



TUAIRISC BHLIANTÚIL | 2012 | ANNUAL REPORT

Institiúid Ard-Léinn
Bhaile Átha Cliath

Dublin Institute for
Advanced Studies

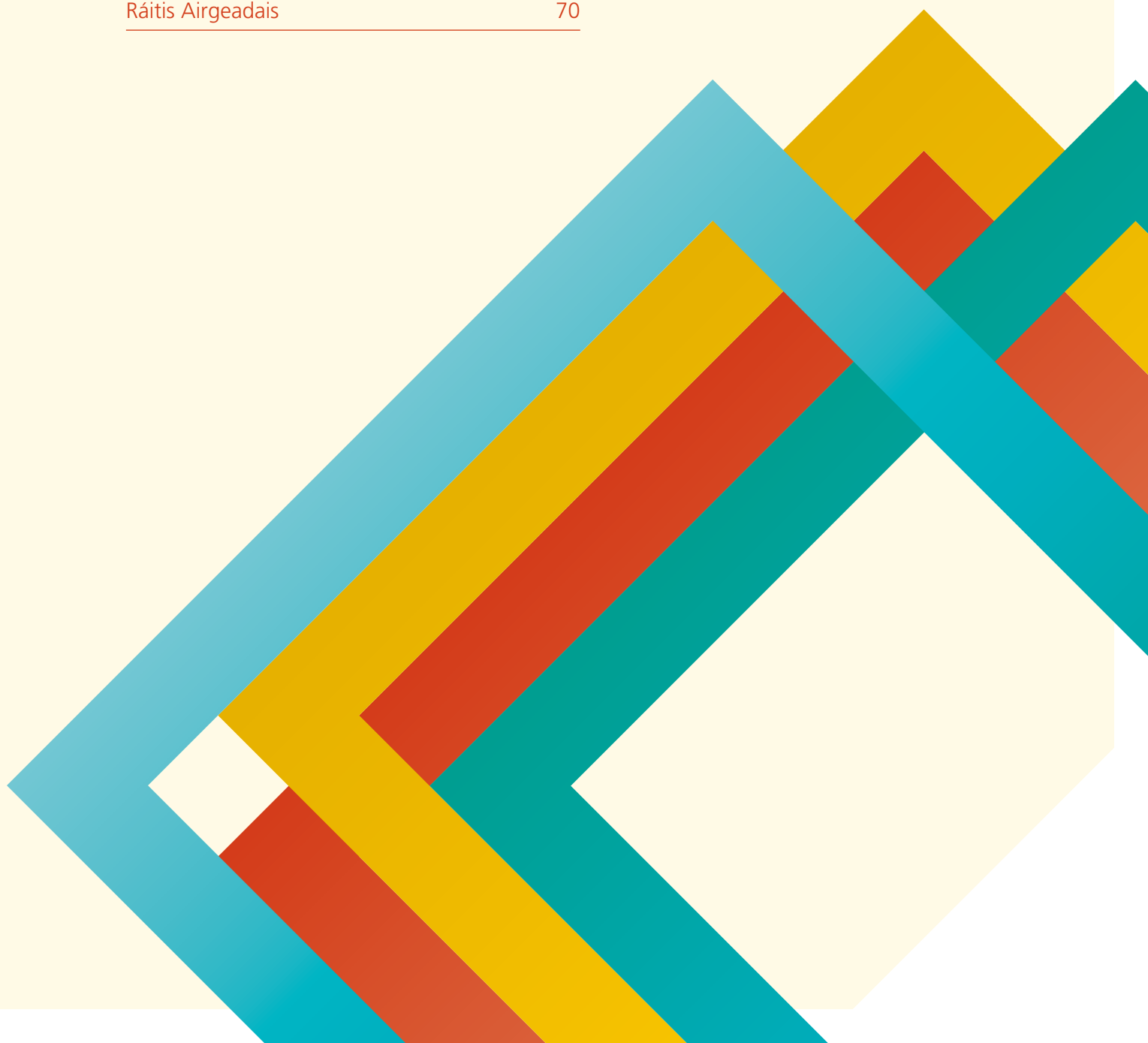


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Chairman's Statement

The Dublin Institute for Advanced Studies (DIAS) is dedicated to the pursuit of advanced fundamental research in physics and Celtic studies. The focus of its work is on the creation of new knowledge, advanced training and the dissemination of this knowledge for the benefit of the wider academic community. DIAS makes a significant contribution to the development of the specialised areas of research which are the subject of study in its three constituent schools. This summary report gives a general account, for each School, of the main research developments that took place during 2012. More detailed information on the research activities of the Schools can be found in their respective annual Research Reports.

DIAS published a new Strategy Statement during the year which sets out key institutional priorities as well as an exciting programme of research activities for each of the three Schools for the period 2012-2016. It was opportune that the new Strategy Statement was being developed at a time when discussion was taking place at the national level about the reconfiguration of the higher education system. Participation in the process of strategic dialogue about a new higher education landscape helped to identify the key priorities for DIAS in restructuring and reorienting itself to maximise its contribution to the national research system. The main focus for DIAS is to continue to be a key force for excellence in fundamental research nationally and internationally. DIAS is already well connected at the international level but needs to strengthen links at the national level with the development of new models of collaborative research. DIAS has already signed co-operative



agreements with UCD and DCU and discussions have taken place with TCD. DIAS will work to forge links with other national and international research groups. In the current economic climate it is important to diversify sources of research funding and one of the measures taken during the year in pursuit of this was the establishment of the Friends of DIAS with a view to supplementing government funding with funds from philanthropic sources. I look forward to working with the foundation to support and promote the work of DIAS. Ensuring quality and excellence of research remains a key priority and arrangements are already being made for the next external review in 2014.

It was another year of productive research for each of the three Schools. The School of Cosmic Physics completed work on a number of key projects during the year. It was a great sense of achievement for researchers in the School, when the MIRI (Mid Infra Red Instrument) that they had been involved in developing for the new James Webb Telescope, was declared ready by ESA and NASA for delivery to NASA's Goddard Space Flight Center. The instrument is a pioneering camera and spectrometer, so sensitive it could see a candle on one of Jupiter's moons. Another School-led initiative involving the development of a shared e-infrastructure, under the e-INIS project, has significantly advanced both the capability and capacity of the ICT infrastructure available to Irish researchers and international collaborators. *The management of the e-INIS resource is now being managed by the Irish Centre for High End Computing.* The Geophysics section made significant progress with research exploring alternative sustainable energy sources, initiating fieldwork on the geothermal energy project IRETherm (www.iretherm.ie). A paper by the Head of the Section, A.G. Jones, on exciting new research looking at a new model for estimating water in the Earth's mantle was highlighted earlier in the year in the American Geophysical Union Journal "Geochemistry, Geophysics, Geosystems". The All-Ireland virtual graduate school, the Irish Geoscience Graduate Programme (www.igpp.ie), that is led by DIAS and with Jones as its Director, grew and expanded yet further during 2012 with now some 24 Short Course modules available, of which DIAS is providing 13.

Chairman of Council, Dr. Vincent Cunnane.

Cathaoirleach na Comhairle, An Dr. Vincent Cunnane.

Ráiteas an Chathaoirligh

Tá Institiúid Ard-Léinn Bhaile Átha Cliath (DIAS) tiomanta don ard-bhuntaighde sa Físic agus sa Léann Ceilteach. Díríonn an obair seo ar eolas nua a chruthú, ardoiliúint agus scaipeadh an eolais seo chun tairbhe an phobail acadúil níos leithne. Déanann DIAS cion tairbhe suntasach d'fhorbairt na réimsí speisialta taighde atá á staidéar sna trí chomhscoil. Tugann an tuarascáil achomair seo cuntas ginearálta, do gach Scoil, ar na príomhfhorbairtí a tharla sa taighde le linn na bliana 2012. Is féidir eolas níos mionsonraithe ar ghníomhaíochtaí taighde na Scoileanna a fháil ina dTuarascálacha Taighde bliantúla faoi seach.

D'fhoilsigh DIAS Ráiteas Straitéise le linn na bliana a leagann amach príomhthosaíochtaí institiúide chomh maith le clár spreagúil de ghníomhaíochtaí taighde do gach ceann de na trí Scoil don tréimhse 2012-2016. B'fhóirsteanach an rud é go raibh an Ráiteas Straitéise á fhorbairt nuair a bhí plé ar bun ar leibhéal náisiúnta faoi athchumraíocht an chórais ardoideachais. Chuidigh rannpháirtíocht sa chomhrá straitéiseach faoi struchtúr nua ardoideachais linn na príomhthosaíochtaí a aithint do DIAS chun é féin a athstruchtú agus a atreoshú d'fhonn a chion tairbhe is fearr a dhéanamh don chóras taighde náisiúnta. Is é an príomhfhócas atá ann do DIAS ná leanúint de bheith ina phríomhfhórsa chun feabhais sa bhuntaighde náisiúnta agus idirnáisiúnta. Tá DIAS nasctha go maith cheana féin ag an leibhéal idirnáisiúnta agus ní mór dó naisc a láidir ag an leibhéal náisiúnta le múnlai nua comhthaighde a fhorbairt. Tá comhaontuithe comhoibríthe sínithe ag DIAS cheana leis an gColáiste Ollscoile, BÁC agus le Ollscoil Chathair BhÁC agus bhí cainteanna ann le Coláiste na Tríonóide. Leanfaidh DIAS de naisc a chruthú le grúpaí taighde náisiúnta agus idirnáisiúnta eile. Sa timpeallacht eacnamaíochta atá ann faoi láthair, tá sé tábhachtach foinsí éagsúla maoinithe a bheith ann agus ceann de na bearta a rinneadh le linn na bliana ab ea Cairde DIAS a bhunú d'fhonn cur le maoiniú an rialtais le cistí ó fhoinsí daonchairdiúla. Táim ag tnúth le hobair leis an bhfundúireacht chun tacaíocht agus bolscaireacht a dhéanamh d'obair DIAS. Príomhthosaíocht fós is ea cáilíocht agus feabhas an taighde a chinntiú agus tá socruithe á ndéanamh cheana don chéad athbhreithniú seachtach eile i 2014.

Bliain táirgiúil taighde eile a bhí ann do na Scoileanna uile. Chuir Scoil na Físice Cosmaí críoch le hobair i roinnt mórtograí le linn na bliana. Cúis mórtais a bhí ann do thaighdeoirí sa Scoil, nuair a dhearbhaigh ESA agus NASA go raibh an MIRI (*Mid Infra Red Instrument*), a raibh baint acu lena fhorbairt don Teileascóp nua James

Webb, réidh le soláthar do Lárionad Spáseilte Goddard NASA. Ceamara agus speictreaméadar ceannródaíoch is ea an uirlis, chomh mothálach sin go bhféadfadh sé coinneal a fheiceáil ar ghealach de chuid lúpatair. Maidir le tionscnamh eile faoi stiúir na Scoile, tá sé tar éis cur go mór le cumas agus inniúlacht an infreastructúir TFC atá ar fáil do thaighdeoirí na hÉireann agus do chomhoibríthe idirnáisiúnta. *Tá an acmhainn e-INIS anois á bainistiú ag Ionad na hÉireann um Ríomhaireacht Ardleibhéil.* Rinne rannóg na Geofisice dul chun cinn suntasach le taighde ag fiosrú foinsí fuinnimh inmharthana malartacha, ag cur tús le hobair allamuigh ar an tionscadal fuinnimh geoiteirmeach IRETherm (www.iretherm.ie). Rinneadh suntas de pháipéar a scríobh Ceann na Rannóige, A.G. Jones, ar thaighde spreagúil nua ag féachaint ar mhúnla nua chun uisce a mheas i maintlín na Cruinne níos luaithe sa bhliain in iris an American Geophysical Union "Geochemistry, Geophysics, Geosystems". Maidir leis an scoil iarchéime fhóruil uile Éireann, Clár Iarchéime Geo-eolaíochta na hÉireann (www.igpp.ie), atá á stiúir ag DIAS agus le Jones mar stiúrthóir, tháinig fás agus borradh níos mó fós air i rith 2012 agus anois tá 24 modúl Gearrchúrsa ar fáil, 13 díobh á sholáthar ag DIAS.

Rinne taighdeoirí i Scoil na Físice Teoiriciúla dul chun cinn maith i gcur chun cinn na tuisceana ar an bhfísic ardfhuinnimh, múnlai mairtise agus teoiric na dteagrán. Bhí lucht freastail maith idirnáisiúnta i láthair ag roinnt ceardlann a tionóladh ag DIAS, ar thopaic a ndéantar staidéar orthu sa Scoil. Mar fhreagra ar bhuarthaí faoin tionchar diúltach a bheidh ag an gcomhpháirt laghdaithe calcalais i gclár matamaitice an dara leibhéil ar chaighdeán na scoláirí matamaitice amach anseo, chuir an tOllamh Dorlas sa Scoil tús le cúrsa calcalais speisialta do scoláirí mata ardleibhéil. Tá an cúrsa seo á thabhairt ag an Ollamh Dorlas ina chuid ama féin ag deirí seachtaine agus tá se le moladh as an dtionscnamh seo a dhéanamh.

Chuir digitiú Thionscadal Leabhar Lios Mór sa Léann Ceilteach go mór le bailiúchán lámhscríbhinní Irish Script on Screen. Bhí an Scoil in ann leanúint dá cuid oibre ar chlocha Ogham a dhigitiú, i gcomhair leis an gClár Fionnachtana, le maoiniú a fuarthas ón Roinn Ealaíon, Cultúir agus Gaeltachta. Mar thoradh ar an suíomh gréasáin nua Ogham atá beagnach críochnaithe, cuirfear an ghné tábhachtach seo d'ár gcultúr ar fáil do chách. Lean an Scoil de dhul chun cinn suntasach a dhéanamh ar a croichlár taighde le roinnt foilseachán nua réidh le cur i gcló.

Chairman's Statement (continued)

Researchers in the School of Theoretical Physics made good progress in advancing understanding of topics related to high energy physics, matrix models and string theory. A number of workshops on topics studied in the School, held at DIAS, attracted a good international attendance. In response to concerns about the negative impact that the reduced calculus component in the second level mathematics programme will have on the standards of future mathematics students, Professor Dorlas in the School initiated a special calculus course for higher level maths students. This course is being given by Professor Dorlas in his own time at weekends and he is to be commended for undertaking this initiative.

The digitisation of the Book of Lismore Project in Celtic Studies was an important addition to the Irish Script on Screen manuscript collection. The School has been able to continue its work on digitising Ogham stones, in collaboration with the Discovery Programme, with funding received from the Department of Arts, Culture & the Gaeltacht. The new Ogham website which is near completion will make this important part of our heritage accessible to all. The School continued to make significant progress on its core research programme with a number of new publications ready to go to press.

DIAS was delighted to host visits by a number of high profile international researchers during the year. Professor Tom Spencer from the Princeton Institute for Advanced Studies visited the School of Theoretical Physics in May. Professor Martin Rees (University of Cambridge) came in November and gave a very interesting public lecture on "Cosmic perspectives: from planets to the multiverse." The Director of the Commission CTBTO visited in September and also delivered a public lecture on "Global Science for the Benefit of Security and Humankind."

A number of new outreach initiatives took place during the year. Both the School of Cosmic Physics and the School of Celtic Studies participated in the Culture Night for the first time. In excess of 700 people came to Dunsink to look through the 12 inch Grubb telescope and listen to talks by DIAS astronomers. The Library in the School of Celtic Studies also received a large number of visitors who were given an opportunity to browse the School's specialised library collection as well as viewing a presentation on the Irish Script on Screen and Ogham projects. A new initiative developed by the School of Cosmic Physics, the Irish

Astronomy Trail, was launched by Minister Joan Burton, T.D. in Dunsink in November. This online portal which links every location around Ireland involved with astronomy, provides a resource both for cultural tourists who want to explore Ireland's rich astronomical heritage and for Irish residents with an interest in astronomy. The School of Cosmic Physics now hosts the Comprehensive Test Ban Treaty Organisation (CTBTO) National Data Centre (NDC). The NDC was officially opened in June by the Tánaiste and Minister for Foreign Affairs and Trade, Eamon Gilmore, T.D., and Dr Lassina Zerbo, Director of the International Data Division, CTBTO. Based at 5 Merrion Square, the centre assists in meeting Ireland's obligations under the Comprehensive Nuclear Test Ban Treaty (CTBT). It also provides international high level research and potential scientific exchange opportunities for Irish research personnel in the areas of seismology, radionuclides, infrasound and hydroacoustic monitoring.

I would like to take this opportunity to congratulate members of DIAS who were honoured with awards during the year. Professor Werner Nahm of the School of Theoretical Physics received the 2012 Gothenburg Lise Meitner prize. Professor Fergus Kelly from the School of Celtic Studies was awarded the Derek Allen Prize in Celtic Studies by the British Academy. Professor Felix Aharonian from the School of Cosmic Physics was elected Vice President of the new IAU Division D (High Energy and Fundamental Physics). Two scholars in the Geophysics section of the School of Cosmic also received awards – a paper J. Adam, and her supervisor S. Lebedev, won one of only three Student Awards for Best paper in the journal of the Royal Astronomical Society "Geophysical Journal International" for its interpretation of the cause of anisotropy in the rocks deep below South Africa; Andrew Shaeffer received the best student oral presentation at the 2012 Irish Geological Research Meeting meeting at University College Cork.

Dr Vincent Cunnane
Chairman of Council

Ráiteas an Chathaoirligh (ar leanúint)

Bhí áthas ar DIAS fáilte a chur roimh roinnt taighdeoirí clúiteacha idirnáisiúnta le linn na bliana. Thug an tOllamh Tom Spencer ó Princeton Institute for Advanced Studies cuairt ar Scoil na Fisice Teoiriciúla i mí Bealtaine. Tháinig an tOllamh Martin Rees (Ollscoil Cambridge) i mí na Samhna agus thug sé léacht phoiblí an-suimiúil ar *“Cosmic perspectives: from planets to the multiverse”*. Thug Stiúrthóir CTBTO an Choimisiúin cuairt i Meán Fómhair agus freisin thug léacht phoiblí ar *“Global Science for the Benefit of Security and Humankind.”*

Bhí roinnt tionscnamh for-rochtana nua ann le linn na bliana. Ghlac Scoil na Fisice Cosmaí agus Scoil an Léinn Cheiltigh araon páirt in Oíche an Chultúir don chéad uair. Tháinig breis agus 700 duine go Dún Sinche chun amharc tríd an teileascóp Grubb 12 orlach agus chun éisteacht le léachtaí ó réalteolaithe DIAS. Bhí líon mór cuairteoirí ann ar an Leabharlann i Scoil an Léinn Cheiltigh freisin, agus tugadh deis dóibh féachaint ar bhailiúchán leabharlainne speisialta na Scoile agus amharc ar láithriú faoi na tograí Irish Script on Screen agus Ogham. I nDún Sinche i mí na Samhna, sheol an tAire Joan Burton, T.D. tionscnamh nua a d’fhorbair Scoil na Fisice Cosmaí, Rian Réalteolaíochta na hÉireann. Nascann an tairseach ar líne seo gach suíomh ar fud na hÉireann a bhaineann leis an réalteolaíocht, agus cuireann sé acmhainn ar fáil do thurasóirí cultúrtha atá ag iarraidh oidhreacht shaibhir réalteolaíochta na hÉireann a fhiosrú agus do mhuintir na hÉireann a bhfuil suim acu sa réalteolaíocht. Tá Scoil na Fisice Cosmaí ina h-óstach anois don Lárionad Sonraí Náisiúnta Eagraíocht an Chonartha um Chosc Cuimsitheach ar Thrialacha (CTBTO). Osclaíodh an LSN go hoifigiúil i mí an Mheithimh ag an Tánaiste agus Aire Gnóthaí Eachtracha agus Trádála, Eamon Gilmore, T.D., agus an Dr Lassina Zerbo, Stiúrthóir an Rannáin Sonraí Idirnáisiúnta, CTBTO. Lonnaithe i 5 Cearnóg Mhuirfean, cuidíonn an lárionad le dualgais na hÉireann a chomhlíonadh maidir leis an gConradh um Chosc Cuimsitheach ar Thrialacha Núicléacha (CTBT). Cuireann sé deiseanna ar fáil freisin do thaighde ardleibhéil idirnáisiúnta agus do mhalartú eolaíochta do lucht taighde na hÉireann i réimsí na seismeolaíochta, radanúiclídí, na hinfreachuime agus na monatóireachta hidrea-fhuaimíochta.

Ba mhaith liom an deis seo a thapú chun comhghairdeas a dhéanamh le comhaltaí DIAS ar a bronnadh gradaim le linn na bliana. Fuair an tOllamh Werner Nahm ó Scoil na Fisice Teoiriciúla duais Gothenburg Lise Meitner 2012. Fuair an tOllamh Fergus Kelly ó Scoil an Léinn Cheiltigh Duais Derek Allen sa Léann Cheilteach ó Acadamh na Breataine. Toghadh an tOllamh Felix Aharonian ó Scoil na Fisice Cosmaí ina Leas-Uachtarán ar Roinn D nua IAU (Fisic Ardhuinnimh agus Bhunúsach). Bronnadh gradam ar bheirt scoláirí i rannóg na Geoifisice i Scoil na Fisice Cosmaí freisin – bhuaigh páipéar a scríobh J. Adam, agus a maoirseoir S. Lebedev, ceann as trí Ghradam Mac Léinn don Pháipéar is Fearr in iris an Chumainn Ríoga Réalteolaíochta *“Geophysical Journal International”* as an léirmhíniú ar an gcúis le hainiseatrópacht go domhain faoin Aifric Theas; fuair Andrew Shaeffer gradam as an láithriú mic léinn ó bhéil is fearr ag cruinniú Thaighde Geolaíochta na hÉireann 2012 sa Choláiste Ollscoile, Corcaigh.

An Dr Vincent Cunnane
Cathaoirleach na Comhairle

School of Celtic Studies

OGHAM IN 3 D: RENEWAL OF PROJECT

A very positive development this year was the renewal of the Ogham in 3 D Project. In April the Director Prof. Pádraig Breatnach met the Minister of Arts, Heritage and the Gaeltacht, Jimmy Deenihan T.D., to discuss prospects for future funding of this project (begun in 2008). Their meeting was followed up by the establishment of a working group with representatives from the School of Celtic Studies and the National Monuments Service (NMS) of the Department of Arts, Heritage and the Gaeltacht. In August 2012 a submission was forwarded by the School of Celtic Studies to Brian Duffy, Chief Archaeologist, NMS, with proposals for a comprehensive programme of study by the School to include 3 D scanning and processing of Ogham stones in state care. Approval by the Department enabled the NMS to provide a grant in aid towards the project. In October the School of Celtic Studies relaunched the Ogham in 3 D Project and work commenced with the additional involvement of the Discovery Programme whose expertise in 3 D capture and modelling has greatly benefited the project to date. In addition to the scanning and modelling of 18 ogham stones located in various parts of the country (Kerry, Waterford, Kilkenny and Wicklow) completed in the current year, a new website is being created by Jean-François Bucas (IT Systems Administrator at DIAS) and Nora White (Principal Investigator on Ogham in 3 D Project, School of Celtic Studies) which is scheduled to be launched in Spring 2013 (see ogham.celt.dias.ie). The School will work closely with the NMS to ensure that the digital record produced is linked to the Department's Archaeological Survey of Ireland (ASI) records and can be



made available through the Department's website www.archaeology.ie. The development of the Ogham in 3D Project is overseen by an expert group which includes Prof. Fergus Kelly and Prof. Werner Nahm of DIAS; Finbarr Moore, Senior Archaeologist, NMS; and Prof. Damian McManus, Professor of Early Irish, TCD.

IRISH SCRIPT ON SCREEN

Book of Lismore

A reception was hosted by the School of Celtic Studies on 15 November to mark the digitization of the Book of Lismore. This digitization project followed the successful exhibition of the Book of Lismore at University College Cork in 2010. It is the product of a threefold collaboration between the Trustees of the Chatsworth Settlement Trust, owners of the manuscript; the Library at University College Cork; and the Irish Script on Screen (ISOS) project which hosts the digital images at www.isos.dias.ie by kind permission of the owners. The Director welcomed the representative of the owners of the manuscript, James Towe (Archivist Librarian at Chatsworth), John Fitzgerald, Librarian, Boole Library, UCC; Crónán Ó Doibhlin, Head of Special Collections, Archives and Repository Services at UCC Library, and Pádraig Ó Macháin, who saw through the digitization process as director of ISOS while a member of the School of Celtic Studies before taking up his appointment to UCC in August.

The Book of Lismore (formerly known as the Book of Máig Carthaigh Riabhach after its original owner who died in 1505) is a fifteenth-century vellum codex in Irish consisting of some 200 leaves. Its contents comprise a hugely important and varied collection of literary texts including medieval saints' lives; a copy of *Acallam na Senórach*; some apocrypha, along with later narratives that are adaptations and translations almost contemporary with the writing; and also many poems, all of which material has been newly described in a summary catalogue supplied by Professor Ó Macháin to accompany the digital images on the website.

An tOllamh Máire Herbert UCC a thug an Léacht Reachtúil 2012 le Cathaoirleach Scoil an Léinn Cheiltigh an tOllamh Anders Ahlqvist agus an tOllamh Máire Ní Annracháin UCD.

Professor Máire Herbert UCC who gave the 2012 Statutory Public Lecture with the Chairman of the School of Celtic Studies Professor Anders Ahlqvist and Professor Máire Ní Annracháin UCD.

Scoil an Léinn Cheiltigh

OGHAM-3D: ATHNUACHAN AN TIONSCNAIMH

Cor uchtúil a tharla i rith na bliana ab ea athnuachan an tionscnaimh Ogham-3D. I mí Aibreáin chas an Stiúrthóir, an tOllamh Pádraig Breatnach, leis an Aire Ealaíon, Oidhreachta agus Gaeltachta, Jimmy Deenihan, T.D., chun plé a dhéanamh ar scéal maoinithe an tionscnaimh (a cuireadh ar bun an chéadúair 2008). Ag éirí as seo bunaíodh grúpa oibre le ballraíocht ó Scoil an Léinn Cheiltigh agus ón Seirbhís um Séadchomharthaí Náisiúnta (SSN) sa Roinn Ealaíon, Oidhreachta agus Gaeltachta. I mí Lúnasa cuireadh aighneacht chuimsitheach ó Scoil an Léinn Cheiltigh ar aghaidh faoi bhráid Brian Duffy, Príomhsheandálaí, SSN, ag leagadh amach clár staidéir maraon le sceideal scanála 3D agus próiseála ag cuimsiú na gcloch Oghaim atá faoi chúram an Stáit. Mhol an Roinn leis an scéim agus faomhadh deontas cúntach ón SSN ar mhaithe léi. I mí Dheireadh Fómhair d'fhógair an Scoil an tionscnamh ar bun as an nua, agus chuaigh an Príomhfhiosraitheoir nua-cheapaithe Dr Nora White i mbun oibre i gcomhpháirtíocht le foireann ón Discovery Programme ar chabhraigh a dtaití ghairmiúil ar theicnící na scanála agus na múnlaithoireachta le hobair an tionscnaimh a chur chun cinn cheana. D'éirigh leis an tionscnamh scanáil mhúnlaith a chur i gcrích ar 18 de chlocha in áiteanna éagsúla ar fud Chiarraí, Port Láirge, Cill Choinnigh agus Cill Mhantáin roimh dheireadh mhí na Nollag. Ina theannta sin tá suíomh lín nua don tionscnamh á chruthú ag J-F Bucas (Riarthóir IT, Institiúid Ard-Léinn Bhaile Átha Cliath) agus ag Nora White le chéile a bheidh sé i gceist a sheoladh go poiblí san Earrach 2013 (ogham.celt.dias.ie) agus tá cuireadh tugtha don Aire Deenihan aitheasc oscailte a thabhairt ar an ócáid. Mar chuid de dhlúthchomhoibriú idir an Scoil agus an SSN i mbun an tionscnaimh féachfaidh an Scoil chuige go ndéanfar an taifead digiteach do réir mar a sholáthrófar é a cheangal le taifead Shuirbhé Seandálaíochta na hÉireann (ASI) atá lonnaithe sa Roinn Ealaíon Oidhreachta agus Gaeltachta i dtreo go mbeifear ábalta ar é a chur ar fáil trí shuíomh lín na Roinne (www.archaeology.ie). Tá forbairt an tionscnaimh Ogham-3D á stiúru ag Scoil an Léinn Cheiltigh i gcomhar le painéal comhairle saineolaíoch arb iad na baill an tOll. Fergus Kelly agus an tOll. Werner Nahm (DIAS); Finbarr Moore, Seandálaí Sinsearach, SSN; agus an tOllamh Damian McManus, Scoil na Gaeilge, Coláiste na Tríonóide.

MEAMRAM PÁIPÉAR RÍOMHAIRE

Leabhar Leasa Móir

Ag fáiltiú i Scoil an Léinn Cheiltigh ar an 15 Samhain seoladh an leagan digitithe de Leabhar Leasa Móir ar líne. Cuireadh an tionscnamh seo i gcrích i ndiaidh d'úinéirí na lámhscríbhinne (lontaobhaithe an Chatsworth Settlement Trust) agus Leabharlann Boole, Coláiste na hOllscoile, Corcaigh, cuireadh a thabhairt do ISOS a bheith freagrach as digitiú a dhéanamh ar an lámhscríbhinn i Chatsworth House, Derbyshire, mar chuid de bheartas chun go gcuirfí ar taispeánt i nGailearaí Glucksman, UCC (lúil-Deireadh Fómhair 2011). D'fháiltigh an Stiúrthóir roimh James Towe (stiúrthóir cartlainne agus leabharlainne Chatsworth) a bhí i láthair mar ionadaí thar ceann na n-úinéirí; John Fitzgerald (Leabharlannaí, Leabharlann Boole, UCC); Crónán Ó Doibhlin (ceann na mbailiúchán speisialta, cartlanna agus seirbhísí buanchoimeáda, Leabharlann Boole, UCC); agus Pádraig Ó Macháin, a bhí i bhfeighil an phróiséis digitithe le linn dó bheith mar stiúrthóir ar ISOS agus é ina bhall de Scoil an Léinn Cheiltigh, roimh aistriú dhó go UCC mar Ollamh le Nua-Ghaeilge i mí Lúnasa.

Thrácht an Stiúrthóir an tOllamh Pádraig Breatnach ina aitheasc ar stair na lámhscríbhinne agus ar a thábhachtaí a bhí an comhoibriú sa chás áirithe seo idir Scoil an Léinn Cheiltigh, eastát an Duke of Devonshire, agus Leabharlann Boole, as ar tháinig an leagan digitithe den lámhscríbhinn ar an saol, agus ar an tairbhe do scoláirí a leanfaidh í a bheith ar fáil feasta ar shuíomh lín ISOS. Lámhscríbhinn meamraim ón 15ú haois í Leabhar Leasa Móir nó 'Leabhar Mhéig Carthaigh Riabhaigh' mar a bhíodh uirthi (ainmnithe ón té ar leis ar dtús í a fuair bás 1505), a bhfuil 200 éigin de dhuilleoga inti. Tháinig sí i seilbh shinsir an Duke of Devonshire i Lios Mór sa 17ú haois. Tá bailiúchán antábhachtach de théacsaí liteartha ó na Meánaoiseanna inti, ina measc beathaí naomh, cóip de *Acallam na Senórach*, scéalta apocrafúla, maraon le hinsintí agus aistriúcháin ar théacsaí eachtraíochta meánaoiseacha ó Mhórroinn na hEorpa, cuid acu a bheag nó a mhór comhairsireach le haois na lámhscríbhinne; agus tá mórchuid dánta inti. Tá cur síos catalóige achomair a réitigh Pádraig Ó Macháin i bhfoirm dhigiteach ag gabháil le híomhánna na lámhscríbhinne ar an suíomh.

Cartlann dhigiteach ISOS

Leanadh ar aghaidh i rith na bliana le sceideal digitithe ar lámhscríbhinní (LSS) ó chnuasaigh náisiúnta agus idirnáisiúnta mar leanas. Ar bhonn an chomhoibrith

ISOS digital archive

A busy schedule of work to expand the by now very substantial digital archive hosted by The School of Celtic Studies / ISOS was completed as follows. The digitization of a further dozen manuscripts mainly of the sixteenth century from the collection in the Royal Irish Academy was facilitated by RIA Librarian, Siobhán Fitzpatrick. Processed images complete with catalogue descriptions for five of these went live on the ISOS website. Included are three vellum manuscripts (Dinnsheanchas; Leabhar Gabhála), two medical manuscripts and an important vellum/paper collection of tales (Cat. nos. 1222, 1224, 754, 967, 443). The very fruitful collaboration between the ISOS and the National Library of Scotland was also continued. An additional 15 manuscripts from the NLS Gaelic collection were digitized and are now available on the ISOS website together with catalogue descriptions provided by kind permission of Ronald Black (and in one instance Pádraig Ó Macháin). Included in this latest tranche are three vellum manuscripts of the fifteenth/sixteenth century; one paper manuscript of the sixteenth, and six of the seventeenth century (important collections of bardic poetry among these); those remaining are of the eighteenth century and later. In all 57 manuscripts from the Scottish collection are now available through ISOS with accompanying catalogue descriptions.

The National Library of Ireland facilitated the digitization of a further sixteen Irish manuscripts (for processing in 2013); of these two are vellums (16th cent.), and the remainder are from the seventeenth century (paper). In all thirty-two manuscripts from the NLI collection have so far been digitized by ISOS.

Pursuant to active digitization agreements with the respective institutional owners, important material was added to the ISOS website also from University College Cork ('Cín Lae Í Mhealláin', paper 17th cent.); Marsh's Library ('Codex Kilkenniensis', vellum 15th cent.); Farmleigh House (IV E 6 comprising of Giraldus Cambrensis, *Topographia Hibernica*, vellum, 13th cent., and Edward Campion, 'A History of Ireland'); and St Patrick's College, Dublin 9 (LS III, 'O hÉineacháin Miscellany').

The ISOS project continued under the direction of Pádraig Ó Macháin until his appointment to UCC from 1 August. Prof. Pádraig Breatnach took over in an acting capacity pending the appointment of a successor. Discussions have taken place with the Keeper of Manuscripts, Trinity College

Dublin, with a view to undertaking further digitization of the Library's Irish-language holdings for inclusion on the ISOS website, and with Marsh's Library with a view to initiating a programme of manuscript digitization in cooperation with ISOS (to begin 2013). Talks also took place towards an agreement with King's Inns library on a possible schedule for digitization by ISOS of their Irish manuscript collection.

RESEARCH

Work on the edition of the Old Irish law tract *Córus Bésgnai*, as well as on a Grammar of Middle Irish, was continued by Liam Breatnach. He also researched material for papers given on a Middle Irish poem on metres (*Sluindfet dúib dagaisti in dána*) (UCD/DIAS, April); forms of payment in the early Irish law tracts (UCD, July); cattle and other forms of payment (Oxford, October); the church in early Irish law (UCD); linguistic aspects of Lebor na hUidre (Royal Irish Academy, November). He was editor (with D. Mc Manus) of *Ériu* vol. 62.

A study of the palaeography of manuscripts written by Br Míchél Ó Cléirigh was completed by Pádraig Breatnach. This involved a comparative analysis of writing styles exemplified in approximately 20 manuscripts. He revised and corrected chapters of his book *The Four Masters and their manuscripts* (to appear 2013). He researched material for papers given on the manuscript tradition of the Irish Grammatical Tracts (UCD/DIAS conference, April), and on the influence of the medieval *ars dictaminis* on the development of bardic poetry (Harvard University, October). The text of a lecture on the development of Irish handwriting in the seventeenth century (XIVth International Congress of Celtic Studies, 2011) was prepared for publication. His edition-in-progress of bardic poems addressed to Aodh Ó Néill (1598) and Aodh Ruadh Ó Domhnaill (1600) by Dubhthach Óg Ó Duibhgeannáin was advanced. He also worked on the Catalogue of Irish Manuscripts in Brussels (in progress). He made study visits to the Bibliothèque Nationale, Paris, and the Bibliothèque Royale de Belgique, Brussels (July). Conference attendance included 'Le *dictamen* dans tous ses états: perspectives de recherche sur la théorie et la pratique de l'*ars dictaminis* (XIe-XVe siècles)' Paris, IRHT (June) and the Harvard Celtic Colloquium (October). He continued as editor (with Fergus Kelly) of *Celtica*.

Work on the edition of an Early Modern Irish legal treatise attributed to the Connacht jurist Giolla na Naomh Mac Aodhagáin who died in 1309 (Binch, *Corpus Iuris Hibernici* ii 691.1-699.4) was continued by Fergus Kelly.

Scoil an Léinn Cheiltigh (ar leanúint)

leanúnaigh atá ar siúl idir ISOS agus Acadamh Ríoga na hÉireann (Leabharlannaí Siobhán Fitzpatrick), dob fhéidir íomhánna a sholáthar de dhosaen eile lámhscríbhinní ó chnuasaigh an Acadaimh, a bhformhór acu ón 16ú haois. Próiseáladh na híomhánna de chúig cinn díobh sin i rith na bliana agus cuireadh in airde beo ar an suíomh lín iad, trí cinn de mheamraim san áireamh (Dinnsheanchas, Leabhar Gabhála, téacsai leighis), maraon le LS meamraim/páipéir ina bhfuil cnuasach scéalta tábhachtach (uimh. catalóige 1222, 1224, 754, 967, 443).

Leanadh ar aghaidh i mbliana leis an scéim chomhoibríthe atá ar bun idir ISOS agus Leabharlann Náisiúnta na hAlban. Deineadh digitiú ar 15 de LSS breise agus cuireadh na híomhánna in airde ar shuíomh ISOS i dteannta le cur síos catalóige le caoinchead an údair Ronald Black (Pádraig Ó Macháin a sholáthair an cur síos i gcás amháin). Ar an gcuid is déanaí seo tá trí LS meamraim ón 15/16ú haois; LS páipéir amháin ón 16ú haois; agus leathdosaen de LSS ón 17ú haois (ina measc roinnt cnuasach tábhachtach d'fhilíocht na scol); baineann na cinn eile leis an 18ú haois agus níos déanaí. 57 LS ar fad ón mbaillíochán Albanach atá ar fáil trí ISOS agus cuntaisí catalóige leo faoin dtráth seo.

Cheadaigh Leabharlann Náisiúnta na hÉireann digitiú a dhéanamh ar 16 de LSS breise i mbliana (a dhéanfar a phróiseáil 2013), ina measc 2 LS meamraim ón 16ú haois, agus an chuid eile ón 17ú haois (páipéar). Fágfaidh seo go mbeidh 32 de LSS Gaeilge san iomlán ó chnuasach na Leabharlainne Náisiúnta ar fáil ar shuíomh ISOS faoi 2013.

De bharr comhaontuithe idir ISOS agus na hinstitiúidí ar leithligh cuireadh íomhánna digitithe maraon le cúntaisí catalóige de LSS mar leanas in airde ar shuíomh lín ISOS: UCC ('Cín Lae Í Mhealláin', LS páipéir, 17ú haois); Leabharlann Marsh ('Codex Kilkenniensis', meamram 15ú haois); Teach Farmleigh (LS IV E 6: Cambrensis *Topographia Hibernica*, meam. 13ú haois); E. Campion, 'A History of Ireland', páip. 17ú haois); agus Coláiste Phádraig, Baile Átha Cliath 9 ('Lámhscríbhinn Uí Éineacháin').

Lean Pádraig Ó Macháin i mbun ISOS mar stiúrthóir go dtí deireadh mí Iúil nuair a d'éirigh sé as bheith ina bhall de Scoil an Léinn Cheiltigh. An tOll. Pádraig Breatnach a chuaigh mar stiúrthóir gníomhach i mbun an tionscnaimh ón 1 Lúnasa nó go gceapfar ball ionaid sa bhfolúntas. Bhí comhráite aige le Coimeádaí na Lámhscríbhinní i gColáiste na Tríonóide ar mhaithe le socruithe a dhéanamh chun leanúint ar aghaidh leis an scéim digitithe a bhí ar bun leis an gColáiste roimhe seo ó tá digitiú an chnuasaigh LSS leighis i gcrích (maraon

leis an gclár LSS atá curtha leo i riocht digiteach ag Scoil an Léinn Cheiltigh). Tá socruithe á mbeartú le Leabharlann Marsh chun an cnuasach de LSS Gaeilge a dhigitiú ar ISOS go luath. Tharla cainteanna le Leabharlannaí King's Inns maidir le scéim dhigitithe a bhunú (2013) a chuirseodh cnuasach na LSS Gaeilge atá i seilbh na leabharlainne sin.

TAIGHDE

Lean obair na heagarthóireachta ar an dtráchtas dlí Sean-Ghaeilge *Córus Bésghnai* agus ar Ghraiméar na Meán-Ghaeilge atá ar siúl ag Liam Breatnach. Bhí sé i mbun taighde do pháipéir a thug uaidh faoi seach ar dhán Meán-Ghaeilge ar mheadrachaí (*Sluindfet dúib dagaisti in dána*) (UCD/DIAS, Aibreán); modhanna íocaíochta i dtráchtas dlí na Luath-Ghaeilge (UCD, Iúil); eallach agus modhanna íocaíochta eile (Oxford, Deireadh Fómhair); an eaglais i seandlithe na hÉireann (UCD); gnéithe teanga i Lebor na hUidre (Acadamh Ríoga na hÉireann, Samhain). Bhí sé ina eagarthóir (i gcomhar le D. McManus) ar *Ériu* iml. 62.

Tugadh chun críche staidéar ar phailéagrafaíocht shaothar an Br Míchél Ó Cléirigh le Pádraig Breatnach. Comparáid anailíseach idir stíleanna peannaireachta i dtuairim is 20 LS leis an scríobhaí mórainmneach atá anseo agus iad suite ina gcomhthéacs ó thaobh stair na peannaireachta Gaeilge i gcoitinne. Chóirigh agus cheartaigh sé caibidlí dá leabhar *The Four Masters and their manuscripts* (le foilsíú 2013). D'oibrigh sé faoi seach ar thaighde do pháipéir ar thraidisiún lámhscríofa na dTráchtas Gramadaí (UCD/DIAS Aibreán) agus ar an anáil is féidir a aithint ón *ars dictaminis* meánaoiseach ag dul i bhfeidhm ar chéadtosach fhilíocht na scol (Ollscoil Harvard, Deireadh Fómhair). Réitigh sé don gcló léacht ar fhorbairt pheannaireacht na Gaeilge sa 17ú haois le haghaidh imeachtaí an XIV Comhdháil Idirnáisiúnta don Léann Ceilteach. Lean sé ar aghaidh le hobair dá shaothar eagarthóireachta ar dhánta a chum Dubhthach Óg Ó Duibhgeannáin d'Aodh Ó Néill (1598) agus d'Aodh Ruadh Ó Domhnaill (1600), agus ar Chlár Lámhscríbhinní na Bruiséile (ar siúl). Chuaigh ar cuairteanna staidéir chun an Bibliothèque Nationale, Páras, agus an Bibliothèque royale de Belgique (mí Iúil). D'fhreastail sé ar chomhdhála san IRHT, Páras ('Le *dictamen* dans tous ses états : perspectives de recherche sur la théorie et la pratique de l'*ars dictaminis* (Xle-Xve siècles', Iúil), agus in Ollscoil Harvard (Harvard Celtic Colloquium, Deireadh Fómhair). Lean sé air ag obair mar eagarthóir ar *Celtica* (le F. Kelly).

Bhí taighde ar bun ar eagrán de thráchtas dlí ón Nua-Ghaeilge Mhoch atá leagtha ar Ghiolla na Naomh Mac

He completed his edition of an Old Irish text on legal disputes within marriage (Binchy, *Corpus Iuris Hibernici* i 144.5-150.16), which will be submitted for publication in 2013. He researched material for papers given on evidence for consensus in Irish law texts (7th-9th cent.) (Reichenau, Germany, March); bee-keeping in ancient Ireland (Dublin, April); Myles Dillon, scholar, organizer, innovator (ITS/UCC, November); women and marriage in early Irish law (October). He continued as editor (with Pádraig Breatnach) of *Celtica*.

Research on the catalogue of Irish medical manuscripts, dating from the fifteenth and sixteenth centuries, in Trinity College Dublin, was continued by Aoibheann Nic Dhonnchadha. Physical descriptions of the collection have been compiled under the following headings: date, material, dimensions, foliation, binding, library markings. Major and minor scribal hands have been distinguished, as have the number and order of quires, and chasms that have arisen from missing or defective quires. The contents of each manuscript are catalogued, and details for each individual text are given (title, incipit, extent of text, explicit, source). Copies catalogued have been compared with other extant copies to ascertain the degree of completion in each case. Data compiled in previous years under these headings was revised and corrected. Particular research was concentrated on the three most extensive volumes in the collection (MSS 1315, 1435 and 1436), consisting of medical miscellanies with upwards of 800 pages of text in total and containing several unique treatises, for some of which Latin sources were identified during 2012. Other work included revisions made to incorporate recent research findings in a detailed description of a 16th- or 17th-century medical manuscript submitted for publication in *Celtica* in 2011 ('Ollscoil na hÉireann, Gaillimh, Lámhscríbhinn Bhreise 175'). Three plague treatises in this manuscript are of particular interest to scholars, and Latin sources for two of these have now been identified. Research was also undertaken for a paper outlining the chronology and extent of the collection of notebooks written by Mícheál Ó Síothcháin (1870-1945) that is held by Coláiste na Rinne (Waterford IT, April). (The School of Celtic Studies publications, M. Sheehan, *Sean-chaint na nDéise* (1944) and R. B. Breatnach, *Seana-chaint na nDéise* II (1961), are based on these notebooks, and the research embraces documents in the DIAS Archive that shed light on the history of the 1944 publication.)

Research notes were prepared by Brian Ó Curnáin on phonetics, phonology, morphology, syntax and vocabulary for his monograph on the Irish of East Galway (in progress). He transcribed and edited some Irish speech-recordings from Aran, East Galway, Ulster and Munster for the School project GLÓR. He prepared an expert's report for the School publications committee on a dialect study. He edited (with Ciarán Lenoach and Conchúr Ó Giollaigáin) *An chonair chaoch: an mionteangachas sa dátheangachas* (Leabhar Breac 2012). He completed the paper '153 Irish *Gaeilge*' for inclusion in a forthcoming volume on word formation. He researched material on traditional and post-traditional discourse-markers for a conference paper (NUI Galway, October).

Research on bardic poetry was continued by Pádraig Ó Macháin. He prepared an article for publication in *Celtica* with editions of three previously unpublished sixteenth-century poems, including a detailed account of the *duanaire* of Domhnall Mac Suibhne which forms part of the important sixteenth-century manuscript known as *Leabhar Chlainne Suibhne*. He researched material for papers given on 'An Canónach Pádraig de Paor agus an Ghaeilge' (Waterford IT, March); a previously unpublished collection of bardic poetry composed at the end of the thirteenth century (UCD/DIAS, April); and the Irish language and politics in the literature of the Decies (Waterford IT, June). He directed the Irish Script on Screen project until July.

A study of the use of the vocative case with the personal name in Irish poetry for publication (2013) was completed by Michelle O Riordan. The work examines the calibration of the modes of lyric address in the poetry culminating in formal poetry in the use of the personal name. The nuances of universality and particularity indicated by the use of the personal name are discussed in respect of political balladry, especially that with presumed allegorical references to Ireland. She continued research for a book-length study of Irish identities in Irish political poetry of the 17th century. She researched materials for a paper on a feature of elaboration in Irish bardic poetry (submission for *Celtica*), and a paper on 'Meon na nGael sna Meánaoiseanna' (St Patrick's College Dublin, October).

Scoil an Léinn Cheiltigh (ar leanúint)

Aodhagáin a fuair bás 1309 (Binchy, *Corpus Iuris Hibernici* ii 691.1-699.4) ag Fergus Kelly. Chríochnaigh sé a eagrán de théacs Sean-Ghaeilge a thráchtann ar aimhréiteachtaí sa phósadh (Binchy, *Corpus Iuris Hibernici* i 144.5-150.16), a fhoilseofar i 2013. Shaothraigh sé taighde ar pháipéir a thug sé uaidh faoi seach ar ghnéithe den chomhaontú i dtéacsáí dlí na Gaeilge (7ú-8ú haois) (Insel Reichenau, Márta); an bheachaireacht in Éirinn sa tseanré (Baile Átha Cliath, Aibreán); 'Myles Dillon, scholar, organizer, innovator' (Cumann na Sgríbeheann Gaeilge/UCC); agus ar na mná agus an pósadh i seandlí na hÉireann (Deireadh Fómhair). Lean sé air ag obair mar eagarthóir ar *Celtica* (le P. Breatnach).

Leanadh ar aghaidh leis an obair chláráithe ar lámhscríbhinní leighis i gColáiste na Tríonóide atá ar siúl ag Aoibheann Nic Dhonnchadha. Lámhscríbhinní ón 15ú/16ú haois iad seo agus is iad na príomhghnéithe den chur síos orthu atá á réiteach (i) comhdhéanamh fisiciúil agus (ii) bunábhar. Faoi (i) áirítear dáta, toisí, staidiúir na mbilleog, ceangal, agus marcanna leabharlainne. Sonraítear lámha na scríobhaithe uile, agus eagrú na gcomhchoda agus na mbearnaí más ann dóibh. Faoi (ii) sonraítear clár ábhair gach lámhscríbhinne agus na dtéacsáí aonair (teideal, túsfhocail, fad, críoch, foinsí). Bíonn comparáidí san áireamh le cóipeanna eile d'fhonn a shocrú cé chomh iomlán agus a bhíonn na téacsáí i ngach cás faoi seach. Chuathas siar i rith na bliana ar data a cláraíodh cheana agus deineadh breis a chur leo agus iad a cheartú mar ba riachtanach. In obair eile cuireadh leasuithe i bhfeidhm ar chur síos ar lámhscríbhinn leighis ón 16ú/17ú haois atá le foilsiú in *Celtica* sa mhéid gur aimsíodh foinsí



Laidne le haghaidh dhá théacs as trí cinn ar an bpláigh ('Ollscoil na hÉireann, Gaillimh, LS Bhreise 175'). Chuathas i mbun taighde ar bhailiúchán de leabhair nótaí a scríobh Mícheál Ó Síothcháin (1870-1945) atá i seilbh Choláiste na Rinne agus a bhfuil an dá fhoilseachán *Sean-chaint na nDéise* (1944) agus *Seana-chaint na nDéise II* (1961) a d'fhoilsigh Scoil an Léinn Cheiltigh bunaithe, le haghaidh léachta (IT, Port Láirge, Aibreán).

Bhí nótaí taighde á réiteach ar fhoghraíocht, fhóneolaíocht, dheilbhíocht, chomhréir agus stór focal ar mhaithe lena mhonagraf ar Ghaeilge Achréidh na Gaillimhe ag Brian Ó Curnáin (le teacht). Réitigh sé trascriobh agus eagarthóireacht ar thaifid Ghaeilge ó Árainn, Achréidh na Gaillimhe, agus ó Chúige Uladh agus Cúige Mumhan don tionscnamh GLÓR. D'ullmhaigh tuairisc shaineolaíoch do choiste na bhfoilseachán ar shaothar canúneolaíochta atá faoi bhráid na scoile. Chríochnaigh páipéar '153 Irish/Gaeilge' a fhoilseofar i leabhar *Word-formation: an international handbook of the languages of Europe* (eag. Peter O. Müller et al.). Bhí páirt mar údar agus mar eagarthóir (le C. Lenoach, Conchúr Ó Giollaigáin) aige i mbun an leabhair *An chonair chaoch: an mionteangachas sa dátheangachas* (Leabhar Breac, Márta 2012).

Mar chuid den taighde atá ar siúl ar fhilíocht na scol aige réitigh Pádraig Ó Macháin alt do *Celtica* ina bhfuil eagar curtha ar thrí cinn de dhánta neamhfhoilsithe ón 16ú haois le Fearghal Óg Mac an Bhaird maraon le cur síos ar dhuanaire Dhomhnaill Mhic Shuibhne atá mar chomhchuid de LS thábhachtach ón 16ú haois ar a dtugtar *Leabhar Chlainne Suibhne*. Dhein sé taighde le haghaidh páipéar a thug sé uaidh faoi seach ar na hábhair seo: 'An Canónach Pádraig de Paor agus an Ghaeilge' (IT, Port Láirge, Márta); bailiúchán nua-aimsithe de dhánta a cumadh i ndeireadh an 13ú haois (UCD/DIAS, Aibreán); an Ghaeilge agus an pholaitíocht i litríocht na nDéise (IT, Port Láirge, Meitheamh). Bhí sé mar stiúrthóir agus ag gabháil do thaighde ar son an tionscnaimh ISOS suas go dtí mí Iúil.

Ó chlár: An tOll. Pádraig Breatnach (Stiúrthóir Scoil an Léinn Cheiltigh), An tOll. Pádraig Ó Macháin, Crónán Ó Doibhlin (Leabharlann Boole, UCC), John Fitzgerald (Leabharlannaí, UCC), ag seoladh Leabhar Leasa Móir ar ISOS.

Left to right: Prof. Pádraig Breatnach (Director of the School of Celtic Studies), Prof. Pádraig Ó Macháin, Crónán Ó Doibhlin (Boole Library, UCC), John Fitzgerald (Librarian, UCC), at the launch of the Book of Lismore on ISOS.

Gordon Ó Riain (Bergin Fellow, from August) began work on a new edition of IGT V. He prepared an edition of the unpublished poem beginning *Comhardadh cionnas is cóir* for publication in *Celtica* (2013). This is the second in a series of poems from the 14th century manuscript G 3 to be edited by him. The subject-matter is an account of the rules of rhyme in terms of consonant classes and vowels.

Work on the Parsed Old and Middle Irish Corpus (POMIC) was continued by Elliott Lash (O'Donovan Scholar). This now contains 14 fully parsed and tagged Old Irish texts. Using it he completed a study of the placement of subject phrases in Old and Middle Irish as an article for submission to *Lingua*. He researched the rise of long distance mutation in Middle Irish, specifically with the numeral *dá*; and he finalized a paper on directionality in the internal reconstruction of pre-Old Irish copular clauses for submission to *Diachronica*. He researched material for papers given on Middle Irish possessive adjectives with the numeral *dá* (UU, April); degrammaticalization and Irish *ro* (UCC, April); new perspectives on diachronic developments in Old and Middle Irish (University of California, Berkeley); pitfalls in the dating of Old and Middle Irish texts (UCC, November).

Sorcha Nic Lochlainn (O'Donovan Scholar) researched a paper on the foster-mother as praise-poet in Gaelic tradition to be published in *Celtica* (2013). She prepared a paper for the Tionól of the School of Celtic Studies (November) on the topic 'Chailín óig as stiùramaiche'. This is a Scottish Gaelic waulking-song which has long intrigued scholars because of its links with the lost Irish song 'Cailín ó chois tSiúire me' adverted to in Shakespeare's *Henry V*. The paper showed that the Scottish song is composed of a number of separate and distinct elements several of which occur in Modern Irish songs also. She also researched material for papers given on the classical ballad in Irish (UCD, October), and emigrant songs in Irish (Derry, March). Nicole Volmering (O'Donovan Scholar, from October) worked to complete her PhD. She also initiated the organization of a colloquium on Genre to be held in the School in 2013.

BOOK SALES AND PUBLICATIONS

The publications committee met in August and October. The following works were sent forward for printing (2012/13): *The Four Masters and their manuscripts* (Pádraig Breatnach); *Math fab Mathonwy* (ed. I. Hughes). The editors of *Celtica* (Fergus Kelly, Pádraig Breatnach) reported that vol. 27 was on schedule to appear in 2013.

Sales of School publications remained buoyant and demand made it necessary to reprint the following in 2012: *Leabhar Branach: the Book of the O'Byrnes* (ed. Seán Mac Airt); *Graiméir Ghaeilge na mBráthar Mionúr* (ed. Parthalán Mac Aogáin).

LIBRARY

Current and retrospective cataloguing continued and regular updates on recent accessions and current periodicals (print and online) were issued. The library committee met in February and November to consider policy and strategy issues and to oversee current library developments. Committee members are: Director (Pádraig Breatnach), Librarian (Margaret Irons), Alexandre Guilarte and Aoibheann Nic Dhonnchadha. A project to reshelve the library collection was completed yielding much-needed space for future acquisitions.

Library conference

Margaret Irons (Librarian) organized a one-day conference which was held in the School of Celtic Studies on 12 October on the theme of 'Irish Studies: current collections and future directions'. The focus was on current Irish and Celtic Studies collections and on resources available in the libraries and archives of many of the major research institutions in Ireland and Scotland. Future accessibility and digitization developments for these collections were highlighted. The conference was attended by 45 paying delegates as well as staff and scholars of the School. The speakers were: Marie Boran (NUI Galway); Nicholas Carolan (Irish Traditional Music Archive); Siobhán Fitzpatrick (Royal Irish Academy); Ulrike Hogg (National Library of Scotland); Gerard Lyne (National Library of Ireland); Deirdre Wildy & Norma Menabney (Queen's University Belfast).

Culture Night

Culture Night is a city-wide night of free cultural events, held on 21 September. The Library opened its doors to visitors. Tours were given, School publications displayed, and visitors were introduced to School projects (ISOS, GLÓR, OGHAM in 3 D). In excess of 40 visitors were recorded.

Chríochnaigh Michelle O Riordan staidéar ar úsáid an tuisil ghairmigh le hainmneacha pearsanta san fhilíocht (le foilsíú 2013). Anailís atá anseo ar mhodhanna an fhorráin liteartha san fhilíocht ón mbailéad go dtí an dioscúrsa foirmiúil. Lean sí dá cuid taighde le haghaidh leabhair ar fhilíocht pholaitiúil na Gaeilge san 17ú haois agus an comhthéacs cultúrtha a bhain léi. Beidh trácht anseo ar fhéintuiscint an phobail Éireannaigh in aimsir Éirí Amach na bliana 1641 agus le linn Chromaill. Scríobh sí páipéar ar 'A feature of elaboration in bardic poetry', agus dhein taighde le haghaidh páipéir ar 'Meon na nGael sna Meánaoiseanna' (Coláiste Phádraig, Baile Átha Cliath 9, Deireadh Fómhair).

Chuaigh Gordon Ó Riain (Comhalta Uí Aimeirgín ó mhí Lúnasa) i mbun taighde ar eagrán nua de IGT V. D'oibrigh sé ar eagrán den dán neamhfhoilsithe dar tos. *Comhardadh cionnas is cóir* le cur faoi bhráid *Celtica* (2013). Is é seo an dara ceann de shraith dánta ón 14ú haois ón LS G 3 atá curtha in eagar aige. Is é is bunábhar dó na rialacha a bhaineann le haicmí na gconsan agus gutaí i gcomhardadh.

Leanadh ar aghaidh le taighde ag réiteach don chorpas d'fhoirmeacha pársáilte ó fhoinsí Sean- agus Meán-Ghaeilge atá ar siúl ag Elliott Lash (Scoláire Uí Dhonnabháin) ('Parsed Old and Middle Irish Corpus'). Tá 14 de théacsáí curtha sa bhunachar aige cheana. Chríochnaigh sé staidéar ar láithriú an fhrása ainmnigh le cur faoi bhráid na hirise *Lingua*. Bhí taighde ar siúl aige ar fhorás na n-athruithe tosaigh fadscartha sa Mheán-Ghaeilge leis an uimhir dá agus chríochnaigh páipéar ar chlásail chopailte sa tSean-Ghaeilge ársa le cur faoi bhráid *Diachronica*. Bhí sé ag obair ar aidiachtaí sealbhacha leis an uimhir dá sa Mheán-Ghaeilge (UU, Aibreán); ar stádas *ro* i ngramadach na Gaeilge (UCC, Aibreán); ar roinnt forbairtí diacronacha sa tSean- agus sa Mheán-Ghaeilge (Ollscoil California, Berkeley); ar chúinsí meallta i ndátú téacsáí Sean-Ghaeilge (UCC, Samhain).

Chríochnaigh Sorcha Nic Lochlainn (Scoláire Uí Dhonnabháin) páipéar ar an mbuime mar fhile molta i dtraidisiún na Gaeilge in Éirinn agus in Albain a fhoilseofar in *Celtica*. D'ullmhaigh páipéar don Tionól (Samhain) ar stair an amhráin 'Chailín óig as stiùramaiche', inar díriodh aird ar eilimintí traidisiúnta éagsúla atá le fáil in amhráin in Éirinn agus in Albain. Bhí taighde ar siúl aici do pháipéar ar an mbailéad clasaiceach sa Ghaeilge (UCD, Deireadh Fómhair), agus ar amhráin ar an imirce sa Ghaeilge (Doire, Márta). Bhí Nicole Volmering ag obair i mbun a tráchtáis dochtúireachta a chríochnú. Tá tosnaithe aici ar chomhdháil a eagrú ar chineálacha liteartha sna Meánaoiseanna a tionólfar i Scoil an Léinn Cheiltigh 2013.

DÍOLACHÁIN LEABHAR AGUS FOILSEACHÁIN

Tháinig coiste na bhfoilseachán le chéile i mí Lúnasa agus i nDeireadh Fómhair. Faomhadh na saothair seo leanas don chló (2012/13): *The Four Masters and their manuscripts* (Pádraig Breatnach); *Math fab Mathonwy* (eag. I. Hughes). Thuairiscigh eagarthóirí *Celtica* (Fergus Kelly, Pádraig Breatnach) go mbeadh iml. 27 ullamh don chló i 2013.

Bhí ceannach maith ar fhoilseacháin na Scoile agus toradh maith ar na tairiscintí speisialta a fógraíodh i rith na bliana do leabhair áirithe ar an liosta. De bharr an éilimh a bhíonn ar fhoilseacháin na Scoile go leanúnach b'éigin athchló a chur ar dhá leabhar i 2012: *Leabhar Branach: the Book of the O'Byrnes* (eag. Seán Mac Airt); *Graiméir Ghaeilge na mBráthar Mionúr* (eag. Parthalán Mac Aogáin).

LEABHARLANN

Leanadh ar aghaidh den chlárú ar leabhair nua agus ar scéim athchláraithe na seantaifead leabharlainne; scaipeadh tuairiscí rialta ar leabhair nua, irisí agus acmhainní ar-líne ar fhoireann na Scoile. Tháinig coiste na leabharlainne le chéile i mí Feabhra agus i mí na Samhna chun ceisteanna polasaí agus straitéise a phlé agus leas agus forbairt na leabharlainne a chur chun cinn. Is iad baill an choiste: An Stiúrthóir (P. Breatnach), Leabharlannaí (M. Irons), Alexandre Guilarte agus Aoibheann Nic Dhonnchadha. Cuireadh críoch leis an athchóiriú ar staidiúir na leabhar a d'éirigh as an athnuachan troscáin agus seilfeanna agus tá an soláthar spáis do leabhair nua feabhsaithe go mór dá bharr seo.

Comhdháil leabharlainne

D'eagraigh Margaret Irons (Leabharlannaí) comhdháil lae a tionóladh i Scoil an Léinn Cheiltigh ar 12 Deireadh Fómhair ar an dtéama 'Irish Studies: current collections and future directions'. Díriodh sna cainteanna go háirithe ar bhailiúcháin an léinn Ghaeilge agus an léinn Cheiltigh i leabharlanna agus cartlanna sna mórinstiúidí taighde in Éirinn agus in Albain. Bhí forbairtí sa soláthar digiteach agus i gcoitinne anois agus san am atá le teacht chun tosaigh sa phlé a deineadh. Chláraigh 45 duine chun freastail mar aon le baill foirne agus scoláirí na Scoile a bhí i láthair ag na himeachtaí. Is iad na cainteoirí a labhair: Marie Boran (Ollscoil na hÉireann, Gaillimh); Nicholas Carolan (Taisce Cheol Dúchais na hÉireann); Siobhán Fitzpatrick (Acadamh Ríoga na hÉireann); Ulrike Hogg (Leabharlann Náisiúnta na hAlban); Gerard Lyne (Leabharlann Náisiúnta na hÉireann); Deirdre Wildy agus Norma Menabney (Ollscoil na Banríona, Béal Feirste).

BILL

Alexandre Guilarte continued the compilation of the Bibliography of Irish Linguistics and Literature, focusing on periodical publications but also on books, particularly multi-authored works. He completed analysis and indexation of *Peritia* (to vol. 17-18, 2003/4); *Ériu* (vol. 61, 2011); *ZCP* (vol. 59, 2012); *Studia Hibernica* (vol. 37, 2011); *Scottish Gaelic Studies* (vol. 28, 2011); *Indogermanische Forschungen* (vol. 116, 2011), and *Historische Sprachforschung* (vol. 124, 2011). New periodical titles added include *History Ireland*, *Notes and Queries* and *Quaestio Insularis*. The contents of *Festschriften* and Congress Proceedings analysed in the current year include *Rannsachadh na Gàidhlig* (5 vols., 2002-2010); *Celtic Englishes* (4 vols., 1997-2006); proceedings of several meetings of the Indogermanische Gesellschaft including *Berthold Delbrück y la sintaxis indoeuropea hoy; Flexion und Wortbildung; Lautgeschichte und Etymologie*. The public web site of the bibliography project <http://bill.celt.dias.ie/> was regularly updated and maintained. Entries were contributed to the *Brepols International Medieval Bibliography*, to appear in vols. 45:2 July-Dec. 2011(2012), and 46:1 Jan.-June 2012 (forthcoming).

LEABHAR BREAC PROJECT

Professor Liam Breatnach continued direction of a diplomatic edition of the *Leabhar Breac*.

GLÓR

Recorded holdings in the School's sound archive (comprising upwards of 60 hours of Irish speech collected in the 1950s and 1960s) continued to be transcribed and edited by Brian Ó Curnáin. Aoibheann Nic Dhonnchadha had discussions on



the viability of making the archive available on the School's website under a Creative Commons copyright licence.

UCD CONFERENCE HELD IN THE SCHOOL OF CELTIC STUDIES

The School was the venue for a very successful one-day conference organized by members of Scoil na Gaeilge, an Léinn Cheiltigh, Bhéaloideas Éireann agus na Teangeolaíochta, UCD (Dr Caoimhín Breatnach, Dr Meidhbhín Ní Urdail), 'Comhdháil Lae ar Léann na Gaeilge 4: Comóradh Céad Bliain Léacht Osborn Bergin ar Fhilíocht na Scol' (20 April). The program of lectures was as follows: 'Remarks on the transmission of IGT' (Pádraig Breatnach, DIAS); '*Éireannach*: bunús, brí agus forás' (Ruairí Ó hUiginn, NUI Maynooth); '*Sluindfet dúib, dagaisti in dána*: a Middle Irish poem on metres' (Liam Breatnach, DIAS); 'Bardic poetry at the end of the thirteenth century' (Pádraig Ó Macháin, DIAS); '*Táinig léan do leith Mhogha*: marbhna le hAonghus Ó Dálaigh' (Eoghan Ó Raghallaigh, NUI Maynooth); '*Táinig an tráth nóna*: old age in bardic religious poetry' (Gordon Ó Riain, Celtic Department, University of Uppsala); 'Women and ancestry in bardic poetry: some observations' (Damian McManus, TCD); 'The Annals of Ulster: verse, editions and manuscripts' (UCD); '*Sléagar* agus "genitives lenited in special circumstances"' (Eoin Mac Cárthaigh, TCD); 'Images for the role of bardic poets' (Katharine Simms, TCD); 'Bergin, Ó Cuív agus próis an Athar Peadair sa "letiriú shimplí"' (Sean Ua Súilleabháin, UCC).

TIONÓL 2012

The Annual Tionól of the School of Celtic Studies was held on 16-17 November and was organized by Professor Fergus Kelly assisted by the School Administrator Eibhlín Nic Dhonncha. A large attendance was present on both days. Papers were delivered on the following topics: 'British loanwords in the Old Irish Priscian glosses' (Bernhard Bauer); 'The origins of hierarchies in early medieval Irish law (Cherie Peters); '*Begriffsgeschichte* na Gaeilge? Roinnt smaointí ar

Margaret Irons (Librarian) and the Director Professor Pádraig Breatnach with some of the speakers at the Library Conference organised by the School.

Margaret Irons (Leabharlannaí Scoil an Léinn Cheiltigh) le Stiúrthóir na Scoile an tOllamh Pádraig A. Breatnach i measc cainteoirí ón gComhdháil Leabharlainne 2012.

Scoil an Léinn Cheiltigh (ar leanúint)

Oíche an Chultúir

Bíonn Oíche an Chultúir ar siúl uair sa bhliain eagraithe ag Comhairle na Cathrach. Ar an 21 Meán Fómhair a tharla sí i mbliana agus bhí leabharlann Scoil an Léinn Cheiltigh ar oscailt do chuariteoirí. Bhí taispeántais ar siúl ag léiriú ar fhoilseacháin na Scoile agus tugadh eolas agus treoir (soláthar fise san áireamh) do chuariteoirí ar na tionscnaimh ISOS, GLÓR, OGHAM 3D. Áiríodh breis is 40 cuairteoirí i gcaitheamh na hoíche agus d'éirigh thar barr leis an ócáid.

BILL

Lean Alexandre Guilarte air ag réiteach ábhair don Bibliography of Irish Linguistics and Literature agus leis an obair ar an leagan leictreonach den saothar bibleagrafúil e-BILL. Díríodh go mórmhór ar fhoilseacháin ócáidiúla, ar leabhair nua, agus go háirithe cnuasaigh in a bhfuil aistí le breis is aon údar. Deineadh clárú anailiseach agus innéacsaithe ar ábhar a bhain leis an Léann Ceilteach in *Peritia* (suas go dtí iml. 17-18, 2003/04); *Ériu* (iml. 61, 2011); *ZCP* (iml. 59, 2012); *Studia Hibernica* (iml. 337, 2011); *Scottish Gaelic Studies* (iml. 28, 2011); *Indogermanische Forschungen* (iml. 116, 2011), agus *Historische Sprachforschung* (iml. 124, 2011). Ar irisí nua a cláraíodh bhí *History Ireland, Notes and Queries* agus *Quaestio Insularis*. Deineadh anailís sa bhliain reatha ar aistí a foilsíodh in *Festschriften* agus in imeachtaí Comhdhála mar leanas: *Rannsachadh na Gàidhlig* (5 iml. 2002-10); *Celtic Englishes* (4 iml., 1997-2006); agus ar imeachtaí cruinnithe den Indogermanische Gesellschaft, ina measc *Berthold Delbrück y la sintaxis indoeuropea hoy; Flexion und Wortbildung; Laugeschichte und Etymologie*. Deineadh cothamháil rialta agus tugadh suas chun dáta go leanúnach an suíomh lín poiblí <http://bill.celt.dias.ie>. Soláthraíodh iontrálacha don *Brepols International Medieval Bibliography* (le foilsíú in iml. 45: 2 July/Dec. 2011 (2012) agus 46:1 Jan.-June 2012 (le teacht).

TIONSCNAMH LEABHAR BREAC

Chuathas ar aghaidh le hobair ar an eagrán dioplamáideach den Leabhar Breac atá á stiúru ag Liam Breatnach.

GLÓR

Leanadh leis an tionscnamh chun na bailiúcháin fhuaimne atá cruinnithe ó chainteoirí Gaeilge ó na caogaidí agus na seascaidí a thrascríobh agus a chur in eagar (Brian Ó Curnáin).

COMHDHÁIL UCD A TIONÓLADH I SCOIL AN LÉINN CHEILTIGH

Tháinig comhdháil lae le chéile i Scoil an Léinn Cheiltigh ar 20 Aibreán a d'eagraigh baill de Scoil na Gaeilge, an Léinn Cheiltigh, Bhéaloideas Éireann agus na Teangeolaíochta, An Coláiste Ollscoile, Baile Átha Cliath (An Dr Caoimhín Breatnach agus An Dr Meidhbhín Ní Úrdail): *Comhdháil Lae ar Léann na Gaeilge 4: Comóradh Céad Bliain Léacht Osborn Bergin ar Fhilíocht na Scol*. D'fháiltigh an Stiúrthóir roimh shlua mór a tháinig i láthair agus thug Meidhbhín Ní Úrdail an t-aitheasc oscailte, agus bhí fáiltiú ag deireadh an lae ann. Clár na gcainteanna: 'Remarks on the transmission of IGT' (Pádraig Breatnach, DIAS); *'Éireannach: bunús, brí agus forás'* (Ruairí Ó hUiginn, Ollscoil na hÉireann, Maigh Nuad); *'Sluindfet dúib, dagaisti in dána: a Middle Irish poem on metres'* (Liam Breatnach, DIAS); *'Bardic poetry at the end of the thirteenth century'* (Pádraig Ó Macháin, DIAS); *'Táinig léan do leith Mhogha: marbhna le hAonghus Ó Dálaigh'* (Eoghan Ó Raghallaigh, NUI Maynooth); *'Táinig an tráth nóna: old age in bardic religious poetry'* (Gordon Ó Riain, Roinn an Bhéarla, Ollscoil Uppsala, an tSualainn); *'Women and ancestry in bardic poetry: some observations'* (Damian McManus, Coláiste na Tríonóide); *'The Annals of Ulster: verse, editions and manuscripts'* (An Coláiste Ollscoile, Baile Átha Cliath); *'Sléagar agus "genitives lenited in special circumstances"'* (Eoin Mac Cárthaigh, Coláiste na Tríonóide); *'Images for the role of bardic poets'* (Katharine Simms, Coláiste na Tríonóide); *'Bergin, Ó Cuív agus prós an Athar Peadair sa "letiriú shimplí"'* (Sean Ua Súilleabháin, Coláiste na hOllscoile, Corcaigh).

TIONÓL 2012

Tháinig Tionól 2012 le chéile i Scoil an Léinn Cheiltigh ar 16-17 Samhain, eagraithe ag Fergus Kelly agus coiste an Tionóil i gcomhpháirt le feidhmeannach riaracháin na Scoile Eibhlín Nic Dhonncha. Bhí slua mór (os cionn céad duine) i láthair ag na himeachtaí i gcaitheamh an dá lá agus léadh scór éigin de pháipéir ar ghnéithe éagsúla den Léann Ceilteach do réir an chláir mar seo leanas: *'British loanwords in the Old Irish Priscian glosses'* (Bernhard Bauer); *'The origins of hierarchies in early medieval Irish law'* (Cherie Peters); *'Begriffsgeschichte na Gaeilge? Roinnt smaointí ar an stair choincheapúil sa Ghaeilge'* (Peadar Mac Cuilinn); *'St Cybi of Holyhead, a saint between Wales and Ireland'* (Barry Lewis); *'Men up every tree: anchoritic tradition in early Ireland'* (Catherine Swift); *'Leading cases in early Irish law: a typological study'* (Fangzhe Qiu); *'Chailin òig as stiùarmaiche": a close analysis'* (Sorcha Nic Lochlainn);

an stair choincheapúil sa Ghaeilge' (Peadar Mac Cuilinn); 'St Cybi of Holyhead, a saint between Wales and Ireland' (Barry Lewis); 'Men up every tree: anchoritic tradition in early Ireland' (Catherine Swift); 'Leading cases in early Irish law: a typological study' (Fangzhe Qiu); "Chailin òig as stiùramaiche": a close analysis' (Sorcha Nic Lochlainn); 'The Irish contribution to Old Welsh glossing' (Paul Russell); 'Word order change in Insular Celtic' (Dorothy Disterheft); 'Irish schematic idioms' (Victor Bayda); 'The non-Brythonic prosodic system of Bothoa Breton and the nature of Celtic "pitch accents"' (Pavel Iosad); 'Some new evidence relating to the sources of the earliest Irish penitentials' (Aidan Breen); 'Traces of the Irish usufruct pledge in brehon law commentaries' (Jaqueline Bemmer); 'Old Irish *muirchrech* "sea-boundary"' (Pamela O'Neill); 'Séimhiú nó loime ar cháilitheoir ainmfhoclach neamhchinnte nuair is ainmfhocal baininsneach san ainmneach nó sa tabharthach atá á cháiliú?' (Ciarán Ó Coigligh); 'Decoding the "Cauldron of Poesy" (Johan Corthals); 'Textual and intertextual aspects of *echtraí* and *imrramaí*' (Leonie Duignan); 'Bilingualism in medieval Ireland project' (Mícheál Ó Flaithearta, Tom de Schepper, Nike Stam); 'What was *carmocol*' (Niamh Whitfield).

Professor Máire Herbert of University College Cork delivered the annual Statutory Public Lecture of the School of Celtic Studies entitled 'Irish History and World History: Some Views from the Pre-Norman Era'. The lecture took place before a large audience in University College Dublin as part of Tionól 2012.

SEMINARS AND LECTURES

Professor Liam Breatnach conducted weekly seminars on Early Irish law (January-May) and on the Early Irish poem *A mmo Choimdiu nél* (October-December). Professor Pádraig Breatnach held a weekly seminar for O'Donovan scholars on IGT 1 (January-April).

Papers and lectures were delivered by staff at national and international conferences as follows: (Liam Breatnach) '*Sluindfet dúib, dagaisti in dána*: a Middle Irish poem on metres', UCD Fourth One-day Irish Studies Conference, held at the School of Celtic Studies, DIAS, 20 April; 'Forms of Payment in the Early Irish Law Tracts', Irish Conference of Medievalists, UCD, 5 July; 'Cattle and other forms of payment in the early Irish law tracts', Oxford Celtic Seminar, 18 October; 'The Church in early Irish law', conference on 'Literacy, Memory, Sanctity and the Conversion of the Isles',

UCD 3 November; '*Lebor na hUidre*: some linguistic aspects', Conference on *Lebor na hUidre*, Royal Irish Academy 22-23 (23) November. (Pádraig Breatnach) 'Remarks on the transmission of IGT', UCD Fourth One-day Irish Studies Conference, held at School of Celtic Studies, DIAS, 20 April; 'Poetics and the bardic imagination', Ninth J. V. Kelleher Lecture, Department of Celtic Languages and Literatures, Harvard University, October. (Fergus Kelly) 'The evidence for consensus in the Irish law-texts of the seventh to ninth centuries AD', Conference on *Pacta and Consensus in the Early Middle Ages*, organised by Konstanzer Arbeitskreis für mittelalterliche Geschichte, at Insel Reichenau, Germany, 29 March; 'Bee-keeping in ancient Ireland', Lecture Series organised by the Federation of Irish Beekeepers' Associations, National Botanic Gardens, Glasnevin, Dublin 9, 15 April; 'Myles Dillon: scholar, organiser, innovator', 14th Annual Seminar jointly organized by the Irish Texts Society and the Combined Departments of Irish at University College Cork, 10 November; 'Women and marriage in early Irish law', Celtic Section, English Department, University of Uppsala, Sweden, 4 October. (Aoibheann Nic Dhonnchadha) 'Leabharlann Choláiste na Rinne: leabhartha nótaí Uí Shíothcháin', Comhdháil na nDéise, Waterford IT, April. (Pádraig Ó Macháin) 'An Canónach Pádraig de Paor agus an Ghaeilge', Canon Patrick Power Commemoration Conference, Waterford Institute of Technology, 8 March; 'Bardic poetry at the end of the thirteenth century' UCD 4 One-Day Irish Studies Conference, held at the School of Celtic Studies, DIAS, 20 April; 'An Ghaeilge agus an pholaitíocht i litríocht na nDéise' (Comhdháil na nDéise) Waterford Institute of Technology, 7 June. (Brian Ó Curnáin) 'Tearmann teanga pobal Gael: anailís sochtheangeolaíochta', Aonad na Pleanála Teanga, Ollscoil na hÉireann Gaillimh, 5 Márta; 'Óige an Oileáin agus a n-oidhreacht' (with Conchúr Ó Giollagáin), Féile Joe Mháirtín, Inis Oírr, 6 September; 'An Ghaeilge in Iorras Aithneach le 150 bliain', Féile Joe Mháirtín, Inis Oírr, 6 September; 'An saol Gaelach i gcontúirt; aghaidh a thabhairt ar an bpráinn' (with Conchúr Ó Giollagáin), Comharchumann Inis Oírr, 19 November; "Bhíodh sure, as san amach, no more," mar a deir Peig Sayers: marcóirí dioscúrsa traidisiúnta agus iarthraidisiúnta', Comhdháil ar Litríocht agus Cultúr na Gaeilge, Ollscoil na hÉireann Gaillimh, 13 October. (Michelle O Riordan) 'Meon na nGael sna meánaoiseanna', Seminar, St Patrick's College, Dublin 9 (3 October). (Nora White) Seminar 'Ogham in 3 D', Mícheál Ó Cléirigh Institute, UCD (February); 'Digitising early medieval Ireland' Ailbhe MacShamhráin Memorial Lecture, Royal Society of Antiquaries, Dublin.

Scoil an Léinn Cheiltigh (ar leanúint)

'The Irish contribution to Old Welsh glossing' (Paul Russell); 'Word order change in Insular Celtic' (Dorothy Disterheft); 'Irish schematic idioms' (Victor Bayda); 'The non-Brythonic prosodic system of Botho Breton and the nature of Celtic "pitch accents"' (Pavel Losad); 'Some new evidence relating to the sources of the earliest Irish penitentials' (Aidan Breen); 'Traces of the Irish usufruct pledge in brehon law commentaries' (Jaqueline Bemmer); 'Old Irish *muirchrech* "sea-boundary"' (Pamela O'Neill); 'Séimhiú nó loime ar cháilitheoir ainmfhoclach neamhchinnte nuair is ainmfhocal baininsneach san ainmneach nó sa tabharthach atá á cháiliú?' (Ciarán Ó Coigligh); 'Decoding the "Cauldron of Poesy"' (Johan Corthals); 'Textual and intertextual aspects of *echtraí* and *imrrama*' (Leonie Duignan); 'Bilingualism in medieval Ireland project' (Mícheál Ó Flaithearta, Tom de Schepper, Nike Stam); 'What was *carmocol*' (Niamh Whitfield).

Léacht Reachtúil

An tOllamh Máire Herbert, Coláiste na hOllscoile Corcaigh, is í a thug an léacht reachtúil uaihi faoin teideal: 'Irish History and World History: Some Views from the Pre-Norman Era'. Sa Choláiste Ollscoile, Baile Átha Cliath, a tugadh an léacht mar chuid de Thionól 2012 agus bhí slua mór i láthair sa halla léachta.

LÉACHTAÍ AGUS SEIMINEÁIR

I rith na bliana bhí an tOllamh Liam Breatnach i bhfeighil ar sheimineáir i Scoil an Léinn Cheiltigh ar Sheandlithe na hÉireann (Eanáir-Bealtaine) agus ar dhán Luath-Ghaeilge *A mmo Choimdiu nél* (Deireadh Fómhair-Nollaig). Thug an tOllamh Pádraig Breatnach seimineár do scoláirí Uí Dhonnabháin ar IGT I ((Eanáir-Aibreán).

Thug baill foirne páipéir agus léachtaí uathu ag comhdhálacha náisiúnta agus idirnáisiúnta i rith na bliana mar seo leanas. (Liam Breatnach) '*Sluindfet dúib, dagaisti in dána*: a Middle Irish poem on metres', Comhdháil Lae ar Léann na Gaeilge 4: Comóradh Céad Bliain Léacht Osborn Bergin ar Philíocht na Scol, UCD/DIAS, 20 Aibreán; 'Forms of Payment in the Early Irish Law Tracts', Irish Conference of Medievalists, UCD, 5 Iúil; 'Cattle and other forms of payment in the early Irish law tracts', Oxford Celtic Seminar, 18 Deireadh Fómhair; 'The Church in early Irish law', Comhdháil ar 'Literacy, Memory, Sanctity and the Conversion of the Isles', UCD 3 Samhain; '*Lebor na hUidre*: some linguistic aspects', Comhdháil ar Lebor na hUidre, Acadamh Ríoga na hÉireann, 22-23 (23) Samhain. (Pádraig Breatnach) 'Remarks on the transmission of IGT', Comhdháil Lae ar

Léann na Gaeilge 4: Comóradh Céad Bliain Léacht Osborn Bergin ar Philíocht na Scol, UCD/DIAS, Aibreán; 'Poetics and the bardic imagination', Ninth J. V. Kelleher Lecture, Department of Celtic Languages and Literatures, Harvard University, Deireadh Fómhair. (Fergus Kelly) 'The evidence for consensus in the Irish law-texts of the seventh to ninth centuries AD', Conference on Pacta and Consensus in the Early Middle Ages, eagraithe ag Konstanzer Arbeitskreis für mittelalterliche Geschichte, ar Insel Reichenau, Germany, 29 Márta; 'Bee-keeping in ancient Ireland', eagraithe ag an Federation of Irish Beekeepers' Associations, Garraithe Náisiúnta na Lus, Glas Naíon, Baile Átha Cliath 9, 15 Aibreán; 'Myles Dillon: scholar, organiser, innovator', An 14ú Seimineár Bliantúil eagraithe ag Cumann na Sgríbhneann Gaeilge agus na Ranna Gaeilge, Coláiste na hOllscoile, Corcaigh, 10 Samhain; 'Women and marriage in early Irish law', Rannóg na Ceiltise, Roinn an Bhéarla, Ollscoil Uppsala, An tSualainn, 4 Deireadh Fómhair. (Aoibheann Nic Dhonnchadha) 'Leabharlann Choláiste na Rinne: leabhartha nótaí Uí Shíothcháin', Comhdháil na nDéise, IT Port Láirge, Aibreán. (Pádraig Ó Macháin) 'An Canónach Pádraig de Paor agus an Ghaeilge', Comhdháil Chuimhneacháin an Chanónaigh Pádraig de Paor, IT Port Láirge, 8 Márta; 'Bardic poetry at the end of the thirteenth century' Comhdháil Lae ar Léann na Gaeilge 4: Comóradh Céad Bliain Léacht Osborn Bergin ar Philíocht na Scol UCD/DIAS, Aibreán; 'An Ghaeilge agus an pholaitíocht i litríocht na nDéise' (Comhdháil na nDéise) IT Port Láirge, 7 Meitheamh. (Brian Ó Curnáin) 'Tearmann teanga pobal Gael: anailís sochttheangeolaíochta', Aonad na Pleanála Teanga, Ollscoil na hÉireann Gaillimh, 5 Márta; 'Óige an Oileáin agus a n-oidhreacht' (with Conchúr Ó Giollagáin), Féile Joe Mháirtín, Inis Oírr, 6 Meán Fómhair; 'An Ghaeilge in Iorras Aithneach le 150 bliain', Féile Joe Mháirtín, Inis Oírr, 6 Meán Fómhair; 'An saol Gaelach i gcontúirt; aghaidh a thabhairt ar an bpráinn' (le Conchúr Ó Giollagáin), Comharchumann Inis Oírr, 19 Samhain; "Bhíodh sure, as san amach, no more," mar a deir Peig Sayers: marcóirí dioscúrsa traidisiúnta agus iarthraidisiúnta', Comhdháil ar Litríocht agus Cultúr na Gaeilge, Ollscoil na hÉireann, Gaillimh, 13 Deireadh Fómhair. (Michelle O Riordan) 'Meon na nGael sna meánaoiseanna', Seimineár, Coláiste Phádraig, Baile Átha Cliath 9 (3 Deireadh Fómhair). (Nora White) Seimineár 'Ogham in 3 D', Institiúid Mhíchíl Uí Chléirigh, UCD (Feabhra); 'Digitising early medieval Ireland' Léacht Chuimhneacháin Ailbhe MacShamhráin, Royal Society of Antiquaries, Baile Átha Cliath.

PUBLICATIONS (STAFF & SCHOLARS)

(Liam Breatnach) 'Dinnseanachas Inbhear Chíochmhaine, "trí comaccomail na Góedelge", agus caibidil i stair litriú na Gaeilge', in Eoin Mac Cárthaigh & Jürgen Uhlich (eds) *Féilscribhinn do Chathal Ó Háinle* (Indreabhán 2012) 39-55; 'Varia III. The meaning of *nómad*', *Ériu* 62 (2012) 197-205; Editor (with Damian McManus), *Ériu* vol. 62 (2012). (Pádraig A. Breatnach) 'Sliocht as litir Naomh Pól chun na Rómhánach aistrithe go Gaeilge' in Eoin Mac Cárthaigh & Jürgen Uhlich (eds) *Féilscribhinn do Chathal Ó Háinle* (Indreabhán 2012) 57-66. (Fergus Kelly) Review of Charlene M. Eska, *Cáin Lánamna: an Old Irish Tract on Marriage and Divorce Law in Medium Aevum* 81 no. 2 (2012) 323-4. (Aoibheann Nic Dhonnchadha) Editor (with Pádraig Ó Macháin), *An Linn Bhúí: Iris Ghaeltacht na nDéise* 16 (2012). (Brian Ó Curnáin) 'An Ghaeilge iarthraidisiúnta agus an phragmataic chódmheasctha thiar agus theas' in Ciarán Lenoach, Conchúr Ó Giollagáin, Brian Ó Curnáin (eag.), *An chonair chaoch: an mionteangachas sa dátheangachas* (Leabhar Breac); 'An dán díreach, carnach, meánach' in Liam Mac Amhlaigh, Brian Ó Curnáin (eag.) *Ilteangach, ilseiftiúil: Féilscribhinn in ómós do Nicholas Williams, A festschrift in honour of Nicholas Williams* (Arlen House). (Pádraig Ó Macháin) 'Fr Séamas Ó Muraidheagh OP (c.1703-1767): an Irish scribe and poet at Louvain', *Seanchas Ard Mhacha* 24/1 (2012) 104-13; 'Pádraig Ó Meachair agus Nioclás Mac Síthigh: dán agus amhrán um bheirt shagart', *An Linn Bhúí* 16 (2012) 199-212; 'The Irish book of hymns', in Salvador Ryan and Brendan Leahy (ed.), *Treasures of Irish Christianity: people and places, images and texts* (Dublin 2012) 84-6; 'Two Nugent manuscripts: the Nugent Duanaire and Queen Elizabeth's Primer', *Ríocht na Midhe: Records of Meath Archaeological and Historical Society* 23 (2012) 121-42; Editor (with Aoibheann Nic Dhonnchadha), *An Linn Bhúí* iml. 16 (2012). (Gordon Ó Riain) 'The language of *Caithréim Thoirdhealbháigh*' in Liam P. Ó Murchú (ed.), *Caithréim Thoirdhealbháigh: reassessments*. Irish Texts Society: Subsidiary series 24. (Elliott Lash) 'The diachronic development of the Irish comparative particle', Charlotte Galves, Sonia Cyrino, Ruth Lopes, Filomena Sandalo, & Juanita Avelar, *Parameter theory and linguistic change*, 196-213 (OUP).

MEMBERSHIPS, EXTERNAL WORK

Pádraig Breatnach was re-elected to membership of the Council of the Royal Irish Academy (March); contributed as a member to the work of the Comité International de Paléographie Latine (CIPL), and as external assessor on behalf of the National Humanities Center, North Carolina, USA; continued as a member of Coiste Léann na Gaeilge, RIA. Aoibheann Nic Dhonnchadha continued as a member of the

editorial board, CELT (Corpus of Electronic Texts), and Coiste na dtéacsleabhar (Coiste Léann na Gaeilge, RIA). Fergus Kelly was External Examiner, Department of Early and Medieval Irish, UCC (2011-12). Michelle O Riordan was external examiner at NUI Galway.

Sorcha Nic Lochlainn was a contributor to the BBC series 'Amhráin Uladh' (December). Gordon Ó Riain continued as a board member (secretary) of the Societas Celtologica Nordica. Margaret Irons (Librarian) continued as committee member of the Library Association of Ireland (Academic and Special Libraries section). In February she was co-organiser of a one-day seminar 'Unlocking your potential: innovative approaches in library service delivery' (Dublin).

Editor of *Ériu*

Liam Breatnach continued as Editor of *Ériu*, published by the Royal Irish Academy.

RETIREMENTS AND APPOINTMENTS

Professor Malachy McKenna retired from the School in January. Professor Pádraig Ó Macháin resigned from the School to take up appointment as Professor of Modern Irish at UCC from 1 August. Dr Gordon Ó Riain was appointed a Bergin Fellow of the School (August). Nora White was appointed Principal Investigator, Ogham in 3 D project.

VISITORS TO THE SCHOOL

Jacqueline Borsje, University of Amsterdam, Netherlands; Elizabeth Boyle, University of Cambridge, England; Melita Cataldi, University of Torino, Italy; Thomas Charles-Edwards, University of Oxford, England; Orit Eshel, Hebrew University, Israel; Markku Filppula, University of Eastern Finland, Finland; Margo Griffin-Wilson, Cambridge University, England; Lynn Gumb, Murdoch University, Australia; Deborah Hayden, Christ Church, University of Oxford, England; Jim McCloskey, UC Santa Cruz, USA; Brent Miles, UAM, Poland; Máire Ní Mhaonaigh, University of Cambridge, England; Tomás Ó Cathasaigh, Harvard University, USA; Dolores O'Higgins, Bates College, Maine, USA; Richard Sharpe, University of Oxford, England.

Visiting lecturer

Dr Richard Sharpe FBA, Professor of Diplomatic in the Faculty of Modern History, Oxford University, during a study-visit to the School in October gave two very well attended talks: 'Irish manuscripts and the market in the early nineteenth century' (6 November); 'The formation and dispersal of Edward O'Reilly's collection of Irish manuscripts' (7 November).

FOILSEACHÁIN (FOIREANN & SCOLÁIRÍ)

(Liam Breatnach) 'Dinnseanchas Inbhear Chíochmhaine, "trí comacmail na Góedelge", agus caibidil i stair litriú na Gaeilge', in Eoin Mac Cárthaigh & Jürgen Uhlich (eag.) *Féilscribhinn do Chathal Ó Háinle* (Indreabhán 2012) 39-55; 'Varia III. The meaning of *nómad*', *Ériu* 62 (2012) 197-205; Eagarthóir (le Damian McManus), *Ériu* iml. 62 (2012). (Pádraig A. Breatnach) 'Sliocht as litir Naomh Pól chun na Rómhánach aistrithe go Gaeilge' in Eoin Mac Cárthaigh & Jürgen Uhlich (eag.) *Féilscribhinn do Chathal Ó Háinle* (Indreabhán 2012) 57-66. (Fergus Kelly) Léirmheas ar Charlene M. Eska, *Cáin Lánamna: an Old Irish Tract on Marriage and Divorce Law in Medium Aevum* 81 no. 2 (2012) 323-4. (Aoibheann Nic Dhonnchadha) Eagarthóir (le Pádraig Ó Macháin), *An Linn Bhui: Iris Ghaeltacht na nDéise* 16 (2012). (Brian Ó Curnáin) 'An Ghaeilge iarthraidisiúnta agus an phragmataic chódmheasctha thiar agus theas' in Ciarán Lenoach, Conchúr Ó Giollaigáin, Brian Ó Curnáin (eag.), *An chonair chaoch: an mionteangachas sa dátheangachas* (Leabhar Breac); 'An dán díreach, carnach, meánach' in Liam Mac Amhlaigh, Brian Ó Curnáin (eag.) *Ilteangach, ilseiftiúil: Féilscribhinn in ómós do Nicholas Williams, A festschrift in honour of Nicholas Williams* (Arlen House). (Pádraig Ó Macháin) 'Fr Séamas Ó Muraidheagh OP (c.1703-1767): an Irish scribe and poet at Louvain', *Seanchas Ard Mhacha* 24/1 (2012) 104-13; 'Pádraig Ó Meachair agus Nioclás Mac Síthigh: dán agus amhrán um bheirt shagart', *An Linn Bhui* 16 (2012) 199-212; 'The Irish book of hymns', in Salvador Ryan and Brendan Leahy (ed.), *Treasures of Irish Christianity: people and places, images and texts* (Dublin 2012) 84-6; 'Two Nugent manuscripts: the Nugent Duanaire and Queen Elizabeth's Primer', *Ríocht na Midhe: Records of Meath Archaeological and Historical Society* 23 (2012) 121-42; Eagarthóir (le Aoibheann Nic Dhonnchadha), *An Linn Bhui* iml. 16 (2012). (Gordon Ó Riain) 'The language of *Caithréim Thoirdhealbhagh*' in Liam P. Ó Murchú (ed.), *Caithréim Thoirdhealbhagh: reassessments*. Irish Texts Society: Subsidiary series 24. (Elliott Lash) 'The diachronic development of the Irish comparative particle', Charlotte Galves, Sonia Cyrino, Ruth Lopes, Filomena Sandalo, & Juanita Avelar, *Parameter theory and linguistic change*, 196-213 (OUP).

BALLRAÍOCHTAÍ, OBAIR SHEACHTRACH

Athtoghadh Pádraig Breatnach mar bhall de Chomhairle Acadamh Ríoga na hÉireann (Márta); ghníomhaigh mar bhall tofa den Comité International de Paléographie Latine (CIPL); bhí sé mar mheasúnóir seachtrach ar son an National Humanities Center, North Carolina, USA; lean mar bhall de Choiste Léann na Gaeilge (Acadamh Ríoga na hÉireann).

Lean Aoibheann Nic Dhonnchadha mar bhall den choiste eagarthóireachta, CELT (Corpus of Electronic Texts), agus mar bhall de Choiste na dtéacsleabhar (Coiste Léann na Gaeilge, ARÉ). Bhí Fergus Kelly ina Scrúdaitheoir Seachtrach i Roinn na Sean- agus na Meán-Ghaeilge, Coláiste na hOllscoile Corcaigh (2011-12). Bhí Michelle O Riordan ina Scrúdaitheoir Seachtrach ag Ollscoil na hÉireann, Gaillimh.

Bhí Sorcha Nic Lochlainn páirteach sa tsraith 'Amhráin Uladh (BBC, Nollaig). Bhí Gordon Ó Riain mar bhall boird (rúnaí) ar an Societas Celtologia Nordica. Bhí Margaret Irons mar bhall coiste de Chumann Leabharlannaíochta na hÉireann. Bhí sí ar dhuine d'eagraitheoirí na comhdhála 'Unlocking your potential: innovative approaches in library service delivery' (Baile Átha Cliath).

Eagarthóir *Ériu*

Lean Liam Breatnach mar Eagarthóir ar *Ériu*, iris Acadaimh Ríoga na hÉireann.

FOIREANN AR PINSEAN, CEAPACHÁIN

D'éirigh an tOllamh Malachy McKenna amach ar a phinsean ón Scoil i mí Eanáir. D'éirigh an tOllamh Pádraig Ó Macháin as a phost chun glacadh lena cheapachán mar Ollamh le Nua-Ghaeilge sa Choláiste Ollscoile, Corcaigh (1 Lúnasa). Ceapadh an Dr Gordon Ó Riain mar Chomhalta Uí Aimhirgin i Scoil an Léinn Cheiltigh (Lúnasa). Ceapadh an Dr Nora White mar Phríomhfhiosraitheoir ar an tionscnamh Ogham 3D.

CUAIRTEOIRÍ CHUN NA SCOILE

Jacqueline Borsje, Ollscoil Amsterdam, An Ísiltír; Elizabeth Boyle, Ollscoil Cambridge, Sasana; Melita Cataldi, Ollscoil Torino, An Iodáil; Thomas Charles-Edwards, Ollscoil Oxford, Sasana; Orit Eshel, Hebrew University, Iosrael; Markku Filppula, University of Eastern Finland, An Fhionlainn; Margo Griffin-Wilson, Ollscoil Cambridge, Sasana; Lynn Gumb, Murdoch University, An Astráil; Deborah Hayden, Christ Church, Ollscoil Oxford, Sasana; Jim McCloskey, UC Santa Cruz, USA; Brent Miles, UAM, An Phólainn; Máire Ní Mhaonaigh, Ollscoil Cambridge, Sasana; Tomás Ó Cathasaigh, Harvard University, USA; Dolores O'Higgins, Bates College, Maine, USA; Richard Sharpe, Ollscoil Oxford, Sasana.

Ollamh cuarda

Bhí An tOllamh Richard Sharpe FBA, Ollscoil Oxford, ar cuairt i Scoil an Léinn Cheiltigh ar feadh seachtaine i mí Dheireadh Fómhair agus bhí pobal mór i láthair do dhá chaint a thug sé uaidh: 'Irish manuscripts and the market in the early nineteenth century' (6 Samhain); 'The formation and dispersal of Edward O'Reilly's collection of Irish manuscripts' (7 Samhain).

School of Cosmic Physics

In 2012 the Institute produced a new strategic plan covering the period 2012-2016. As part of the development of this overarching Institutional strategy each School also produced its own strategic programme of activities. In the case of the School of Cosmic Physics this strategy identified four broad 'pillars' that together support the School. The first and most important of these is the School's reputation for pioneering and excellent research, the others being its contributions to the third-level educational system, its involvement in shared research infrastructure and general public service and finally its work in public outreach. This summary report, as well as the detailed reports on the accompanying CD, follows this structure.

FIRST PILLAR - RESEARCH ACTIVITY

Astronomy/Astrophysics Activity

The research work concentrated on two main areas, star formation, and high-energy non-thermal astrophysics.

The work in star formation (together with associated outflow phenomena) addresses one of the key problems in modern astrophysics, understanding in detail how stars and planets condense out of dust and gas clouds in interstellar space. Once stars have formed their subsequent evolution is generally very well understood, but we still lack a good understanding of the formation process itself. In large part this is because the phenomena are both complex and very difficult to observe. Stars form in the interiors of dense clouds where our view is heavily obscured by the surrounding dust and gas, and the important physics occurs on rather small length-scales which would be hard to resolve even if we had an unobstructed view. Big advances are however being made with new observing instruments and techniques some of which, precision spectro-astrometry for example, were pioneered by the Dublin group.

Brown dwarfs (objects too low in mass to sustain nuclear burning, but more massive than planets) are a particular area of study in the Dublin group. Among other interesting results obtained during the year one of the first systematic studies of discs around brown dwarfs by Dawson et al. yielded the important result that the disc lifetimes are very similar to those observed in low-mass stars and appear to be largely independent of the mass of the central object.

In the second broad area we seek to understand the high-energy particles and radiation emitted by many astronomical systems - these are typically at energies very much higher than those associated with thermal phenomena and unambiguously require strong charged particle acceleration in these systems. The field has been transformed in recent years by the development of techniques to perform gamma-ray astronomy at photon energies of around a TeV from the ground as well as the launch of a number of excellent space missions. In addition to the high-energy photons, particle interactions at high-energy in these objects should produce high-energy neutrinos which are in principle detectable, although with great difficulty.

One significant research highlight during the year was contained in a letter to Nature where Aharonian et al argue that recent observations of pulsed high-energy γ -ray emission from the Crab pulsar are best explained by the presence of a cold wind originating near the site of emission.

Geophysics Activity

Research in the Geophysics Section focused on three main areas, from global imaging to regional studies, including understanding physical properties, to local studies of direct Irish societal benefit.

Global studies

Global seismology studies by PhD student Andrew Schaeffer and supervisor Sergei Lebedev are resulting in high resolution images of the upper mantle through mapping seismic velocities and anisotropy using teleseismic surface waves. A model will be released in 2013 that will be the most precise currently available. This work was presented at the 2012 Irish Geological Research Meeting (IGRM), that took place at University College Cork on February 17-19, for which Schaeffer was awarded the best student oral presentation prize.

Work by Zdenek Martinec on the theory related to the magnetic field induced by ocean circulation will be used when modelling the data from the CHAMP and SWARM magnetic space satellite missions. Such studies have the potential to map ocean dynamics and thereby monitor the effects of climate change.

Scoil na Fisice Cosmaí

Sa bhliain 2012 chruthaigh an Institiúid plean straitéiseach nua a chlúdaíonn an tréimhse 2012-2016. Mar chuid den fhorbairt ar straitéis fhoriomlán seo na hInstitiúide chruthaigh gach scoil freisin a clár straitéiseach gníomhaíochtaí. I gcás Scoil na Fisice Cosmaí, d'ainmnigh sé seo ceithre 'cholún' leathan a thacaíonn leis an scoil le chéile. Is é an chéad cheann díobh seo, agus an ceann is tábhachtaí, ná cáil na Scoile as an sár-thaighde ceannródaíoch, is iad na cinn eile ná a cion tairbhe don chóras oideachais tríú leibhéal, a rannpháirtíocht in infreastruchtúr taighde comhroinnte agus sa tseirbhís phoiblí i gcoitinne agus, ar deireadh, a cuid oibre i bhfor-rochtain phoiblí. Féachann an tuarascáil achomair seo, chomh maith leis an tuarascáil mhionsonraithe sa dhlúthdhiosca a ghabhann leis seo, leis an struchtúr seo a leanúint sa mhéid agus is féidir.

AN CHÉAD CHOLÚN - GNÍOMHAÍOCHT TAIGHDE

Gníomhaíocht Réalteolaíocht agus Réaltfhisic

Dhírigh an obair thaighde ar dhá phríomhréimse, réaltfhoirmíocht, agus réaltfhisic ardfhuinnimh neamhtheirmeach.

Tugann an obair sa réaltfhoirmíocht (chomh maith le feiniméin eis-sreafa a ghabhann leis) aghaidh ar cheann de na fadhbanna móra i réaltfhisic na linne seo, tuiscint go mionsonrach conas a comhdhlúthaíonn réalta agus pláinéid as scamaill deannaigh agus gáis sa spás idir-réaltach. Agus réalta foirmithe, i gcoitinne tá tuiscint mhaith ann ar a n-éabhlóid ina dhiaidh sin, ach fós níl tuiscint mhaith againn ar an bpróiseas foirmíochta féin. Ar an mórchuid, is tóisc go bhfuil na feiniméin casta agus an-deacair le breathnú. Foirmíonn réalta istigh i scamaill dhlútha áit a gcuireann an deannach agus an gás mórthimpeall bac mór ar ár radharc, agus tarlaíonn an fhisic thábhachtach ar scálaí faid measartha beag a bheadh deacair le réiteach fiú dá mbeadh radharc gan bac againn. Tá dul chun cinn mór á dhéanamh, áfach, le huirlisí agus teicnící breathnaithe nua, cuid díobh a thug grúpa Bhaile Átha Cliath chun cinn, speictri-réaltmhéadracht chruinn mar shampla.

Réimse staidéir ar leith i ngrúpa Bhaile Átha Cliath is ea an staidéir ar abhaic dhonna (réada a bhfuil mais ró-íseal acu le dó núicléach a choinneáil, ach níos mó ná pláinéid). I measc na dtorthaí suimiúla eile a fuarthas le linn na bliana, thug ceann de na chéad staidéir chórasacha ar dhioscaí thart ar abhaic dhonna a rinne Dawson et al an toradh go bhfuil ré na ndioscaí an-chosúil eo siúd a breathnaíodh i réalta le

mais íseal agus is cosúil go bhfuil siad neamhspleách, a bheag nó a mhór, ar mhais an réada lárnaigh.

Sa dara réimse leathan féachaimid le tuiscint a fháil ar na cáithníní agus radaíocht ardfhuinnimh eisithe ag neart córas réalteolaíochta - go tipiciúil tá siad seo ag fuinnimh i bhfad níos airde ná na cinn a ghabhann le feiniméin theirmeacha agus gan aon amhras éilíonn siad luasghéarú cáithníní uchtaithe go láidir sna córais seo. Tá athrú as cuimse tagtha ar an réimse seo le blianta beaga anuas mar thoradh ar fhorbairt na dteicnící chun réalteolaíocht gháma-gha a dhéanamh ag fuinnimh fótóin thart ar TeV amháin ón talamh chomh maith le roinnt misean spáis den scoth. Chomh maith leis na fótóin ardfhuinnimh, ba chóir go dtáirgeodh idirghníomhaíochtaí cáithníní ag ardfhuinneamh sna réada seo neoidrionónna atá, i bprionsabal, teimhneach, cé go mbeidh an-deacracht ann.

Buaicphointe taighde suntasach le linn na bliana ab ea litir chuig *Nature* ina n-áitíonn Aharonian et al gur fearr is féidir breathnuithe a rinneadh le déanaí ar astú ardfhuinnimh bíogach gáma-gha ón bpulsár Crab a mhíniú trí ghaoth fhuar a bheith ann ag teacht ó chomharsanacht an phointe astuithe.

Gníomhaíocht Geoifisice

Dhírigh taighde i Rannóg na Geoifisice ar thrí phríomhréimse, ó íomháú domhanda go staidéir réigiúnda, lena n-áirítear tuiscint ar airíonna fisiciúla, go staidéir áitiúil chun leasa shochaí na hÉireann go díreach.

Staidéir dhomhanda

Toradh ar staidéir seismeolaíochta domhanda ag an mac léinn PhD Andrew Schaeffer agus an maoirseoir Sergei Lebedev is ea íomhánna ardtaifeacha den mhaintlín uasta trí ainiseatrópacht sheismeach a mhapáil ag baint úsáide as tonnta dromchla teilisheismeacha. Eiseofar múnla i 2013 a bheidh ar an gceann is cruinne ar fáil faoi láthair. Cuireadh an saothar seo i láthair ag Cruinniú Taighde Geolaíoch na hÉireann 2012 (IGRM), a bhí ann i gColáiste na hOllscoile Corcaigh ar 17-19 Feabhra, agus fuair Schaeffer an duais as an láithriú mic léinn ó bhéil is fearr.

Bainfear úsáid as saothar Zdenek Martinec ar an teoiric a bhaineann leis an réimse maignéadach spreagtha ag imshruthú aigéin nuair atá múnla á dhéanamh ar an sonraí ó mhisin sailtílte maignéadacha spáis CHAMP agus SWARM. Tá cumas ag staidéir dá leithéid dinimic aigéin a mhapáil agus ar an gcaoi sin monatóireacht a dhéanamh ar thionchar an athraithe aeráide.

Regional studies

Regional studies using electromagnetic, seismological and potential field (gravity, magnetic) imaging techniques continued in southern Africa, Canada, and China. Highlights of regional studies include:

- 1) A new tectonic process was proposed by Florian Le Pape and Alan Jones to explain electromagnetic observations made across the northern rim of the Tibetan Plateau, marked by the Kunlun Fault. Penetrative melts in finger-like fashion across the fault from south-to-north explain the data, and suggest progressive northward extension of the ductile partially-molten middle crust of the Tibetan Plateau. This work was published in *Nature Geoscience*.
- 2) Seismological work on data from southern Africa was interpreted in terms of azimuthal anisotropy, and a new model was proposed that explains the somewhat enigmatic observations. The paper, first-authored by DIAS student Joanne Adam together with her supervisor Sergei Lebedev and published in *Geophysical Journal International*, was chosen as one of only three for 2012 to receive a Student Author Award.
- 3) Alan Jones addressed the disparity between laboratories measuring the effects that minute amounts of water (100 parts per million) have on the electrical conductivity of olivine, and showed that none of the models produced by the three main laboratories undertaking the experiments could explain field observations. Jones produced a new model based on field observations. The paper, published in the American Geophysical Union's online journal *Geochemistry, Geophysics, Geosystems*, was highlighted in July, 2012 as one of six research articles from all AGU journals. The paper

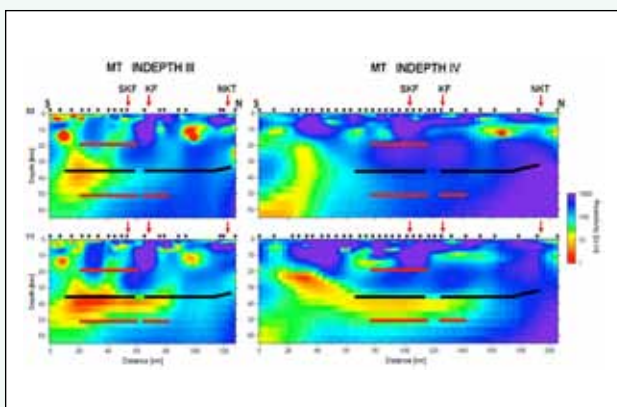
featured in AGU's weekly newsletter EOS as one of three highlighted papers (EOS, vol. 93, number 32, page 316, 7 August 2012).

- 4) Ice-mass loss from Greenland's glaciers have been modelled in a self-consistent manner and regional trends established for the Greenland Ice Sheet showing accumulation of ice on one part of the sheet outweighed losses of ice from another part. This study directly relates to the climate change debate.

Local studies of societal benefit

For local studies of societal relevance, the IRETherm project (www.iretherm.ie) on geothermal energy assessment expanded through new scientific collaborators that joined during 2012 (see Research Report). The first electromagnetic measurements were made, using both the natural-source magnetotelluric technique and also controlled-source techniques, during the Summer on prospective areas of Ireland that included radiogenic granites, sedimentary basins and warm springs. An additional activity for geothermal energy assessment was the initiation of the SIM-CRUST (Seismic imaging of the Irish crust) project, led by SFI-funded SIRG (Starting Investigator Research Grant) awardee Nicola Piana Agostinetti.

A new activity that will initiate in 2013 comes from SFI Investigator Programme funding awarded to Jones for carbon sequestration studies. The project, called IRECCSEM (www.ireccsem.ie), will acquire EM data over two of Ireland's sedimentary basins that are potential candidates for the long-term storage of carbon.



Models of the electrical resistivity for two profiles crossing the Kunlun Fault at the northern rim of the Tibetan Plateau. The upper models are for currents flowing along the fault (approx. E-W), whereas the lower models are for currents flowing across the fault (approx. N-S). The black and red lines are interfaces imaged seismologically by Karpus et al. (Journal of Geophysical Research-Solid Earth, 116, doi: 10.1029/2010jb007911, 2011).

Múnlaí den fhriotachas leictreach do dhá phróifí ag trasnú an Éisc Kunlun ag imeall thuaidh Ardchlár na Tibéide. Tá na múnlaí uasta do shruthanna ag sreabhadh feadh an éisc (E-W go garbh), ach tá na múnlaí thíos ann do shruthanna ag sreabhadh trasna an éisc (N-S go garbh). Séard atá sna línte dubha agus dearga ná comhéadain íomháithe go seismeoilíoch ag Karpus et al. (Journal of Geophysical Research-Solid Earth, 116, doi: 10.1029/2010jb007911, 2011).

Scoil na Fisice Cosmaí (ar leanúint)

Staidéir réigiúnda

Lean staidéir réigiúnda ag baint úsáide as teicnící leictreamaighnéadacha, seismeolaíochta agus íomháithe réimse poitéinsil (domhantarraingt, maighnéadach) i ndeisceart na hAfraice, i gCeanada, agus sa tSín. I measc bhuaicphointí na staidéar réigiúnda bhí na nithe seo a leanas:

- 1) Mhol Florian Le Pape agus Alan Jones próiseas teicteonach nua mar mhíniú ar bhreathnuithe leictreamaighnéadacha a rinneadh thar imeall thuaidh Ardchlár na Tibéide, marcáilte ag Éasc Kunlun. Míníonn leátáin treáiteacha ar chuma méire thar an éisc ón deisceart go dtí an tuaisceart na sonraí, agus tugann siad le tuiscint go bhfuil síneadh ó thuaidh de réir a chéile ann ar screamh láir insínte páirt-leáite Ardchlár na Tibéide. Foilsíodh an saothar seo i Nature Geoscience.
- 2) Rinneadh obair seismeolaíoch ó shonraí ó dheisceart na hAfraice a léirmhíniú i dtéarmaí ainiseatrópachta asamataí, agus moladh múnla nua a mhíníonn na breathnuithe atá beagán dúrúnda. Ba í Joanne Adam, mac léinn DIAS an chéad údar ar an bpáipéar in éineacht lena maoirseoir Sergei Lebedev agus foilsíodh é i *Geophysical Journal International*, agus roghnaíodh é do Dhuais Údair Mac Léinn 2012 - nach raibh ach trí cinn díobh ann ar an iomlán.
- 3) Thug Alan Jones aghaidh ar an éagothromaíocht idir saotharlanna ag tomhas na n-éifeachtaí atá ag méideanna fíorbheaga uisce (100 páirt in aghaidh an mhilliúin) ar sheoltacht leictreach olaivín, agus thaispeáin nach bhféadfadh ceann ar bith de na múnlaí táirgthe ag na trí phríomhshaotharlann ag déanamh na dturgnamh míniú a thabhairt ar bhreathnuithe allamuigh. Rinne Jones múnla nua bunaithe ar bhreathnuithe allamuigh. Foilsíodh an páipéar in iris ar líne American Geophysical Union *Geochemistry, Geophysics, Geosystems*, agus rinneadh suntas de i mí Iúil 2012 mar cheann de shé alt taighde ó na hirísí taighde AGU uile. Bhí an páipéar i nuachtlitir sheachtainiúil AGU EOS mar cheann de thrí pháipéar aibhsithe (EOS, vol. 93, uimhir 32, leathanach 316, 7 Lúnasa 2012).
- 4) Tá múnla déanta ar mhodh féin-chomhsheasmhach ar chaillteanas maise oighir ó oighearshruthanna na Graonlainne agus tá treochtaí réigiúnda bunaithe d'Oighearchlúid na Graonlainne a léiríonn go raibh carnadh oighir ar chuid amháin den chlúid níos mó ná cailteanas oighir ó chuid eile. Baineann an staidéar seo go díreach leis an díospóireacht faoi athrú aeráide.

Staidéir áitiúla chun leasa na sochaí

Do staidéir áitiúla le hábharthacht shoचाíoch, leathnaigh an tionscadal IRETherm (www.iretherm.ie) ar mheasúnú fuinnimh geoiteirmeach trí chomhoibríthe eolaíochta nua a tháinig isteach le linn na bliana 2012 (féach Tuarascáil Taighde). Rinneadh na tomhais leictreamaighnéadacha osaigh, ag baint úsáide as an teicníc maighnéadaiteallúrach foinse nádúrtha agus teicnící foinse rialta ar aon, le linn an tSamhraidh i limistéir ionchasacha in Éirinn a chuimsigh eibhir radaigineacha, imchuacha dríodair agus foinsí bogthe. Gníomhaíocht bhreise do mheasúnú ar fhuinneamh geoiteirmeach ab ea tús leis an tionscadal SIM-CRUST (*Seismic Imaging of the Irish Crust*), faoi stiúir ag Nicola Piana Agostinetti, a fuair deontas SIRG (Starting Investigator Research Grant) ó SFI.

Beidh gníomhaíocht nua ann sa bhliain 2013 ag teacht ó mhaoiniú Chlár Taighdeoirí SFI a bronnadh ar Jones do staidéar ar cheapadh carbóin. Gheobhaidh an tionscadal, ar a dtugtar IRECCSEM (www.ireccsem.ie), sonraí EM thar dhá cheann d'imchuacha dríodair na hÉireann a d'fhéadfaí a úsáid do stóráil fadtéarma carbóin.

Leathnaíodh struchtúr seisimeach screamh agus litisféar na hÉireann chun tusiceart Shasana agus Alba a áireamh d'fhonn múnla a chruthú d'fhorbairt screimhe a bhaineann le próisis teicteonacha thart ar 400 milliún bliain ó shin de réir mar a chomhtháthaigh tuaisceart Éireann (móide Alba, tuaisceart Thalamh an Éisc agus Ceanada) le deisceart na hÉireann (móide Sasana, deisceart Thalamh an Éisc agus an Eoraip) le dúnadh an aigéin (Aigéan Iapetus) a bhí eatarthu.

Leabhar foilsithe

Mar chríoch, mar chion tairbhe mór leis an taighde ar mhaighnéadaiteallúracht, rinne Jones, in éineacht lena chomhghleacaí le fada an Dr Alan D. Chave ó Woods Hole Oceanographic Institution, leabhar a chomhscríobh agus a chur in eagar dar teideal "The Magnetotelluric Method: Theory and Practise", foilsithe ag Cambridge University Press (ISBN: 9780521819275).

AN DARA COLÚN - CION TAIRBHE DON OIDEACHAS

An Chéad agus an Dara Leibhéal

Eagraíonn an Scoil an clár an-rathúil Seismeolaíocht i Scoileanna/Seismeolaíocht sa Scoil (<http://www.dias.ie/sis/>), le seisimwith seisimiméadair lonnaithe i 55 bunscoil agus meánscoil ar fud an Stáit. Gach uair a bhíonn crith

School of Cosmic Physics (continued)

The seismic structure of Ireland's crust and lithosphere was expanded to include northern England and Scotland so as to construct a model for crustal development pertinent to the tectonic processes of some 400 million years ago as northern Ireland (plus Scotland, northern Newfoundland and Canada) coalesced with southern Ireland (plus England, southern Newfoundland and Europe) with the closure of the ocean (Iapetus Ocean) that lay between them.

Book published

Finally, as a major contribution to research in magnetotellurics, Jones, together with long-time colleague Dr Alan D. Chave of Woods Hole Oceanographic Institution, co-wrote and edited a book titled "The Magnetotelluric Method: Theory and Practise", published by Cambridge University Press (ISBN: 9780521819275).

SECOND PILLAR - CONTRIBUTIONS TO EDUCATION

First and Second Levels

The School runs the highly successful Seismology In Schools/ Seismeolaíocht sa Scoil programme (<http://www.dias.ie/sis/>), with seismometers located in 55 primary and secondary schools across the State. Every time there is an earthquake, either a local one close to Ireland or a large one globally, over 25,000 schoolchildren are exposed to the science of seismology and of the Earth. In addition, SIS seismometers have been placed in three GeoParks, Copper Coast, Co. Waterford, Cliffs of Moher, Co. Clare and Marble Arch Caves, the only international GeoPark in Counties Cavan (Ireland) and Fermanagh (Northern Ireland). The Cliffs of Moher location enjoys more than 700,000 visitors a year, and has been very active at working with DIAS to publicize seismology in the media.

Third Level

The Geophysics Section runs the Irish Geoscience Graduate Programme (IGGP, www.iggp.ie), an All-Ireland virtual graduate training school in the geosciences providing tuition on Short Courses located at the Institution where the expertise is. Irish (North and South) students travel for the 3-5 day courses, with reimbursement of some costs. Currently there are 24 modules on offer, and over 135 students are being trained in the academic year 2012-2013. DIAS/Geophysics offers 13 of the courses. Jones is the Director of the IGGP, with Professor Ben Kennedy as the Co-ordinator and Caroline Moloney as the Administrator.

The staff of the Astronomy/Astrophysics Section are regular contributors to international graduate schools such as the International School of Space Science in l'Aquila (Italy) where both Tom Ray and Felix Aharonian gave courses and the Erasmus Mundus Joint Doctorate Programme of the University of Nice where Felix Aharonian gave a course. In addition Tom Ray gave two lecture courses to undergraduate physics students in TCD.

School staff supervised or co-supervised 30 (11 Astro, 19 Geo) PhD students and 3 (Geo) MSc students of whom 19 were registered in Irish universities.

Other

Luke Drury served on the search committee for the next President of UCD.

The meeting room facilities in Dunsink were used for away-day strategic meetings by a number of academic groups during the year. The proximity to Dublin combined with a rural setting and the historic associations make it an ideal location for such events. In a significant development it was also used by a commercial partner, DELL, to host a national meeting on high-performance computing.

THIRD PILLAR - RESEARCH INFRASTRUCTURES AND PUBLIC SERVICE

Advanced research requires access to advanced research infrastructures. For this reason the School participates in a number of major international collaborations building and operating advanced observational facilities and has also invested in building up the national e-infrastructure.

In the area of star formation Tom Ray is a co-principal investigator on the Mid-Infrared Instrument (MIRI) which is one of the major European contributions to the James Webb Space Telescope. A major project milestone during the year was the hand-over of the complete tested flight-model of MIRI to NASA for integration into the satellite. The focus of work in the Institute has now turned to the development of data-analysis software and two new staff members supported by the European Space Agency's PRODEX programme have been recruited to work on this. Tom Ray has also been invited to become a co-Principal investigator on an exciting new project, the Exoplanet Characterisation Observatory currently under consideration by the European Space Agency.

Scoil na Fisice Cosmaí (ar leanúint)

talún ann, bíodh sé ina cheann cóngarach d'Éirinn nó ina cheann mór domhanda, faigheann breis agus 25,000 páiste scoile taithí ar eolaíocht na seismeolaíochta agus na Cruinne. Ina theannta sin, tá trí sheismiméadar SIS curtha i dtrí Gheo-Pháirc, An Cósta Copair, Co. Phort Láirge, Aillte an Mhothair, Co. an Chláir agus Uaimheanna na hÁirse Marmair, an t-aon Gheo-Pháirc idirnáisiúnta i gContaetha an Chabháin (Éire) agus Fhear Manach (Tuaisceart Éireann). Bíonn níos mó ná 700,000 cuairteoir ar shuíomh Aillte an Mhothair, agus tá sé an-ghníomhach ag obair le DIAS chun an tseismeolaíocht a phoibliú sna meáin.

An Tríú Leibhéal

Eagraíonn Rannóg na Geoifisice Clár Iarchéime Geo-eolaíochta na hÉireann (IGGP, www.iggp.ie), scoil oiliúna fhíorúil iarchéime uile-Éireann sna geo-eolaíochtaí a chuireann teagasc ar fáil ar Ghearrchúrsaí lonnaithe san Institiúid ina bhfuil an saineolas. Taistealaíonn mic léinn Éireannacha (Thuaidh agus Theas) do na cúrsaí 3-5 lá, le haisíoc ar roinnt de na costais. Faoi láthair tá 24 modúl ar fáil agus tá breis agus 135 mac léinn faoi oiliúint sa bhliain acadúil 2012-2013. Cuireann DIAS/Geoifisic 13 de na cúrsaí ar fáil. Is é Jones Stiúrthóir an IGGP, leis an Ollamh Ben Kennedy ina Chomhordaitheoir agus Caroline Moloney ina Riarthóir

Déanann foireann na rannóige a gcion tairbhe go rialta do scoileanna iarchéime idirnáisiúnta ar nós the International School of Space Science i l'Aquila (An Iodáil) áit a thug Tom Ray agus Felix Aharonian cúrsaí agus Clár Comh-Dhochtúireachta Erasmus Mundus in Ollscoil Nice áit a thug Felix Aharonian. Ina theannta sin thug Tom Ray dhá chúrsa léachtaí d'fhochéimithe fisice i gColáiste na Tríonóide. Rinne an foireann maoirsiú ar 11 mac léinn PhD, a raibh 6 díobh cláraithe in ollscoileanna na hÉireann.



Bhí Luke Drury ar an gcoiste cuardaigh don chéad uachtarán eile ar an gColáiste Ollscoile BÁC.

Baineadh úsáid as na háiseanna cruinnithe i nDún Sinche do chruinnithe straitéiseacha lasmuigh ag roinnt grúpaí acadúla le linn na bliana. Toisc go bhfuil an t-ionad i ngaireacht do Bhaile Átha Cliath, faoin tuath, agus le stair shuntasach aige, is áisiúil an suíomh é d'ócáidí dá leithéid. Forbairt shuntasach ab ea an uair a d'úsáid comhpháirtí tráchtála, DELL, é chun cruinniú náisiúnta ar ríomhaireacht ardfheidhmíochta a óstáil.

AN TRÍÚ COLÚN - INFREASTRUCHTÚIR TAIGHDE AGUS AN TSEIRBHÍS PHOIBLÍ

Má táthar le hardtaighde a dhéanamh, ní mór rochtain a fháil ar ard-infreastruchtúir taighde. Ar an gcúis seo glacann an rannóg páirt i roinnt mórchomhoibrithe idirnáisiúnta ag tógáil agus an oibriú ard-áiseanna breathnaithe agus tá infheistíocht déanta aige i dtógáil an ríomh-infreastruchtúir náisiúnta.

I réimse na réaltfhoirmíochta is comh-Phríomhthaighdeoir é Tom Ray ar an *Mid-Infrared Instrument* (MIRI) atá ar cheann de na príomhchionta tairbhe Eorpacha do Spásteileascóp James Webb. Garspríoc mhór don tionscnamh le linn na bliana ab ea múnla eitle a bhí tástáilte go hiomlán de MIRI a thabhairt do NASA le comhcheangal sa tsaitilít. Tá fócas na hoibre san Institiúid dírithe anois ar bhogearraí anailíse sonraí a fhorbairt agus earcaíocht beirt chomhaltai foirne nua chun obair air seo, le tacaíocht ó chlár PRODEX Ghníomhaireacht Spáis na hEorpa. Tugadh cuireadh do Tom Ray freisin a bheith ina chomh-Phríomhthaighdeoir ar thionscnamh spreagúil nua, *the Exoplanet Characterisation Observatory* atá á mheas faoi láthair ag Gníomhaireacht Spáis na hEorpa. Ailíniú agus tástáil deiridh á dhéanamh ar an uirlis MIRI i Saotharlann Rutherford Appleton sular cuireadh go NASA é.

High Energy Stereoscopic System (HESS) based in Namibia.

High Energy Stereoscopic System (HESS) lonnaithe Namibia.

The MIRI instrument undergoing final alignment and testing in Rutherford Appleton Laboratory before shipping to NASA.

In the area of high-energy astrophysics one of the main observational facilities used by the group is the High Energy Stereoscopic System (HESS) based in Namibia. DIAS is a member of the consortium operating this experiment, the leading imaging atmospheric Cherenkov telescope system in the world. During the year the system was expanded with the addition of a fifth very large telescope to the existing four telescopes of the original array.

X-ray astronomy is a vital tool in the multi-wavelength studies needed to interpret high-energy objects and DIAS is a participant in the Japanese satellite project ASTRO-H. Felix Aharonian spent six weeks working in Tokyo helping to prepare the scientific programme for this exciting mission, due for launch later this year.

The high-energy Astrophysics group also provided scientific advice to two large projects in the roadmap of the European Strategic Forum for Research Infrastructures (ESFRI), the KM3NeT proposal for a large neutrino observatory in the deep Mediterranean Sea and the Cherenkov Telescope Array project to build a next-generation observatory building on the success of HESS and other projects.

The School has used two cycles of funding under the Programme for Research in Third Level Institutions (PRTLII) to make substantial investments in Ireland's research e-infrastructure through the CosmoGrid and e-INIS projects. A major outcome of this investment was the establishment, in collaboration with other partners, of the Irish Centre for High-End Computing (ICHEC). During the year DIAS facilitated a major bid by ICHEC to the SFI infrastructure call and participated in intensive discussions aimed at securing

the long-term sustainability of ICHEC. The e-INIS project ran a public procurement for the final phase of the national federated data store, to be co-hosted and (subject to agreement) co-managed with the main ICHEC computing facility in UCD.

The Geophysics Section runs the Irish National Seismic Network (INSN), an array of five very broadband seismometers located around Ireland sending information in real-time to Dublin, from which the data are made available internationally. The INSN records both local seismicity (down to magnitude 1.0) as well as large teleseismic events, and seismic information is made available to the State.

Irish National Data Centre for the Preparatory Commission for the Comprehensive nuclear-Test-Ban Treaty Organization (CTBTO, www.ctbto.org/) was officially opened in June, 2012 by Mr. Eamon Gilmore, Tanaiste, Minister for Foreign Affairs and Trade and Dr. Lassina Zerbo, Director of International Monitoring Division, CTBTO, Vienna.

The NDC both receives data from global sources and makes data available to the CTBTO network. Ireland has a special position with regard to nuclear disarmament, as it was an Irish politician, Mr. Frank Aiken then Minister for External Affairs, who launched the process at the United Nations in 1958 that resulted in the Non-Proliferation Treaty, of which Ireland was the first signatory.

Staff of the School served in a wide range of public roles as members and chairs of expert committees. Among others Felix Aharonian was elected as vice-president of the 'High-Energy Phenomena and Fundamental Physics' division of the International Astronomical Union, Tom Ray became a member of the European Southern Observatory's Observing Programme Committee. Luke Drury continued as President of the Royal Irish Academy.



The H.E.S.S. facility in Namibia with the new large H.E.S.S.-II telescope at the centre of the array - its mirror area is that of two tennis-courts.

Áis H.E.S.S. sa Namaib leis an teileascóp mór nua H.E.S.S.-II i lár an eagair - tá a réimse scátháin chomh mór le dhá chúirt leadóige.

Scoil na Fisice Cosmaí (ar leanúint)

I réimse na réaltfhisice ardfhuinnimh tá an High Energy Stereoscopic System (HESS) atá lonnaithe sa Namaib ar cheann de na príomháiseanna breathnaithe a úsáideann an grúpa. Tá DIAS ina bhall den chuibhreannas a oibríonn an turgnamh seo, an córas teileascóip cherenkov atmaisféireach íomháithe is túisce ar domhan. Le linn na bliana leathnaíodh an córas tríd an gcúigiú teileascóp an-mhór a chur leis na ceithre theileascóp a bhí sa bhuneagar.

Uirlis riachtanach is ea réalteolaíocht X-gha sna staidéir il-tonnfhaid atá de dhíth chun réada ardfhuinnimh a léirmhíniú agus tá DIAS páirteach i dtionscnamh sailtilite ASTRO-H na Seapáine. Chaith Felix Aharonian sé seachtaine ag obair i Tokyo ag cuidiú leis an gclár eolaíochta a ullmhú don mhisean spreagúil seo, atá le lainseáil níos déanaí i mbliana.

Chuir an grúpa réaltfhisice ardfhuinnimh comhairle eolaíochta ar fáil freisin do dhá thionscadal mhóra i dtreochlár Fhóram Straitéiseach na hEorpa d'Infreastruchtúir Taighde (ESFRI), an t-iarratas KM3NeT do réadlann neodrionónna arda sa Mheánmhuir dhomhain agus tionscnamh an Eagair Teileascóip Cherenlov chun réadlann nua-aimseartha a thógáil bunaithe ar rath HESS agus tograí eile.

D'úsáid an rannóg dhá thimthriall maoinithe faoin gClár um Thaighde in Institiúidí Tríú Leibhéal (PRTL) le hinfheistíochtaí suntasacha a dhéanamh i ríomh-infreastruchtúr taighde na hÉireann trí na tograí CosmoGrid agus e-INIS. Toradh mór ar an infheistíocht seo ab ea bunú, i gcomhair le compháirtithe eile, Ionad na hÉireann um Ríomhaireacht Ardleibhéil (ICHEC). Le linn na bliana chuidigh DIAS le mórthairiscint ag ICHEC do ghlaoch infreastruchtúr SFI agus ghlac sé páirt i ndianchainteanna a d'fhéach le hinmharthanacht fadtéarma ICHEC a dhaingniú. Rinne togra e-INIS soláthar poiblí don chéim deiridh den stóras

sonraí cónaidhmeach náisiúnta, le comhóstáil agus (faoi réir comhaontaithe) le comhbhainistiú le príomhais ríomhaireachta ICHEC i gCOBÁC.

Ritheann Rannóg na Geoifisice Líonra Seismeach Náisiúnta na hÉireann (INSN), eagar de chúig sheismiméadar le banda an-leathan lonnaithe timpeall na hÉireann a chuireann eolas réad-ama go Baile Átha Cliath, óna gcuirtear na sonraí ar fáil go hidirnáisiúnta. Déanann an INSN taifeadadh ar sheismeacht áitiúil (síos go méid 1.0) chomh maith le heachtraí móra teiliseismeacha, agus cuirtear eolas seismeach ar fáil don Stát.

Rinne an tUas. Eamon Gilmore, Tánaiste, Aire Gnóthaí Eachtracha agus Trádála agus an Dr. Lassina Zerbo, Stiúrthóir an Rannáin Sonraí Idirnáisiúnta, CTBTO, An Vín, an oscailt oifigiúil ar Lárionad Sonraí Náisiúnta na hÉireann Eagraíocht an Chonartha um Chosc Cuimsitheach ar Thrialacha (CTBTO, www.ctbto.org/) i mí an Mheithimh 2012.

Faigheann an NDC sonraí ó fhoinsí domhanda agus cuireann sé sonraí ar fáil do líonra CTBTO. Tá suíomh speisialta ag Éirinn maidir le dí-armáil núicléach ó tharla gurb é polaiteoir Éireannach, an tUas. Frank Aiken, an tAire Gnóthaí Seachtracha na linne sin, a chuir tús leis an bpróiseas ag na Náisiúin Aontaithe i 1958 a raibh an Conradh in Aghaidh Iomadú Núicléach mar thoradh air, agus Éire mar chéad sínitheoir.

D'fhreastal foireann na rannóg i réimse leathan de ról phoiblí mar bhaill agus mar chathaoirigh ar shainchoistí. I measc nithe eile toghadh Felix Aharonian ina leas-uachtarán ar an roinn 'Fisic Ardfhuinnimh agus Bhunúsach' den Aontas Réalteolaíochta Idirnáisiúnta, bhí Tom Ray ina bhall de Choiste Chlár Breathnaithe Réadlann Theas na hEorpa agus lean Luke Drury ina Uachtarán ar Acadamh Ríoga na



Left-Right: Dr. Gerry Wrixon, Chairman of the Board, School of Cosmic Physics, DIAS; Mr. Eamon Gilmore, Tánaiste, Minister for Foreign Affairs and Trade; Dr. Lassina Zerbo, Director of International Monitoring Division, CTBTO, Vienna; Mr. Tom Blake, Head of National Data Centre (NDC), CTBTO, Ireland (DIAS).

Clé-Deas: An Dr. Gerry Wrixon, Cathaoirleach an Bhoird, Scoil ns Fisice Cosmaí, DIAS; An tUas. Eamon Gilmore, Tánaiste, Aire Gnóthaí Eachtracha agus Trádála; Dr. Lassina Zerbo, Stiúrthóir an Rannáin Sonraí Idirnáisiúnta, CTBTO, An Vín; An tUas. Tom Blake, Ceann an Lárionaid Sonraí Náisiúnta (LSN), CTBTO, Éire (DIAS).

School of Cosmic Physics (continued)

Alan Jones is the Irish National Correspondent to the International Association of Geomagnetism and Aeronomy, an International Member of the Geo-Electromagnetism Committee, Chinese Geophysical Society, a member of the Geosciences Committee of the Royal Irish Academy, and a member of the Consultative Committee of the Geological Survey of Ireland.

FOURTH PILLAR - PUBLIC OUTREACH

The public outreach activities in Astronomy and Astrophysics are mainly, though not exclusively, held in Dunsink Observatory which has over the last few years been extensively refurbished by the Institute and the Office of Public Works to provide a good meeting venue and visitor experience. In addition to the normal public open nights (held every second Wednesday during the winter months) we are increasingly running special interest events in partnership with amateur societies, in particular the Irish Astronomical Association and the Irish Astronomical Society, local schools and other groups.



Building on this outreach activity, and with funding from the European City of Science 2012 Public Engagement Programme, an Irish Astronomy Trail was developed linking all the sites in Ireland associated with Astronomy. The trail links not just sites with a heritage content (such as Newgrange) but seeks also to include sites active in modern research astronomy. The trail was officially launched by Minister Joan Burton, in whose constituency Dunsink is located, on 23 November. Prof Clive Ruggles, coordinator of the UNESCO world heritage programme for astronomical observatories also attended and the French embassy was represented (the Irish trail was in part inspired by a similar initiative in France and the two projects will be linked as part of a pan-European 'Route des Observatoires').

The Geophysics Section opened up 5 Merrion Square to be part of the highly successful Walking Tour of Merrion Square (<http://merrionsquare.ie/index.php/walking-tours/>) organized by Ingenious Ireland. Visitors were able to access parts of the complex and see the CTBTO NDC as well as hear about the work of the Geophysics Section, the history of the Institute and the history of the building. Every tour was fully booked out, with some people returning a second time.

Prof Luke Dury, Director School of Cosmic Physics, Prof Clive Ruggles, Univ. of Leicester, Vincent McCarthy, Curator of Dublin City of Science, Joan Burton TD, Minister for State and Cecil Keaveney, Registrar.

An tOllamh Luke Dury, Stiúrthóir Scoil na Fisice Cosmaí, An tOll. Prof Clive Ruggles, Ollscoil Leicester, Vincent McCarthy, Coimeadaí Chathair Bhaile Atha Cliath na hEolaíochta, Joan Burton TD, Aire Stáit agus Cecil Keaveney, Cláráitheoir.

Scoil na Fisce Cosmaí (ar leanúint)

hÉireann. Tá Alan Jones ina Chomhfhreagraí Náisiúnta na hÉireann don International Association of Geomagnetism and Aeronomy, ina Bhall Idirnáisiúnta den Choiste Geo-Leictreamhaighnéadachta, Cumann Geoifisice na Síne, ina bhall de Choiste Geo-eolaíochtaí Acadamh Ríoga na hÉireann, agus ina bhall de Choiste Comhairleach Shuirbhé Geolaíoch na hÉireann.

AN CEATHRÚ COLÚN - FOR-ROCHTAIN PHOIBLÍ

Is i Réadlann Dhún Sinche is mó a bhíonn gníomhaíochtaí for-rochtana sa Réalteolaíocht agus sa Réaltfhisic, (cé nach ansin amháin a bhíonn siad), agus le blianta beaga anuas rinne an Institiúid agus Oifig na nOibreacha Poiblí athchóiriú forleathan uirthi chun go mbeadh sé taitneamhach mar áit do chruinnithe agus do chuartheoirí. Chomh maith leis na gnáthoicheanta oscailte poiblí (a bhíonn ann gach dara Céadaoin le linn an gheimhridh) tá níos mó ócáidí spéise speisialta á n-eagrú againn i gcomhair le cumainn amaitéaracha, ach go háirithe Irish Astronomical Association agus Irish Astronomical Society, scoileanna áitiúla agus grúpaí eile.

Ag tógáil ar an gníomhaíocht for-rochtana seo, agus le maoiniú ó Chlár Rannpháirtíochta Poiblí Chathair Eolaíochta na hEorpa 2012, bunaíodh Rian Réalteolaíochta na hÉireann a nascann na suíomhanna uile ar fud na hÉireann a bhaineann leis an Réalteolaíocht. Nascann an rian ní hamháin suíomhanna a bhaineann le hoidhreacht (ar nós Bhrú na Bóinne) ach féachann sé freisin le suíomhanna a áireamh atá gníomhach i réalteolaíocht taighde na linne seo. Is í an tAire Joan Burton, a bhfuil Dún Sinche ina dailcheantar, a sheol an rian go hoifigiúil ar 23 Samhain. Bhí an tOllamh Clive Ruggles, comhordaitheoir ar chlár oidhreacht domhanda UNESCO do réadlanna réalteolaíochta i láthair freisin agus bhí ionadaíocht ann ó ambasáid na Fraince (tháinig cuid den inspioráid do rian na hÉireann ó thionscnamh dá leithéid sa Fhrainc agus nascfar an dá thogra mar chuid de 'Route des Observatoires' uile-Eorpach).

D'oscail Rannóg na Geoifisice suas Uimhir 5 Cearnóg Mhuirfean le bheith mar chuid den Turas Siúlóide an-rathúil ar Cearnóg Mhuirfean (<http://merrionsquare.ie/index.php/walking-tours/>) a d'eagraigh Ingenious Ireland. Bhí cuairteoirí in ann dul chuig codanna éagsúla den ionad agus an CTBTO NDC a fheiceáil chomh maith le cloisteáil faoi obair na Rannóige Geoifisice, stair na hInstitiúide agus stair an fhoirgnimh. Bhí gach turas curtha in áirithint go hiomlán, agus tháinig roinnt daoine ar ais don dara huair.

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- ### 1 Geophysics
- #### 1.1 Publications in International Literature
1. Adam, J. M.-C., and S. Lebedev (2012), Azimuthal anisotropy beneath southern Africa from very broad-band surface-wave dispersion measurements. *Geophysical Journal International*, **191**: 155–174. doi: 10.1111/j.1365-246X.2012.05583.x
 2. Afonso, J.C., J. Fullea, W. L. Griffin, Y. Yang, A.G. Jones, J.A.D. Connolly, and S.Y. O'Reilly (2013). 3D multi-observable probabilistic inversion for the compositional and thermal structure of the lithosphere and upper mantle. I: a priori petrological information and geophysical observables. *Journal of Geophysical Research - Solid Earth*, in press.
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1.2 Publications in Proceedings Volumes

Adam, J., S. Lebedev, 2012. Broad-band measurement of inter-station phase velocities and their inversion for shear-velocity azimuthal anisotropy (poster, extended abstract published), Noise and Diffuse Wavefields workshop, Neustadt, Germany, 11 - 14 November.

1.3 Theses

Agius, M.R., 2012. The structure and dynamics of the lithosphere beneath Tibet from seismic surface-wave analysis. Trinity College Dublin. Submitted October 31, defended November 28, 2012.

Khosa, D., 2012. Magnetotelluric studies across the Damara Orogen and southern Congo Craton. Ph.D. thesis, The University of the Witwatersrand, South Africa.

Le Pape, F., 2012. Characterization of a Crustal Transition Zone in Northern Tibet using Magnetotelluric Modelling. National University of Ireland, Galway.

Share, P.-E., 2012. Prediction of DC current flow between the Otjiwarongo and Katima Mulilo regions, Namibia. M.Sc. thesis, The University of the Witwatersrand, South Africa.

1.4 Invited presentations

1. Afonso, J.C., **J. Fullea**, Y. Yang, **A.G. Jones**, W.L. Griffin, J.A.D. Connolly, S.Y. O'Reilly, and **S. Lebedev**, 2012. The compositional and thermal structure of the lithosphere from thermodynamically-constrained multi-observable probabilistic inversion. Invited paper at: EGU, Vienna, Austria, 22-27 May.
2. Brun, J.-P., C. Tirel, M. Philippon, E. Burov, C. Faccenna, F. Gueydan, and **S. Lebedev**, 2012. On the role of horizontal displacements in the exhumation of high pressure metamorphic rocks (Solicited Talk), EGU General Assembly 2012, 22-27 April, Vienna, Austria.
3. **Jones, A.G.**, 2012. Illuminating lithospheric structures using electromagnetic waves and correlations with other geophysical, geological and petrological data. Invited presentation at: Lithosphere Workshop, University College Cork, Ireland, 17 February.
4. **Jones, A.G.**, 2012. Lighting up the lithosphere using electromagnetic waves and correlations with other geophysical, geological, geochemical and petrological data. Invited seminar at: ETH Zurich, 24 February.
5. **Jones, A.G.**, **M.R. Muller**, N.H. Hunter Williams, J.S. Daly, A. Allen, R. Goodman, M. Lee, D. Reay, M. Feely, P. Hanly, and R. Pasquali, 2012. IREATHERM: A New Project to Develop a Strategic and Holistic Understanding of Ireland's Deep Geothermal Energy Potential. SEEP 2012, 5th International Conference on Sustainable Energy & Environmental Protection, Dublin City University, Ireland, 5-8 June.
6. **Jones, A.G.**, 2012. Lighting up the lithosphere: Obtaining information about the Earth using very low frequency electromagnetic waves. Invited seminar, Macquarie University, 19 October.
7. **Jones, A.G.**, 2012. Petrophysical information of the Earth's lithosphere from electromagnetic and seismic studies. Invited seminar, University of Adelaide, 31 October.
8. **Jones, A.G.**, 2012. Petrophysical information of the Earth's lithosphere from electromagnetic and seismic studies. Invited seminar, University of Western Australia, 5 November.
9. **Jones, A.G.**, 2012. MT -The answer to everything (What was the question?). Invited research seminar, Macquarie University, 8 November.
10. **Jones, A.G.**, 2012. Velocity-conductivity relations for cratonic lithosphere and their application: Example of southern Africa. Invited keynote presentation at: 6th International Conference on Applied Geophysics, Kanchanaburi, Thailand, 15-17 November.
11. **Lebedev, S.**, 2012. Regional and global seismic tomography: Imaging the structure and dynamics of the Earth, Invited Seminar, University of Strasbourg, EOST, 16 October.
12. **Muller, M.R.**, **A.G. Jones**, **J. Fullea**, **C. Yeomans**, **M. Loewer**, L. Ayres, M. Desissa, and D. Reay, 2012. Geophysics (mostly electromagnetic and thermal modelling) in (high- and low-enthalpy) geothermal energy investigations. Geophysical Association of Ireland Seminar on Environmental Geophysics, Dublin, 15 February.

School of Theoretical Physics

Research

In high energy physics the discovery of the Higgs boson has been confirmed. Its mass is rather low, which hints at the existence of super-symmetric phenomena within reach of the LHC accelerator at CERN. The accelerator will reach its design energy only in 2015, however. We expect that the copious dark matter in the universe consists mainly of super-symmetric partners of known gauge bosons and of the Higgs, but claims of a detection of such dark matter particles have always turned out to be premature so far. At STP we studied recent claims in some detail, but soon concluded that they are unreliable. Thus at the moment the study of new fundamental physical phenomena remains to a large extent theoretical.

The groups of both Denjoe O'Connor and Werner Nahm are looking at matrix models, though with somewhat different perspectives. On the one hand matrix models may describe the emergence of geometry in a non-geometrical universe, on the other hand a specific super-symmetric matrix model has a chance to describe basic structures in a string-theoretic universe.

Denjoe and R. Delgadillo-Blando from NUI Maynooth published a study of a matrix model with two different phases, a non-geometric one and one with fuzzy geometry (JHEP 1211 (2012) 057). The model has a very interesting phase structure with critical fluctuations of the specific heat only on the low temperature side of the transition. With V. Filev from DIAS he made a more detailed investigation of this model and found the joint eigenvalue distribution of the matrices (archiv:1212.4818, December 2012).

The transition from non-geometrical to geometrical physics is likely to involve intermediate situations with fuzzy geometry. The latter pose still many technical and conceptual problems, in particular concerning fields with spin. Moreover, it is possible that ideas of fuzzy geometry will have to be combined with the concept of extra dimensions to make closer contact with particle phenomenology. With two Mexican former students of his and with Brian Dolan, NUI Maynooth and associate of DIAS, Denjoe published a paper which describes scalar and spinor fields over a fuzzy spherical four-dimensional space with two extra dimensions (JHEP 1208 (2012) 070).

An important development in recent years was the realization that insights into super-symmetric quantum

field theory can be used to understand features of quark-gluon plasmas produced at CERN. Such plasma filled the universe in one stage of the big bang. In a later stage it transformed into the presently existing elementary particles. This transformation occurred together with the breaking of the chiral symmetry which was a feature of the very early universe. The calculation of the quantitative properties of this plasma is very difficult. At present the only working approach uses a surprising detour via super-symmetric theories. Properties of super-symmetric analogues of a dense plasmas of this kind can be calculated due to a duality discovered in the context of superstring theory, then the super-symmetric effects have to be suppressed. Veselin Filev has published a series of papers following this approach. With J. Erdmenger (Max Planck Institute Munich) and D. Zoakos (Porto Univ.) he studied the required duality (JHEP 1208 (2012) 004), with M. Ammon (UCLA), J. Tarrío (Utrecht Univ.) and D. Zoakos he calculated thermodynamic properties of the dual theory (JHEP 1209 (2012) 039) and with Matthias Ihl (DIAS) he studied the effect of a strong magnetic field on the super-symmetric plasma. In particular they calculated the thermodynamic properties of the transition to chiral symmetry breaking (archiv:1211.1164, November 2012).

Matthias Ihl also studied the introduction of non-super-symmetric probes into super-symmetric theories (with A. Kundu and S. Kundu, Texas Univ., JHEP 1212 (2012) 070) and the resulting particle spectrum in comparison with experimental data (with A. Ballon Bayona, Durham Univ., H. Boschi-Filho and N. Braga and M. Torres, Rio de Janeiro Federal Univ., Phys. Rev. D86 (2012) 126002). With the latter co-authors he also published a conference paper with calculations of relativistic properties of baryonic particles (PoS ICMP2012 (2012) 020).

Tony Dorlas and Mathieu Beau studied mathematical properties of the Feynman path integral. The latter is fundamental for many calculations in quantum mechanics and quantum field theory, but still mathematically ill defined. Dorlas and Beau considered an approximation where continuous time is replaced by an infinite number of discrete steps. They obtained a mathematically well defined construction of the integral for all smooth potentials, where previous approaches had only allowed to study very special potentials (arxiv 1202.2033, February 2012).

Scoil na Fisice Teoiriciúla

Taighde

San fhisic ardfhuinnimh, tá aimsiú an bhósóin Higgs deimhnithe. Tá a mhais measartha íseal, rud a thugann leid go bhfuil feiniméin shár-shiméadracha ann gur féidir leis an luasaire LHC ag CERN teacht orthu. Ní shroichfidh an luasaire an fhuinneamh atá deartha dó go dtí 2015, áfach. Measfaimid gurb é is mó atá in iliomad damhna dorcha na cruinne ná comhpháirtithe sár-shiméadracha de thomhasbhósóin aitheanta agus an Higgs, ach go dtí seo fuarthas amach i gcónaí go raibh maíomh gur aimsíodh cáithníní damhna dorcha dá leithéid roimh am. I Scoil na Fisice Teoiriciúla rinneamar staidéar domhain go leor ar mhaíomh le déanaí, ach tháingamar ar an tuairim go luath nach féidir brath orthu. Mar sin, faoi láthair, fanann an staidéar ar fheiniméin fhisice bhunúsacha nua mar rud teoiriciúil, don chuid is mó.

Tá grúpaí Denjoe O'Connor agus Werner Nahm araon ag féachaint ar mhúnlaí maitrise, cé go bhfuil dearcthaí éagsúla acu. Ar thaobh amháin den scéal, féadfaidh múnlaí maitrise cur síos a thabhairt ar theacht chun cinn na geoiméadrachta i gcruinne neamh-gheoiméadrach, agus ar an taobh eile tá deis ag múnla maitrise sár-shiméadrach sainiúil cur síos a thabhairt ar struchtúir bhunúsacha i gcruinne teaghrán-theoirice.

D'fhoilsigh Denjoe agus R. Delgadillo-Blando ó OÉ Má Nuad staidéar ar mhúnla maitrise le dhá phas éagsúla, ceann neamh-gheoiméadrach agus ceann le geoiméadracht dhoiléir (JHEP 1211 (2012) 057). Tá pas-struchtúr an-suimiúil ag an múnla le hiomlaoidí criticiúla sa sainteas ar thaobh na teochta isle amháin den aistriú. In éineacht le V. Filev ó DIAS tá scrúdú níos mionsonraithe déanta aige ar an múnla seo agus d'aimsigh sé comhdháileadh luach eigen na maitrisí (archiv:1212.4818, Nollaig 2012).

Is dócha go gcuimseoidh an t-aistriú ó fhisic neamh-gheoiméadrach go fhisic gheoiméadrach staideanna eatramhacha le geoiméadracht dhoiléir. Baineann neart fadhbanna teicniúla agus coincheapa lena leithéid, ach go háirithe maidir le réimsí le guairne. Ina theannta sin, b'fhéidir nach mór tuairimí na geoiméadrachta doiléire a nascadh le coincheap na ndimínsean breise chun teagmháil níos dlúithe a dhéanamh le feiniméineolaíocht cáithníní. In éineacht le beirt iarscoláirí dá chuid ó Mheicsiceo agus le Brian Dolan, OÉ Má Nuad agus comhlach DIAS, d'fhoilsigh Denjoe páipéar a thugann cur síos ar réimsí scálacha agus spinóire thar spás doiléir sféarúil ceithre dhimínsean le dhá dhimínsean breise (JHEP 1208 (2012) 070).

Forbairt thábhachtach le blianta beaga anuas ab ea an tuiscint gur féidir léargas ar theoiric réimse chandamach shár-shiméadrach a úsáid chun tuiscint a fháil ar ghnéithe de phlasmaí cuairc-glúóin a táirgthe ag CERN. Líon plasma dá leithéid an chruinne ag céim amháin den ollphléasc. I gcéim níos déanaí d'aistrigh sé go dtí na cáithníní bunúsacha atá ann faoi láthair. Tharla an clochlú seo in éineacht le briseadh na siméadrachta ciriúile a bhí mar thréith ag an gcruinne fíorluath. Tá ríomh airíonna cainníochtúla an phlasma seo an-deacair. Faoi láthair baineann an t-aon chur chuige oibre úsáid as malairt slí aisteach trí theoiricí sár-shiméadracha. Is féidir na hairíonna atá ag analóga sár-shiméadracha ar dhlúth-phlasmaí den chineál seo a ríomh mar thoradh ar dhéacht a aimsíodh i gcomhthéacs theoiric na sártheaghrán, ansin ní mór na héifeachtaí sár-shiméadracha a shochtadh. Tá sraith de pháipéir foilsithe ag Veselin Filev a leanann an cur chuige seo. In éineacht le J. Erdmenger (Max Planck Institute Munich) agus D. Zoakos (Porto Univ.) rinne sé staidéar ar an déacht riachtanach (JHEP 1208 (2012) 004), in éineacht le M. Ammon (UCLA), J. Tarrio (Utrecht Univ.) agus D. Zoakos ríomh sé airíonna teirmidinimiciúla theoiric na déachta (JHEP 1209 (2012) 039) agus in éineacht le Matthias Ihl (DIAS) rinne sé staidéar ar tionchar na réimse maignéadaí láidre ar an bplasma sár-shiméadrach. Ach go háirithe ríomh siad airíonna teirmidinimiciúla an chlaochlath go briseadh siméadrachta ciriúile (archiv:1211.1164, Samhain 2012).

Rinne Matthias Ihl staidéar freisin ar thabhairt isteach na dtóireadóirí neamh-shár-shiméadracha i dteoiricí sár-shiméadracha (le A. Kundu agus S. Kundu, Texas Univ., JHEP 1212 (2012) 070) agus an speictream cáithníní dá bharr i gcomparáid le sonraí turgnaimh (le A. Ballon Bayona, Durham Univ., H. Boschi-Filho agus N. Braga agus M. Torres, Rio de Janeiro Federal Univ., Phys.Rev. D86 (2012) 126002). Leis na húdair deiridh sin d'fhoilsigh sé freisin páipéar comhdhála le ríomhanna ar airíonna coibhneasáiocha cháithníní barónacha (PoS ICMP2012 (2012) 020).

Rinne Tony Dorlas agus Mathieu Beau staidéar ar airíonna matamaitice shuimeálaí chonair Feynman. Rud bunúsach is ea é seo do roinnt mhaith ríomhanna i meicnic chandamach agus teoiric na réimse candamaí, ach tá siad fós droch-shainmhínithe go matamaiticiúil. Scrúdaigh Dorlas agus Beau meastachán áit a gcuirtear líon éigríochta de chéimeanna scartha in ionad an ama leanúnaigh. Bhain siad forléiriú dea-shainithe go matamaiticiúil amach ar an suimeálaí do na slimphoitéinsil uile, áit nár cheadaigh cuir

Stefano Kovacs worked on the solution of $N=4$ super Yang-Mills theory. The manifest and hidden symmetries of this theory should allow a complete solution. The problem is hard, but there is steady progress (arxiv: 1203.5376). The main emphasis of his work concerns M-theory. This theory became the focus of attention when it turned out that superstring theory cannot be mathematically complete without the introduction of higher dimensional objects, in particular membranes. The study of membranes is much more demanding than the study of strings. It has been proposed to study it in terms of a matrix model, but this idea has only been tested in very limited ways. Kovacs has given a series of talks on a much more conclusive test. Calculations will be finalised in 2013. The work is very promising and certain to find great international attention.

Volker Braun found an effective method for calculating the Hilbert series for Calabi-Yau manifolds given by reflexive polytopes (473,800,776 cases, arxiv:1206.2236, June 2012). He also published a paper which showed how the basic features of the minimal super-symmetric extension of the standard model can be realised in string theory (JHEP 1205 (2012) 127).

Research of Werner Nahm and F. Laytimi (Lille Univ.) led to a paper which will appear in Proceedings Mathematical Sciences Vol 123 and a paper with the title 'Generation by Sections and k -Ampleness' submitted to the Journal of Algebra. A visit of T. Spencer from the Princeton Institute of Advanced Studies led to research on Ising correlators with an unexpected link to previous work of Nahm's on modular forms and hyper-geometric series. It turned out that the two-point correlators of the Ising model at the phase transition can be expressed in terms of polynomials with integer coefficients evaluated on the well known values on the diagonal. This result was presented at a conference in Bad Honnef, but has not yet been written up.

Other Activities

The statutory public talk was given by Martin Rees, former President of the Royal Society on 19 November 2012. Its title was 'Cosmic Perspectives: from Planets to the Multiverse'.

Apart from our on-going research and the statutory public talk, we regard the organisation of international conferences as core activities. Tony Dorlas organised a conference on Quantum Physics and the Bethe Ansatz (7-10 October). A conference on Holography and Magnetic Catalysis of Chiral Symmetry Breaking (19-22 November) was organised by V. Filev with ESF funds (HoloGrav network).

Currently mathematics teaching at Irish schools is being reformed. Much greater emphasis will be placed on student understanding of mathematical concepts, with increased use of contexts and applications that will enable students to relate mathematics to everyday experience. Much of calculus will be cut. To help interested students Tony Dorlas provided a 10-week course on Mathematical Calculus on Saturdays before Christmas, open to all Higher-Level Leaving Certificate students from both the 2012 and 2013 cohort.

Werner Nahm's work was recognized by the 2012 Gothenburg Lise Meitner Prize for his 'pioneering and innovative research in mathematical physics which includes early studies on possible super-symmetric structures'.

Scoil na Fisice Teoiriciúla (ar leanúint)

chuige roimhe seo ach staidéar a dhéanamh ar phoitéinsil an-speisialta (arxiv 1202.2033, Feabhra 2012).

Rinne Stefano Kovacs obair ar chruthú na teoirice $N=4$ sár-shiméadraigh Yang-Mills. Ba chóir go gceadódh siméadrachtaí soiléire agus folaithe na teoirice seo réiteach iomlán. Tá an fhadhb crua, ach dul chun cinn réidh ann (arxiv: 1203.5376). Baineann príomhbhéim a chuid oibre le M-teoiric. Díriodh aird ar an teoiric seo nuair a aimsíodh nach féidir teoiric na sártheagrán a bheith iomlán go matamaiticiúil gan réada ó dhiminsin níos airde a thabhairt isteach, scannáin ach go háirithe. Tá an staidéar ar scannáin i bhfad níos déine ná an staidéar ar theagrán. Tá sé molta é a staidéar i dtéarmaí mhúnla mairíse, ach níor tástáladh an tuairim seo ach ar bhealaí an-teoranta. Tá sraith de chainteanna tugtha ag Kovacs ar thástáil i bhfad níos dochloíte. Cuirfear ríomhanna i gcrích i 2013. Tá cuma an-mhaith ar an obair agus is cinnte go mbeidh an-aird idirnáisiúnta air.

Tháinig Volker Braun ar mhodh éifeachtach chun sraith Hilbert a ríomh do na hipeardhromchlaí Calabi-Yau a éiríonn ó na polaitóipeanna athfhillteacha (473,800,776 cás, arxiv:1206.2236, Meitheamh 2012). D'fhoilsigh sé páipéar freisin a thaispeáin conas is féidir bunghnéithe shíneadh íosta an mhúnla caighdeánaigh a réadú i dteoiric na dteagrán (JHEP 1205 (2012) 127).

Mar thoradh ar thaighde Werner Nahm agus F. Laytimi (Lille Univ.) scríobhadh páipéar a fhoilseofar i Proceedings Mathematical Sciences Vol 123 agus páipéar dar teideal 'Generation by Sections and k -Ampleness' a seoladh isteach chuig Journal of Algebra. Mar thoradh ar chuairt ag T. Spencer ón Princeton Institute of Advanced Studies rinneadh taighde ar chomhchoibhneasóirí Ising le nasc nach rabhthas ag súil leis le hobair a rinne Nahm roimhe seo ar fhoirmeacha modhúlacha agus sraitheanna hipirgeoiméadracha. Tarlaíonn gur féidir comhchoibhneasóirí dhá phointe an mhúnla Ising ag an gclaochlú pas a lua i dtéarmaí iltéarmach le comhéifeachtaí slánuimhreacha measta ar luachanna aithnidiúla ar an trasnán. Cuireadh an toradh seo i láthair ag comhdháil i Bad Honnef, ach níor scríobhadh suas go fóill é.

Imeachtaí Eile

Thug Martin Rees, iar-Uachtarán an Chumainn Ríoga an léacht phoiblí reachtúil ar 19 Samhain 2012. Ba é 'Cosmic Perspectives: from Planets to the Multiverse' an teideal.

De bhreis ar ár dtaighde leanúnach agus an léacht phoiblí reachtúil, breathnaímid ar eagrú comhdhálacha idirnáisiúnta mar chroí-ghníomhaíochtaí. D'éagraigh Tony Dorlas comhdháil ar *Quantum Physics and the Bethe Ansatz* (7 - 10 Deireadh Fómhair). D'éagraigh V. Filev comhdháil ar *Holography and Magnetic Catalysis of Chiral Symmetry Breaking* (19 - 22 Samhain) le maoiniú ESF (líonra HoloGrav).

Faoi láthair tá teagasc na matamaitice i scoileanna na hÉireann á leasú. Leagfar béim i bhfad níos mó ar thuiscint na scoláirí ar choincheapa na matamaitice, le húsáid níos mó de chomhthéacsanna agus d'fheidhmeanna a chuirfidh ar chumas na scoláirí an mhatamaitic a cheangal le taitheí an ghnáthshaoil. Gearrfar cuid mhór den chalcalas. Mar chabhair do scoláirí a bhfuil suim acu ann, chuir Tony Dorlas cúrsa 10 seachtaine ar fáil ar Chalcalas Matamaitice ar Sathairn roimh Nollag, a bhí oscailte do na scoláirí Ardteistiméireachta Ardleibhéal uile ó chohórt na bliana 2012 agus na bliana 2013 araon.

Mar aitheantas ar shaothar Werner Nahm, bronnadh duais Gothenburg Lise Meitner 2012 air as 'a thaighde ceannródaíoch agus nuálaíoch san fhisic mhatamaiticiúil a áiríonn staidéar luath ar struchtúir ionchasacha sár-shiméadracha. *

SCHOOL OF THEORETICAL PHYSICS PUBLICATIONS 2012

Papers published in refereed journals

1. **Dolan, B.**, Wang, Y.T., Kim, G.H., Huang, C.F., Lo, S.T., Chen, W.J., Nicholls, J.T., Lin, L.H., Ritchie, D.A., Chang, Y.H. and Liang, C.T. (2012) "Probing temperature-driven flows lines in a gated two-dimensional electron gas with tunable spin-splitting", *Journal of Physics: Condensed Matter*, v. 24, no. 40.
2. **Dolan, B.**, Medina, J., Huet, Y. and **O'Connor, D.** (2012) "Scalar and spinor field actions on fuzzy S^4 : fuzzy CP^3 as a S^2/F bundle over S^4/F ", *JHEP*, 08/70.
3. Ballon-Bayona, A., Boschi-Filho, H., Braga, N.R.F., **Ihl, M.** and Torres, M.A.C. (2012) "Production of negative parity baryons in the holographic Sakai-Sugimoto model", *Physics Review D*, v. 86.
4. **Ihl, M.**, Kundu, A. and Kundu, S. (2012) "Back-reaction of non-supersymmetric probes: phase transition and stability", *JHEP*, 12/70.
5. Boschi-Filho, H., Braga, N.R.F., **Ihl, M.** and Torres, M.A.C. (2012) "Relativistic baryons in the Skyrme model revisited", *Physics Review D*, v. 85.
6. Brihaye, Yves, Radu, Eugen and **Tchrakian, D.H.** (2012) "An instability of the Reissner-Nordström solution and new hairy black holes in $d=5$ dimensions", *Physics Review D*, v. 85.
7. Brihaye, Yves, Radu, Eugen and **Tchrakian, D.H.** (2012) "Stable black hole solutions with non-Abelian fields", *Physics Review D*, v. 85.
8. Radu, Eugen and **Tchrakian, D.H.** (2012) "Instantonic dyons of Yang-Mills-Chern-Simons models in $d=2n+1$ dimensions, $n>2$ ", *Journal of Physics A*, v. 45.
9. **Beau, M.** (2012) "Feynman path integral approach to electron diffraction for one and two slits, analytical results", *European Journal of Physics*, v. 33.
10. Ammon, M., **Filev, V. G.**, Tarrio, J. and Zoakos, D. (2012) " $D3/D7$ quark-gluon plasma with magnetically induced anisotropy" *JHEP*, 09/39.
11. Erdmenger, J., **Filev, V. G.** and Zoakos, D. (2012) "Magnetic catalysis with massive dynamical flavours", *JHEP*, 08/4.
12. Ananth, S., **Kovac, S.** and Parikh, S. (2012) "Gauge-invariant correlation functions in light-cone superspace", *JHEP*, 05/96.
13. **Braun, V.** (2012) "The 24-Cell and Calabi-Yau threefolds with Hodge numbers (1,1)", *JHEP*, 05/101.
14. **Braun, V.**, Candelas, P., Davies, R., Donagi, R. (2012) "The MSSM Spectrum from (0,2)-deformations of the heterotic standard embedding", *JHEP*, 05/127.
15. Hofmann, F., Abbey, B., Connor, L. Baimpas, N., Song, X., **Keegan, S.**, Korsunsky, A.M. (2012) "Imaging of grain level orientation and strain in thicker metallic polycrystals by high energy transmission micro-beam Laue (HETL) diffraction techniques" *International Journal of Materials Research*, v. 103
16. Anderson, Lara B., **Braun, Volker**, Karp, Robert L. and Ovrut, Burt A. (2012) "Numerical Hermitian Yang-Mills connections and Kahler Cone substructure", *JHEP*, 01/014
17. Delgadillo-Blando, Rodrigo & **O'Connor, Denjoe** (2012) "Matrix geometries and matrix models", *JHEP*, 11/057.
18. **Nahm, Werner** (2012) "The placement and chronological sequence of the stelae from Assur", *Altorientalische Forschungen*, v. 39, no. 1, pp. 112-123.

Papers published in conference proceedings and edited works

1. Boschi-Filho, H., Braga, N.R.F., **Ihl, M.** and Torres, M.A.C. (2012), "Towards relativistic skyrmions", *Proceedings of Science*, ICMP, 020.
2. Radu, E. & **Tchrakian, D.H.** (2012) "New Chern-Simons densities in both odd and even dimensions" in Gurzadyan, V.G., Klümper, A., and Sedrakyan A.G. (ed.) *Low Dimensional Physics and Gauge Principle, Matinyan Festschrift*, Singapore : World Scientific Press.
3. **Braun, V.** (2012) "Counting points and Hilbert series in string theory", in Rebhan, A. [et al.] (ed.) *Max Kreuzer memorial volume*, Singapore : World Scientific Press.

4. **Dolan, B.** (2012) "Where is the PdV term in the first law of black hole thermodynamics?" in Olmo, G. J. (ed.) *Open Questions in Cosmology*: InTech, ISBN 9789535108801.
5. **Dorlas, T.C.** (2012) Contribution to "In Memoriam' for Professor Erik G.F. Thomas, 1939-2011" in *Nieuw Archief voor Wiskunde*, 5/13, no. 4, December.

Preprints (unpublished articles)

1. **Beau, M., Dorlas, T. C.** (2012) "Discrete-time path distributions on Hilbert space".
2. Balasubramanian, V., Berglund, P., Braun, V., Garcia-Etxebarria, I. (2012) "Global embeddings for branes at toric singularities".
3. **Kovacs, S.**, Ananth, S., Parikh, S. (2012) "Gauge-invariant correlation functions in light-cone superspace".
4. **Filev, V.** (2012) "D3/D7 Quark-gluon plasma with magnetically induced anisotropy".
5. **Dolan, B.**, Szabo, R. (2012) "Solitons and Yukawa couplings in nearly Kahler flux compactifications".
6. **Ihl, M.** (2012) "Back reaction of non-supersymmetric probes".
7. **Dolan, B.** (2012) "Where is the PdV term in the first law of black hole thermodynamics".
8. **Beau, M.** (2012) "Hypothèse théorique concernant l'induction d'un champ gravitationnel de type vectoriel généré par le déplacement accéléré des masses en mouvement".
9. **Ihl, M.** (2012) "Production of negative parity baryons in the holographic Sakai-Sugimoto model".
10. **Ihl, M.** & **Filev, V.** (2012) "Flavoured large N-gauge theory on a compact space with an external magnetic field".
11. Brihaye, Y., Manvelyan, R., Radu, E. and **Tchraikian, D.H.** (2012) "Electrically charged black branes in N=4+D=5 gauged supergravity".
12. **O'Connor, D., Filev V.** (2012) "Near commuting multi-matrix models".
13. **Braun, V.** (2012) "Counting points and Hilbert series in string theory."
14. Medina, J., Huet, I., **O'Connor, D., Dolan, B. P.** (2012) "Scalar and spinor field actions on fuzzy S4: fuzzy CP3 as a S2F bundle over S4F".
15. Delgadillo-Blando, R., **O'Connor, D.** (2012) "Matrix geometries and matrix models."
16. Boschi-Filho, H., Braga, N.R.F., **Ihl, M.**, Torres, M.A.C. (2012) "Towards relativistic skyrmions."
17. **Lyberg, I.** (2012) "A 'Quantum spherical model' with transverse magnetic field".
18. **Nahm, W.** (2012) "Generation by sections and k-ampleness."
19. **Nahm, W.** (2012) "A general vanishing theorem".

Administration and Finance

A new Strategy Statement for the period 2012-2016 was developed during the year. This was the product of extensive consultation with staff, members of the governing bodies of the Schools and other academic partners. Progress has been made on implementing some of the key objectives during the year with the establishment of a Foundation called the Friends of DIAS which will work to generate additional external financial support and generally promote the research work of the Schools. The format of the Annual Report for individual Schools was standardised to make it more understandable for the general reader and to allow progress to be assessed against the performance indicators identified in the Strategy Statement.

Dialogue took place during the year with the HEA regarding proposals for reforming the higher education sector. DIAS continued to network with other organisations in the higher education sector to exchange information on the implementation of administrative and financial initiatives as well as exploring any opportunities that may arise for shared service provision. Following a tender process, a new firm of Internal Auditors was appointed for a term of three years.

The European Charter for Researchers which outlines the roles, responsibilities and entitlements of researchers as well as employers, has been adopted by all three Schools of DIAS. Work commenced during the year on the development of a Human Resource Strategy that is designed to give effect to the implementation of the Charter by integrating the principles in the Charter with institutional policies and practices.

Finance

The attached financial statements report a loss of €147,246 for the year. This compares with a loss of €89,658 in the year to 31st December 2011. The reason for this overspend in 2012 is due to the payment of pension gratuities to staff members who opted for early retirement in February 2012.

Total income for the Institute decreased from €11,894,998 in 2011 after adjusting for pensions to €10,839,464 in 2012.

This represents a decrease of €1,055,534 or 8.87% and the main decreases occurred in projects and capital grant income.

In 2012, an amount of €60,000 was invested in the upgrade of the DIAS network.

Riarachán agus Airgeadas

Forbraíodh Ráiteas Straitéise don tréimhse 2012-2016 le linn na bliana. Toradh ab ea é seo ar chomhairliúchán leathan leis an bhfoireann, le baill de bhoird rialaithe na Scoileanna agus le comhpháirtithe acadúla eile. Tá dul chun cinn déanta i bhfeidhmiú roinnt de na príomhchuspóirí le linn na bliana le bunú Fundúireachta ar a dtugtar Cairde DIAS a oibreoidh chun breis tacaíochta airgeadais a ghineadh agus chun obair thaighde na Scoileanna a chothú i gcoitinne. Rinneadh formáid na Tuarascála Bliantúla do Scoileanna aonair a chaighdeánú chun í a dhéanamh níos intuigthe don léitheoir ginearálta agus d'fhonn dul chun cinn a mheas i gcoinne na dtáscairí feidhmíochta atá ainmnithe sa Ráiteas Straitéise.

Bhí plé ann le linn na bliana leis an ÚAO maidir le moltaí chun earnáil an ardoideachais a leasú. Lean DIAS den líonrú le heagrais eile in earnáil an ardoideachais chun eolas a mhalartú ar fheidhmiú na dtionscnamh riaracháin agus airgeadais chomh maith le haon deiseanna eile a fhiosrú a d'fhéadfadh a bheith ann do sholáthar comhroinnte seirbhísí. Mar thoradh ar phróiseas tairisceana, ceapadh comhlacht nua d'Iniúcháirí Inmheánacha do théarma trí bliana.

Tá Chairt na hEorpa do Thaighdeoirí, a thugann cur síos ar ról, ar fhreagrachtaí agus ar theidlíochtaí thaighdeoirí chomh maith le fostóirí, glactha ag na trí Scoil i DIAS. Cuireadh tús le hobair le linn na bliana ar Straitéis Acmhainne Daonna a fhorbairt atá ceaptha le feidhm a thabhairt don Chairt trí na príonsabail sa Chairt a chomhtháthú le polasaithe agus le cleachtais na hinstiúide.

Airgeadas

Tuairiscíonn na ráitis airgeadais, atá ag gabháil leis seo, caillteanas €147,246 don bhliain. Is féidir seo a chur i gcomparáid le caillteanas €89,658 sa bhliain go dtí 31 Nollaig 2011. Is í an chúis leis an ró-chaiteachas seo i 2012 ná an íocaíocht aiscí pinsin do bhaill foirne a roghnaigh scor luath i mí Feabhra 2012.

Tar éis coigeartú do phinsin i 2012, laghdaigh ioncam iomlán na hinstiúide ó €11,894,98 i 2011 go €10,839,464 i 2012.

Léiríonn sé seo laghdú €1,055,534 nó 8.87% agus tharla na laghdaithe is mó i dtionscadail agus in ioncam deontais.

Sa bhliain 2012 infheistíodh méid €60,000 in uasghrádú an líonra DIAS.

Institute Staff

Council of the Institute

Chairman

V. Cunnane

Ex-Officio Members

H. Brady, President, UCD

L. Drury, President, RIA

P. Prendergast, Provost, TCD

Members Appointed by the Governing Boards of Constituent Schools

G. Wrixon

A. Jaffe

A. Ahlqvist

W. Nahm

F. Kelly

Governing Board of the School of Celtic Studies

Chairman

A. Ahlqvist

Senior Professors

L. Breatnach

F. Kelly

P. Breatnach

Appointed Members

D. Ó Baoill

M. Herbert

R. Ó hUiginn

E. Ní Dhea

K. Simms

N. Ó Muraíle

A. Ó Corráin

M. Ní Mhaonaigh

J. McCloskey

U. Mac Gearailt

Governing Board of the School of Theoretical Physics

Chairman

A. Jaffe

Senior Professors

T. Dorlas

D. O'Connor

W. Nahm

Appointed Members

A. Breslin

H. Nicolai

M. Grünewald

M. Tuite

P. Knight

L. Hau

R. Dijkgraaf

S. Shatashvili

D. Gilbert

D. Zagier

J. Frohlich

Governing Board of the School of Cosmic Physics

Chairman

G. Wrixon

Senior Professors

L. Drury

A. Jones

Appointed Members

A. Khan

O. Glaser

L. Enright

R. Perrott

M. Fowler

S. Cloetingh

L. Pedersen

C. Ceccarelli

E. Meehan

A. Watson

Administrative Staff of the Institute 2012

Registrar

C. Keaveney

Finance Officer

G. Forkin

Senior Administrative Officer

M. Burke

Assistant Finance Officer

R. Byrne

Clerks

M. Loughman

H. Moynihan

E. Barrett

M. Brennan

Senior Administrator

M. Ó Glasáin (to 29 February)

Head of IT

D. Grigoriev

Senior Systems Administrator

J. Bucas

Systems Administrator

P. Grange

Support Staff

G. Casey

R. Jones

B. Judge

P. McDonald

C. Doyle

T. Ó Gríofa

K. Earley

P. Wynne

Staff and Scholars of the School of Celtic Studies 2012

Senior Professors

F. Kelly

L. Breatnach (Director from November 2012)

P. Breatnach (Director to November 2012)

Professors

M. McKenna (to 12 January)

P. Ó Macháin (to 31 July)

Assistant Professors

A. Nic Dhonnchadha

M. O Riordan (Publications Officer)

Dialectologist

B. Ó Curnáin

Assistant Librarian

M. Irons

Library Assistant

Ó. Ní Chanainn

School Administrator

E. Nic Dhonncha

Technical Staff

ISOS

A. O'Brien

IT Support

A. McCarthy (part-time)

S. McCullagh (part-time)

Bibliographer

A. Guilarte

Bergin Fellows

G. O Riain (Ireland) (from 1 August)

Scholars

A. Matheson (Canada) (to 30 September)

H. Imhoff (Germany) (to 31 October)

E. Lash (U.S.A.)

S. Nic Lochlainn (Ireland)

N. Volmering (Netherlands) (from 1 October)

Institute Staff (continued)

Project Staff

Irish Research Council for the Humanities and Social Sciences (IRCHSS) Government of Ireland Fellowship

R. McLaughlin (to 30 September)

Ogham in 3D Principal Investigator

N. White (From 1 October)

Professor Emeritus

M. Ó Murchú

Staff and Scholars of the School of Theoretical Physics 2012

Senior Professors

W. Nahm (Director)

T. Dorlas

D. O'Connor

Librarian

M. Williams

School Administrator

M. Matthews (to 1 July)

Post-Doctoral Scholars

M. Beau (France)

Pre-Doctoral Scholars

O. Smits (Netherlands)

M. Vachovski (Bulgaria)

T. Kaltenbrunner (Austria)

Schrodinger Fellows

V. Braun (Germany)

S. Kovacs (Italy)

I. Lyberg (Sweden)

Project Staff

Irish Research Council for Science, Engineering & Technology (IRCSET) Government of Ireland Postdoctoral Research Fellows

V. Filev (Bulgaria) *"Phase structure of flavored holographic gauge theories in external magnetic field"*

M. Ihl (Germany) *"Application of gauge/gravity correspondences to strongly coupled physical systems, with an emphasis on phenomenology of pions, mesons and baryons in holographic realizations of QCD-like flavour physics at zero and finite temperature"*

Staff and Scholars of the School of Cosmic Physics 2012

Senior Professors

L. Drury (Director)

A. Jones

Professors

T. Ray

F. Aharonian

Z. Martinec

Assistant Professors

S. Lebedev

B. O'Reilly

Fellows

M. Muller (South Africa)

A. Scholz (Germany)

A. Taylor-Castillo (U.K.) (from 1 August)

Experimental Officer

T. Blake

Senior Technical Assistants

C. Horan

M. Smyth

Technical Assistants

E. Flood
A. Grace
H. O'Donnell
L. Collins
C. Hogg

Clerical Staff

P. Daly
A. Sewielska

Scholars

M. Miensopest (Germany) (to 14 March)
D. Khoza (South Africa) (to 30 September)
L. Fallon (Ireland) (to 13 July)
G. Polat (Turkey) SFI Project (to 25 June)
J. Buckenmeyer (France)
E. Mandolesi (Italy) SFI Project
M. Agius (Malta) SFI Project (to 30 November)
N. Noorae (Iran) (to 16 September)
F. Le Pape (France) Geo External
D. Kiyani (Turkey) IRCSET
G. Costigan (Ireland) Lindsay Scholar
A. Schaeffer (Canada) SFI Project
R. Ainsworth (USA) SFI Project
P. Dawson (Ireland) Brown Dwarfs
T. Farrell (Ireland) Iretherm
C. Yeomans (U.K.) Iretherm (to 1 October)
S. Blake (Ireland) Iretherm
T. Fritschle (Germany) Iretherm
J. Hagedoorn (Germany) (from 1 May)
C. Romoli (Italy) (from 1 December)
D. Rodgers-Lee (Ireland) (from 1 December)
R. Delhaye (France/New Zealand) Iretherm (from 9 January)
D. Bolte (Germany) SFI Project (from 15 January)
A. Licciardi (Italy) SFI Project (from 1 September)
T. Waters (Ireland) Iretherm (from 1 October)

Project Staff

E. Whelan (Ireland) IRCSET (to 31 August)
K. Rochford (Ireland) e-INIS
D. Coffey (Ireland) IRCSET (to 5 February)
G. Murphy (Ireland) SFI Project (to 29 February)
V. Bosch Ramon EU Marie-Curie (to 29 June)
C. Moloney (Ireland) IGGP
R. Azzollini MIRI (from 1 November)
V. Geers MIRI (from 1 December)
J. Vozar SFI Project (from 1 May)
N. Piana Agostinetti SFI Project (from 1 May)

Professor Emeritus

P. Readman
D. O'Sullivan
A. Thompson

Vacation Students

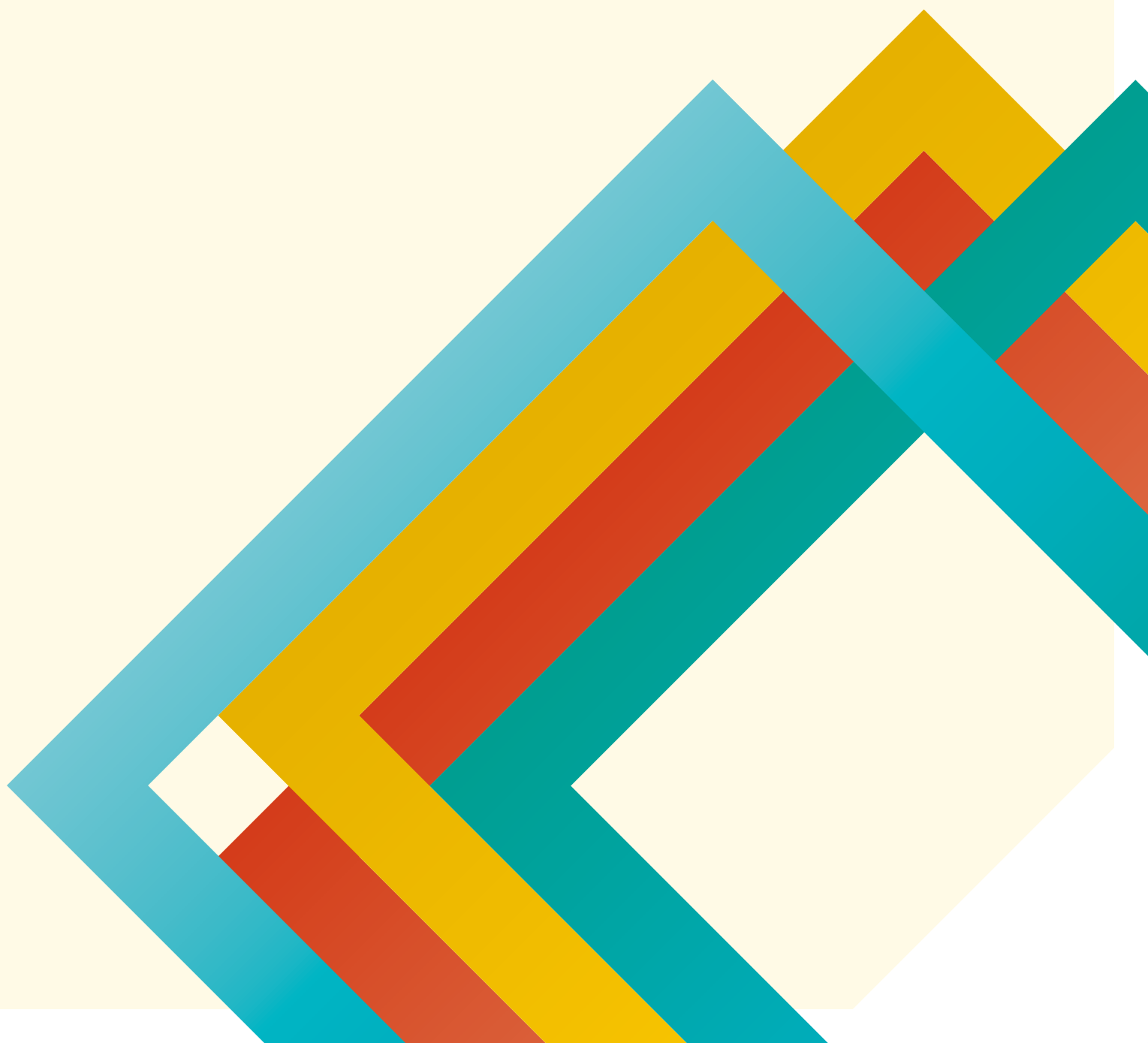
M. Shahrukh (from 14 May to 14 August)
S. Sihelnik (from 3 January to 30 April)
D. Rodgers-Lee (from 25 June to 17 August)
E. Neenan (from 1 December)



**Financial Statements
for year ended
31 December 2012**

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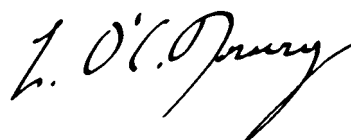
Statement of Responsibilities of the Council

The Council of the Dublin Institute for Advanced Studies is required under section 28(2) of the Institute for Advanced Studies Act 1940 to prepare financial statements in such form as shall be approved by the Minister for Education & Skills with the concurrence of the Minister for Finance.

In preparing those financial statements the Council is required to:

- select suitable accounting policies and apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Institute will continue in operation; and
- disclose and explain any material departures from applicable accounting standards.

The Council is responsible for keeping proper books of account which disclose with reasonable accuracy at any time the financial position of the Institute and which enable it to ensure that the financial statements comply with Section 28(2) of the Act. The Council is responsible for safeguarding the assets of the Institute and for taking reasonable steps for the prevention and detection of fraud and other irregularities.



Luke Drury
Council Member



Liam Breatnach
Council Member

Statement on Internal Financial Control

Responsibility for Internal Financial Control

On behalf of the Council of the Institute I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

The system can only provide reasonable and not absolute assurance that assets are safeguarded, transactions authorised and properly recorded, and that material errors or irregularities are either prevented or would be detected in a timely period.

Key Control Procedures

The Council has taken steps to ensure an appropriate control environment by

- clearly defining management responsibilities;
- establishing formal procedures for reporting significant control failures and ensuring appropriate corrective action.

The Council has established processes to identify and evaluate business risks by

- identifying the nature, extent and financial implication of risks facing the Institute including the extent and categories which it regards as acceptable;
- assessing the likelihood of identified risks occurring;
- assessing the Institute's ability to manage and mitigate the risks that do occur;
- assessing the costs of operating particular controls relative to the benefit obtained.

The system of internal financial control is based on a framework of regular management information, administrative procedures including segregation of duties, and a system of delegation and accountability.

In particular it includes:

- comprehensive budgeting system with an annual budget which is reviewed and agreed by the Council of the Institute;
- regular reviews by the Council of periodic and annual financial reports which indicate financial performance against forecasts;

- setting targets to measure financial and other performance;
- adherence to public procurement guidelines;
- regular reviews by the Council of external research projects.

The Audit Committee continues to review internal control matters and issues raised by the Comptroller and Auditor General. In 2012, the Audit Committee met on three occasions.

In addition, the 2012 report on internal control systems as provided by the Internal Auditor has been made available to Members of Council.

The Council's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor, the Registrar and other officers within the Institute who have responsibility for the development and maintenance of an appropriate financial control framework and comments made by the Audit Committee and the Comptroller and Auditor General in his management letter or other reports.

Annual Review of Controls

I confirm that in the year ended 31st December 2012 Council conducted a review of the effectiveness of the internal financial controls of the Institute.

Signed on behalf of the Council of the Institute



Vincent Cunnane

Chairman - Council of the Institute

27 June 2013

Comptroller and Auditor General

Report for presentation to the Houses of the Oireachtas

Dublin Institute for Advanced Studies

I have audited the financial statements of the Dublin Institute for Advanced Studies for the year ended 31 December 2011 under the Institute for Advanced Studies Act 1940. The financial statements, which have been prepared under the accounting policies set out therein, comprise the Accounting Policies, the Income and Expenditure Account, the Statement of Total Recognised Gains and Losses, the Balance Sheet, the Cash Flow Statement and the related notes. The financial statements have been prepared in the form prescribed under Section 28 of the Act and in accordance with Generally Accepted Accounting Practice in Ireland.

Responsibilities of the Council

The Council is responsible for the preparation of the financial statements, for ensuring that they give a true and fair view of the state of the Institute's affairs and of its income and expenditure, and for ensuring the regularity of transactions.

Responsibilities of the Comptroller and Auditor General

My responsibility is to audit the financial statements and report on them in accordance with applicable law.

My audit is conducted by reference to the special considerations which attach to State Bodies in relation to their management and operation.

My audit is carried out in accordance with the International Standards on Auditing (UK and Ireland) and in compliance with the Auditing Practices Board's Ethical Standards for Auditors.

Scope of Audit of the Financial Statements

An audit involves obtaining evidence about the amounts and disclosures in the financial statements, sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of

- whether the accounting policies are appropriate to the Institute's circumstances, and have been consistently applied and adequately disclosed
- the reasonableness of significant accounting estimates made in the preparation of the financial statements, and
- the overall presentation of the financial statements.

I also seek to obtain evidence about the regularity of financial transactions in the course of audit.

In addition, I read the Institute's Annual Report to identify material inconsistencies with the audited financial statements. If I become aware of any apparent material misstatements or inconsistencies I consider the implications for my report.

Opinion on the Financial Statements

In my opinion, the financial statements, which have been properly prepared in accordance with Generally Accepted Accounting Practice in Ireland, give a true and fair view of the state of the Institute's affairs at 31 December 2012 and of its income and expenditure for 2012.

In my opinion, proper books of account have been kept by the Institute. The financial statements are in agreement with the books of account.

Matters on which I Report by Exception

I report by exception if

- I have not received all the information and explanations I required for my audit, or
- my audit noted any material instance where money has not been applied for the purposes intended or where the transactions did not conform to the authorities governing them, or
- the information given in the Institute's Annual Report is not consistent with the related financial statements, or
- the Statement on Internal Financial Control does not reflect the Institute's compliance with the Code of Practice for the Governance of State Bodies, or
- I find there are other material matters relating to the manner in which public business has been conducted.

I have nothing to report in regard to those matters upon which reporting is by exception.



Patricia Sheehan

For and on behalf of the Comptroller and Auditor General

30 June 2013

Accounting Policies

GENERAL

The Institute was established under the Institute for Advanced Studies Act, 1940.

Its functions include the provision of facilities for the furtherance of advanced studies and the conduct of research in specialised branches of knowledge.

It comprises three Schools - Celtic Studies, Theoretical Physics and Cosmic Physics.

ACCOUNTING POLICIES

1. Basis of Accounting

The financial statements have been prepared on an accruals basis under the historical cost convention and in accordance with generally accepted accounting practice. Financial Reporting Standards recommended by the recognised accounting bodies are adopted as they become applicable.

2. Oireachtas Grants

Income is shown on a cash received basis.

3. Fixed Assets

Fixed Assets comprise the furniture, equipment, computers and motor vehicles of the Institute and are shown at cost less accumulated depreciation. The rates of depreciation, calculated on a straight line basis, are as follows:

| | |
|-------------------------|-----|
| Furniture and Equipment | 10% |
| Computers | 25% |
| Motor Vehicles | 25% |

Premises occupied by the Institute are leased from the Office of Public Works.

4. Capital Reserve

The capital reserve represents the unamortised value of income used for the purchase of Fixed Assets.

5. Library

Expenditure on library books and materials is written off in the year in which it is incurred.

6. Publications

Expenditure on publications is written off in the year in which it is incurred.

7. Superannuation

The Dublin Institute for Advanced Studies operates a defined benefit pension scheme which is funded annually on a pay as you go basis from monies available to it, including monies provided by the Department of Education and Skills and from contributions deducted from staff salaries.

Pension costs reflect pension benefits earned by employees in the period and are shown net of staff pension contributions which are retained by the Dublin Institute for Advanced Studies. An amount corresponding to the pension charge is recognised as income to the extent that it is recoverable, and offset by grants received in the year to discharge pension payments.

Actuarial gains or losses arising on scheme liabilities are reflected in the Statement of Recognised Gains and Losses and a corresponding adjustment is recognised in the amount recoverable from the Department of Education and Skills.

Pension liabilities represent the present value of future pension payments earned by staff to date. Deferred pension funding represents the corresponding asset to be recovered in future periods from the Department of Education and Skills.

8. Projects


The Dublin Institute for Advanced Studies receives external funding from industry, government bodies and the European Commission. A chart of accounts is maintained for each project.

Income and expenditure on projects is reflected in the financial statements in the year to which they relate. A surplus or deficit on a project is reflected in the financial statements when realised.

Income and Expenditure Account

| | Notes | 2012 € | 2011 € |
|---|-------------|--------------------|--------------------|
| Income | | | |
| Oireachtas Grant | | 6,856,000 | 7,270,604 |
| Net deferred funding for pensions | 11.c | 1,719,800 | 2,066,798 |
| Sales of Publications | | 41,487 | 44,896 |
| Projects | 2 | 2,157,337 | 2,450,582 |
| Other | 3 | 64,840 | 62,118 |
| | | 10,839,464 | 11,894,998 |
| Transfer (to)/from Capital Reserve | 5 | 4,287 | 76,698 |
| | | 10,843,751 | 11,971,696 |
| Expenditure | | | |
| | 1 | | |
| School of Celtic Studies | | 1,316,886 | 1,524,227 |
| School of Theoretical Physics | | 1,068,519 | 1,217,542 |
| School of Cosmic Physics | | 3,285,046 | 3,884,122 |
| Administration | | 5,320,546 | 5,435,463 |
| | | 10,990,997 | 12,061,354 |
| Deficit/Surplus for the year | | (147,246) | (89,658) |
| Balance at 1 January | | 827,351 | 917,009 |
| Balance at 31 December | | 680,105 | 827,351 |
| Statement of Total Recognised Gains and Losses | | | |
| | | 2012 | 2011 |
| (Deficit)/Surplus for the year | | (147,246) | (89,658) |
| Experience (gains)/losses on pension scheme liabilities | | 2,499,000 | (188,000) |
| Changes in assumptions underlying the present value of pension scheme liabilities | | (5,398,000) | (1,514,000) |
| Actuarial Loss on Pension Liabilities | 11.b | (2,899,000) | (1,702,000) |
| Adjustment to Deferred Pension Funding | | 2,899,000 | 1,702,000 |
| Total Recognised (Loss) for the Year | | (147,246) | (89,658) |

The Statement of Accounting Policies and notes 1 to 14 form part of these financial statements.



Luke Drury
Council Member

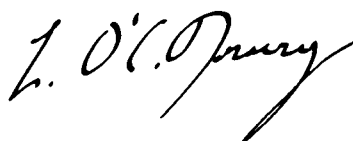


Liam Breatnach
Council Member

Balance Sheet

| | Notes | 2012 € | 2011 € |
|---|-------|------------------|------------------|
| Assets | | | |
| Fixed Assets | 4 | 2,120,435 | 2,124,722 |
| Current Assets: | | | |
| Cash on Hand and at Bank | | 3,490,596 | 3,989,556 |
| Debtors and Prepayments | 7 | 213,197 | 201,444 |
| Project Debtors | 2 | 19,092 | 148,896 |
| Total Assets | | 5,843,320 | 6,464,618 |
| Less Liabilities | | | |
| Creditors - Amounts falling due within one year | | | |
| Creditors and Accruals | 6 | 1,550,260 | 1,272,320 |
| Project Creditors | 2 | 1,448,834 | 2,184,661 |
| Creditors - Amounts falling due after one year | | | |
| | 6 | 43,686 | 55,564 |
| Total Liabilities Before Pensions | | 3,042,780 | 3,512,545 |
| Assets Less Liabilities Before Pensions | | 2,800,540 | 2,952,073 |
| Deferred Pension funding | 11.c | 45,125,000 | 40,506,000 |
| Pension Liabilities | 11.b | (45,125,000) | (40,506,000) |
| | | - | - |
| Net Assets | | 2,800,540 | 2,952,073 |
| Financed by: | | | |
| Income and Expenditure Account | | 680,105 | 827,351 |
| Capital Reserve | 5 | 2,120,435 | 2,124,722 |
| | | 2,800,540 | 2,952,073 |

The Statement of Accounting Policies and notes 1 to 14 form part of these financial statements.



Luke Drury
Council Member



Liam Breatnach
Council Member

Cash Flow Statement

| | Notes | 2012 € | 2011 € |
|---|-------|------------------|--------------------|
| Reconciliation of Operating (Deficit)/Surplus to Net Cash Inflow from Operating Activities | | | |
| (Deficit)/Surplus for the Year | | (147,246) | (89,658) |
| Interest Received | 3 | (51,045) | (37,924) |
| Increase/(Decrease) in Creditors | | 266,062 | (735,947) |
| (Increase)/Decrease in Debtors | | (11,753) | 128,962 |
| Net (Decrease)/Increase in Research Programmes and Fees | | (606,023) | (514,983) |
| Depreciation | 4 | 472,486 | 464,777 |
| Capital Reserve Transfer | 5 | (4,287) | (76,698) |
| Loss on Disposal | | 1,746 | 21,915 |
| Net Cash (Outflow)/Inflow from Operating Activities | | (80,060) | (839,556) |
| Cash Flow Statement | | | |
| Net Cash (Outflow) from Operating Activities | | (80,060) | (839,556) |
| Returns on Investments and Servicing of Finance | | | |
| Bank Interest Received | 3 | 51,045 | 37,924 |
| Capital Expenditure | | | |
| Purchase of Tangible Assets | 4 | (469,945) | (409,994) |
| (Decrease)/Increase in Cash | | (498,960) | (1,211,626) |
| Reconciliation of Net Cash Flow to Movement in Net Funds | | | |
| (Decrease)/Increase in Cash | | (498,960) | (1,211,626) |
| Net Funds at 1 January | | 3,989,556 | 5,201,182 |
| Net Funds at 31 December | | 3,490,596 | 3,989,556 |

| | Cash at bank and in hand € | Bank Overdraft € | Total € |
|---------------------------------|----------------------------------|------------------------|------------------|
| Analysis of Change in Net Funds | | | |
| At Beginning of Year 2012 | 3,989,556 | - | 3,989,556 |
| Cash Flows | (498,960) | - | (498,960) |
| At End of Year 2012 | 3,490,596 | - | 3,490,596 |

The Statement of Accounting Policies and notes 1 to 14 form part of these financial statements.



Luke Drury
Council Member



Liam Breatnach
Council Member

Notes to the Financial Statements

1. Detailed Analysis of Income & Expenditure for the year ended 31/12/2012

| | Notes | School of Celtic Studies € | School of Theoretical Physics € | School of Cosmic Physics € | Adminis- tration € | 2012 Total € | 2011 Total € |
|---|-------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------|--------------------|
| INCOME | | | | | | | |
| Dept.of Education and Skills Grant-In-Aid (Annual) | | 1,756,586 | 1,076,864 | 2,380,984 | 1,641,566 | 6,856,000 | 7,270,604 |
| *Net Deferred Funding for Pensions | 11.c | (511,902) | (157,303) | (711,430) | 3,100,435 | 1,719,800 | 2,066,798 |
| Sales of Publications | | 41,487 | - | - | - | 41,487 | 44,896 |
| Project Income | 2.a | 25,436 | 130,886 | 1,596,184 | 404,831 | 2,157,337 | 2,450,582 |
| Other | 3 | 1,080 | 4,000 | 7,592 | 52,168 | 64,840 | 62,118 |
| | | 1,312,687 | 1,054,447 | 3,273,330 | 5,199,000 | 10,839,464 | 11,894,998 |
| Transfer (to)/from Capital Reserve | | | | | 4,287 | 4,287 | 76,698 |
| | | 1,312,687 | 1,054,447 | 3,273,330 | 5,203,287 | 10,843,751 | 11,971,696 |
| EXPENDITURE | | | | | | | |
| Payroll Costs | 8 | 1,203,634 | 867,678 | 1,545,918 | 753,564 | 4,370,794 | 4,721,347 |
| *Pension Costs | 11.a | (28,689) | (39,667) | (59,107) | 3,364,490 | 3,237,027 | 3,271,132 |
| Project Costs | 2.a | 25,465 | 130,886 | 1,596,762 | - | 1,753,113 | 2,250,109 |
| Summer School High Energy Gamma Ray | | - | - | - | - | - | 22,160 |
| Library and Book Storage | | 45,936 | 71,412 | 52,341 | 4,400 | 174,089 | 213,704 |
| Depreciation | 4 | - | - | - | 472,486 | 472,486 | 464,777 |
| Rent, Rates and Insurance | | - | - | - | 187,716 | 187,716 | 195,058 |
| General Expenses | 9 | 30,428 | 3,749 | 41,958 | 125,606 | 201,741 | 209,588 |
| Travel and Seminar Expenses | | 13,662 | 18,207 | 52,068 | 8,905 | 92,842 | 74,666 |
| Premises Maintenance and Security | | - | - | - | 157,158 | 157,158 | 224,148 |
| Computer and Internet Expenses | | 2,780 | 8,351 | 39,641 | 57,037 | 107,809 | 91,647 |
| Fuel Light and Power | | - | - | - | 151,650 | 151,650 | 134,586 |
| Postage and Telephone | | - | - | - | 27,114 | 27,114 | 30,578 |
| Stationery | | 5,599 | 431 | 10,734 | 8,624 | 25,388 | 30,812 |
| Publications | | 17,317 | - | 1,693 | - | 19,010 | 37,673 |
| Advertising | | - | 7,472 | 215 | - | 7,687 | 5,400 |
| Minor Office Equipment | | 754 | - | 2,823 | 50 | 3,627 | 62,054 |
| Disposal | 5 | - | - | - | 1,746 | 1,746 | 21,915 |
| | | 1,316,886 | 1,068,519 | 3,285,046 | 5,320,546 | 10,990,997 | 12,061,354 |
| SURPLUS/(DEFICIT) FOR YEAR | | (4,199) | (14,072) | (11,716) | (117,259) | (147,246) | (89,658) |
| Balance at 1 January | | 268,966 | 107,443 | 1,111,121 | (660,180) | 827,351 | 917,009 |
| Balance at 31 December | | 264,767 | 93,371 | 1,099,405 | (777,439) | 680,105 | 827,351 |

Note (a) * The net of 11c and 11a represents the superannuation paid less contributions deducted within each of the schools and section.

Note (b) Costs directly related to research (e.g., pay, library, computer expenses, travel) have been apportioned to the schools. Overhead costs such as rent, insurance, utilities and property maintenance have been charged to Administration.

Notes to the Financial Statements (continued)

2. (a) Projects

| | 2012 | 2011 | | | |
|--|----------------|--------------------|----------------|--------------|--------------|
| | € | € | | | |
| Opening Balances | 2,035,765 | 2,550,748 | | | |
| Receipts | 1,551,314 | 1,935,599 | | | |
| | 3,587,079 | 4,486,347 | | | |
| Closing Balances (Project Debtors €20,048, Project Creditors €1,449,790) | (1,429,742) | (2,035,765) | | | |
| Applied as Income | 2,157,337 | 2,450,582 | | | |
| Income Allocation | | | | | |
| School of Celtic Studies | 25,436 | 58,815 | | | |
| School of Theoretical Physics | 130,886 | 248,384 | | | |
| School of Cosmic Physics | 1,596,184 | 1,943,272 | | | |
| | 1,752,506 | 2,250,471 | | | |
| Administration Capital | 404,831 | 200,111 | | | |
| Total Project Income | 2,157,337 | 2,450,582 | | | |
| Project Costs | | | | | |
| | Celtic | Theoretical | Cosmic | 2012 | 2011 |
| | Studies | Physics | Physics | Total | Total |
| | € | € | € | € | € |
| Payments to Partners/Associates | - | - | 794,359 | 794,359 | 911,515 |
| Salaries/Scholarships | 37,321 | 106,073 | 520,178 | 663,572 | 988,956 |
| Travel | 864 | 24,379 | 157,609 | 182,852 | 191,923 |
| Other | (12,720) | 434 | 124,616 | 112,330 | 157,715 |
| Total Project Cost | 25,465 | 130,886 | 1,596,762 | 1,753,113 | 2,250,109 |

2.(b) Project Detail

| | | Opening | | Recurrent | Applied | Closing | |
|---------------------------------|------------------|----------------|-----------------|--------------------|-------------------|----------------|----------------|
| | Funding | Balance | Receipts | Expenditure | as Income | Balance | Capital |
| | Authority | € | € | € | (including | € | € |
| | | | | | Capital) | | |
| | | | | | € | | |
| School of Celtic Studies | | | | | | | |
| Irish Script on Screen | | 18,201 | - | 829 | 829 | 17,372 | - |
| Celtic Summer School | | 12,350 | - | - | - | 12,350 | - |
| Ogham | Dept. Arts | - | 43,000 | (166) | (691) | 43,691 | - |
| R.Mclaughlin Fellow | IRCHSS | 8,620 | 16,678 | 24,802 | 25,298 | - | - |
| Total Celtic Studies | | 39,171 | 59,678 | 25,465 | 25,436 | 73,413 | - |

Notes to the Financial Statements (continued)

2.(b) Project Detail (continued)

| | Funding Authority | Opening Balance € | Receipts € | Recurrent Expenditure € | Applied as Income (including Capital) € | Closing Balance € | Capital € |
|--------------------------------------|-------------------|----------------------|----------------|----------------------------|---|----------------------|------------------|
| School of Theoretical Physics | | | | | | | |
| Bethe Ansatz | SFI | 23,980 | 1,080 | 6,709 | 6,709 | 18,351 | - |
| Non-Commutative Geometry | EC | (32,182) | 41,589 | 9,406 | 9,406 | 1 | - |
| T.Tchrakian 07 | SFI | 23,708 | | 5,932 | 5,932 | 17,776 | - |
| Veselin Filev Inspire Award PD 2010 | IRCSET | 15,268 | 112,576 | 68,998 | 68,998 | 58,846 | - |
| M.Ihl Fellow PD 2011 | IRCSET | 11,177 | 49,550 | 39,841 | 39,841 | 20,886 | - |
| Total Theoretical Physics | | 41,951 | 204,795 | 130,886 | 130,886 | 115,860 | - |
| School of Cosmic Physics | | | | | | | |
| Gamma Ray Bursts | SFI | 17,293 | - | 1,250 | 1,250 | 16,043 | - |
| Total Astronomy | | 17,293 | | 1,250 | 1,250 | 16,043 | - |
| Dos Max | EC | 2,752 | - | 1,250 | 1,250 | 1,502 | - |
| CosmoGrid | PRTL | 509,056 | - | - | - | 509,056 | - |
| Nam Conference | A. Observ'tory | 16,644 | 13,125 | - | - | 29,769 | - |
| Jetset | EC | 11,652 | - | 2,425 | 2,425 | 9,227 | - |
| GNM | SFI | 22,015 | - | 6,856 | 6,856 | 15,159 | - |
| Cores to Disks | SFI | 12,226 | - | 10,333 | 12,226 | - | (1,835) |
| E-Inis -Cycle 4 | PRTL | 915,629 | 254,086 | 876,240 | 1,188,918 | (19,203) | (315,711) |
| Pic Simulations | SFI | 57,424 | 12,325 | 9,366 | 8,960 | 60,789 | - |
| D.Coffey Fellow | IRCSET | 4,453 | 7,364 | 5,584 | 5,467 | 6,350 | - |
| KM3Net -PP | EC | 6,228 | 9,600 | 2,275 | 2,275 | 13,553 | - |
| E.Whelan Inspire | IRCSET | (2,811) | 55,521 | 44,258 | 44,258 | 8,452 | - |
| NGST Project | ESA | (70,310) | 121,349 | 26,479 | 33,108 | 17,931 | (6,629) |
| Dobies | ESA | 4,370 | - | - | 1,055 | 3,315 | (1,055) |
| KVM3Net | EC | (845) | - | - | - | (845) | - |
| Valenti EC Reintegration | EC | 23,115 | 41,978 | 48,232 | 52,607 | 12,486 | - |
| Aleks Scholz-Brown Dwarfs | SFI | 37,153 | 33,150 | 26,147 | 26,147 | 44,156 | - |
| Alessio Caratti -EC Reintegration | EC | (7,426) | 7,476 | 109 | 50 | - | - |
| Origin of Jets 2011 | SFI | 28,032 | 33,963 | 28,559 | 31,223 | 30,772 | (2,663) |
| Total Astrophysics | | 1,569,357 | 589,937 | 1,088,113 | 1,416,825 | 742,469 | (327,893) |

Notes to the Financial Statements (continued)

2.(b) Project Detail (continued)

| | Funding Authority | Opening Balance | Receipts | Recurrent Expenditure | Applied as Income (including Capital) | Closing Balance | Capital |
|----------------------------------|-------------------|------------------|------------------|-----------------------|---------------------------------------|------------------|------------------|
| | | € | € | € | € | € | € |
| Samtex | Industry | 42,702 | - | 1,764 | 1,764 | 40,938 | - |
| Geo External Funds | Industry | 21,032 | 96,230 | 53,738 | 111,785 | 5,477 | (58,047) |
| Joint RFP | SFI | 12,849 | 11,665 | 19,301 | 19,301 | 5,213 | - |
| Isle 2 | SFI | 20,049 | - | 12,316 | 12,316 | 7,733 | - |
| Geophysics Schools Seismology | Various | 11,936 | - | 3,469 | 3,469 | 8,467 | - |
| Dynamics of Continuity | SFI | (5,783) | 15,442 | 1,426 | 1,426 | 8,233 | - |
| Indepth 4 | SFI | 1,483 | 17,535 | 19,018 | 19,018 | - | - |
| TopoMed | IRCSET | (29,539) | 93,973 | 22,804 | 22,804 | 41,630 | - |
| Regional Seismic 09 | SFI | 54,417 | 9,540 | 43,977 | 44,802 | 19,155 | (825) |
| Irish Geoscience Graduate Prog. | Dept. Commun. | 94,437 | 3,750 | 25,985 | 27,620 | 70,567 | (1,635) |
| IRETHERM | SFI | 112,572 | 307,034 | 210,916 | 219,602 | 200,004 | (10,084) |
| GIANICE 11 | SFI | 31,838 | 32,500 | 19,048 | 21,136 | 43,202 | (2,088) |
| SIRG E2174 | SFI | - | 95,598 | 73,206 | 77,466 | 18,132 | (4,259) |
| ESA UWB Grant | ESA | - | 13,637 | 431 | 431 | 13,206 | - |
| Total Geophysics | | 367,993 | 696,904 | 507,399 | 582,940 | 481,957 | (76,938) |
| Total Cosmic Physics | | 1,954,643 | 1,286,841 | 1,596,762 | 2,001,015 | 1,240,469 | (404,831) |
| Total Net Balances - DIAS | | 2,035,765 | 1,551,314 | 1,753,113 | 2,157,337 | 1,429,742 | (404,831) |

Note

Project receipts are applied as project income, at a level that equals the annual expenditure incurred by the associated project. The closing balances above represent overhead earned to date and advance funding to meet financial commitments in 2013. The capital column outlines the expenditure on fixed assets during 2012, the largest of which was data storage equipment under the E-Inis project.

3. Other Income

| | 2012 | 2011 |
|---|---------------|---------------|
| | € | € |
| Bank Interest | 51,045 | 37,924 |
| Astrophysics Summer School | - | 22,160 |
| Fees and Grants (Forfás and Loughborough Univ.) | 4,692 | 2,034 |
| Other | 9,103 | - |
| Total | 64,840 | 62,118 |

Notes to the Financial Statements (continued)

4. Fixed Assets

| | Furniture & Equipment | Motor Vehicles | Computers | Total |
|---------------------------|----------------------------------|-----------------------|------------------|------------------|
| Cost | € | € | € | € |
| Opening Balance 1/1/2012 | 3,793,626 | 53,200 | 2,219,964 | 6,066,790 |
| Additions* | 69,008 | - | 400,937 | 469,945 |
| Disposals** | - | - | (200,934) | (200,934) |
| | 3,862,634 | 53,200 | 2,419,967 | 6,335,801 |
| Depreciation | | | | |
| Opening Balance 1/1/2012 | 2,147,167 | 53,200 | 1,741,701 | 3,942,068 |
| Charge | 250,298 | - | 222,188 | 472,486 |
| Disposals | - | - | (199,188) | (199,188) |
| | 2,397,465 | 53,200 | 1,764,701 | 4,215,366 |
| Net book value 31/12/2012 | 1,465,169 | - | 655,266 | 2,120,435 |
| Net book value 31/12/2011 | 1,646,459 | - | 478,263 | 2,124,722 |

Note

* All fixed assets in excess of €1,000 are capitalised in the books of DIAS.

** Following a detailed computer asset verification exercise, the register was updated to reflect a large number of disposals that had occurred in previous years.

5. Capital Reserve

| | 2012 | 2011 |
|---|------------------|------------------|
| | € | € |
| Balance at 1 January | 2,124,722 | 2,201,420 |
| Transfer from/(to) Income and Expenditure Account | | |
| Income allocated to acquire fixed assets (Project Funded) | 404,831 | 409,994 |
| Income allocated to acquire fixed assets (Exchequer Funded) | 65,114 | |
| Amortisation in line with asset depreciation | (472,486) | (464,777) |
| Amount released on disposals | (1,746) | (21,915) |
| | (4,287) | (76,698) |
| Balance at 31 December | 2,120,435 | 2,124,722 |

Notes to the Financial Statements (continued)

6. Creditors due within twelve months

| | 2012 | 2011 |
|-------------------------|------------------|------------------|
| | € | € |
| Trade Creditors | 176,838 | 163,139 |
| Accruals | 947,887 | 848,001 |
| Sundry | 12,011 | 555 |
| VAT | 11,145 | 23,194 |
| Revenue Creditors | 288,507 | 146,696 |
| Pension Control Account | 113,872 | 90,735 |
| | 1,550,260 | 1,272,320 |

Creditors due after twelve months

| | 2012 | 2011 |
|---------------------|---------------|---------------|
| | € | € |
| These comprise: | | |
| Vernam Hull Bequest | 41,226 | 53,105 |
| Carmody Fund | 2,460 | 2,459 |
| | 43,686 | 55,564 |

The funds relating to the above are held on deposit. Funds were utilised during the year.

7. Debtors

| | 2012 | 2011 |
|--------------------|----------------|----------------|
| | € | € |
| Prepayments | 192,924 | 133,622 |
| Book Sales Debtors | 2,618 | 3,490 |
| Sundry | - | 22,588 |
| Accrued Income | 17,655 | 41,744 |
| | 213,197 | 201,444 |

8. Payroll Costs

| | Celtic Studies | Theoretical Physics | Cosmic Physics | Admin. | 2012 Total | 2011 Total |
|----------------|-------------------|------------------------|-------------------|----------------|------------------|------------------|
| | € | € | € | € | € | € |
| Salaries/Wages | 1,103,378 | 795,790 | 1,462,008 | 753,564 | 4,114,740 | 4,392,814 |
| Scholarships | 93,958 | 68,205 | 77,968 | - | 240,131 | 308,166 |
| Visitors | 4,698 | 3,683 | 5,942 | - | 14,323 | 20,367 |
| Honoraria | 1,600 | - | - | - | 1,600 | - |
| | 1,203,634 | 867,678 | 1,545,918 | 753,564 | 4,370,794 | 4,721,347 |

Note

Pension levy deductions of €293,028 were paid to the Department of Education and Skills during 2012.

Notes to the Financial Statements (continued)

9. General Expenses

| | Celtic Studies | Theoretical Physics | Cosmic Physics | Admin. | 2012 Total | 2011 Total |
|------------------------|---------------------------|--------------------------------|---------------------------|----------------|-----------------------|-----------------------|
| | € | € | € | € | € | € |
| Miscellaneous | 21,826 | 407 | 29,547 | 20,041 | 71,821 | 119,923 |
| Promotions/Lunches | 4,314 | 143 | 5,331 | 5,950 | 15,738 | 12,725 |
| Professional Fees | 3,133 | - | 5,920 | 42,039 | 51,092 | 36,302 |
| Training | 1,155 | 3,199 | 1,160 | 2,200 | 7,714 | 14,697 |
| Audit Fee | - | - | - | 18,189 | 18,189 | 17,672 |
| Bank Charges | - | - | - | 2,855 | 2,855 | 3,743 |
| Board Meeting Expenses | - | - | - | 31,487 | 31,487 | - |
| Health & Safety | - | - | - | 2,845 | 2,845 | 4,526 |
| | 30,428 | 3,749 | 41,958 | 125,606 | 201,741 | 209,588 |

10. Leasing

Operating Leases

The premises occupied by the Institute are leased from the Office of Public Works.

The premises include Observatory House Dunsink, 5 Merrion Square, 9-10 Burlington Road and 31 Fitzwilliam Place.

There is a term of 84 years left on the lease for Observatory House and the other leases are renewed on an annual basis.

The commitment on foot of such leases in respect of 2013 is €113,609.

| | Annual Rent |
|--------------------------------------|--------------------|
| | € |
| Office of Public Works Leases | |
| Observatory House Dunsink | 330 |
| 5 Merrion Square | 5,022 |
| 9-10 Burlington Road | 50,167 |
| 31 Fitzwilliam Place | 58,090 |
| | 113,609 |

Notes to the Financial Statements (continued)

11. Pension Costs

| | 2012 (€'000) | 2011 (€'000) |
|--|-----------------|-----------------|
| a) Analysis of total pension costs charged to Expenditure | | |
| Current Service Cost | 1,339 | 1,493 |
| Interest on Pension Scheme Liabilities | 2,051 | 1,970 |
| Employee Contributions | (153) | (192) |
| | 3,237 | 3,271 |

| | 2012 (€'000) | 2011 (€'000) |
|---|-----------------|-----------------|
| b) Movement in Net Pension Liability during the financial year | | |
| Net Pension Liability at 1 January | (40,506) | (36,736) |
| Current Service Cost | (1,339) | (1,493) |
| Interest Costs | (2,051) | (1,970) |
| Actuarial (Loss)/Gain | (2,899) | (1,702) |
| Pensions Paid in the Year | 1,670 | 1,395 |
| Net Pension Liability at 31 December | (45,125) | (40,506) |

c) Deferred Funding for Pensions

DIAS recognises these amounts as an asset corresponding to the unfunded deferred liability for pensions on the basis of the set of assumptions described above and a number of past events. These events include the statutory basis for the establishment of the pension scheme, and the policy and practice in relation to funding public service pensions including contributions by employees and the annual estimates process. While there is no formal agreement regarding these specific amounts with the Department of Education and Skills, the DIAS has no evidence that this funding policy will not continue to meet such sums amount in accordance with current practice.

The Net Deferred Funding for Pensions recognised in Income and Expenditure Account was as follows:

| | 2012 (€'000) | 2011 (€'000) |
|--|-----------------|-----------------|
| Funding Recoverable in Respect of Current Year Pension Costs | 3,390 | 3,463 |
| State Grant Applied to Pay Pensioners | (1,670) | (1,395) |
| | 1,720 | 2,068 |

The deferred funding asset for pensions as at 31 December 2012 amounted to €45.125 million (2011: €40.5 million).

d) History of defined benefit obligations

| | 2012 (€'000) | 2011 (€'000) | 2010 (€'000) | 2009 (€'000) | 2008 (€'000) |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|
| Defined Benefit Obligations | 45,125 | 40,506 | 36,736 | 32,556 | 32,718 |
| Experience (Gains)/Losses on Scheme Liabilities Amount | 2,499 | (188) | (1,998) | (328) | (1,258) |
| Percentage of Scheme Liabilities | 5.54% | (0.50%) | (5.40%) | (1.01%) | (3.84%) |

The cumulative actuarial (gain)/loss recognised in the Statement of Total Recognised Gains and Losses amounts to (€1,094,000).

Notes to the Financial Statements (continued)

11. Pension Costs (continued)

e) General Description of the Scheme

The pension scheme is a defined benefit final salary pension arrangement with benefits and contributions defined by reference to current "model" public sector scheme regulations.

The scheme provides a pension (eightieths per year of service), a gratuity or lump sum (three eightieths per year of service) and spouse's and children's pensions. Normal Retirement Age is a member's 65th birthday, and pre 2004 members have an entitlement to retire without actuarial reduction from age 60. Pensions in payment (and deferment) normally increase in line with general public sector salary inflation.

The valuation used for FRS17 disclosures has been based on a full actuarial valuation by a qualified independent actuary taking account of the requirements of the FRS in order to assess the scheme liabilities at 31 December 2012.

The principal actuarial assumptions were as follows:

| | At 31/12/12 | At 31/12/11 | At 31/12/10 |
|---|-------------|-------------|-------------|
| Rate of Increase in Salaries | 3.00% | 3.50% | 3.50% |
| Rate of Increase in Pensions in Payment | 2.50% | 3.25% | 3.25% |
| Discount Rate | 3.50% | 5.00% | 5.25% |
| Inflation Rate | 2.00% | 2.00% | 2.00% |

The mortality basis adopted allows for improvements in life expectancy over time, so that the life expectancy at retirement will depend on the year in which a member attains retirement age (age 65). The table below shows the life expectancy for members attaining age 65 in 2012 and 2032.

| Year of Attaining Age 65 | 2012 | 2032 |
|--------------------------|------|------|
| Life Expectancy - Male | 87.3 | 89.9 |
| Life Expectancy - Female | 88.7 | 90.9 |

12. Disclosure of Transactions

The Council of the Institute adopts procedures in accordance with guidelines issued by the Department of Finance in relation to the disclosure of interests by Council Members and these procedures have been adhered to by the Council Members during the year. No Council Member has declared an interest.

Notes to the Financial Statements (continued)

13. Disclosure of Council Members/Registrar Salary, Fees and Expenses

| | Total Remuneration 2012 € | Total Expenses 2012 € | Total Remuneration 2011 € | Total Expenses 2011 € |
|---|------------------------------------|--------------------------------|------------------------------------|--------------------------------|
| Council Member | | | | |
| Dr Vincent Cunnane | | None | | None |
| Members Appointed by the Governing Boards of Constituent Schools | | | | |
| Professor Gerry Wrixon | | 621 | | 834 |
| Professor Arthur Jaffe | | 1,935 | | 1,758 |
| Professor Anders Ahlqvist | | 9,195 | | 8,497 |
| Professor Werner Nahm | | | | |
| Professor Luke Drury | | | | |
| Professor Pdraig Breatnach | | | | |
| Registrar | | | | |
| Mr. Cecil Keaveney * | 101,021 | | 100,575 | |
| | 101,021 | 11,750 | 100,575 | 11,089 |

*** Note**

The Registrar is in receipt of a salary only. He is not paid any bonus. The Registrar's pension entitlements does not exceed the standard entitlements in the model public sector defined benefit superannuation scheme.

14 Approval of Accounts

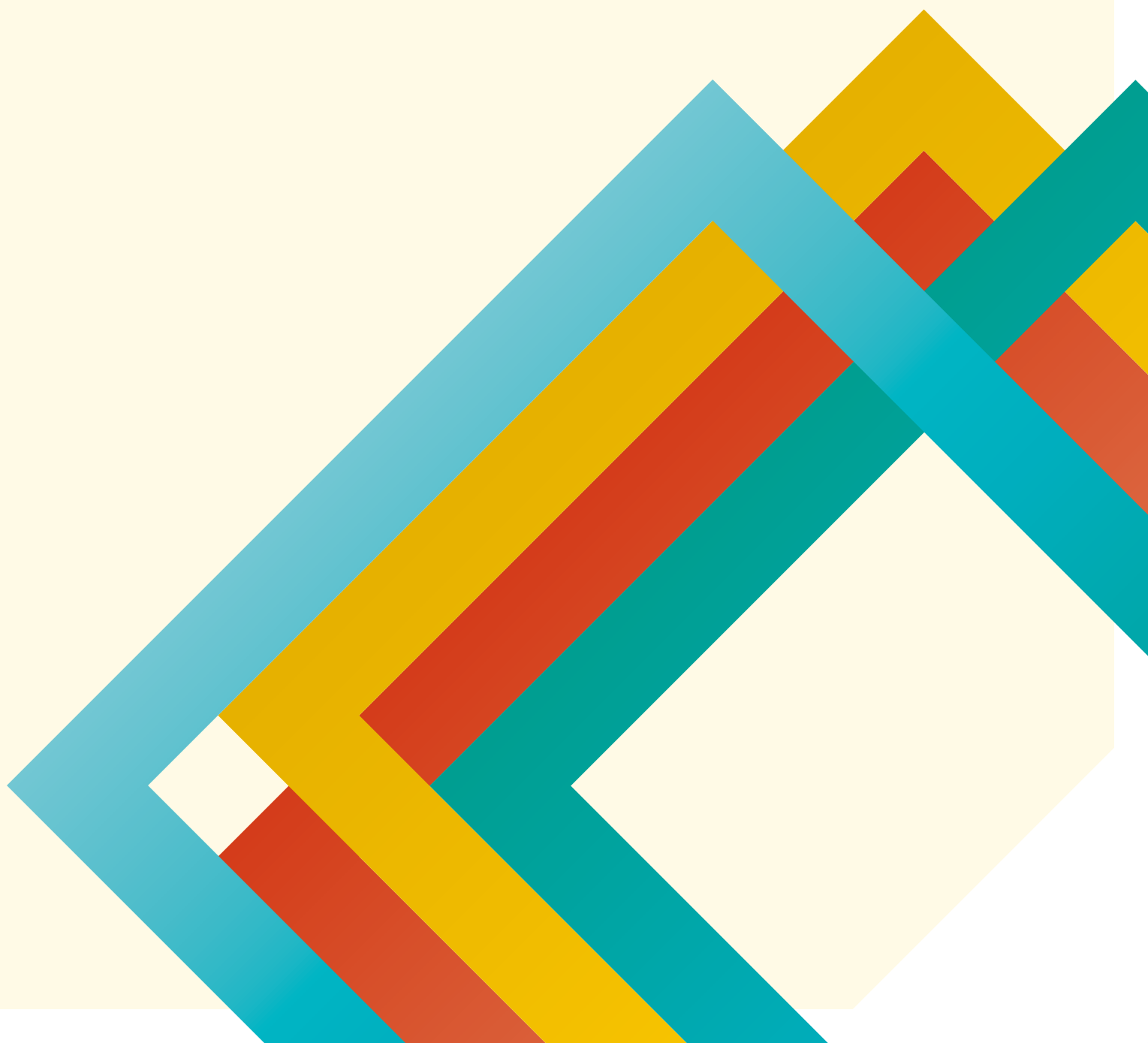
The Financial Statements were approved by Council on the 18 June 2013.



**Ráitis Airgeadais
don bhliain dar críoch
31 Nollaig 2012**

Clár

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Ráiteas Freagrachtaí na Comhairle

Éilítear ar Chomhairle Institiúid Ard-Léinn Bhaile Átha Cliath faoi alt 28(2) den Acht um Institiúid Ard-Leighinn, 1940 ráitis airgeadais a ullmhú ar shlí a cheadóidh an tAire Oideachais & Eolaíochta le comhthoilíú an Aire Airgeadais.

Agus an Chomhairle ag ullmhú na ráitis airgeadais sin éilítear uirthi:

- polasaithe chuntasáochta oiriúnacha a roghnú agus iad a chur i bhfeidhm go comhleanúnach;
- breithiúnais agus meastacháin a dhéanamh atá réasúnach agus stuama;
- na ráitis airgeadais a ullmhú ar bhonn gnóthais leantach mura bhfuil sé míchuí glacadh leis go leanfaidh an Institiúid ag oibriú; agus
- aon imeacht ábhartha ó chaighdeáin chuntasáochta infheidhme a nochtadh agus a mhíniú

Tá freagracht ar an gComhairle leabhair chuntais chearta a choinneáil a nochtáinn ag aon am le cruinneas réasúnach staid airgeadais na hInstitiúide agus a chuireann ar a cumas a chinntiú go gcloíonn na ráitis airgeadais le hAlt 28(2) den Acht. Tá freagracht ar an gComhairle sócmhainní na hInstitiúide a shlánú agus as céimeanna réasúnacha a ghlacadh le cosc a chur ar chalaos agus ar neamhrialtachtaí eile agus iad a aimsiú.



Luke Drury
Comhalta Den Chomhairle



Liam Breatnach
Comhalta Den Chomhairle

Ráiteas faoin gCóras Rialaithe Airgeadais Inmheánaigh

Freagracht as an gCóras Rialaithe Airgeadais Inmheánaigh

Thar ceann Chomhairle na hInstitiúide is mian liom ár bhfreagracht a chur in iúl lena chinntiú go ndéantar cothabháil agus go n-oibrítear córas rialaithe airgeadais inmheánaigh.

Ní féidir leis an gcóras ach dearbhú réasúnach agus ní dearbhú críochnaitheach a chur ar fáil go ndéantar slánú ar shócmhainní, go mbíonn idirbheartaíochtaí údaraithe agus taifeadta i gceart, agus go gcuirtear cosc ar earráidí ábhartha nó ar neamhrialtachtaí nó go n-aimseofaí iad i dtréimhse chaoithiúil.

Nósanna Imeachta Rialaithe Lárnacha

Tá céimeanna glactha ag an gComhairle lena chinntiú go mbeidh timpeallacht rialaithe chuí i bhfeidhm trí

- sainmhíniú soiléir a thabhairt maidir le freagrachtaí bainistíochta;
- nósanna imeachta foirmiúla a bhunú le teipeanna rialaithe suntasacha a thuiriscíú agus lena chinntiú go dtógtar gníomh cuí leis an gceist a cheartú.

Tá próisis bunaithe ag an gComhairle le rioscaí gnó a aithint agus iad a luacháil trí

- nádúr, méid agus tionchar airgeadais na rioscaí a bhíonn os comhair na hInstitiúide a aithint lena n-áirítear méid agus catagóir a mheasann an Institiúid a bheith inghlactha;
- measúnú a dhéanamh ar an dóchúlacht atá ann go dtarlóidh na rioscaí aitheanta;
- measúnú a dhéanamh ar chumas na hInstitiúide na rioscaí a tharlaíonn a bhainistiú agus a mhaolú;
- measúnú a dhéanamh ar na costais a bhaineann le rialacháin áirithe a oibriú a bhaineann leis an sochar a bhaintear amach.

Tá an córas rialaithe airgeadais inmheánaigh bunaithe ar chreat oibre eolais bainistíochta rialta, nósanna imeachta riaracháin lena n-áirítear dualgais a roinnt, agus córas toscaireachta agus cuntasachta.

Áirítear leis go háirithe:

- córas buiséid cuimsitheach le buiséad bliantúil a ndéanann Comhairle na hInstitiúide athbhreithniú air agus a bhíonn comhaontaithe aici;
- athbhreithnithe rialta ag an gComhairle ar thuiriscí airgeadais tréimhseacha agus bliantúla a léiríonn feidhmíocht airgeadais in aghaidh réamhaisnéisí;
- spriocanna a leagan síos le feidhmíocht airgeadais agus feidhmíocht eile a thomhas;
- cloí le treoirlínte chun soláthar don earnáil phoiblí;
- athbhreithnithe rialta ag an gComhairle ar thionscadail taighde seachtaracha.

Leanann an Coiste Iniúcháireachta ag déanamh athbhreithniú ar chúrsaí rialaithe inmheánacha agus ar shaincheisteanna a d'ardaigh an tArd-Reachtaire Cuntas agus Ciste. I 2012, bhuail an Coiste Iniúcháireachta le cheile trí huair. Ina theannta sin, an tuarascáil ar chórais rialaithe inmheánacha don bhliain 2012 a chuir an tIniúcháir Inmheánach ar fáil tugadh do bhaill na Comhairle í.

Tá monatóireacht agus athbhreithniú na Comhairle ar éifeachtúlacht an chórais rialaithe airgeadais inmheánaigh coinnithe ar an eolas trí obair an iniúchára inmheánaigh, trí obair an Chláraitheora agus oifigigh eile laistigh den Institiúid atá freagrach as creat oibre rialaithe airgeadais cuí a fhorbairt agus a chothabháil, agus trí thuirimí a dhéanann an Coiste Iniúchta agus an tArd-Reachtaire Cuntas agus Ciste ina litir bhainistíochta no i dtuiriscí eile.

Athbhreithniú Bliantúil ar Rialacháin

Dearbhaím go ndearna an Bord athbhreithniú ar éifeachtachas chórais rialaithe airgeadais inmheánaigh na hInstitiúide sa bhliain dár críoch 31ú Nollaig 2012.

Sínithe thar ceann Chomhairle na hInstitiúide



Vincent Cunnane

Cathaoirleach-Comhairle Na hInstitiúide

27 Meitheamh 2013

Tuarascáil an Ard-Reachtair Cuntas agus Ciste

le cur i láthair Thithe an Oireachtais

Institiúid Ard-Léinn Bhaile Átha Cliath

Tá ráitis airgeadais Institiúid Ard-Léinn Bhaile Átha Cliath don bhliain dar críoch 31 Nollaig 2012 iniúchta agam faoin Acht Um Institiúid Ard-Léinn, 1940.

Tá na ráitis airgeadais, a ullmhaíodh faoi na beartais chuntasaíochta arna leagan amach sna ráitis, comhdhéanta de na Beartais Chuntasaíochta, an Cuntas Ioncaim agus Caiteachais, an Ráiteas Gnóthachan agus Cailteanas Aitheanta Iomlán, an Clár Comhardaithe, an Ráiteas ar Shreabhadh Airgid, agus na nótaí gaolmhara. Ullmhaíodh na ráitis airgeadais san fhoirm a leagtar amach faoi Alt 28 den Acht agus de réir Cleachtas Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn.

Freagrachtaí na Comhairle

Tá an Chomhairle freagrach as na ráitis airgeadais a ullmhú, as léargas fíorcheart ar riocht ghnóthaí na hInstitiúide a chinntiú, as a hioncam agus a caiteachas a chinntiú, agus as rialtacht na n-idirbheart a chinntiú.

Freagrachtaí an Ard-Reachtair Cuntas agus Ciste

Is é m'fhreagrachta ná na ráitis airgeadais a iniúchadh agus tuairisc a thabhairt orthu de réir dlí is infheidhme.

Riar mé m'iniúchadh trí thagairt a dhéanamh to na nithe ar leith is gá a chur san áireamh i ndáil le cúrsaí bainisteoireachta agus oibriúcháin a ghabhann le Comhlachtaí Stáit.

Rinne mé m'iniúchadh de réir Caighdeán Idirnáisiúnta maidir le hIniúcháireacht (Ríocht Aontaithe agus Éire) agus de réir Caighdeán Eiticiúil an Bhoird um Chleachtas Iniúcháireachta d'Iniúcháirí.

Réimse Iniúchta na Ráiteas Airgeadais

Cuimsíonn iniúchadh fianaise a fháil faoi na suimeanna agus na nochtuithe sna ráitis airgeadais, ionas go mbeadh leordhóthain fianaise agam a d'fhágfadh cinnteacht réasúnach ann go bhfuil na ráitis airgeadais saor ó mhíríteas ábhartha, cibé acu calaois nó neamhrialtacht is cúis leis sin. Cuimsíonn sé seo measúnú

- an n-oireann na beartais chuntasaíochta don bhail atá ar chúrsaí na hInstitiúide, ar feidhmíodh na beartais sin ar bhealach leanúnach agus ar foilsíodh iad ar bhealach sásúil
- réasúntacht meastacháin suntasacha chuntasaíochta a rinneadh in ullmhúchán na ráiteas airgeadais, agus
- leagan amach foriomlán na ráiteas airgeadais.

ina theannta sin, léigh mé Tuarascáil Bhliantúil na hInstitiúide le haghaidh neamhréireachtaí ábhartha leis na ráitis airgeadais iniúchta. Mar aon leis sin, léim an fhaisnéis airgeadais agus neamhairgeadais sa Tuarascáil Bhliantúil chun neamhréireachtaí ábhartha a aithint leis na ráitis airgeadais iniúchta. Má thagaim ar an eolas faoi mhíríteis ábhartha dealraitheacha nó neamhréireachtaí cuirim na himpleachtaí san áireamh i mo thuarascáil.

Tuairim ar na Ráitis Airgeadais

Is é mo thuairim go dtugann na ráitis airgeadais, a ullmhaíodh i gceart de réir Cleachtas Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn, léargas fíorcheart ar riocht ghnóthaí na hInstitiúide ag 3 Nollaig 2012 agus ar a hioncam agus ar a caiteachas don bhliain 2012.

Is é mo thuairim go raibh leabhair chuntais chúil coinnithe ag an Institiúid. Tá na ráitis airgeadais ag teacht leis na leabhair chuntais.

Nithe ar a dTuairiscím Eisceachtaí

Tuairiscím eisceachtaí

- mura bhfuair mé an fhaisnéis agus na mínithe ar fad a theastaigh uaim do m'iniúchadh, nó
- má d'aimsigh m'iniúchadh aon chás ábhartha nár feidhmíodh suimeanna airgid chun na gcríoch a bhí beartaithe nó sa chás nár lean na hidirbhearta do na húdaráis a rialaíonn iad, nó
- mura bhfuil an fhaisnéis a tugadh i dTuarascáil Bhliantúil na hInstitiúide ag teacht leis na ráitis airgeadais gaolmhara,
- mura gcomhlíonann Ráiteas na hInstitiúide maidir le Rialú Inmheánach Airgeadais Cód Cleachtas maidir le Rialachas Comhlachtaí Stáit, nó
- má fhaighim amach go bhfuil nithe ábhartha eile maidir leis an modh a riaradh gnó poiblí.

Níl a thuilleadh le tuairisciú agam maidir leis na nithe seo lena mbaineann tuairisceoireacht eisceachtaí.

Patricia Sheehan

Le haghaidh agus thar ceann an Ard-Reachtair Cuntas agus Ciste
30 Meitheamh 2013

Polasaithe Chuntasaíochta

GINEARÁLTA

Bunaíodh an Institiúid faoin Acht um Institiúid Ard-Leighinn, 1940.

Áirítear ar a cuid feidhmeanna saoráidí a sholáthar le hardléinn a chur chun cinn tuilleadh agus le taighde a dhéanamh i mbrainsí speisialtacha eolais.

Tá trí Scoil inti - Scoil an Léinn Cheiltigh, Scoil na Fisice Teoiriciúla agus Scoil na Fisice Cosmaí.

POLASAITHE CHUNTASAÍOCHTA

1. Bunús Cuntasaíochta

Tá na ráitis airgeadais ullmhaithe ar bhonn fabhráithe faoin gcoinbhinsiún costais stairiúil agus de réir chleachtas cuntasaíochta a nglactar leo tríd is tríd. Glactar le Caihdeáin Thuairiscithe Airgeadais a bhí molta ag na comhlachtaí cuntasaíochta aitheanta mar is infheidhme iad.

2. Deontais Oireachtais

Taispeántar ioncam ar bhunús airgid isteach.

3. Sócmhainní Seasta

Is éard is Sócmhainní Seasta ann ná troscán, trealamh, ríomhairí agus mótarfheithiclí na hInstitiúide agus taispeántar iad ag costas lúide dímheas carntha. Is mar seo a leanas atá na rátaí dímheasa, ríofa ar bhunús dronlíneach:-

| | |
|-----------------------|-----|
| Troscán agus Trealamh | 10% |
| Ríomhairí | 25% |
| Mótarfheithiclí | 25% |

Faightear áitribh atá i seilbh na hInstitiúide ar léas ó Oifig na nOibreacha Poiblí.

4. Cúlchiste Caipitil

Léiríonn cúlchiste caipitil luach neamh-amúchta ioncaim a úsáidtear le Sócmhainní Seasta a cheannach.

5. Leabharlann

Díscriobhtar caiteachas ar leabhair leabharlainne agus ábhair sa bhliain a dtabhaítear é.

6. Foilseacháin

Díscriobhtar caiteachas ar fhoilseacháin sa bhliain a dtabhaítear é.

7. Aoisliúntas Pinsin

Feidhmíonn Institiúid Ard-Léinn Bhaile Átha Cliath scéim phinsin shochair shonraithe a mhaoinítear go bliantúil ar bhonn íoc mar a imíonn tú ó chistí atá ar fáil dó, lena n-áirítear cistí a chuireann an Roinn Oideachais agus Scileanna ar fáil agus ó ranníocaíochtaí a asbhaintear ó thuarastail foirne.

Léiríonn costais phinsin na sochair phinsin a thuilleann fostaithe sa tréimhse agus léirítear iad glan ar ranníocaíochtaí pinsin foirne a bhíonn coinnithe ag Institiúid Ard-Léinn Bhaile Átha Cliath. Aithnítear suim a chomhfhreagraíonn don mhuirear pinsin mar ioncam sa mhéid go bhfuil sé inaisghabhála, go ndéantar é a fhritháireamh in aghaidh deontais a bhíonn faighte sa bhliain chun íocaíochtaí pinsin a ghlanadh.

Tá gnóthachain nó caillteanais achtúireacha ar dhliteanais na scéime léirithe sa Ráiteas ar Ghnóthachain agus Caillteanais Aitheanta agus aithnítear coigeartú comhfhreagrach sa mhéid is féidir a aisghabháil ón Roinn Oideachais agus Scileanna.

Léiríonn na dliteanais phinsin luach reatha na n-íocaíochtaí pinsin don todhchaí atá tuillte ag an bhfoireann go dtí seo. Léiríonn maoiniú pinsin iarchurtha an tsócmhainn chomhfhreagrach a bheidh aisghafa i dtréimhsí amach anseo ón Roinn Oideachais agus Scileanna.

8. Tionscadail

Faigheann Institiúid Ard-Léinn Bhaile Átha Cliath maoiniú seachtarach ó thionscal, ó chomhlachtaí rialtais, agus ó Choimisiún na hEorpa. Coinnítear cairt chuntais i gcás gach tionscadail.

Léirítear ioncam agus caiteachas ar thionscadail sna ráitis airgeadais sa bhliain lena mbaineann siad. Taispeántar barrachas nó easnamh tionscadail sna ráitis airgeadais nuair a léirítear sin.

Cuntas Ioncaim agus Caiteachais

| | Notáí | 2012 € | 2011 € |
|--|-------------|--------------------|--------------------|
| Ioncam | | | |
| Deontas Oireachtais | | 6,856,000 | 7,270,604 |
| Glan-mhaoiniú iarchurtha do phinsin | 11.c | 1,719,800 | 2,066,798 |
| Díolacháin Foilseachán | | 41,487 | 44,896 |
| Tionscadail | 2 | 2,157,337 | 2,450,582 |
| Eile | 3 | 64,840 | 62,118 |
| | | 10,839,464 | 11,894,998 |
| Aistriú (chuig)/ó Cúlchiste Caipitil | 5 | 4,287 | 76,698 |
| | | 10,843,751 | 11,971,696 |
| Caiteachas | | | |
| | 1 | | |
| Scoil an Léinn Cheiltigh | | 1,316,886 | 1,524,227 |
| Scoil na Fisice Teoiriciúla | | 1,068,519 | 1,217,542 |
| Scoil na Fisice Cosmaí | | 3,285,046 | 3,884,122 |
| Riarachán | | 5,320,546 | 5,435,463 |
| | | 10,990,997 | 12,061,354 |
| (Easnamh)/Barrachas don bhliain | | (147,246) | (89,658) |
| Iarmhéid amhail an 1 Eanáir | | 827,351 | 917,009 |
| Iarmhéid amhail an 31 Nollaig | | 680,105 | 827,351 |
| Ráiteas ar Ghnóthachain agus Cailteanais Aitheanta | | | |
| | | 2012 | 2011 |
| (Easnamh)/Barrachas don bhliain | | (147,246) | (89,658) |
| (Gnóthachain) iarbhíre ar dhliteanais na scéime pinsin | | 2,499,000 | (188,000) |
| Athruithe i dtuairimí is bonn do luach reatha dhliteanais na scéime pinsin | | (5,398,000) | (1,514,000) |
| (Gnóthachan) achtúireach ar Dhliteanais Phinsin | 11.b | (2,899,000) | (1,702,000) |
| Coigeartú ar Mhaoiniú an Phinsin Iarchurtha | | 2,899,000 | 1,702,000 |
| (Gnóthachan) iomlán aitheanta don bhliain | | (147,246) | (89,658) |

Is cuid de na ráitis airgeadais sin é an Ráiteas Beartais Cuntasaíochta agus nótaí 1 go dtí 14.



Luke Drury
Comhalta Den Chomhairle



Liam Breatnach
Comhalta Den Chomhairle

Clár Comhardaithe

| | Notáí | 2012 € | 2011 € |
|--|-------|------------------|------------------|
| Sócmhainní | | | |
| Sócmhainní Seasta | 4 | 2,120,435 | 2,124,722 |
| Sócmhainní Reatha: | | | |
| Airgead sa Lámh agus ag an mBanc | | 3,490,596 | 3,989,556 |
| Féichiúnaithe agus Réamhíocaíochtaí | 7 | 213,197 | 201,444 |
| Féichiúnaithe Tionscadal | 2 | 19,092 | 148,896 |
| Sócmhainní Iomlána | | 5,843,320 | 6,464,618 |
| Lúide Dliteanais | | | |
| Creidiúnaithe - Méideanna atá dlite laistigh de bhliain amháin | | | |
| Creidiúnaithe agus Fabhruithe | 6 | 1,550,260 | 1,272,320 |
| Creidiúnaithe Tionsadail | 2 | 1,448,834 | 2,184,661 |
| Creidiúnaithe - méideanna atá dlite tar éis bliana amháin | | | |
| | 6 | 43,686 | 55,564 |
| Dliteanais Iomlána Roimh Phinsin | | 3,042,780 | 3,512,545 |
| Sócmhainní lúide dliteanais Roimh Phinsin | | 2,800,540 | 2,952,073 |
| Maoiniú an Phinsin Iarchurtha | | | |
| Dliteanais Phinsin | 11.c | 45,125,000 | 40,506,000 |
| | 11.b | (45,125,000) | (40,506,000) |
| Sócmhainní Glana | | 2,800,540 | 2,952,073 |
| Maoinithe ag: | | | |
| Cuntas Ioncaim agus Caiteachais | | 680,105 | 827,351 |
| Cúlchiste Caipitil | 5 | 2,120,435 | 2,124,722 |
| | | 2,800,540 | 2,952,073 |

Is cuid de na ráitis airgeadais seo é an Ráiteas Beartais Cuntasaíochta agus na nótaí ó 1 go dtí 14.



Luke Drury
Comhalta Den Chomhairle



Liam Breatnach
Comhalta Den Chomhairle

Ráiteas Sreabhadh Airgid

| | Nótaí | 2012 € | 2011 € |
|---|-------|------------------|--------------------|
| Réiteach (easnaimh)/barrachais oibríochta chuig glan-insreabhadh airgid ó ghníomhaíochtaí oibríochta | | | |
| (Easnamh)/Barrachas don bhliain | | (147,246) | (89,658) |
| Ús infhaighte | 3 | (51,045) | (37,924) |
| Ardú i gCreidiúnaithe | | 266,062 | (735,947) |
| Laghdú i bhFéichiúnaithe | | (11,753) | 128,962 |
| Glan-(laghdú)/ardú i gCláir Thaighde agus Táillí | | (606,023) | (514,983) |
| Dímheas | 4 | 472,486 | 464,777 |
| Aistriú Cúlchiste Caipitil | 5 | (4,287) | (76,698) |
| Caillteanas ar dhiúscairt | | 1,746 | 21,915 |
| Glan(eis-sreabhadh)/insreabhadh Airgid tirim ó ghníomhaíochtaí oibríochta | | (80,060) | (839,556) |
| Ráiteas Sreabhadh Airgid | | | |
| Glan(eis-sreabhadh)/insreabhadh airgid tirim ó ghníomhaíochtaí oibríochta | | (80,060) | (839,556) |
| Aischiú ar infheistíochtaí agus seirbhísiú airgeadais | | | |
| Ús Bainc Infhaighte | 3 | 51,045 | 37,924 |
| Caiteachas Caipitiúil | | | |
| Ceannach Sócmhainní Inláimhsithe | 4 | (469,945) | (409,994) |
| (Laghdú)/Ardú ar Airgead | | (498,960) | (1,211,626) |
| Réiteach glaninsreabhadh airgead tirim chuig gluaiseacht i nglanchistí | | | |
| (Laghdú)/Ardú ar Airgead Tirim | | (498,960) | (1,211,626) |
| Iarmhéid faoin 1 Eanáir | | 3,989,556 | 5,201,182 |
| Iarmhéid faoin 31 Nollaig | | 3,490,596 | 3,989,556 |

| Anailís ar athrú i nglanchistí | Airgead infhaighte sa Bhanc € | Ró tharraingt € | Iomlán € |
|-----------------------------------|----------------------------------|--------------------|------------------|
| I dtús na bliana 2012 | 3,989,556 | | 3,989,556 |
| Sreabhadh Airgid | (498,960) | | (498,960) |
| Ag deireadh na bliana 2012 | 3,490,596 | | 3,490,596 |

Is cuid de na ráitis airgeadais seo é an Ráiteas Beartais Cuntasaióchta agus na nótaí ó 1 go dtí 14.



Luke Drury
Comhalta Den Chomhairle



Liam Breatnach
Comhalta Den Chomhairle

Nótaí do na Ráitis Airgeadais

1. Anailís Shonraithe d'Ioncam & Caiteachas don bhliain dár críoch 31/12/2012

| | Nótaí | Léann Cheilteach € | Fisic Theoiriciúil € | Fisic Chosmach € | Fisic Riarachán € | 2012 Iomlán € | 2011 Iomlán € |
|--|-------|--------------------------|----------------------------|------------------------|-------------------------|---------------------|---------------------|
| IONCAM | | | | | | | |
| Deontais Oireachtais | | 1,756,586 | 1,076,864 | 2,380,984 | 1,641,566 | 6,856,000 | 7,270,604 |
| *Glan-mhaoiniú iarchurtha do phinsin | 11.c | (511,902) | (157,303) | (711,430) | 3,100,435 | 1,719,800 | 2,066,798 |
| Díolacháin Foilseachán | | 41,487 | - | - | - | 41,487 | 44,896 |
| Ioncam Tionscadail | 2.a | 25,436 | 130,886 | 1,596,184 | 404,831 | 2,157,337 | 2,450,582 |
| Ioncam Eile | 3 | 1,080 | 4,000 | 7,592 | 52,168 | 64,840 | 62,118 |
| | | 1,312,687 | 1,054,447 | 3,273,330 | 5,199,000 | 10,839,464 | 11,894,998 |
| Aistriú (chuig) ó Chúlchiste Caipitil | | | | | 4,287 | 4,287 | 76,698 |
| | | 1,312,687 | 1,054,447 | 3,273,330 | 5,203,287 | 10,843,751 | 11,971,696 |
| CAITEACHAS | | | | | | | |
| Costais Phárola | 8 | 1,203,634 | 867,678 | 1,545,918 | 753,564 | 4,370,794 | 4,721,347 |
| *Costais phinsin | 11.a | (28,689) | (39,667) | (59,107) | 3,364,490 | 3,237,027 | 3,271,132 |
| Costais Tionscnamh | 2.a | 25,465 | 130,886 | 1,596,762 | - | 1,753,113 | 2,250,109 |
| Scoil Samhraidh High Energy Gamma Ray | | - | - | - | - | - | 22,160 |
| Stóráil Leabharlaine agus Leabhar | | 45,936 | 71,412 | 52,341 | 4,400 | 174,089 | 213,704 |
| Dímheas | 4 | - | - | - | 472,486 | 472,486 | 464,777 |
| Cíos, Rátaí agus Árachas | | - | - | - | 187,716 | 187,716 | 195,058 |
| Costais Ghinearálta | 9 | 30,428 | 3,749 | 41,958 | 125,606 | 201,741 | 209,588 |
| Costais Taistil agus Seimineáir | | 13,662 | 18,207 | 52,068 | 8,905 | 92,842 | 74,666 |
| Cothabháil Áitribh agus Slándáil | | - | - | - | 157,158 | 157,158 | 224,148 |
| Costais ríomhairí agus Idirlín | | 2,780 | 8,351 | 39,641 | 57,037 | 107,809 | 91,647 |
| Breosla Solas agus Cumhacht | | - | - | - | 151,650 | 151,650 | 134,586 |
| Post agus Teileafón | | - | - | - | 27,114 | 27,114 | 30,578 |
| Páipéarachas | | 5,599 | 431 | 10,734 | 8,624 | 25,388 | 30,812 |
| Foilseacháin | | 17,317 | - | 1,693 | - | 19,010 | 37,673 |
| Fógraíocht | | - | 7,472 | 215 | - | 7,687 | 5,400 |
| Mion Trealamh Oifige | | 754 | - | 2,823 | 50 | 3,627 | 62,054 |
| Caillteanas ar dhiúscairt | 5 | - | - | - | 1,746 | 1,746 | 21,915 |
| | | 1,316,886 | 1,068,519 | 3,285,046 | 5,320,546 | 10,990,997 | 12,061,354 |
| BARRACHAS/(EASNAMH) DON BHLIAIN | | (4,199) | (14,072) | (11,716) | (117,259) | (147,246) | (89,658) |
| Iarmhéid amhail an 1 Eanáir | | 268,966 | 107,443 | 1,111,121 | (660,180) | 827,351 | 917,009 |
| Iarmhéid amhail an 31 Nollaig | | 264,767 | 93,371 | 1,099,405 | (777,439) | 680,105 | 827,351 |

Nóta (a) *Léiriú is ea glanshuim 11c agus 11a ar an aoisliúntas a foadh lúide ranníocaíochtaí a asbhaineadh laistigh gach ceann de na scoileanna agus rannóga.

Nóta (b) Cionroinneadh costais a bhaineann go díreach le taighde (m.sh. pá, leabharlann, costais ríomhaire, taisteal) ar an scoileanna. Gearradh forchostais ar nós cíós, árachas, fóntais agus cothabháil maoinne ar Riarachán.

Nótaí do na Ráitis Airgeadais (ar leanúint)

2.(a) Tionscadail

| | 2012 € | 2011 € |
|--|-------------|-------------|
| Iarmhéideanna Tosaigh | 2,035,765 | 2,550,748 |
| Admhálacha | 1,551,314 | 1,935,599 |
| | 3,587,079 | 4,486,347 |
| Iarmhéideanna Deiridh (Féichiúnaithe €20,048 Creidiúnaithe €1,449,790) | (1,429,742) | (2,035,765) |
| Curtha i bhfeidhm mar ioncam | 2,157,337 | 2,450,582 |
| Leithroinnt Ioncaim | | |
| Scoil an Léinn Cheiltigh | 25,436 | 58,815 |
| Scoil na Fisice Teoiriciúla | 130,886 | 248,384 |
| Scoil na Fisice Cosmaí | 1,596,184 | 1,943,272 |
| | 1,752,506 | 2,250,471 |
| Riarachán | 404,831 | 200,111 |
| Ioncam Iomlán Thionscadal | 2,157,337 | 2,450,582 |

Costais Tionscadal

| | Léann Ceilteach € | Fisic Theoiriciúil € | Fisic Chosmach € | 2012 Iomlán € | 2011 Iomlán € |
|---|-------------------------|----------------------------|------------------------|---------------------|---------------------|
| Íocaíochtaí chuig Páirtithe/Comhlachais | - | - | 794,359 | 794,359 | 911,515 |
| Tuarastail/Scoláireachtaí | 37,321 | 106,073 | 520,178 | 663,572 | 988,956 |
| Taisteal | 864 | 24,379 | 157,609 | 182,852 | 191,923 |
| Eile | (12,720) | 434 | 124,616 | 112,330 | 157,715 |
| Costas Iomlán Tionscadal | 25,465 | 130,886 | 1,596,762 | 1,753,113 | 2,250,109 |

2.(b) Sonraí Tionscadail

| | Udarás Cistiúcháin | Iarmhéid | | Caiteachas Aisfhillteach € | Curtha i bhfeidhm mar ioncam (Caipiteal san áireamh) € | Iarmhéid | | |
|---------------------------------|-----------------------|---------------|-----------------|----------------------------------|---|---------------|----------------|--|
| | | Tosaigh € | Admhálacha € | | | Deiridh € | Caipiteal € | |
| Scoil an Leinn Cheiltigh | | | | | | | | |
| Irish Script on Screen | | 18,201 | - | 829 | 829 | 17,372 | - | |
| Celtic Summer School | | 12,350 | - | - | - | 12,350 | - | |
| Ogham | Dept. Arts | - | 43,000 | (166) | (691) | 43,691 | - | |
| R.Mclaughlin Fellow | IRCHSS | 8,620 | 16,678 | 24,802 | 25,298 | - | - | |
| Iomlán-Leánn Ceilteach | | 39,171 | 59,678 | 25,465 | 25,436 | 73,413 | - | |

Nótaí do na Ráitis Airgeadais (ar leanúint)

2.(b) Sonraí Tionscadail (ar lean)

| | Udarás Cistiúcháin | Iarmhéid Tosaigh € | Admhálacha € | Caiteachas Aisfhillteach € | Curtha I bhfeidhm mar Ioncam (Caipiteal san áireamh) € | Iarmhéid Deiridh € | Caipiteal € |
|--|-----------------------|--------------------------|-----------------|----------------------------------|---|--------------------------|------------------|
| Scoil na Fisce Teoiriciúla | | | | | | | |
| Bethe Ansatz | SFI | 23,980 | 1,080 | 6,709 | 6,709 | 18,351 | - |
| Non-Commutative Geometry | EC | (32,182) | 41,589 | 9,406 | 9,406 | 1 | - |
| T.Tchrakian 07 | SFI | 23,708 | | 5,932 | 5,932 | 17,776 | - |
| Veselin Filev Inspire Award PD 2010 | IRCSET | 15,268 | 112,576 | 68,998 | 68,998 | 58,846 | - |
| M.Ihl Fellow PD 2011 | IRCSET | 11,177 | 49,550 | 39,841 | 39,841 | 20,886 | - |
| Iomlán-FisicTheoiriciúil | | 41,951 | 204,795 | 130,886 | 130,886 | 115,860 | - |
| Scoil na Fisce Cosmaí | | | | | | | |
| Gamma Ray Bursts | SFI | 17,293 | - | 1,250 | 1,250 | 16,043 | - |
| Iomlán-Réalteolaíocht | | 17,293 | | 1,250 | 1,250 | 16,043 | - |
| Dos Max | EC | 2,752 | - | 1,250 | 1,250 | 1,502 | - |
| CosmoGrid | PRTL | 509,056 | - | - | - | 509,056 | - |
| Nam Conference | A. Observ'tory | 16,644 | 13,125 | - | - | 29,769 | - |
| Jetset | EC | 11,652 | - | 2,425 | 2,425 | 9,227 | - |
| GNM | SFI | 22,015 | - | 6,856 | 6,856 | 15,159 | - |
| Cores to Disks | SFI | 12,226 | - | 10,333 | 12,226 | - | (1,835) |
| E-Inis -Cycle 4 | PRTL | 915,629 | 254,086 | 876,240 | 1,188,918 | (19,203) | (315,711) |
| Pic Simulations | SFI | 57,424 | 12,325 | 9,366 | 8,960 | 60,789 | - |
| D.Coffey Fellow | IRCSET | 4,453 | 7,364 | 5,584 | 5,467 | 6,350 | - |
| KM3Net -PP | EC | 6,228 | 9,600 | 2,275 | 2,275 | 13,553 | - |
| E.Whelan Inspire | IRCSET | (2,811) | 55,521 | 44,258 | 44,258 | 8,452 | - |
| NGST Project | ESA | (70,310) | 121,349 | 26,479 | 33,108 | 17,931 | (6,629) |
| Dobies | ESA | 4,370 | - | - | 1,055 | 3,315 | (1,055) |
| KVM3Net | EC | (845) | - | - | - | (845) | - |
| Valenti EC Reintegration | EC | 23,115 | 41,978 | 48,232 | 52,607 | 12,486 | - |
| Aleks Scholz-Brown Dwarfs | SFI | 37,153 | 33,150 | 26,147 | 26,147 | 44,156 | - |
| Alessio Caratti -EC Reintegration | EC | (7,426) | 7,476 | 109 | 50 | - | - |
| Origin of Jets 2011 | SFI | 28,032 | 33,963 | 28,559 | 31,223 | 30,772 | (2,663) |
| Iomlán-Réaltfhisic | | 1,569,357 | 589,937 | 1,088,113 | 1,416,825 | 742,469 | (327,893) |

Nótaí do na Ráitis Airgeadais (ar leanúint)

2.(b) Sonraí Tionscadail (ar lean)

| | Udarás Cistiúcháin | Iarmhéid Tosaigh € | Admhálacha € | Caiteachas Aisfhillteach € | Curtha I bhfeidhm mar ioncam (Caipiteal san áireamh) € | Iarmhéid Deiridh € | Caipiteal € |
|---|-----------------------|--------------------------|------------------|----------------------------------|---|--------------------------|------------------|
| Samtex | Industry | 42,702 | - | 1,764 | 1,764 | 40,938 | - |
| Geo External Funds | Industry | 21,032 | 96,230 | 53,738 | 111,785 | 5,477 | (58,047) |
| Joint RFP | SFI | 12,849 | 11,665 | 19,301 | 19,301 | 5,213 | - |
| Isle 2 | SFI | 20,049 | - | 12,316 | 12,316 | 7,733 | - |
| Geophysics Schools Seismology Dynamics of Continuity | Various SFI | 11,936 (5,783) | - 15,442 | 3,469 1,426 | 3,469 1,426 | 8,467 8,233 | - - |
| Indepth 4 | SFI | 1,483 | 17,535 | 19,018 | 19,018 | - | - |
| TopoMed | IRCSET | (29,539) | 93,973 | 22,804 | 22,804 | 41,630 | - |
| Regional Seismic 09 | SFI | 54,417 | 9,540 | 43,977 | 44,802 | 19,155 | (825) |
| Irish Geoscience Graduate Prog. | Dept. Commun. | 94,437 | 3,750 | 25,985 | 27,620 | 70,567 | (1,635) |
| IRETHERM | SFI | 112,572 | 307,034 | 210,916 | 219,602 | 200,004 | (10,084) |
| GIANICE 11 | SFI | 31,838 | 32,500 | 19,048 | 21,136 | 43,202 | (2,088) |
| SIRG E2174 | SFI | - | 95,598 | 73,206 | 77,466 | 18,132 | (4,259) |
| ESA UWB Grant | ESA | - | 13,637 | 431 | 431 | 13,206 | - |
| Iomlán-Geoifisic | | 367,993 | 696,904 | 507,399 | 582,940 | 481,957 | (76,938) |
| Iomlán Físic Chosmach | | 1,954,643 | 1,286,841 | 1,596,762 | 2,001,015 | 1,240,469 | (404,831) |
| Iomlán DIAS | | 2,035,765 | 1,551,314 | 1,753,113 | 2,157,337 | 1,429,742 | (404,831) |

Nótaí

Cuirtear fáiltis tionscadail i bhfeidhm mar ioncam tionscadail, ag leibhéal arb ionann an caiteachas bliantúil ag an tionscadal lena mbaineann siad. Léiriú is ea na comhorduithe dúnta thuas ar forchostas a tuilleadh go dáta agus maoiniú roimh ré chun freastal ar thiomantais airgeadais i 2013. Léiríonn an colún caipitil an caiteachas ar shócmhainní seasta i rith 2012 - ba é treallamh stórála sonraí faoi thionscadal e-INIS an ceann ba mhó acu.

Nótaí do na Ráitis Airgeadais (ar leanúint)

3. Ioncam Eile

| | 2012 | 2011 |
|------------------------------|---------------|---------------|
| | € | € |
| Ús bainc | 51,045 | 37,924 |
| Scoil Samhraidh Realtfhisice | - | 22,160 |
| Táillí & Deontais | 4,692 | 2,034 |
| Eile | 9,103 | - |
| Iomlán | 64,840 | 62,118 |

4. Sócmhainní Seasta

| | Troscán & Trealamh | Mótarfheithicilí | Ríomhairí | Iomlán |
|--|-----------------------|------------------|-----------|-----------|
| Costais | € | € | € | € |
| Iarmhéid Tosaigh 1/1/2012 | 3,793,626 | 53,200 | 2,219,964 | 6,066,790 |
| Breiseanna * | 69,008 | - | 400,937 | 469,945 |
| Riartha ** | - | - | (200,934) | (200,934) |
| | 3,862,634 | 53,200 | 2,419,967 | 6,335,801 |
| Dímheas | | | | |
| Iarmhéid Tosaigh 1/1/2012 | 2,147,167 | 53,200 | 1,741,701 | 3,942,068 |
| Muirear | 250,298 | - | 222,188 | 472,486 |
| Riartha | - | - | (199,188) | (199,188) |
| | 2,397,465 | 53,200 | 1,764,701 | 4,215,366 |
| Luach glan de réir na leabhar 31/12/2012 | 1,465,169 | - | 655,266 | 2,120,435 |
| Luach glan de réir na leabhar 31/12/2011 | 1,646,459 | - | 478,263 | 2,124,722 |

Nota

* Caipitlítear na sócmhainní seasta de bhreis ar €1,000 I leabhair DIAS.

** Mar thoradh ar chleacht deimhnithe um shócmhainn ríomhaireachta, nuashonraíodh an clár chun an líon mór diúscairtí a rinneadh i mblianta roimhe sin a léiriú.

Nótaí do na Ráitis Airgeadais (ar leanúint)

5. Cúlchiste Caipítíl

| | 2012 | 2011 |
|---|------------------|------------------|
| | € | € |
| Iarmhéid amhail an 1 Eanáir | 2,124,722 | 2,201,420 |
| Aistriú ó/(chuig) Cuntas Ioncaim agus Caiteachais | | |
| Ioncam leithroinnte le sócmhainní seasta a fháil (Maoinithe ag Tionascadal) | 404,831 | 409,994 |
| Ioncam leithroinnte le sócmhainní seasta a fháil (Maoinithe ag an Státchiste) | 65,114 | |
| Amúchadh ag teacht le dímhéas sócmhainní | (472,486) | (464,777) |
| Méid scaoilte ar dhiúscairtí | (1,746) | (21,915) |
| | (4,287) | (76,698) |
| Iarmhéid amhail an 31 Nollaig | 2,120,435 | 2,124,722 |

6. Creidiúnaithe - Méideanna atá dlite laistigh de bhliain amháin

| | 2012 | 2011 |
|---------------------------|------------------|------------------|
| | € | € |
| Creidiúnaithe Trádála | 176,838 | 163,139 |
| Fabhrúithe | 947,887 | 848,001 |
| Ilnithe | 12,011 | 555 |
| CBL | 11,145 | 23,194 |
| Creidiúnaithe Ioncaim | 288,507 | 146,696 |
| Cuntas Rialúcháin Pinsean | 113,872 | 90,735 |
| | 1,550,260 | 1,272,320 |

6. Creidiúnaithe dlite tar éis dhá mhí dhéag

| | 2012 | 2011 |
|---------------------|---------------|---------------|
| | € | € |
| Comhdhéanta as: | | |
| Vernam Hull Bequest | 41,226 | 53,105 |
| Carmody Fund | 2,460 | 2,459 |
| | 43,686 | 55,564 |

Tá an t-airgead a bhaineann leo seo sealbhaithe mar éarlais. Baineadh úsáid as méideanna le linn na bliana.

Nótaí do na Ráitis Airgeadais (ar leanúint)

7. Féichiúnaithe

| | 2012 | 2011 |
|----------------------------------|----------------|----------------|
| | € | € |
| Réamhíocaíochtaí | 192,924 | 133,622 |
| Féichiúnaithe-Díolacháin Leabhar | 2,618 | 3,490 |
| Ilnithe | - | 22,588 |
| Ioncam Fabhráithe | 17,655 | 41,744 |
| | 213,197 | 201,444 |

8. Costais Phárolla

| | Léann Cheilteach | Fisic Theoiriciúil | Fisic Chosmach | Riar. | 2012 Iomlán | 2011 Iomlán |
|----------------|---------------------|-----------------------|-------------------|----------------|------------------|------------------|
| | € | € | € | € | € | € |
| Tuarastal/Pá | 1,103,378 | 795,790 | 1,462,008 | 753,564 | 4,114,740 | 4,392,814 |
| Scoláireachtaí | 93,958 | 68,205 | 77,968 | - | 240,131 | 308,166 |
| Cuairteoirí | 4,698 | 3,683 | 5,942 | - | 14,323 | 20,367 |
| Airgead Oinigh | 1,600 | - | - | - | 1,600 | - |
| | 1,203,634 | 867,678 | 1,545,918 | 753,564 | 4,370,794 | 4,721,347 |

Nota

Tocadh luach €293,028 laghdaithe tabhaidh pinsin leis on Roinn Oideachais agus Scileanna I rith 2012.

9. Costais Ghinearálta

| | Léann Cheilteach | Fisic Theoiriciúil | Fisic Chosmach | Riar. | 2012 Iomlán | 2011 Iomlán |
|-----------------------------------|---------------------|-----------------------|-------------------|----------------|----------------|----------------|
| | € | € | € | € | € | € |
| Ilghnéitheach | 21,826 | 407 | 29,547 | 20,041 | 71,821 | 119,923 |
| Tionscnaimh cur chun cinn/Lóin | 4,314 | 143 | 5,331 | 5,950 | 15,738 | 12,725 |
| Táillí Gairmiúla | 3,133 | - | 5,920 | 42,039 | 51,092 | 36,302 |
| Oiliúint | 1,155 | 3,199 | 1,160 | 2,200 | 7,714 | 14,697 |
| Táille Iniúchta | - | - | - | 18,189 | 18,189 | 17,672 |
| Muirir Bhainc | - | - | - | 2,855 | 2,855 | 3,743 |
| Costais Cruinnithe Boird | - | - | - | 31,487 | 31,487 | - |
| Sláinte agus Sábháilteacht | - | - | - | 2,845 | 2,845 | 4,526 |
| | 30,428 | 3,749 | 41,958 | 125,606 | 201,741 | 209,588 |

Nótaí do na Ráitis Airgeadais (ar leanúint)

10. Léasáil

Léasanna Oibríochta

Tá na háitribh atá i seilbh na hInstitiúide ar léas ó Oifig na nOibreacha Poiblí.

Is iad na háitribh a n-áirítear ná Réadlann Dhún Since, 5 Cearnóg Mhuirfean, 9-10 Bóthar Burlington agus 31 Plás Mhic Liam.

Tá téarma 87 bliana fágtha ar an léas do Réadlann Dhún Since agus athnuaitear na léasanna eile ar bhonn bliantúil.

Is é tiomantas ar bhonn léasanna den sórt sin maidir le 2013 na €113,609.

| Léasanna Oifig na nOibreacha Poiblí | Cíos Bliantúil € |
|-------------------------------------|---------------------|
| Réadlann Dhún Since | 330 |
| 5, Cearnóg Mhuirfean | 5,022 |
| 9-10 Bóthar Burlington | 50,167 |
| 31, Plás Mhic Liam. | 58,090 |
| | 113,609 |

11. Costais Pinsean

| | 2012 (€'000) | 2011 (€'000) |
|---|-----------------|-----------------|
| a) Anailís ar na costais iomlána pinsin curtha chun dochair do Chaiteachas | | |
| Costas seirbhíse reatha | 1,339 | 1,493 |
| Ús ar Dhliteanais na Scéime Pinsin | 2,051 | 1,970 |
| Ranníocaíochtaí Fostaí | (153) | (192) |
| | 3,237 | 3,271 |

| | 2012 (€'000) | 2011 (€'000) |
|--|-----------------|-----------------|
| b) Gluaiseacht i nGlan-Dliteanas Pinsin i rith na bliana airgeadais | | |
| Glan-Dliteanas Pinsin amhail an 1 Eanáir | (40,506) | (36,736) |
| An Costas Seirbhíse Reatha | (1,339) | (1,493) |
| Costais Úis | (2,051) | (1,970) |
| (Gnóthachan)/caillteanas achtúireach | (2,899) | (1,702) |
| Pinsin íoctha sa bhliain | 1,670 | 1,395 |
| Glan-Dliteanas Pinsin amhail an 31 Nollaig | (45,125) | (40,506) |

c) Cistiú larchurtha do Phinsin

Aithníonn DIAS na méideanna seo mar shócmhainn a chomhfhreagraíonn don dliteanas iarchurtha neamh-mhaoinithe do phinsin bunaithe ar na toimhdí thuaslaithe agus ar roinnt imeachtaí a tharla cheana. Áirítear ar na himeachtaí seo an bonn reachtúil chun sceim aoisliúntais a bhunú, agus an polasaí agus an cleachtas i ndáil le pinsin seirbhíse poiblí a mhaoiniú, lena n-áirítear ranníocaíochtaí ag fostóirí agus próiseas na meastachán bliantúil. Cé nach bhfuil aon socrú foirmiúil maidir leis na méideanna sonracha seo déanta leis an Roinn Oideachais agus Scileanna, níl aon fhianaise ag DIAS nach leanfaidh an polasaí maoinithe seo de bheith ag freastal ar a leithéid de shuímeanna de réir an chleachtais reatha.

Nótaí do na Ráitis Airgeadais (ar leanúint)

11. Costais Pinsean (ar lean)

Sa Chuntas Ioncam agus Caitheachais, aithníodh an Glan-Mhaoiniú larchurtha do Phinsin sa bhliain mar seo leanas:

| | 2012 (€'000) | 2011 (€'000) |
|---|-----------------|-----------------|
| Maoiniú inaisghabhála i ndáil le costais phinsin na bliana reatha | 3,390 | 3,463 |
| Deontas Stáit feidhmithe chun pinsinéirí a íoc | (1,670) | (1,395) |
| | 1,720 | 2,068 |

Ba í €45.125 milliún (2011: €40.5 milliún) an tsócmhainn mhaoinithe iarchurtha do phinsin amhail an 31 Nollaig 2012.

d) Stair na nOibleagáidí faoin scéim shochair shainithe.

| | 2012 (€'000) | 2011 (€'000) | 2010 (€'000) | 2009 (€'000) | 2008 (€'000) |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|
| Oibleagáidí shochair shainithe. | 45,125 | 40,506 | 36,736 | 32,556 | 32,718 |
| (Gnóthachain)/caillteanais iarbhíre ar dhliteanais na scéime | 2,499 | (188) | (1,998) | (328) | (1,258) |
| Céatadán de luach dhliteanais na scéime | 5.54% | (0.50%) | (5.40%) | (1.01%) | (3.84%) |

Tá (gnóthachan)/caillteanas achtúireach carnach (€1,094,000) aitheanta sa Ráiteas d'Iomlán na nGnóthachan agus na gCailteanas Aitheanta.

e) Cur síos ginearálta ar an Scéim

Is é atá sa scéim pinsean ná socrú aoisliúntais shochair shonraithe chríoch-thuarastail le sochair agus ranníocaíochtaí faoi threoir rialachán reatha scéime 'eiseamláire' na hearnála poiblí.

Soláthraíonn an scéim pinsean (ochtóidí in aghaidh na bliana seirbhíse), aisce nó cnapshuim (trí hochtóidí in aghaidh na bliana seirbhíse) agus pinsin do chéilí agus leanaí. De ghnáth, is é an 65ú breithlá an aois scoir agus tá baill a thosaigh roimh 2004 i dteideal éirí as ag aois 60 gan aon laghdú achtúireach. De ghnáth, méadaíonn na pinsin atá á n-íoc (agus pinsin iarchurtha) de réir bhoilsciú ginearálta na hearnála poiblí.

Bunaíodh an luacháil a úsáideadh i gcás nochtadh faisnéise faoi FRS17 ar luacháil iomlán achtúireach a rinne achtúire neamhspleách cáilithe a chuir ceanglais FRS san áireamh chun dliteanais na scéime amhail an 31 Nollaig 2012 a mheasúnú.

Is mar a leanas a bhí na príomh-thoimhdí achtúireacha a úsáideadh:

| At 31/12/12 | At 31/12/11 | At 31/12/10 |
|-------------|-------------|-------------|
| 3.00% | 3.50% | 3.50% |
| 2.50% | 3.25% | 3.25% |
| 3.50% | 5.00% | 5.25% |
| 2.00% | 2.00% | 2.00% |

Leis an mbonn mortlaíochta atá á leanadh, is féidir dul chun cinn in ionchas saoil le himeacht ama a chur san áireamh; mar sin, braithfidh ionchas saoil ag dul ar scor ar an mbliain a shroichfidh ball aois scoir (65 bliana). Léiríonn an tábla thíos ionchas saoil na mball a shroichfidh aois 65 in 2012 agus in 2032.

Nótaí do na Ráitis Airgeadais (ar leanúint)

11. Costais Pinsean (ar lean)

| | | |
|---------------------|-------------|-------------|
| Aois 65 sa bhliain | 2012 | 2032 |
| Ionchas saoil – fir | 87.3 | 89.9 |
| Ionchas saoil – mná | 88.7 | 90.9 |

12. Nochtadh Idirbheartaíochtaí

Glacann Comhairle na hInstitiúide le nósanna imeachta de réir threoirlínte atá eisithe ag an Roinn Airgeadais maidir le leasanna a nochtáíonn Comhaltaí na Comhairle agus chloígh Comhaltaí na Comhairle leis na nósanna imeachta sin le linn na bliana. Níor léirigh aon Chomhalta de chuid na Comhairle leas.

13. Nochtadh Comhaltaí na Comhairle/Tuarastal an Chláraitheora, Táillí agus Costais

| | Luach Saothair Iomláin 2012 € | Speansais Iomlána 2012 € | Luach Saothair Iomláin 2011 € | Speansais Iomlána 2011 € |
|--|--|---|--|---|
| Comhalta den Chomhairle | | | | |
| Dr Vincent Cunnane | | Nada | | Nada |
| Baill ceaptha ag Boird Rialaithe na gComhScoileanna | | | | |
| An tOllamh Gerry Wrixon | | | | |
| An tOllamh Arthur Jaffe | | 621 | | 834 |
| An tOllamh Anders Ahlqvist | | 1,935 | | 1,758 |
| An tOllamh Werner Nahm | | 9,195 | | 8,497 |
| An tOllamh Luke Drury | | | | |
| An tOllamh Pdraig Breatnach | | | | |
| Cláraitheoir | | | | |
| Cecil Uasal Keaveney * | 101,021 | | 100,575 | |
| | 101,021 | 11,750 | 100,575 | 11,089 |

* Nóta

Faigheann an Cláraitheoir turastail anháin. Ní íochtar aon bhónas leis.

Ní sháraíonn teidliochtaí pinsin an Chláraitheora gnáththeidliochtaí scéim aoisliúntais le sochar sainithe na hearnála poiblí.

14 Ceadú Cuntais

Cheadaigh an Chomhairle na Ráitis Airgeadais ar an 18 Meitheamh 2013.



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