media appearances. In particular, the judges complimented his work on the exit poll for this year's election for its accuracy and high quality".

Fellows Honoured

We offer our congratulations to our Fellows who recently have been honoured in the following ways:

Fellows elected to the Academy of Social Sciences

Professor Alan Alexander OBE, Emeritus Professor of Local and Public Management, University of Strathclyde and General Secretary of the RSE.

Professor John Beath OBE, Emeritus Professor of Economics, University of St Andrews.

Fellow elected to the Royal Academy of Engineering

Professor René de Borst, Regius Professor of Civil Engineering and Mechanics, University of Glasgow, has been elected to the Royal Academy of Engineering (RAEng) this year. Professor de Borst is also a consultant with Dassault Aviation, Paris.

Fellow awarded Honorary Degree by University of St Andrews

Professor the Right Honourable Sir David Edward KCMG QC was awarded an Honorary Degree during the St Andrew's Day Graduation Ceremony at the University of St Andrews on Monday 30 November 2015.

Sir David is Professor Emeritus of the University of Edinburgh and former Judge of the Court of Justice of the European Communities (1992–2004). He was awarded the RSE Royal Medal in 2005 and served as Convener of the RSE International Committee (2007–2012) and on Council (2011–2013).

RSE Council and Office Bearers

Council and other Office-Bearers for the 233rd Session were elected at the Annual Statutory Meeting on 26 October 2015. Due to recent changes to align the period of election of Office-Bearers to the financial year, rather than the RSE Session, those newly elected will take up their posts in April 2016.

Our thanks go to outgoing Council Members and Office-Bearers for their hard work and dedication during their time in post, and our congratulations go to those newly elected (shown in italics below).

President
Professor Dame Jocelyn Bell Burnell

Vice-Presidents
Mr Iain Gray CBE – Business
(Mr Ian Ritchie until March 2016)
Professor Neva Haites – Life Sciences
Professor Marian Scott OBE – International
(Professor Tariq Durrani until March 2016)
Professor Sir David Wallace – Physical Sciences
Professor John Wallace – Arts, Humanities & Social Sciences

General Secretary
Professor Alan Alexander

Treasurer
Mr Gerald Wilson

Fellowship Secretary
Professor John Connell

Ordinary Members
Mr John Baxter
Professor Doreen Cantrell
Dr Barbara Crawford
Professor Mandy MacLean MBE
Dame Joan Stringer
Professor Robert Cormack and Sir Muir Russell will continue on Council until March 2016.

Observer
Dr Robert Black

Curator
Dr Iain Gordon Brown

Programme Convener
Sir Andrew Cubie CBE

Research Awards Convener
Professor Bonnie Webber (Professor Steven Beaumont OBE until March 2016)

Young People's Programme Convener
Professor Stuart Monro OBE (Dr Chris Van Der Kuyl until March 2016)

Education Committee Convener
Mr Keir Bloomer (Professor Sally Brown OBE until March 2016)

RSE President receives Prudential Women of the Year Award

In October 2015, RSE President, Professor Dame Jocelyn Bell Burnell, won the Prudential Women of the Year Award for Lifetime Achievement.

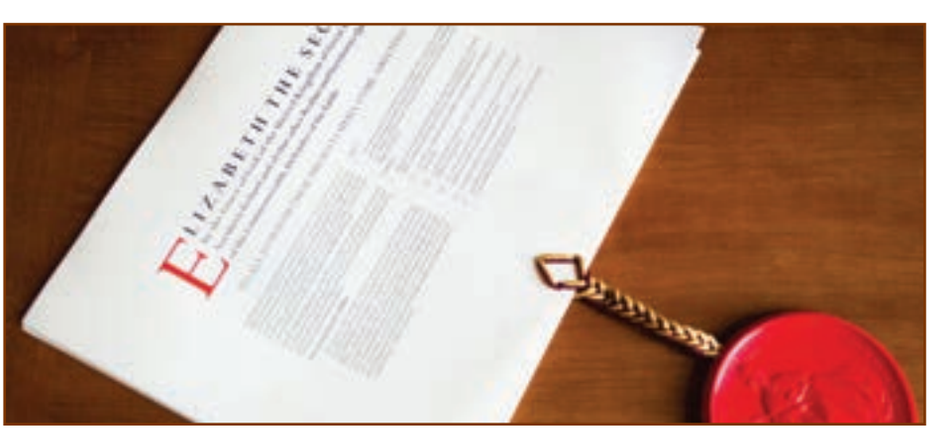
The Award was made to Dame Jocelyn at a special 60th anniversary Awards Ceremony and recognised her lifetime accomplishments, her remarkable contributions to science, and her support of women in science.

Dame Jocelyn was one of very few women 'allowed' to study science at Cambridge; she was the first female President of the Institute of Physics (2008–2010); and since 2014 has been the RSE's first female President.

Congratulations to The Learned Society of Wales

On the evening of Thursday 19 November 2015, Sir Emyr Jones Parry, President of the Learned Society of Wales, was pleased to host an event at the Wales Millennium Centre marking the conferment of the Society's Royal Charter.

Professor Alan Alexander OBE, General Secretary of the RSE, was present at the event and, in an address on behalf of the RSE, congratulated the Society on this prestigious occasion.



The Learned Society of Wales (LSW) is an independent, all-Wales, self-governing, pan-discipline educational charity.

The Society was established in 2010, and draws upon the considerable strengths of nearly 400 distinguished Fellows based in Wales, the UK and beyond. It provides public benefit, including expert scholarly advice on a variety of public policy issues related to science, engineering, medicine, arts, humanities and social sciences.

RSE Outreach Programmes

The RSE Outreach Programmes have delivered some exciting and inspirational events throughout 2015.

RSE @ Scottish Borders

The RSE@ project is a programme of outreach activities involving active engagement with schools and the wider public delivered in an area outside the Central Belt. A very successful pilot scheme ran in Arbroath in 2008–09, followed by larger projects in Dumfries and Galloway in 2010–11 and Lochaber in 2012–13. The aim of these initiatives is to enhance and improve the understanding and appreciation that people, particularly school-aged children, have for their local community.

The most recent project has been run in the Scottish Borders, with events taking place in Galashiels, Kelso, Selkirk, Duns, Jedburgh, Hawick and Eyemouth. Full details of all these talks are available on the RSE website. The final public talk has taken place, but Schools activities will continue until Spring 2016.

Visit: www.royalsoced.org.uk/1164_PublicProgramme.html

Talk Science @ Irvine Bay 2015–16

Following an extremely successful project in 2014–15, the RSE is delighted to be working with Irvine Bay Regeneration Company to deliver a similar programme of activities during this academic year. Uptake of school talks, focused on STEM subjects, has once again been exceptional and these will continue until May 2016.

The Talk Science @ Irvine Bay programme will also provide four public events. For the first of these, the RSE was delighted to present RSE Fellows, Ian Rankin and Professor Sue Black in an 'In Conversation' event at St Matthew's Academy, Saltcoats in October 2015. The pair told anecdotes about their lives, highlighted the people and events that have shaped their work and discussed how their disciplines intersect.

A film and report of the event are available to view on the RSE website, where details of future Talk Science public talks will be published when known.

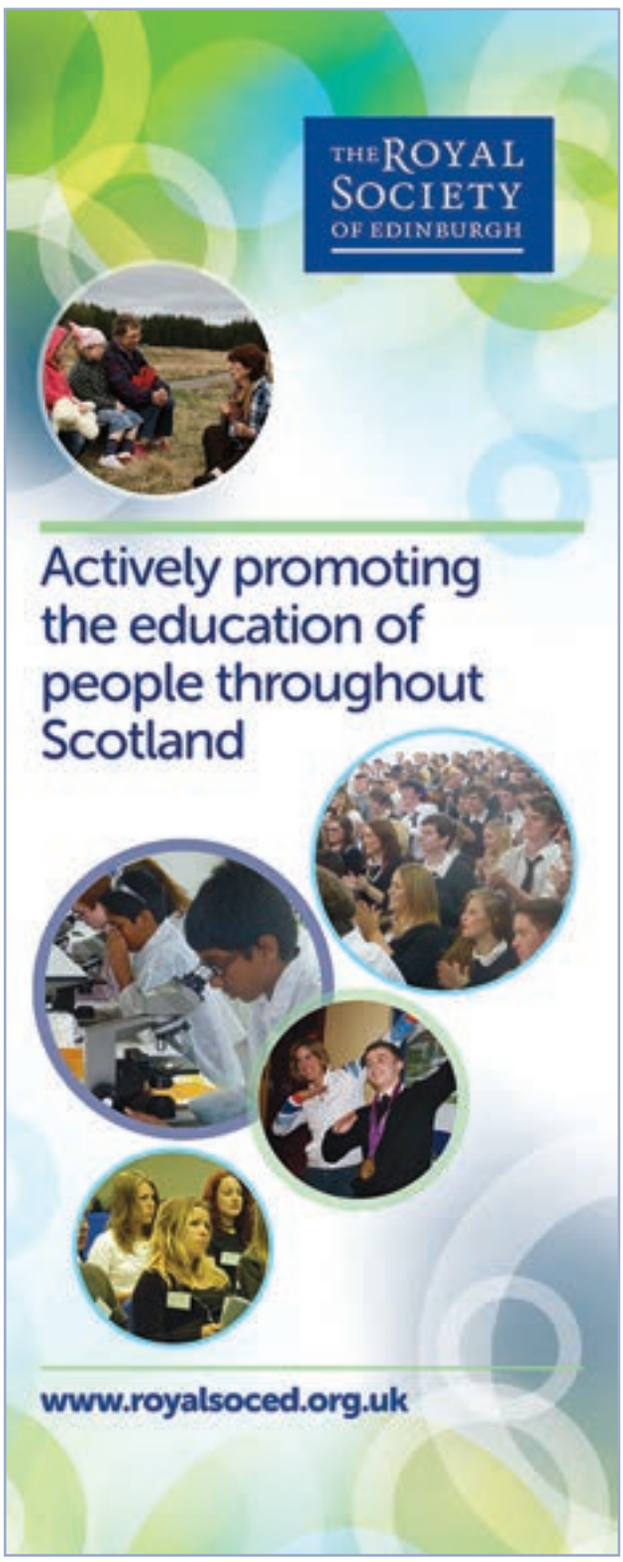
Visit: www.royalsoced.org.uk/1142_TalkScienceIrvineBay201415.html

RSE @ The Holywood Trust

RSE @ The Holywood Trust has been running in Dumfries and Galloway since 2012 and is a legacy of the successful RSE @ Dumfries & Galloway programme that took place in the region during 2010–11. This programme, funded by The Holywood Trust, delivers at least five school events and one public talk each year.

The 2015 Public Talk, which took place at Moffat Academy in October, included the presentation of the RSE Public Engagement Prizes. This year's recipients were Professor Martin Hendry (Senior Prize for Public Engagement) and Dr Mhairi Stewart (Innovator's Prize for Public Engagement).

The RSE Public Engagement Prizes are supported by the James Weir Foundation and were awarded by Dame Jocelyn Bell Burnell, President of the Royal Society of Edinburgh.



Visit: www.royalsoced.org.uk/1187_RSETheHolywoodTrustDumfriesGalloway.html

Friends at Home and Abroad

Memorandum of Understanding (MoU) with the Brazilian Academy of Sciences

The RSE was delighted to sign an MOU with the Brazilian Academy of Sciences on 20 November 2015 in Vienna.

Professor Tariq Durrani, RSE Vice-President (International) is pictured with Professor Chunli BAI HonFRSE, President, Chinese Academy of Sciences and Professor Jacob Palis Jr., President of the Brazilian Academy of Sciences (l–r), on the occasion of the signing of the MOU.

Professor Chunli BAI was the witness of the MoU signing, acting in his capacity as an RSE Honorary Fellow.

FRIENDS OF THE SOCIETY

CORPORATE PARTNERS OF THE ROYAL SOCIETY OF EDINBURGH

If you would like to know more about the Royal Society of Edinburgh's Friends of the Society initiative, or if your organisation may be interested in joining the scheme, please contact:
Alan Salonika, Business Development Officer – 0131 240 2785 – asalonika@royalsoced.org.uk

MoU with the Ministry of Science and Technology (MoST), Taiwan

The RSE signed a Memorandum of Understanding (MoU) with the Ministry of Science and Technology, Taiwan (MoST) on Friday 30 October 2015 in London. The RSE had an existing MoU with the National Science Council, Taiwan, but following the name change to MoST in 2014, a new agreement was required.

The agreement sets out the commitment to facilitate, encourage and support research collaboration between research groups in Scotland and Taiwan. Under this agreement, the two academies agree to fund academic exchanges between the two countries through the International Exchange Bilateral Programme and to organise joint workshops.

The RSE and MoST held two joint workshops in 2015. The first of these was at the RSE in January, on the topic of *Sensors and Imaging and their Applications including Medical Areas.*

During this workshop, the RSE welcomed 40 experts in the field of sensors and imaging from both Scotland and Taiwan for a two-day seminar, followed by site visits to laboratories at the University of Edinburgh.

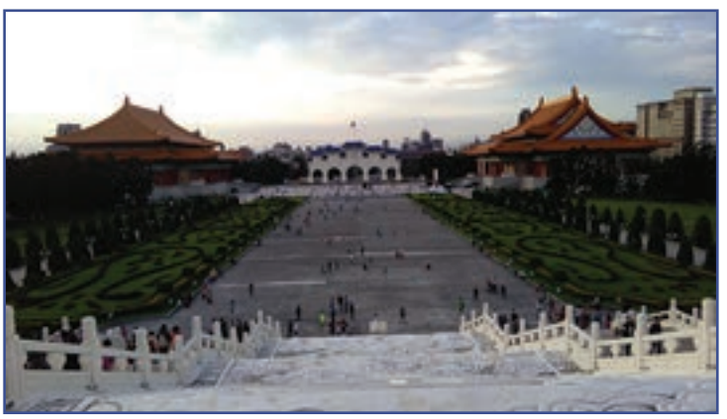
Representatives at the seminar included the founder of a wireless IC design company which enabled the world's first smart phone, Dr. Kwang-Cheng Chen, Distinguished Professor and Associate Dean for Academic Affairs in the College of Electrical Engineering and Computer Science, National Taiwan University.

The second workshop was held in Taiwan in November, on the topic of Neuroscience. This workshop consisted of two days of presentations, followed by two days of laboratory visits to the Kaohsiung Chang-Gung Memorial Hospital, National Yang-Ming University and National Taiwan University.

Following these two workshops, the RSE has increased the number of person-weeks available for bilateral exchanges with Taiwan to 20 this financial year.

Applications are particularly welcome in the topic areas covered by both of the 2015 workshops.

RSE delegation at the Kaohsiung Chang Gung Memorial Hospital visit



View from Chiang Kai-shek Memorial Hall with the National Theatre (left) and the National Concert Hall (right)

Professor Tariq Durrani, RSE Vice-President for International, (right) is pictured with the Ambassador, Dr Liu Chih-Kung, Taipei Representative Office in the UK

Further information on this Bilateral Exchange and the application process is available on the RSE website at: www.royalsoced.org.uk/802_InternationalExchangeProgrammeBilateral.html

RSE Research Awards

JM Lessells Travel Scholarships in Engineering

Lessells Scholarships arise from a bequest from the late Professor John Moyes Lessells, an eminent mechanical engineer who emigrated to the United States of America in 1920. The Scholarships are for Honours Graduates in all forms of Engineering from Scottish Universities, who wish to study some aspect of their profession outwith the UK. All branches of engineering are eligible for consideration, including computer and software engineering. The first Scholarship was awarded in 1985, and since then, the Lessells Bequest has funded 109 scholars, totalling nearly half a million pounds.

The Lessells Committee were pleased to host the annual Lessells Travel Scholarships presentation event on 28 October 2015. The Committee heard presentations from four Scholars about their recent research experiences in the USA and Australia. Also present was Dr Alistair Lessells, who joined the meeting to find out more about how his Uncle's bequest continues to help young engineers travel and work overseas.

Scholars' reports and further information about the eligibility criteria can be found on the RSE website. Applications for the 2016 round of scholarships will open in mid-February 2016. The deadline for applications will be mid-April 2016.

Full details at: www.royalsoced.org.uk/973_JohnMoyesLessellsScholarships.html

Top row (from left to right): Professor Jon Cooper FRSE, Professor Raffaella Ocone FRSE, Martyn McLaggan, Shahid Naseer, Maggie Creed, David Garcia Cava and Dr Alistair Lessells. Bottom row: Professor John Barker FRSE, Professor Jim Murry FRSE and Professor John Chapman FRSE.

David Garcia Cava,
University of Strathclyde
Visited: Department of Aerospace Engineering, University of Michigan, USA

Project: *Development of an automatic online vibration-based health monitoring system for structures made of composites.*

Nowadays, engineering challenges require multi-disciplinary research groups to convert the promise offered by new materials into commercial reality.

Thanks to the RSE, David was able to collaborate with the Aerospace Engineering Department at the University of Michigan to explore the possibilities of using nano-materials in composition with other materials for the purposes of building self-sensing structures, which are capable of self-control in terms of their dynamic and vibratory behaviour. The investigation steps on the advances and the available knowledge in the area of smart composites and shape memory alloys and their capabilities as vibratory sensors and actuators; and develops and advances this knowledge for nano-composites, taking into account their dramatic enhancement properties. Fruitful results have been obtained and David has started to write a paper in collaboration with the research group at The University of Michigan for possible publication in the *Journal of Smart Materials and Structures*. This collaboration has established a strong connection with one of the greatest research group in the field and future collaborations for further development of the analysis are guaranteed.

Shahid Naseer,
University of Glasgow
Visited: Harvard-MIT Health Sciences & Technology, Massachusetts Institute of Technology.

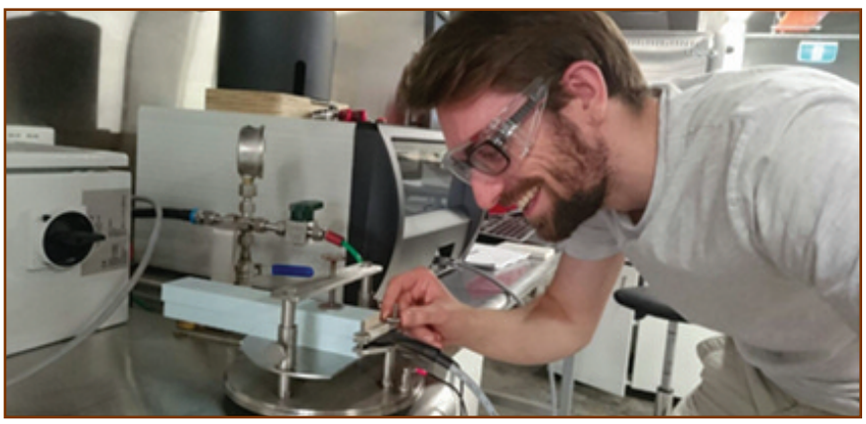
Project: *3D Micro-Organisation of Cardiac Muscle Cells in Gelma Using Surface Acoustic Waves*

The visit to MIT and HMS was an invaluable experience to Shahid Naseer's PhD research and future career. From the visit, Shahid received useful feedback from leading academics and experienced engineers on how to improve his work. Extensive research and industrial links were also developed. The visit also facilitated collaborations between the University of Glasgow and Harvard University, and led to the publication of a journal paper.

JM Lessells Travel Scholarships in Engineering

Martyn McLaggan,
University of Edinburgh (pictured below while on visit)
Visited: Department of Civil Engineering, University of Queensland, Australia

Project: *Prevention of fire spread through walls containing novel phase change materials*



The John Moyes Lessells Scholarship enabled Martyn to visit the School of Civil Engineering at the University of Queensland. This was part of a project which involves the development of bespoke fire test methods for innovative materials which do not behave in the same manner as traditional materials during a fire. During the Scholarship, a method was developed to experimentally determine accurate thermal properties so that the heat transfer through walls can be more precisely predicted. This, in turn, can be used to quantify the potential for fire spread, and allows designers to mitigate the potential fire risk. This work was done under the supervision of world-leading fire expert and Fellow of the RSE, Professor José Torero. The Scholarship has also initiated joint seminars and will host a research meeting between the students of the two groups to disseminate findings and promote future collaboration.

Maggie Creed, University of Edinburgh
Visited: Faculty of Engineering, Computing and Mathematics, University of Western Australia.

Project: *Modelling the Environmental Impact of Tidal Stream Turbines*

The Scholarship provided Maggie Creed, a 3rd-year PhD student, the opportunity to broaden her horizons while working to investigate depth-averaged shallow water flow through a very porous obstacle in a uniform channel; with Dr Scott Draper, in the industry-focused Centre for Offshore Foundation Systems at UWA, Australia, in late 2014. The aim of this study was to improve the understanding of the hydrodynamics of the wake behind a very porous obstacle, an area of interest for a variety of physical situations and engineering applications, including: flow through a tidal stream turbine or array of turbines; flow around a group of offshore piles or a group of small islands; flow through aquatic vegetation such as reeds; and coastal or river bed vegetation and urban flood flows, where the porous obstacle represents a group of buildings.

Robert Cormack Bequest Fund

In 1942, the RSE received the estate of Mr Robert Cormack and was directed to administer this Bequest for the purpose of promoting astronomical knowledge and research in Scotland.

Each year, the Cormack Committee awards six undergraduate vacation scholarships and an undergraduate and a postgraduate research prize. The Committee also awards small research grants on an *ad hoc* basis for new projects in astronomy which will benefit the public understanding of science, and astronomy in particular.

In addition, a Cormack Bequest Meeting is held annually for the Scottish Astronomy community to gather and share, via talks and posters, some of the very wide range of astronomy research being conducted in Scotland.

This event is now supported by the Scottish Universities Physics Alliance (SUPA). Every second year, the event concludes with the Cormack Lecture, which will next take place in 2016.

This year, at the Meeting, the Undergraduate Award was presented to Amy Rankine, University of St Andrews, and the Postgraduate Prize went to Jovan Veljanoski, who then spoke about his research in his talk on *The Outer Halo Globular Cluster System of M31: Clues to Galaxy Formation.*

Amy and Jovan are pictured at the meeting being presented with their awards by Professor Andy Lawrence FRSE, Regius Professor of Astronomy, University of Edinburgh and a member of the Cormack Committee.

More details are available online at: www.royalsoced.org.uk/562_ScienceFunding.html

RSE Young Academy of Scotland

2020 Vision

The RSE Young Academy of Scotland (YAS) has launched its first five-year Strategic Plan, 2020 Vision. The plan was produced with the input of YAS's interdisciplinary membership and identifies six core societal themes which will direct its future activities: Healthier; Smarter; Enterprising; Sustainable; Equal; and International.

Strategy Group Lead and current Co-Chair Karly Kehoe said: "YAS is at a point where its members are ready to take the next step. We want to find ways of sharing our expertise for the common good. The six themes were unanimously endorsed by the membership and give us a powerful focus for the future. It's a really exciting time for all of us."

YAS also commissioned a short video which outlines 2020 Vision and showcases its members' work. The Strategic Plan and its accompanying video can be found at: www.youngacademyofscotland.org.uk/about/2020-vision.html

Connecting Scotland's Entrepreneurial Network

On the evening of 6 October 2015, over 80 entrepreneurs from across Scotland gathered for the second annual 'Connecting Scotland's Entrepreneurial Network' event. The event brought together entrepreneurs from across Scotland, allowing them to network and showcase their business propositions.

Edward Cunningham OBE FRSE chaired the event, which was supported by the RSE Enterprise Fellowships Programme with additional funding from the RSE Young Academy of Scotland, Converge Challenge and Interface. The focus of the evening was linking talent across the organisations, providing an opportunity for budding entrepreneurs to practise their business pitches and stimulating discussion around issues faced by start-up and spin-out companies. Entrepreneurs benefited from the diversity of other participants from varied backgrounds covering technology, life sciences, business, finance, retail and food and drink.

There was opportunity for 27 entrepreneurs to pitch their businesses and a panel of industry experts assessed each pitch and awarded prizes. Two first-place prizes were given to Simon Greenway of Rigs Pigz and Caroline Barelle of Elasmogen Ltd. Kara Nisbet of Articulate Language Camps was awarded second place. The prizes were kindly donated by *M2 Lasers* and Converge Challenge.

Members of the YAS Strategy Group (right) present 2020 Vision (l–r) Dr Sinead Rhodes, Des Balmforth, Dr Karly Kehoe and Neil McLennan

Pictured (right) at Entrpreneurial Network evening: (l–r) Elizabeth Fairley (RSE YAS), Kara Nisbet (Articulate Language Schools), Simon Greenway (Rigs Pigz), Caroline Barelle (Elasmogen Ltd), Edward Cunningham OBE FRSE, Anne Fraser (RSE Research Awards Manager), Marie Montondo (RSE Communications & Executive Assistant YAS)

Rewrite the Headlines

The YAS Working Group behind the *Research the Headlines* blog launched a new competition in September, *Rewrite the Headlines*, to encourage young people to evaluate how the latest research findings become headline news.

YAS researchers and professionals hosted workshops in primary schools across Scotland to help children understand how research becomes headline news. These workshops explored recent examples of research which have been reported in the media, highlighting good reporting as well as showing where inaccuracies can sneak in.

After the workshops, pupils were asked to find their own media report of research, and give it a new headline. The school with the best headline will win books or technology of their choice up to the value of £1000. The competition ran until 30 November 2015, and prizes will be announced at an event in January 2016.

Dr Sinead Rhodes, Co-Chair of *Research the Headlines,* is pictured delivering a *Rewrite the Headlines* workshop at Sandaig Primary School in Glasgow.

Dr Rhodes said, "Often, the general public aren't able to access the research findings on which many of the headlines that might affect their lives are based. We want to use our new competition to remind students they can, and should, always be critical consumers of information".

Undergraduate students were also invited to participate in the competition; their task was to write a blog post very similar to those the Young Academy publishes.

Details of both the primary schools and undergraduate competitions can be found at the *Research the Headlines* blog, www.researchtheheadlines.org

Talking Aspiration with Ian Rankin

Radio Edutalk, a teaching and learning resource for Scottish parents and teachers, has featured YAS member Neil McLennan and Ian Rankin OBE FRSE in an episode about YAS's #AspirationalAdvice campaign. The campaign, which ran from January to June this year, encouraged people across all sectors of Scottish society to provide a piece of advice for young people to help them aim high, dream big, lift their aspirations and achieve their hopes and goals.

In the episode, which aired on Tuesday 20 October, Neil and Ian discuss literacy, education and attainment, and how to inspire the next generation. The episode is available to listen to at: www.edutalk.info

Ian Rankin (right) offers his #AspirationalAdvice to young people:
"Creating keeps us human! Keep creating."

For more information on these projects and other YAS activites, please visit the website: www.youngacademyofscotland.org.uk

RSE Christmas 2015 – a lecture with a difference ...

When news broke that Minecraft legend Stampy Cat (aka Joseph Garrett) was coming to the Caird Hall in Dundee to deliver the RSE Christmas Lecture 2015, over 500 excited fans queued for the coveted tickets; some from as early as 5.20 am. Such was the interest that the event sold out within a few hours.

Stampy Cat is Garrett's Minecraft character who shot to fame when Garrett began posting videos of himself building virtual worlds in Minecraft. Today, Stampy is one of the most successful YouTube stars. His channel has more than 6.7 million subscribers, mostly pre-teen, who watch his videos to gain tips and inspiration for their own Minecraft creations.

The RSE hosts an educational Christmas Lecture every year; however, this event was bigger than anything that has gone before. Around 2,000 local school children attended the day-time event on Monday 30 November at the Caird Hall, during which Stampy gave insights into how he makes his videos and what it takes to be a successful YouTuber. Stampy also created a brand new Minecraft adventure episode live on stage. The evening event held at the same venue allowed a further 2,000 fans to witness Stampy in action.

The RSE aims to appeal to a wide range of ages and audiences and to make learning accessible and interesting for all. This year's Christmas Lecture was a truly inspiring event which illustrated the power that gaming has to engage young people with technology, creativity, collaborative working and much more.

Stampy is pictured on stage with Professor Chris Van der Kuyl FRSE, Convener of the RSE Young People's Committee, who was hugely instrumental in bringing Stampy to Dundee and in helping to organise the event.

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ADDRESS
22–26 GEORGE STREET
EDINBURGH, SCOTLAND
EH2 2PQ

INFORMATION
website: www.royalsoced.org.uk
www.rsescotlandfoundation.org.uk
e-mail: rse@royalsoced.org.uk
Tel: 0131 240 5000
Fax: 0131 240 5024
Events ticketline: 0131 240 2780

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