

Institute of Physics in Ireland | April 2018

# Annual Report

IOP Ireland activities March 2017 – March 2018





**Cover image:**  
James Soper at the Physics of  
the Circus Tyndall Lecture.

The Institute of Physics has been at the heart of the physics community in Ireland throughout the year. Our members have been driving involvement across public engagement, gender issues, research funding and membership of international instruments. In the past year, more than 159,000 people have engaged with physics at 90 events across the island. This would not be possible without the high energy, enthusiasm and passion for physics that our volunteers bring. Many thanks!

### Engaging

Working with a range of organisations, the Institute supported a number of highly innovative activities such as Voice of Young Science Workshops, SciFest, Schools Formula 1 Racing, Dublin Maker, the Irish Science Teachers Association student quiz, the Robert Boyle Summer School in Lismore and air-pollution monitoring in schools, to name but a few. A key part of physics outreach in Ireland is the Physics Busking project. The troupe of 45 buskers, volunteered 174 days in 14 venues across Ireland including, Derry, Belfast, Dublin, Limerick, Waterford, Mallow, Galway and Tullamore. with an audience reach of ~124,000. The project, which is jointly organised by the CASTeL group at DCU and IOP, is supported by a grant from the SFI Discover Science and Engineering programme.

Expertise in informal physics learning in Ireland is being recognised across Europe with five Irish physicists taking part in the H2020 Doing it Together science bus project. Eight Irish teachers took part in the European-wide 2017 Science on Stage festival in Debrecen, Hungary, bringing back many new ideas for teaching physics using everyday items. They have been sharing these at workshops across Ireland. In addition, Paul Nugent, IOP Teacher Network Co-ordinator, was elected to the executive board of Science on Stage Europe.

The IOPI stand at the BT Young Scientist Exhibition was a particular highlight with around 15,000 visitors exploring some fun physics with IOPI's custom-made diffraction glasses. Volunteers from the Irish Association of Physicists in Medicine brought a selection of hands-on demos to the stand while colleagues from NUI Galway and Dublin City University brought equipment that had been purchased using the IOP Walton Fund. These included a Quantum Levitation Maglev kit and laser beam demos.

Awareness of industry links and careers in physics was a key issue with the IOP working at events throughout Ireland, distributing copies of its publication, *28 Days*, *28 Physicists* at careers fairs in Dublin, Galway, Cavan and Belfast. The materials were also made available to schools and colleges across Ireland on request. More than 300 students from across Northern Ireland were given the opportunity to explore apprenticeships and technical careers at the IOP's first Technical Careers Fair held at Belfast Metropolitan College in October.

IOP Ireland was closely involved in the fourth annual Northern Ireland Science Festival with more than 180 events running over 11 days in February 2018. The festival featured an eclectic mix of art, drama, comedy, debates and history all infused with science. A particular physics highlight in the festival was Entangled. This event celebrated the work of renowned Belfast physicist, John Bell, through a specially commissioned musical composition for a string quartet combined with film and a lecture on quantum computing.



Students at the Technical Careers Fair.



## Educating

The five teacher network co-ordinators in IOPI have provided tremendous support for hundreds of teachers throughout the island with many talks and workshops. These include What Happens Next, Physics in Action, Shocked and Stunned, Virtual Lab, Lights, Camera Images, Playful Physics, Rocket Launching and Physics@work events. Regular newsletters have been produced and exam papers reviewed. Much of this work has been done in conjunction with the Professional Development Service for Teachers, the Northern Ireland Department of Education as well as with the Irish Science Teachers Association.

More than 130 gathered in the University of Limerick in September 2017 for the 17th annual Frontiers of Physics teachers conference. The programme included talks from international speakers and workshops and activities such as My Bike is a Physics Expert and Superhero Science.

The teacher network co-ordinators also contributed physics demonstrations to many other events around the country, including the Galway Science and Technology Festival. They also worked closely with the Irish Science Teachers Association and the Association for Science Education to provide support, particularly for newly qualified teachers and non-specialist physics teachers.

This year's Tyndall Schools' lecture tour was the Physics of the Circus given by James Soper. This highly entertaining talk was delivered in nine venues across Ireland with around 2,500 students attending.

The IOPI academic lecture programme included speakers on stellar clusters, pulsars, gravitational waves and photonics who gave talks across Ireland. The 2017 Spring Meeting was held in Dublin with the theme Physics and Life. The event combined academic talks on biophysics, the use of physics in everyday life, unconscious bias in the science community and true-life tales, as well as the Rosse Medal competition for postgraduate physics communication.

The annual Spring Meeting 2018 was planned for Limerick with the theme Sensing the Universe.

## Rewarding

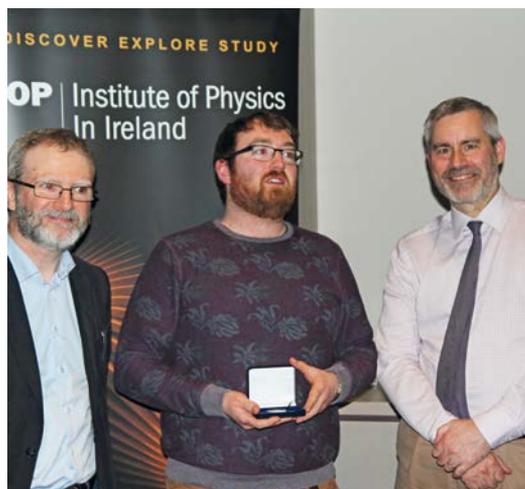
Excellence in physics at all levels was highlighted through the Institute's medals and awards.

The top physics award at the 2018 BT Young Scientist, which is sponsored by IOP, was won by Dónal Close and Siân Donaghy of Loreto College Coleraine for their project 'Water Bridges'. They were presented with the award by the 2017 winner of the IOPI Rosse Medal for physics communication, Cian McKeown of the University of Limerick.

Maxime Gadioux, Coláiste Einde, Salthill, Galway and Oisín McEnroe, Blackrock College, Dublin were awarded the prize for the 2017 top Leaving Certificate physics performance while Angus Harley, Royal Belfast Academical Institution won the equivalent award for N. Ireland A-level physics.

Anton Feeney-Johansson of Trinity College Dublin won the Earnshaw Award for best final-year undergraduate project, while Orla Condren of Dominican College, Sion Hill, Dublin, was named Irish Physics Teacher of the Year at IOP's annual award ceremony in London.

Last year, IOPI introduced its school award for physics, in which schools may nominate up to two students to receive a special certificate for physics performance and are included on the roll of honour on the IOPI website. The award has proved popular with 102 students being honoured in 2017.



Left to right: Mark Lang and Cian McKeown, winner of the Rosse Medal, with Prof. Paul Hardaker at the 2017 Spring Meeting.

## Images (left to right):

Cian McKeown presenting the top physics award at BT Young Scientist to Dónal Close and Siân Donaghy; Visitors at the IOP Ireland stand at BT Young Scientist; Aurea string quartet playing at Entangled event; Physics busking team; Prof. Winfried Hensinger giving the John Bell lecture; David Keenahan demonstrating some physics at the Frontiers teachers conference.

## Influencing

The Institute contributed to consultations on a range of issues affecting physics including the Education Authority in Northern Ireland and pre-budget submissions to the Department of Business, Enterprise and Innovation. There was an emphasis on the need for enhanced and sustained funding for basic research and measures to address the shortage of physics teachers in Ireland. A particular highlight of the year was the announcement in October 2017 that Ireland would join the European Southern Observatory in 2018. This welcome news comes after a long campaign from the astrophysics community in Ireland – and telling advocacy from the IOP. The Institute is continuing with its drive to see Ireland also join CERN.

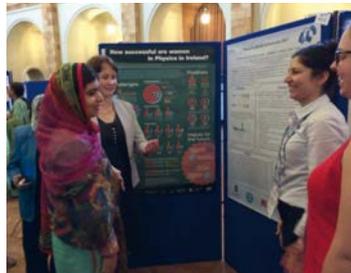
In 2017 there was a small decrease in the number of students taking the Leaving Certificate physics course after steady rises over the previous five years; 13.0% of the total leaving certificate cohort of 58543 compared with 13.3% in 2016 and 12% in 2009. The number of girls taking the subject remains stubbornly low at just a quarter of the group. IOP and Dublin City University is seeking to redress this through a pilot project funded by Science Foundation Ireland.

The Improving Gender Balance project will work with six schools using a whole-school approach, which is also being trialed in Scotland and England. Gender was also a key issue with the Ireland team led by Yvonne Kavanagh presenting a poster at the International Conference on Women in Physics (ICWIP) in Birmingham, and at an IOP seminar at the GIREP-ICPE-EPEC conference on physics education at Dublin City University, organised by Eilish McLoughlin and Paul van Kampen.

The IOP in Ireland continued to work closely with organisations such as the Royal Irish Academy, Engineers Ireland, the Institution of Engineering and Technology, Royal Dublin Society and the Royal Society of Chemistry to highlight many issues of common interest particularly in relation to uptake of science at school level and the funding of research. The IOPI has had a number of meetings with politicians, ministers and senior civil servants on both sides of the Irish border to both raise concerns and to offer help in implementing possible solutions.

In the upcoming year, IOP Ireland will continue to work closely with its members, teachers, academics, government and business to promote physics and support physicists.

**Image clockwise:** Maxime Gadioux, Coláiste Einde, Salthill, Galway and Oisín McEnroe, Blackrock College, winners of the top Leaving Certificate physics award; Angus Harley, winner of the top NI A-level award; Anton Feeney-Johansson winner of the Earnshaw Award with Prof. David Riley; Family fun with bubbles; Science on Stage team at Debrecen meeting; GIREP Women in Physics Symposium participants, Eilish McLoughlin (DCU), Hideo Nitta (Tokyo Gakugei University Japan); Silvina Ponce Dawson (Universidad de Buenos Aires), Yvonne Kavanagh (IT Carlow), Miriam Byrne (NUI Galway), Charles Tracy (IOP), Sheila Gilheany (IOP), Cait MacPhee (University of Edinburgh); Nobel Peace Prize winner, Malala Yousafza, visiting the Ireland team poster at the ICWIP conference.



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