



# Annual Report Adroddiad Blynyddol

2010–2011

Activities • Policy • Education • The year ahead  
Gweithgareddau • Polisi • Addysg • Y flwyddyn i ddod

*“The Institute in Wales’ grant scheme is designed to give financial support of up to £1000 to individuals and organisations running physics-based events and activities in Wales.”*

**Cover images (top to bottom):** a stellar field with nebulae, (credit iStock); the sign for the “Pipeline PIG” challenge at the National Eisteddfod of Wales; the national officer at a previous National Eisteddfod of Wales; Rubens’ tube at the ninth Annual Welsh Physics Teachers Conference; Gruffudd Antur, winner of the Goronwy Jones prize; the Brecon Beacons; Senedd, National Assembly for Wales.

## Activities

The lecture programme and event calendar of the Institute of Physics in Wales (IOPW) continues to expand. Prof. Geraint Vaughan gave a topical lecture on “The ash cloud of the Eyjafjallajökull volcano” at Aberystwyth University in a joint IOPW/RSC lecture. A lecture on “The Large Hadron Collider at CERN” was given by Prof. Lyn Evans at Swansea University, which was the annual joint IET Wales South West Network and IOPW lecture. More than 350 people attended this lecture and the topic proved to be popular with physicists and engineers alike. Following the participation of the Physics Buskers from Aberystwyth University at the Wrexham Science Festival last year IOPW continued its involvement with the festival by holding the first conference for all who teach physics at Glyndŵr University and by sponsoring a talk by Dr Mark Lewney entitled “Rock guitar in 11 dimensions”. More than 130 people aged 10 and over came along to this informative and entertaining show for an interactive look at the physics of rock guitar.

The Goronwy Jones prize is the only physics prize awarded directly by the Institute of Physics in Wales. It was introduced by the then south Wales branch of the Institute and named after John Goronwy Jones (1920–1999) in recognition of the contribution that he made to physics education in south Wales and, indeed, throughout the UK. The Goronwy Jones prize is currently £300 and is awarded on an annual basis to the top-scoring A-level candidate in physics (WJEC). Our hope is that it will continue to serve the purposes for which it was introduced, namely to promote excellence in the study of A-level physics, and to recognise the contribution made by Jones to both physics education and the Institute of Physics in Wales. Last year the winner was Gruffudd Antur, former head boy of Ysgol y Berwyn, Bala. We are pleased that he is continuing his studies in physics at Aberystwyth University.

A number of physicists contributed to the success of The Big Bang Cymru on 12 July 2011 at the National Waterfront Museum, Swansea, by judging the competition entries or by demonstrating a number of interactive computer games. Students and teachers were given a leaflet that listed the games and explained how to access them online at [www.physics.org/facts.asp](http://www.physics.org/facts.asp) and [www.iop.org/simphysics](http://www.iop.org/simphysics).

This year saw the formation of the Joint Institution Forum (JIF) in north Wales. The forum consists of representatives from five institutions: IOP, ICE, IET, IMechE and the NI. One of the aims of JIF is to give the STEM community in north Wales an opportunity to collaborate on joint events. The first event was the JIF stand at The National Eisteddfod of Wales, Wrexham

and District this August. The joint stand was a great success and there were teams competing throughout the week in the “Pipeline PIG” challenge.

The Institute of Physics in Wales’ grant scheme is designed to give financial support of up to £1000 to individuals and organisations running physics-based events and activities in Wales. The main criterion for the awarding of a grant is the benefit of a project/event to Wales. In the past requests had been received and allocated on an ad hoc basis. However, there is now a formal mechanism for applying for funding with the scheme advertised on [www.iopwales.org/activities/public/](http://www.iopwales.org/activities/public/). In the first round IOPW awarded the first such grant of £600 to Cymdeithas Wyddonol Cylch Caerdydd to support science engagement in a variety of ways.

## Policy

IOPW launched its manifesto for physics in the run up to the recent National Assembly for Wales election. Politics moved centre stage with a determined campaign that involved the Institute contacting all candidates with details of the key concerns for physics. Physics-based innovation is part of the solution to many of the big issues of our time, particularly economic renewal and sustainability in energy. Physics-based sectors in Wales account for (based on 2005 figures) 50 000 jobs (4.4% of the workforce) and 10% of GVA (£4.1 bn contributed to the economy). The campaign was supported by our members who distributed postcards to the candidates.

IOPW submitted evidence to the National Assembly for Wales Enterprise and Learning Committee’s inquiry into the STEM Agenda in November 2010. The committee published their report in January 2011. It highlighted a number of issues and listed a number of recommendations. IOPW inquiry and consultation submissions can be found at [www.iopwales.org/policy/consultations/](http://www.iopwales.org/policy/consultations/).

The national officer is a member of cydSTEM, which is an alliance of organisations that promote science, technology, engineering and mathematics (STEM) across Wales. Communication and networking within cydSTEM enables the exchange of information and the highlighting of current issues furthering the cross-fertilisation of ideas, and enabling the individual member organisations to be aware of broader policy discussions.

This year’s Science and the Assembly event was held in the Pierhead Building in Cardiff on 24 May 2011. The presentations were based on themes heralded by the United Nations International Year of Chemistry, such as climate change, energy, food, water and health.

IOPW is a key member of the National Assembly for Wales Cross-Party Group on Science and Technology.

## Education

The three teacher co-ordinators of IOPW provided effective support for teachers throughout Wales with numerous events. Teacher visits to the medical physics department of the University of Wales Hospital in Cardiff, twilight workshops and conferences for those who teach physics have contributed to teacher understanding and confidence.

The ninth Annual Welsh Physics Teachers Conference was held in October at Christ College, Brecon, with more than 100 attendees. The day was full of workshops and included the keynote presentation on the Bloodhound SSC. The workshops included “Lights Cameras Images”, “Physics and Toys” and “Waves on Custard and Dancing Flames”. In north Wales, the fourth annual Teacher’s Conference for all who Teach Physics was held at Bangor University in June. There were more than 100 people attending with 47 physics teachers and 34 PGCE students. It featured Dr Lyn Evans speaking on “Back to the Big Bang, the Large Hadron Collider” and Prof. Dame Athene Donald DBE FRS speaking on “Physics at the Interface with Biology”. The workshops included “Physics of Computer Games” and “How to Get More Girls into Physics”. Some people left with wind turbines, others with a “Joule thief” and yet more with knowledge of using multimillion-pound robotic telescopes.

More than 600 people attended the BBC Stargazing Live events organised across Wales by Andrea Fesmer, Cerian Angharad, Gary Williams, Angharad Thomas and David Grace of the Institute of Physics. The four locations were Glyndŵr University; Christ College, Brecon; the University of Glamorgan; and the National Botanic Garden of Wales. Despite the rain, fog and cloudy skies preventing live astronomy observations, the audiences were treated to a variety of activities, including presentations on navigating the night sky, an inflatable planetarium and a display of meteorites. A wide range of resources were available from the BBC, IOP and STFC. The feedback was overwhelmingly positive, including comments such as, “Some fantastic ideas I can take into school with me. Diolch yn fawr,” and “Very interesting, loved it! Hope they do one again!”.

As part of the National Science Academy, IOPW worked with Careers Wales Cardiff and Vale to organise a one-day seminar on “Diversity in STEM Education: Gender” at ACE2, RWE npower’s Centre for Energy

and Environment. The seminar’s objective was to encourage the development of gender-awareness skills in the teaching of science, especially physics and technology. Twenty eight teachers from schools in south Wales attended the event. They were introduced to findings from recent educational research, and used case studies and activities to encourage gender-aware teaching practices.

This year saw the Stimulating Physics in Wales initiative come to an end. This initiative began in August 2008 and was funded by the Higher Education Funding Council for Wales and managed by the Institute of Physics. The initiative consisted of six strands, which covered a broad range. Some strands were concerned with demonstrating the application of physics, both in industry and by providing an enterprise activity within a physics context. Others were closer to the classroom, supporting non-specialist teachers, and looking at the bridge between A-level and degree-level. Further information can be found at [www.stimulatingphysics.org/wales](http://www.stimulatingphysics.org/wales). The provision of Ashfield Music Festival (the enterprise activity) to all schools in Wales and through the medium of Welsh (apart from the videos) brought the initiative to an end. A document has also been published explaining how the activity can be used to demonstrate working towards, or the achievement of, certain Essential Skills Wales criteria, and produce evidence that can contribute to the pupils’ key skills portfolios ([www.iopwales.org/news/11/file\\_49547.pdf](http://www.iopwales.org/news/11/file_49547.pdf)).

## Members

Approximately 3% of the overall membership of IOP are members of IOPW. More than 70 schools in Wales are part of the Institute’s Affiliated Schools and Colleges programme. Visits by the national officer to all higher-education physics departments in Wales to promote the free student membership of the Institute attracted nearly 400 student members at Welsh universities.

## Capability

The Institute employs one full-time member of staff to work exclusively on Welsh issues and there are three part-time teacher network co-ordinators in Wales.

There is an IOPW committee which meets once every term via video-conferencing and a number of IOPW members represent Wales on the IOP boards.

*“More than 600 people attended the BBC Stargazing Live events organised across Wales.”*

## Looking ahead

This year the Institute will work with the higher-education institutions in Wales in a comprehensive survey of graduate employment history and acquired skills. Joint activities with other organisations are also planned to increase the number of physics-related events across Wales.

### Events

#### 5 October 2011: 5 Hydref 2011

10th Annual Welsh Physics Teachers Conference – a conference for teachers and technicians  
10fed Gynhadledd Flynnyddol Athrawon Ffiseg Cymru – cynhadledd i athrawon a thechnegwyr  
Christ College, Brecon – Coleg Crist, Aberhonddu  
[www.eventsforce.net/iop/190/home](http://www.eventsforce.net/iop/190/home)

#### 20 October 2011: 20 Hydref 2011

The first Institute of Physics in Wales and Cardiff University annual joint lecture  
**The Antikythera Mechanism Decoded**  
Prof. Mike Edmunds, School of Physics & Astronomy, Cardiff University and Antikythera Mechanism Research Project  
The Wallace Lecture Theatre, Main Building, Cardiff University

Reception at 6.00 p.m. in the foyer with the lecture beginning at 6.30 p.m.

#### Autumn term 2011: Tymor yr hydref 2011

Institute of Physics in Wales and Aberystwyth University joint lecture  
**Taming Schrödinger's Cat**  
Dr Daniel Burgarth, Institute of Mathematics and Physics, Aberystwyth University

#### 10 November 2011: 10 Tachwedd 2011

IET Wales South West Network and Institute of Physics in Wales annual joint lecture  
**Radar – Old and New**  
An occasion to mark the centenary of the birth of EG Bowen of Swansea who is internationally recognised as the 'Father of Airborne Radar'  
Faraday Lecture Theatre, Swansea University  
7.00 p.m. with light refreshments after lecture

#### 6 December 2011: 6 Rhagfyr 2011

Schools and Colleges Lecture Tour  
**From X-rays to Antimatter: the Science of Seeing Inside your Body**  
Swansea University

#### 14 December 2011: 14 Rhagfyr 2011

Schools and Colleges Lecture Tour  
**From X-rays to Antimatter: the Science of Seeing Inside your Body**  
Cardiff University

#### 19 June 2012: 19 Mehefin 2012

**A teacher's conference for all who teach physics**  
Trefenai, The College of Education and Lifelong Learning, Bangor University

For more information about these and other events go to [www.iopwales.org/events](http://www.iopwales.org/events).

The Institute of Physics is a leading scientific society promoting physics and bringing physicists together for the benefit of all. It has a worldwide membership of around 40 000 comprising physicists from all sectors, as well as those with an interest in physics. It works to advance physics research, application and education, and engages with policy makers and the public to develop awareness and understanding of physics. Its publishing company, IOP Publishing, is a world leader in professional scientific communications.

The Institute of Physics in Wales has more than 1000 members and is part of the Institute of Physics. It aims to promote the role of physics in society, covering education, health, the environment and technology. Its membership is wide-ranging and multidisciplinary, including the educational, industrial, medical and general public sectors. The Institute seeks common purpose with other organisations to promote science and science-based learning and to influence science policy. Special emphasis is placed on supporting physics teachers by promoting in our schools the value, joy and benefits of a knowledge of physics and its applications.

Mae'r Sefydliad Ffiseg yn gymdeithas wyddonol flaenllaw sy'n hyrwyddo ffiseg ac sy'n dod â ffisegwyr ynghyd er budd pawb. Mae gan y Sefydliad oddeutu 40 000 o aelodau o bob cwr o'r byd, sy'n cynnwys ffisegwyr o bob sector yn ogystal ag unigolion sydd â diddordeb mewn ffiseg. Mae'r Sefydliad yn ceisio hybu ymchwil ym maes ffiseg, hybu'r defnydd a wneir o ffiseg a hybu addysg yn ymwneud â ffiseg; ac mae hefyd yn ymgysylltu â llunwyr polisi a'r cyhoedd i ddatblygu ymwybyddiaeth a dealltwriaeth o ffiseg. Mae cwmni cyhoeddi'r Sefydliad Ffiseg, IOP Publishing, ymysg y gorau yn y byd ym maes cyfathrebu gwyddonol proffesiynol.

Mae gan y Sefydliad Ffiseg yng Nghymru dros 1000 o aelodau, ac mae'n rhan o'r Sefydliad Ffiseg. Ei nod yw hyrwyddo rôl ffiseg yn y gymdeithas, ym maes addysg, iechyd, yr amgylchedd a thechnoleg, er enghraifft. Mae ystod eang o unigolion o wahanol ddisgyblaethau'n aelodau o'r Sefydliad, gan gynnwys unigolion o'r sector addysg, y sector diwydiannol a'r sector meddygol, ac unigolion o blith y cyhoedd. Mae'r Sefydliad yn chwilio am ddiben sy'n gyffredin rhyngddo a sefydliadau eraill er mwyn hybu gwyddoniaeth a dysgu sy'n seiliedig ar wyddoniaeth a chyfrannu at bolisi sy'n ymwneud â gwyddoniaeth. Rhoddir pwyslais arbennig ar gynorthwyo athrawon ffiseg trwy hybu yn ein hysgolion y gwerth, y plaser a'r manteision sy'n deillio o wybodaeth am ffiseg a'r defnydd a wneir o ffiseg.

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