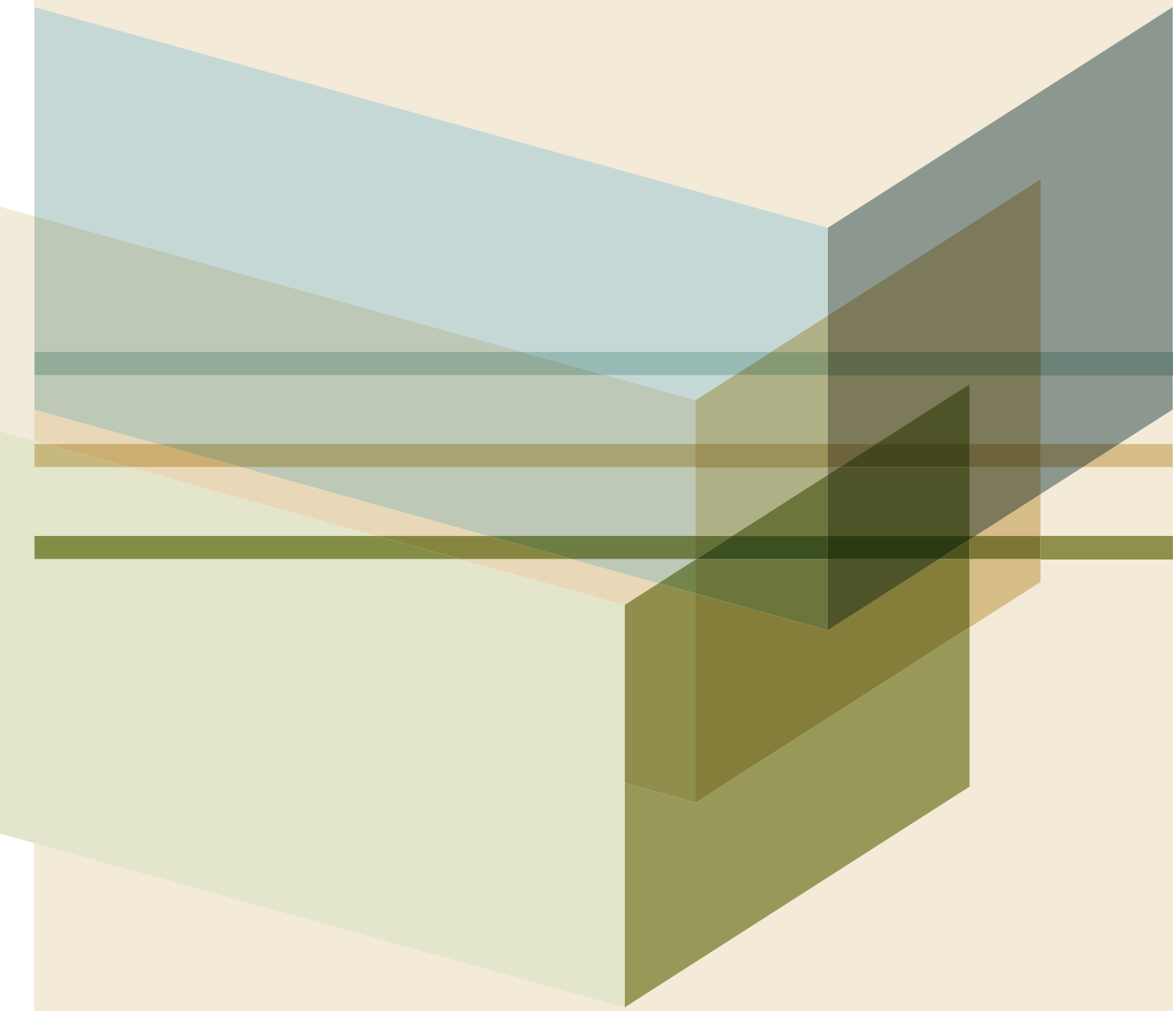
Institiúid Ard-Léinn Bhaile Átha Cliath

TUAIRISC BHLIANTÚIL 2009



Dublin Institute for Advanced Studies

ANNUAL REPORT 2009

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Chairman's Introduction

The Dublin Institute for Advanced Studies (DIAS) has significantly increased its international profile in recent years and will continue to develop overseas links pursuing opportunities for growth through collaboration and high impact publishing. The scientists and scholars of the Institute are well capable of seeing the potential application of new technologies and work collaboratively to make progress possible by raising awareness and understanding of the role and value of the physical sciences. We can through science both in Cosmic Physics and in Theoretical Physics and in the Humanities through the School of Celtic Studies be of influence and relevance to the Ireland we serve especially through our strong relations with the Universities and other third level Institutes to whom we willingly share with their researchers our strong international contacts and networks. In 2009 aware of the Government policy to boost scientific and technological competitiveness in line with other European countries the Council of the Institute once again tested the level of its international standing and arranged the quinntennial review of the three Schools. The Council commissioned international Review Panels to assess, using accepted international standards, the research work of the DIAS Schools. The Chairmen of the Review Panels were: Tomás Ó Cathasaigh, Henry L. Shattuck Professor of Irish Studies, Harvard University, USA (*__Celtic Studies__*); Professor Thijs de Graauw, ALMA Observatory, Chile, and Observatory of the University of Leiden, the Netherlands (*__Cosmic Physics__*); Professor Juerg Froehlich Nobel Laureate Eidgenossische Technische Hochschule, Zurich, Switzerland (*__Theoretical Physics__*).

Director of the School of Celtic Studies, Prof. Padraig Breatnach, Prof. Fergus Kelly, Director of the School of Cosmic Physics, Prof. Luke Drury, Prof. Denjoe O' Connor, Prof. Dorlas, Registrar, Mr. Cecil Keaveney, Prof. Liam Breatnach. Germany's Ambassador to Ireland, His Excellency Busso von Alvensleben, Chairman of Council, Prof. Dervilla Donnelly.

Stiúrthóir Scoil an Léinn Cheiltigh, An tOll. Pádraig Breatnach, An tOll. Fergus Kelly, Stiúrthóir Scoil na Fisice Cosmaí, An tOll. Luke Drury, An tOll. Denjoe O'Connor, An tOll. Dorlas, An Cláraitheoir, An tUas. Cecil Keaveney, An tOll. Liam Breatnach, Ambasadóir na Gearmáine go hÉirinn, A Shoilse Busso von Alvensleben, Cathaoirleach na Comhairle, An tOll. Dervilla Donnelly.

The Council is indebted to the members of the Review Panels and appreciates their commitment to the task and especially their observations and advice. The Council is happy to record the positive nature of the reports and pleased that despite rigid financial controls in place in the Institute the calibre of the work being carried out in the Institute has not been affected. The Panel members were particularly complimentary regarding the success of the Fellowship programme (Schroedinger Fellows in the Science Schools and Bergin Fellows in Celtic Studies) and were hopeful of an expansion of this programme in the future. The reports which were presented to Council will be forwarded to the Minister for Education and Science.

In honour of the 60th birthday of Professor Werner Nahm the Director of the School Theoretical Physics a conference on */Advances in Theoretical Physics/* was held in November 2009 with an attendance of world leaders in mathematics and theoretical physics. The programme included the annual statutory public lecture which was given by Professor P. Goddard FRS, Director of the Institute for Advanced Studies in Princeton, which was the first Institute of this type and the model for the Dublin Institute which was the second in the world, others have followed, some important ones in recent years. In many countries they are perceived as one of the most valuable assets in research. It seems odd that in 2009 we had to live under a threat. In spite of the worsening financial situation we hope that the environment will become more conducive to the use of our potential in the many challenging problems posed by the growing importance of applied computing which motivates research particularly in mathematics. The future scientific disciplines will need trained researchers attracted to these subjects. The Institute staff who are mandated to focus on original and future areas of research in specialised fields are so well placed to take up these challenges.

Réamhrá an Chathaoirligh

Chuir Institiúid Ard-Léinn Bhaile Átha Cliath (DIAS) go mór lena hiomrá idirnáisiúnta le blianta beaga anuas agus leanfaidh sí ag forbairt a cuid nasc thar lear, ag saothrú a cuid deiseanna chun fás trí chomhoibriú agus trí fhoilsitheoireacht a mbeidh tionchar láidir aici. Aithníonn eolaithe agus scoláirí na hInstitiúide go maith feidhmeanna féideartha na nuatheicneolaíochta agus comhoibríonn siad chun dul chun cinn a éascú trí fheasacht agus thuiscint ar ról agus ar luach na n-eolaíochtaí fisiceacha a ardú. Freastalaímid ar Éirinn; agus is féidir linn dul i bhfeidhm uirthi agus bheith ábhartha di tríd an eolaíocht, san Fhisic Chosmach agus san Fhisic Theoriciúil araon, agus sna Daonnachtaí, trí Scoil an Léinn Cheiltigh. Déanaimid an freastal seo trínar gcaidreamh leis na hOllscoileanna agus le hInstitiúidí tríú leibhéil eile, agus chun seo a dhéanamh táimid toilteanach ár dteagmhálacha agus ár líonraí láidre idirnáisiúnta a chomhroinnt lena gcuid taighdeoirí. In 2009 bhí a fhios ag Comhairle na hInstitiúide faoi pholasaí an Rialtais chun iomaíocht eolaíochta agus teicneolaíochta a threisiú le bheith ar aon dul le tíortha Eorpacha eile, agus dá bharr sin, thriail an Chomhairle arís eile leibhéal a caighdeáin idirnáisiúnta agus d'eagraigh sí athbhreithniú cúigbhliantúil ar na trí Scoil. Choimisiúnaigh an Chomhairle Painéil Athbhreithnithe idirnáisiúnta chun obair thaighde Scoileanna DIAS a mheas, ag baint úsáide as caighdeáin idirnáisiúnta. Ba iad Cathaoirligh na bPainéal Athbhreithnithe: Tomás Ó Cathasaigh, Henry L. Shattuck, Ollamh le Léann Éireannach, Ollscoil Harvard, SAM (***Léann Ceilteach***); an tOllamh Thijs de Graauw, réadlann ALMA, an tSile, agus Réadlann Ollscoil Leiden, an Ísiltír (***Fisic Chosmach***); an tOllamh Juerg Froehlich, Craobh Labhrais Nobel, Eidgenossische Technische Hochschule, Zurich, an Eilvéis (***Fisic Theoiriciúil***).

Tá an Chomhairle faoi chomaoin ag comhaltaí na bPainéal Athbhreithnithe agus tá sí buíoch as a dtiomantas don tasc agus as a gcuid barúlacha agus as a gcomhairle go háirithe. Tá áthas ar an gComhairle a rá go raibh na tuarascálacha dearfach agus nár chuir na dianrialála airgeadais, atá i bhfeidhm san Institiúid, isteach ar chaighdeán na hoibre atá á dhéanamh inti. Mhol comhaltaí na bPainéal rath an chláir Ánrachta go háirithe (Ánraí Schroedinger sna Scoileanna Eolaíochta agus Ánraí Bhergin sa Léann Ceilteach) agus bhí siad dóchasach go bhforbrófaí an clár amach anseo. Cuireadh na tuarascálacha faoi bhráid na Comhairle agus cuirfear ar aghaidh iad chuig an Aire Oideachais agus Scileanna.

I mí na Samhna, comóradh 60ú breithlá an Ollaimh Werner Nahm, Stiúrthóir na Scoile Fisice Teoiriciúla, le comhdháil ar */Dhul Chun Cinn san Fhisic Theoriciúil/* ar ar fheastail ceannairí domhanda na matamaitice agus na fisice teoiriciúla. Mar chuid den chlár thug an tOllamh P. Goddard FRS an léacht phoiblí reachtúil; is eisean Stiúrthóir na hInstitiúide Ard-Léinn, Princeton. Ba é Princeton an chéad institiúid den chineál seo ar domhan agus an tsamhail don Institiúid i mBaile Átha Cliath, an dara ceann ar domhan; bunaíodh cinn eile ó shin agus roinnt cinn thábhachtacha le blianta beaga anuas. Ina lán tíortha feictear orthu mar cheann de na tairbhí is luachmhaire i réimse an taighde. Nach ait é go raibh orainn maireachtáil faoi bhagairt i 2009. D'ainneoin an choir chun donais i gcúrsaí airgeadais, tá súil againn go mbeidh timpeallacht níos fabhraí le haghaidh úsáid ár n-acmhainneachta maidir le go leor de na fadhbanna dhúshlánacha a bhaineann le méadú thábhacht na ríomhaireachta feidhmí a spreagann taighde, sa mhatamaitic go háirithe. Beidh gá ag na disciplíní eolaíochta sa todhchaí le taighdeoirí oilte sna hábhair seo. Tá foireann na hInstitiúide faoi shainordú díriú ar réimsí taighde bunaigh agus ar réimsí nua speisialaithe sa todhchaí; tá an fhoireann in áit chuí chun tabhairt faoi na dúshláin seo.

I mí Lúnasa, ba chúis áthais don Institiúid, trí Scoil na Fisice Cosmaí, fáiltiú roimh an Ollamh Zdenek Martinec dá phost mar Ollamh le Geoifisic agus guímid gach rath air ina chuid oibre. Éiríonn an Dr Peter Readman as a phost tar éis tríocha bliain i rannóg Geoifisice na Scoile agus gabhann an Chomhairle buíochas leis as a dhílseacht agus a thiomantas don Institiúid thar na blianta go léir agus guímid rath air ar scor dó. I mí na Samhna bhí rath ar iarracht na Scoile Fisice Cosmaí le bheith ina hIonad Náisiúnta Sonraí (INS) don Chonradh um Chosc Cuimsitheach ar Thrialacha (CCCT). Is é Stiúrthóir na Scoile, an tOllamh Luke Drury, Ceannaire an INS agus is é an tUasal Tom Blake ón rannóg Gheoifisice an Príomhphointe Teagmhála.

I mí na Samhna, sheol an tOllamh Tomás Ó Cathasaigh an leabhar /Scriptural Instruction in the Vernacular: the Irish Society and its Teachers 1818-1827/ le Pádraig de Brún. Tugann an saothar seo léargas domhain ar staid Léann na Gaeilge ag tús an naoú haois déag agus ar na scríobhaithe, na filí agus na máistrí scoil scairte a bhí gníomhach ag an am. Bhí an t-údar ar fhoireann Scoil an Léinn Cheiltigh ó 1968 go dtí 1998.

Chairman's Introduction {continued}

In August the Institute through the School of Cosmic Physics had the pleasure of making welcome Professor Zdenek Martinec in the post of Professor of Geophysics and wish him every success in his work. Dr Peter Readman retires after thirty years in the Geophysics section of the School and Council thanks him for his loyalty and commitment to the Institute over the many years and wishes him well in his retirement. In November 2009 the School of Cosmic Physics was successful in its bid to assume the role of National Data Centre (NDC) for the comprehensive Test Ban Treaty (CTBT). The Director of the School Professor Luke Drury is the Head of the NDC and Mr Tom Blake from the Geophysics section is the principal point of contact.

Pádraig de Brún's book *Scriptural Instruction in the Vernacular: the Irish Society and its Teachers 1818-1827* was launched in November 2009 by Professor Tomas O Cathasaigh. This work provides a deep insight on the state of Irish learning at the beginning of the nineteenth century and on the scribes, poets and hedge-school masters who were active at that time. The author had been a member of the staff of the School of Celtic Studies from 1968 until 1998.

Whilst the focus of all the Schools is very clearly on research and advanced training, public outreach is an important activity of the Institute and the development of the programme Seismology in Schools (SIS) progressed with a workshop for teachers dealing with the subject of operational seismology and was held in Burlington Road in April 2009. The open-night programme at Dunsink has been considerably expanded with the addition of special events for selected groups and a strong science week programme aimed at schools. The Council recognises and thanks Hilary O'Donnell for her strong commitment to this programme. 2009 was the International Year of Astronomy and in cooperation with Blackrock Castle Observatory in Cork and the Armagh Observatory in Northern Ireland two international speakers were invited to Ireland: Brother Guy Consolmagno (Vatican Observatory) and Caroline Porco the principal investigator of the Cassini Mission to Saturn and its moons. The Institute's website continues to be of service to scholars worldwide.

Council wishes to thank sincerely the work and leadership given by the Chairmen of the School Boards, Professor Arthur Jaffe of Harvard University to the School of Theoretical Physics, Professor Anders Ahlqvist of University of Sydney, Australia to the School of Celtic Studies and to Professor Gerry Wrixon former President University College Cork to the School of Cosmic Physics.

The Council continues to make progress on improving its risk management and control processes and systems and wishes to recognise and thank the Audit Committee and its Chairman Professor David Spearman for their diligent guardianship.

The Council thanks the Department of Education and Science for their continued interest in the work of the Institute.

The last few years have at times been challenging. I take this opportunity to thank Council, the Governing Boards, the academics and scholars and pay tribute to the management staff that has played such an active role in making this success story in such a competitive market place.

Réamhrá an Chathaoirligh {ar lean}

Cé gur ríshoiléir go bhfuil fócas na Scoileanna uile ar thaighde agus ar oiliúint ardchéime, is gníomhaíocht thábhachtach de chuid na hInstitiúide í an fhor-rochtain phoiblí agus cuireadh forbairt an chláir Seismeolaíocht sa Scoil (SSS) chun cinn le ceardlann do mhúinteoirí ar an ábhar seismeolaíocht oibríochtúil i mBóthar Bhurlington i mí Aibreáin. I nDún Sinche leathnaíodh an clár oíche oscailte go mór le hócáidí speisialta nua le haghaidh grúpaí roghnaithe agus cuireadh clár láidir seachtaine eolaíochta leis a dhírigh ar na scoileanna. Aithníonn an Chomhairle tiomantas láidir Hilary Sullivan don chlár seo agus gabhann sí a buíochas di as. Bliain Idirnáisiúnta na Réalteolaíochta ba ea 2009 agus i gcomhoibriú le Réadlann na Dúcharraige i gCorcaigh agus le Réadlann agus Pláinéadlann Ard Mhacha i dTuaisceart Éireann, tugadh cuireadh do bheirt chainteoirí iomráiteacha teacht go hÉirinn: an Br. Guy Consolmagno (Réadlann na Vatacáine) agus Caroline Porco, Príomhthaighdeoir Mhisean Cassini go dtí Satarn agus a chuid gealaí. Leanann suíomh Gréasáin na hInstitiúide ag freastal ar scoláirí ar fud an domhain.

Is mian leis an gComhairle a buíochas dáiríre a ghabháil le Cathaoirligh na mBord Scoile as a gcuid oibre agus as a gceannaireacht: an tOllamh Arthur Jaffe ó Ollscoil Harvard do Scoil na Fisice Teoiriciúla; an tOllamh Anders Ahlquist ó Ollscoil Sydney, an Astráil, do Scoil an Léinn Cheiltigh; agus an tOllamh Gerry Wrixon, iar-Uachtarán Choláiste na hOllscoile, Corcaigh, do Scoil na Fisice Cosmaí.

Leanann an Chomhairle ag déanamh dul chun cinn i bhfeabhsú bainistíochta riosca agus i bpróisis rialaithe agus i gcóras rialaithe agus is mian léi aitheantas a thabhairt agus buíochas a ghabháil leis an gCoiste Iniúchóireachta agus lena Cathaoirleach, an tOllamh David Spearman as a gcuid caomhnóireachta díograsaí.

Is mian leis an gComhairle buíochas a ghabháil leis an Roinn Oideachais agus Scileanna as a suim leanúnach in obair na hInstitiúide.

Bhí na blianta beaga anuas dúshlánach ag amanna áirithe. Glacaim leis an deis seo chun buíochas a ghabháil leis an gComhairle, leis na Boird Bhainistíochta, leis na hacadóirí agus leis na Scoláirí agus chun ómós a thabhairt don fhoireann bhainistíochta as an scéal rathúil seo a bhaint amach ina leithéid de mhargadh iomaíoch.

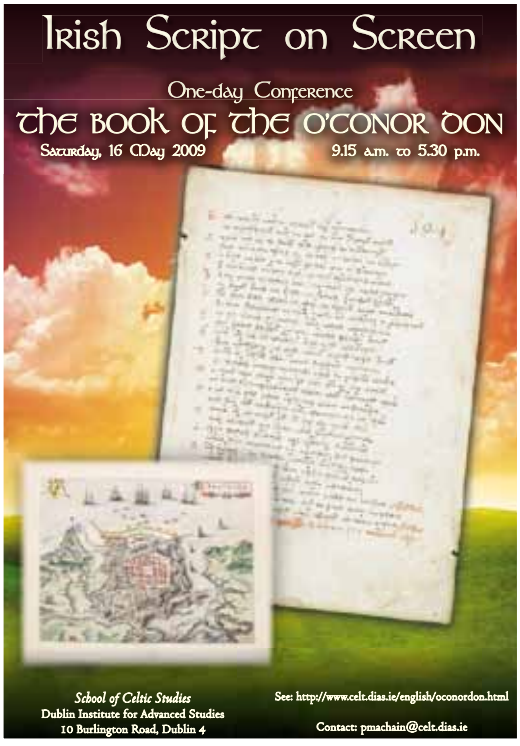
His Excellency Busso von Alvensleben pictured with Professor Dervilla Donnelly, Chairman of Council.

A Shoilse Busso von Alvensleben agus an tOllamh Dervilla Donnelly, Cathaoirleach na Comhairle.

School of Celtic Studies

A successful conference on the Book of the O'Conor Don was organised by Professor Pádraig Ó Macháin on 16 May. Pyers O'Conor Nash, the owner of this renowned manuscript, opened the conference, and nine papers (including two by members of the School) were then read on various aspects of the manuscript. The proceedings of this conference will be published in book form.

On 20 November, Professor Tomás Ó Cathasaigh launched *Scriptural Instruction in the Vernacular: the Irish Society and its Teachers 1818-1827* by Pádraig de Brún (on the staff of the School of Celtic Studies from 1968 until 1998). This very important book gives an account of the 'Irish Society for the Promotion of the Education of the Native Irish through the Medium of their own Language'. This Society was founded so that illiterate Irish speakers would be able to read the Scriptures in their own language. The author has assembled an annotated list of 750 Bible-teachers employed by the Society to teach the Scriptures to their neighbours. This information provides an unparalleled insight on the state of Irish learning at the beginning of the nineteenth century, and on the scribes, poets and hedge-school masters who were active at the time.



A successful conference on the Book of the O'Conor Don was organised by Professor Pádraig Ó Macháin in May.

Comhdháil rathúil ar Leabhar Uí Chonchubhair Dhoinn a d'eagraigh an tOllamh Pádraig Ó Macháin i mí Bealtaine.

The ongoing demand for our publications made it necessary to reprint the following: *Dr Bedell and Mr King: the making of the Irish Bible* (Terence McCaughey, 2001), *The Irish of Cois Fhairrge, Co. Galway: a phonetic study* (Tomás de Bhaldraithe, 1945, repr. 1966, 1975), *The Irish of Ring, Co. Waterford: a phonetic study* (Risteard B. Breatnach, 1947, repr. 2001), *Gàidhlig Uidhist a Deas* (Gordon Mac Gill-Fhinnein, 1966), *Aspects of Irish personal names* (Brian Ó Cuív, 1986), *Les fragments de La Destruction de Jérusalem et des Amours du Vieillard (textes en moyen-breton), traduits et annotés* (ed. Roparz Hemon, 1969), *Dhá scéal Artúraíochta* (ed. Máire Mhac an tSaoi, 1946, repr. 1984), *Lectures on early Welsh poetry* (Sir Ifor Williams, 1944, repr. 1970), *The Latin of Saint Patrick: four lectures* (Christine Mohrmann 1961). There was also a reprint of *A Guide to Early Irish Law* (Fergus Kelly, 1988, repr. 1991, 1995, 1998, 2003), with revised bibliography up to 2009.

The development of the ISOS (Irish Script on Screen) project continued under the direction of Professor Pádraig Ó Macháin, and there were more than 2,700,000 visits to the website during the year. Digitisation was carried out on manuscripts in the Royal Irish Academy and in the Russell Library, National University of Ireland, Maynooth. Also digitised were deeds and manuscript fragments from the collection in Clonalis House, Co. Roscommon, and a manuscript of Piaras Grás (owned privately). An agreement was made with the University of Melbourne to digitise two nineteenth-century Irish manuscripts, and both are displayed on the website. Another Irish manuscript from Australia is of especial interest: it is 'John Howard's Prayer Book', from the Benedictine Monastery in New Norcia, Western Australia. The presence of this manuscript was noticed by Professor Neil McLeod (scholar at the School of Celtic Studies from 1983 to 1985), whose description of it is reproduced beside the images on the ISOS site. An agreement was reached with the National Library of Scotland to collaborate on the digitisation and display of the Irish manuscripts in that collection, and it is intended that this work will commence in 2010.

Scoil an Léinn Cheiltigh

D'éirigh go maith le comhdháil ar Leabhar Uí Chonchubhair Dhoinn a d'eagraigh an tOllamh Pádraig Ó Macháin ar an 16 Bealtaine. Chuir Pyers O'Conor Nash, úinéir na lámhscríbhinne clúití seo, tús leis an gcomhdháil, agus ansin léadh naoi bpáipéir (dhá pháipéar le baill d'fhoireann na Scoile san áireamh) ar ghnéithe éagsúla a bhaineann leis an lámhscríbhinn. Foilseofar imeachtaí na comhdhála seo i bhfoirm leabhair.

Ar an 20 Samhain sheol an tOllamh Tomás Ó Cathasaigh *Scriptural Instruction in the Vernacular: The Irish Society and its Teachers 1818-1827* le Pádraig de Brún (ar fhoireann Scoil an Léinn Cheiltigh ó 1968 go dtí 1998). Tugann an leabhar fíor-thábhachtach seo cuntas ar an 'Irish Society for the Promotion of the Education of the Native Irish through the Medium of their own Language'. Bunaíodh an Cumann seo chun go mbeadh Gaeilgeoirí neamhliteartha in ann na Scrioptúir a léamh ina dteanga féin. Tá liosta nótáilte curtha le chéile ag an údar de 750 Bíoblóirí a d'fhostaigh an Cumann chun na Scrioptúir a mhúineadh dá gcomharsana. Tugann an t-eolas seo léargas thar cionn ar staid Léann na Gaeilge ag tús na naoú haoise déag, agus ar na scríobhaithe, filí agus múinteoirí chois claí a bhí gníomhach ag an am.

Mar gheall ar an éileamh leanúnach a bhíonn ar ár gcuid foilseachán caitheadh na leabhair seo leanas a chur i gcló arís: *Dr Bedell and Mr King: the making of the Irish Bible* (Terence McCaughey, 2001), *The Irish of Cois Fhairrge, Co. Galway: a phonetic study* (Tomás de Bhaldraithe, 1945, athchló 1966, 1975), *The Irish of Ring, Co. Waterford: a phonetic study* (Risteard B. Breatnach, 1947, athchló 2001), *Gàidhlig Uidhist a Deas* (Gordon Mac Gill-Fhinnein, 1966), *Aspects of Irish personal names* (Brian Ó Cuív, 1986), *Les fragments de La Destruction de Jérusalem et des Amours du Vieillard (textes en moyen-breton), traduits et annotés* (eag. Roparz Hemon, 1969). *Dhá scéal Artúraíochta* (eag. Máire Mhac an tSaoi, 1946, athchló 1984), *Lectures on early Welsh poetry* (Sir Ifor Williams, 1944, athchló 1970), The *Latin of Saint Patrick: four lectures* (Christine Mohrmann, 1961). Cuireadh athchló freisin ar *A Guide to Early Irish* Law (Fergus Kelly, 1988, athchló 1991, 1995, 1998, 2003), le clár leabhar athchóirithe go dtí 2009.

Lean forbairt an tionscnaimh MPR (Meamram Páipéar Ríomhaire) faoi stiúradh an Ollaimh Pádraig Ó Macháin, agus bhí níos mó ná 2,700,000 cuairt don suíomh idirlín i rith na bliana. Rinneadh digitiú ar lámhscríbhinní in Acadamh Ríoga na hÉireann agus i Leabharlann Ruiséil, Ollscoil na hÉireann, Má Nuad. Rinneadh digitiú freisin ar chairteacha agus ar bhlúirí de lámhscríbhinní ón mbailiúchán i dTeach Cluain Mhailis i gContae Roscomáin, agus ar lámhscríbhinn Phiarais Grás (i seilbh phríobháideach). Rinneadh comhaontú le húdaráis Ollscoil Melbourne chun dhá lámhscríbhinn Gaeilge ón naoú aois déag a dhigitiú, agus tá siad araon ar taispeáint ar an súiomh idirlín. Is díol suime faoi leith lámhscríbhinn eile ón Astráil: 'Leabhar Urnaí Sheáin Uí Úmhair', ón Mainistir Bheinidicteach i Nua-Norcia, san Astráil Thiar. Is é an tOllamh Neil McLeod (scoláire i Scoil an Léinn Cheiltigh ó 1983 go dtí 1985) a thug suntas don lámscríbhinn seo, agus tá a chur síos uirthi ar taispeáint in aice leis na híomhánna. Rinneadh comhaontú le Leabharlann Náisiúnta na hAlban chun comhoibriú a dhéanamh le digitiú agus taispeáint na lámhscríbhinní Gaeilge insan mbailiúchán sin, agus tá sé ar intinn againn tosú leis an obair seo i 2010.

Leanadh le catalógú reatha agus aisbhreathnaithneach na Leabharlainne faoi stiúradh an Leabharlannaí Margaret Kelly le cabhair ón gCúntóir Leabharlainne Órla Ní Chanainn. Déileáladh le ceisteanna taighde agus bibleagrafaíochta ó bhaill na Scoile agus ó chuairteóirí. Chuidigh Alex Kouker – ag obair dá dheoin féin lá amháin sa tseachtain – leis an gcatalóg aisbhreathnaithneach. Bhí Réiltín Mhac Cana agus baill eile de mhuintir Mhic Cana i láthair ag fáiltiú ar an 26 Feabhra nuair osclaíodh Leabharlann Phroinsiais Mhic Cana i Seomra 21.

Chríochnaigh an tOllamh Fergus Kelly a sheimineár ar théacs Sean-Ghaeilge ar chionta agus fadhbanna dlí idir lánuineacha pósta (Eanáir-Feabhra), agus thug Clodagh Downey seimineár ar dhánta Chúáin Uí Lothcháin (Eanáir-Aibreán). Thug an tOllamh Pádraig Breatnach seimineáir ar na Ceithre Máistrí (Márta-Bealtaine) agus ar 'Togha na héigse 1700-1800' (Feabhra-Bealtaine). Thug an tOllamh Liam Breatnach seimineáir ar an dtéacs dlí *Críth Gablach* (Eanáir-Bealtaine) agus ar dhíolaim téacsanna próis agus filíochta (Deireadh Fómhair-Nollaig). Thosaigh sé seimineár freisin ar an dtéacs dlí *Bretha Nemed Toísech* (Deireadh Fómhair-Nollaig). Thug Breandán Ó Buachalla, ollamh le Teanga agus Litríocht na Gaeilge in Ollscoil Notre Dame, dhá léacht ar chúrsaí meadarachta (4, 9 Márta).

Lean eagarthóirí *Celtica*, na hOllúna Malachy McKenna agus Fergus Kelly, ag obair ar *Celtica* 26, a fhoilseofar i 2010. Réitigh an tOllamh Pádraig Breatnach, Eagarthóir *Éigse:*

Current and retrospective cataloguing of the Library continued under the direction of the Librarian Margaret Kelly, with the assistance of the Library Assistant Órla Ní Chanainn. Research and bibliographical queries from members of the staff and from visitors were dealt with. Alex Kouker – working as a volunteer one day a week – assisted with the retrospective catalogue. Réiltín Mhac Cana and other members of the Mac Cana family were present at a reception on 26 February to mark the opening of the Proinsias Mac Cana Library in Room 21.

Professor Fergus Kelly finished his seminar on an Old Irish text on offences and legal problems between married couples (January-February), and Dr Clodagh Downey gave a seminar on the poems of Cúán Ua Lothcháin (January-April). Professor Pádraig Breatnach gave seminars on the Four Masters (March-May) and 'Togha na héigse 1700-1800' (February-May). Professor Liam Breatnach gave seminars on the law-text *Críth Gablach* (January-May) and on a selection of prose and verse texts (October-December). He also started a seminar on the law-text *Bretha Nemed Toísech* (October-December). Breandán Ó Buachalla, Professor of Irish language and Literature in the University of Notre Dame, gave two lectures on metrical topics (4, 9 March).

The editors of *Celtica*, Professors Malachy McKenna agus Fergus Kelly continued work on *Celtica* 26, which will be published in 2010. Professor Pádraig Breatnach edited volume 37 of *Éigse: A Journal of Irish Studies*, which will be published in 2010. He completed a monograph on the O'Clery recension of the *Leabhar Gabhála*, as well as a booklet entitled 'The Four Masters and their works: a team enterprise' (Statutory Public Lecture of the School of Celtic Studies 2008). Professor Liam Breatnach worked on his edition of the law-text *Córus Bésgnai*, and Professor Fergus Kelly continued with his edition of the *Legal Treatise* composed by Giolla na Naomh Mac Aodhagáin († 1309). Professor Pádraig Ó Macháin carried out editorial work on *The Book of the O'Conor Don: essays on an Irish manuscript*.

Dr Aoibheann Nic Dhonnchadha worked on the preparation of fasciculus I (the medical manuscripts) of the new Catalogue of the Irish manuscripts in the Library of Trinity College Dublin. The Bibliographer Alexandre Guilarte continued with the compilation of the fourth volume of the *Bibliography of Irish Linguistics and Literature*, focusing on the cataloguing and analysis of periodical publications in the field of Irish studies. Dr Clodagh Downey worked on an edition of the poems of Cúán Ua Lothcháin († 1024), and Dr Roisin McLaughlin worked on her edition of the Middle Irish metrical treatise (*Mittleirische Verslehren* III), and on *Cédaín in Braith*, a Latin-Irish homily in the Leabhar Breac. Dr Michelle O Riordan continued to work on political poetry from the seventeenth century.

Dr Brian Ó Curnáin prepared his monograph on the Irish of East Galway, and recorded speakers in Rosmuc and in An Achréidh (Claregalway), Co. Galway. Professor Malachy McKenna continued to work on his linguistic study of the dialect of Rannafast, Co. Donegal, and carried out field-work in the area. Dr Nora White continued with her edition of 'Riagail Mo Chuta', and carried out preliminary work for the project to laser-scan the Ogam inscriptions. Eoin O'Flynn continued with his doctoral thesis on the Clann Cholmáin kings of Meath. Anna Matheson was appointed an O'Donovan Scholar from 1 October, and carried out research on references to madness in the early Irish sources, particularly in the law-texts. Helen Imhoff was appointed an O'Donovan Scholar from 1 October, and commenced a study of the Middle Irish tale *Fástini Airt* 'the prophesy of Art' and related tales.

The Annual Tionól of the School was held on Friday 20 and Saturday 21 November. It was organised by Clodagh Downey assisted by Roisin McLaughlin and Alexandre Guilarte, and by the School Administrator Eibhlín Nic Dhonncha. Twenty papers were read by scholars from Ireland, England, Wales, Scotland, Germany, Italy and Austria; there was an attendance of more than one hundred. Fergus Kelly gave the Statutory Public Lecture in Trinity College Dublin on the topic 'Women's rights and duties in early Irish law, with special reference to marriage'. Approximately one hundred and fifty people were present.

On 3 March, Dr Jimmy Devins, T. D., Minister of State in the Department of Education and Science paid a visit to the Institute. As he is a medical doctor, he took particular interest in the research which Dr Aoibheann Nic Dhonnchadha is carrying out on the Irish medical manuscripts. The Ambassador of Germany, His Excellency Dr Busso von Alvensleben, visited the Institute on 4 November. Publications of the School of Celtic Studies were presented to these two distinguished visitors.

Scoil an Léinn Cheiltigh {ar lean}

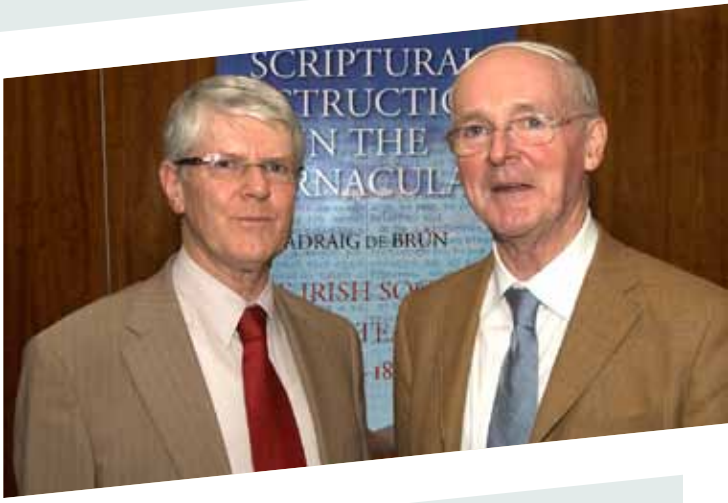
A Journal of Irish Studies, imleabhar 37 den iris, a fhoilseofar i 2010. Chríochnaigh sé monagraf ar leagan Uí Chléirigh den *Leabhar Gabhála*, chomh maith le leabhrán dar teideal 'The Four Masters and their works: a team enterprise' (Léacht Reachtúil Scoil an Léinn Cheiltigh 2008). D'oibrigh an tOllamh Liam Breatnach ar a eagrán den téacs dlí *Córus Bésgnai*, agus choinnigh an tOllamh Fergus Kelly air ag obair ar eagrán den *Tráchtas Dlí* a chum Giolla na Naomh Mac Aodhagáin († 1309). Rinne an tOllamh Pádraig Ó Macháin obair eagarthóireachta ar *The Book of the O'Conor Don: essays on an Irish manuscript*.

D'oibrigh an tOllamh Aoibheann Nic Dhonnchadha ag ullmhú fascúil I (na lámhscribhinní leighis) den gClár nua desna lámhscríbhinní Gaeilge i Leabharlann Choláiste na Tríonóide, Baile Átha Cliath. Lean an Bibleagrafóir Alexandre Guilarte le cnuasach an cheathrú imleabhair den *Bhibleagrafaíocht Teangeolaíochta agus Litríochta na Gaeilge*, ag díriú ar chatalogú agus anailís na bhfoilseachán tréimhsiúla i réimse léann na Gaeilge. D'oibrigh an Dr Clodagh Downey ar eagrán de dhánta Chúáin Uí Lothcháin († 1024), agus d'oibrigh an Dr Roisin McLaughlin ar a heagrán den tráchtas meadarachta Meán-Ghaeilge (*Mittleirische Verslehren* III), agus ar *Chédaín in Braith*, seanmóir Laidin-Gaeilge insan Leabhar Breac. Lean an Dr Michelle O Riordan ag obair ar fhilíocht pholaitiúil ón seachtú céad déag.

D'ullmhaigh an Dr Brian Ó Curnáin a mhonagraf ar Ghaeilge Oirthear na Gaillimhe, agus thaifead sé cainteoirí i Ros Muc agus ar Achréidh na Gaillimhe. Lean an tOllamh Malachy McKenna ag obair ar a staidéar teangeolaíochta ar chanúint Rann na Feirste, Co. Dhún na nGall, agus rinne sé obair pháirce sa cheantar. Lean Dr Nora White ar a heagrán de 'Riagail Mo Chuta', agus rinne sí réamhobair don tionscnamh léasar-scannála ar na h-inscríbhinní Oghaim. Lean Eoin O'Flynn ag réiteach a thráchtas dochtúireachta ar ríthe Chlainn Cholmáin na Mí. Ceapadh Anna Matheson ina Scoláire Uí Dhonnabháin ó 1 Deireadh Fómhair, and rinne sí taighde ar thagairtí don ngealtacht insna luath-fhoinsí Gaeilge, go háirithe insna téacsanna dlí. Ceapadh Helen Imhoff ina Scoláire Uí Dhonnabháin ó 1 Deireadh Fómhair, agus thosaigh sí ar staidéar ar an scéal Meán-Ghaeilge *Fháistini Airt* agus scéalta gaolmhara.

Reachtáladh Tionól bliantúil na Scoile Dé hAoine 20 agus Dé Sathairn 21 Samhain. Is í Clodagh Downey a d'eagraigh é i mbliana le cabhair ó Roisin McLaughlin agus Alexandre Guilarte, agus ó Riarthóir na Scoile, Eibhlín Nic Dhonncha. Léadh fiche páipéar le scoláirí ó Éirinn, ó Shasana, ón mBreatain Bhig, ó Albain, ón nGearmáin, ón Iodáil, agus ón Ostair; bhí níos mó ná céad duine i láthair. Thug Fergus Kelly an Léacht Reachtúil i gColáiste na Tríonóide ar an ábhar 'Women's rights and duties in early Irish law, with special reference to marriage'. Bhí tuairim céad duine is caoga i láthair.

Ar an 3 Márta thug an Dr Séamus Ó Daimhín, T. D., Aire Stáit sa Roinn Oideachais agus Eolaíochta, cuairt ar an Institiúid. Ós dochtúir le leigheas é, chuir sé spéis faoi leith san taighde atá ar siúl ag an Dr Aoibheann Nic Dhonnchadha ar na lámhscríbhinní Gaeilge leighis. Thug Ambasadóir na Gearmáine, a Shoillse an Dr Busso von Alvensleben, cuairt ar an Institiúid ar an 4 Samhain. Bronnadh foilseacháin de chuid Scoil an Léinn Cheiltigh ar an mbeirt chuairteóir cháiliúla seo.



The Director, Professor Pádraig A. Breatnach, with Professor Tomás Ó Cathasaigh at the launch of *Scriptural Instruction in the Vernacular The Irish Society and its Teachers 1818-1827* by Pádraig de Brún.

An Stiúrthóir, An tOllamh Pádraig A. Breatnach, leis an Ollamh Tomás Ó Cathasaigh ar ócáid seolta *Scriptural Instruction in the Vernacular The Irish Society and its Teachers 1818-1827* le Pádraig de Brún.

School of Celtic Studies {continued}

On the 18-19 June, an External Review was carried out on the work of the School of Celtic Studies. On the review panel were Professor James McCloskey (University of California, Santa Cruz), Professor Catherine McKenna (Harvard University), Professor Damian McManus (Trinity College Dublin), Professor Tomás Ó Cathasaigh, Chairman, (Harvard University), and Professor Patrick Sims-Williams (Aberystwyth University). The panel conducted interviews with the staff of the School, the Bergin Fellows and the O'Donovan Scholars. The report of the panel was brought before the Governing Board (1 October) and the Council of the Institute (23 November). The panel congratulated the School on the outstanding work which is in progress, and on the amount which has been completed over the past few years.

On his visit to the School The Minister of State at the Department of Enterprise, Trade and Innovation at the Department of Education and Science, Jimmy Devins TD with Professor Pádraig Ó Macháin Director of Irish Script on Screen.

Ar cuairt chuig an Scoil An tAire Stáit ag an Roinn Fiontar, Trádála agus Nuálaíochta ag an Roinn Oideachais agus Eolaíochta Séamus Ó Daimhín TD leis an Ollamh Pádraig Ó Macháin Stiúrthóir ISOS.

On 13 July the database of the *Monasticon Hibernicum* project was launched on the School's website, providing information on the monastic settlements of Ireland from the fifth to the twelfth centuries AD. The database was compiled between 2003 and 2007 by Dr Ailbhe Mac Shamhráin, assisted by Dr Nora White and by Dr Aidan Breen, under the general direction of Professor Kim McCone, National University of Ireland, Maynooth, with funding from the Irish Research Council for the Humanities and Social Sciences. The database was prepared for the website by Andrew McCarthy, IT consultant in the School of Celtic Studies.

The Honourable Mr Justice Séamus Henchy, a judge of the Supreme Court from 1972 to 1988, died on 5 April at the age of 91. He studied Irish at University College Galway, and obtained a doctorate from the National University of Ireland in the year 1943 for a thesis on fosterage in Early and Medieval Ireland. He maintained a constant interest in the work of the School of Celtic Studies, and the School published his edition of the *Miscellaneous Irish Annals* (A.D. 1114-1437) in 1947 (reprinted in 2004). May he rest in peace.

Scoil an Léinn Cheiltigh {ar lean}

Ar an 18-19 Meitheamh, cuireadh Measúnóireacht Sheachtrach i bhfeidhm ar obair Scoil an Léinn Cheiltigh. Ar an bpainéal mheasúnóireachta a bhí an tOllamh James McCloskey (Ollscoil California, Santa Cruz), an tOllamh Catherine McKenna (Ollscoil Harvard), an tOllamh Damian McManus (Coláiste na Tríonóide, Baile Átha Cliath), an tOllamh Tomás Ó Cathasaigh, Cathaoirleach, (Ollscoil Harvard), agus an tOllamh Patrick Sims-Williams (Ollscoil Aberystwyth). Rinne an painéal agallamh le foireann na Scoile, le comhaltaí Uí Aimhirgín agus le scoláirí Uí Dhonnabháin. Tugadh tuarascáil an phainéil os comhair an Bhoird Rialúcháin (1 Deireadh Fómhair) agus os comhair Chomhairle na hInstitiúide (23 Samhain). Rinne an painéal comhghairdeas leis an Scoil faoin obair shuntasach atá ar siúl i láthair na huaire, agus faoin méid atá curtha i gcrích le cúpla bliain anuas.

Ar an 13 Iúil seoladh ar shuíomh idirlín na Scoile bunachar an tionscnaimh *Monasticon Hibernicum*, a chuireann eolas ar fáil faoi áitribh eaglasta na hÉireann ón gcúigiú go dtí an dara céad déag AD. Thiomsaigh an Dr Ailbhe Mac Shamhráin an bunachar idir 2003 agus 2007, le cabhair ón Dr Nora White agus ón Dr Aidan Breen, faoi stiúradh an Ollaimh Kim McCone, Ollscoil na hÉireann, Má Nuad, le maoiniú ón gComhairle um Thaighde sna Dána agus sna hEolaíochtaí Sóisialta. D'ullmhaigh Andrew McCarthy, comhairleoir ríomhaireachta i Scoil an Léinn Cheiltigh, an bunachar i gcomhair an tsuímh idirlín.

Fuair an tOnórach an Breitheamh Séamus Ó hInnse, breitheamh sa Chúirt Uachtarach ó 1972 go dtí 1988, bás ar an 5 Aibreán in aois 91. Rinne sé staidéar ar an nGaeilge i gColáiste na hOllscoile, Gaillimh, agus fuair sé dochtúireacht ó Ollscoil na hÉireann sa bhliain 1943 ar thráchtas faoi altramas in Éirinn sa tSeanré agus insna Meánaoiseanna. Chuir sé suim i gcónaí in obair Scoil an Léinn Cheiltigh, agus d'fhoilsigh an Scoil a eagrán den *Miscellaneous Irish Annals* (A.D. 1114-1437) in 1947 (athchló 2004). Ar dheis Dé go raibh a anam.

School of Cosmic Physics

Astronomy and Astrophysics

The combined Astronomy and Astrophysics section continues to be scientifically very productive,with some 55 refereed publications covering a broad range of topics in high-energy astrophysics and star formation, the two main interests of the section, appearing in main-stream journals during the year. Full details can be found in the Research Report of the School. It is noteworthy that this high level of productivity was maintained despite the effort that had to be put into preparations for the quinquennial external peer review of the school which took place from 19 to 21 August. The review panel were very impressed by the quality and depth of the work of the section and drew attention in particular to the way in which it adds value to the Irish research system through international linkages, project leadership and the promotion of advanced research infrastructures. The panel also commented on the fact that Ireland in not a member of the European Southern Observatory and encouraged the section to seek a leadership role in promoting Irish membership.

In high-energy non-thermal astrophysics the section continues to benefit enormously from the global connections and reputation of Prof Felix Aharonian as well as its participation in the HESS experiment. The HESS (High Energy Stereoscopic System) experiment's imaging atmospheric Cherenkov telescopes, located in Namibia in south west Africa, have revolutionised the field of ground-based gamma-ray astronomy and opened a new observational window on the universe at extremely high energies. To put it in perspective, HESS routinely detects particles of light (photons) with energies similar to those to which particles are accelerated in the LHC at CERN (a few TeV). A bibliometric study recently concluded that HESS was one of the ten astronomical research facilities which had the greatest scientific impact in the last five years. In a not unexpected, but nevertheless important, development HESS succeeded during the year in detecting the near-by star-burst galaxy NGC253 as a high energy gamma-ray source thereby confirming long-standing theoretical expectations that the high rate of massive star formation and resulting high rate of supernovae in these galaxies should be linked to strong particle acceleration. While HESS continues to produce much new material, it is clear that the "low-hanging fruit" has now largely been harvested and it is time to start seriously planning for a next generation instrument with higher sensitivity and resolution. The European initiative in this direction, the CTA project in which the Institute is a participant, has now been included in the roadmap of the European Strategic Forum for Research Infrastructures.

There are also exciting prospects for high-energy astrophysics with the next generation of X-ray telescopes, in particular the Japanese Astro-H project. It is therefore very significant that Prof Aharonian and the Institute were able during the year to join the Astro-H consortium and secure key positions in the project by assigning a newly-appointed Schroedinger fellow, Dr A. Bamba, to work with the Japanese space agency. Astro-H, scheduled for launch in 2014, will be the first hard X-ray telescope to have good spectroscopic resolution and is expected to be the leading experiment in the field for at least the next decade. With the background in HESS, participation in the Neutrino astronomy project KM3NeT, involvement in CTA and membership of Astro-H the section ends the year very well placed to continue as a leading world centre for high-energy astrophysics research.

Prof Evert Meurs worked mainly in the area of observational follow-up studies of gamma-ray bursts using high-resolution optical spectroscopy to study the intervening intergalactic gas along the line of sight to the distant burst source. He also continued work on understanding the origin of the so-called 'runaway' OB stars which are seen moving away from regions of star formation at unusually high speeds.

The other main scientific area of research, star formation, also saw significant evolution during the year as some projects ended and new initiatives started up under the dynamic leadership of Prof Tom Ray. The highly successful and well regarded European FP6 research training network JETSET concluded with a final meeting in January. A proposal for a continuation of the network under FP7 was prepared and submitted during the year, including for the first time industrial partners (now an essential condition for European funding).

Scientifically the trend in star formation studies over the last decade has been to move towards probing the jets and outflows associated with star formation as close as possible to the star itself using ever more sophisticated observational techniques. The ultimate aim is to distinguish observationally between the various theoretical models for jet launching (a fundamental open question in astrophysics) as well as to gain insight into the process of planet formation in proto-stellar discs. The Dublin group was one of the first to detect spectroscopic evidence for jet rotation and has also

Scoil na Fisice Cosmaí

Réalteolaíocht agus Réaltfhisic

Tá rannóga aonaithe na Réalteolaíochta agus na Réaltfhisice ag leanúint lena dtáirgiúlacht ard le 55 foilseachán measúnaithe i gcló sna hirisí príomhshrutha i rith na bliana agus chlúdaigh siad réimse leathan ábhar i réaltfhisic ardfhuinnimh agus i réaltfhoirmíocht, dhá phríomhspéis na rannóige. Tá na sonraí go léir ar fáil i dTuairisc Thaighde na Scoile. Is fiú a lua gur leanadh leis an táirgiúlacht ard seo in ainneoin an stró a bhain le hullmhú don athbhreithniú piaraí cúigbhliantúil, a tharla ón 19 go dtí an 21 Lúnasa. Bhí an painéal athbhreithnithe an-tógtha le cáilíocht agus le doimhneacht oibre na rannóige agus tharraing siad aird go háirithe ar an gcaoi ina gcuireann sí le luach chóras taighde na hÉireann trí nascálacha idirnáisiúnta, trí cheannaireacht tionscadal, agus trí chur chun cinn ardinfreastruchtúir taighde. Dúirt an painéal freisin nach bhfuil Éire ina bhall de Réadlann Dheisceart na hEorpa agus ghríosaigh siad an rannóg chun ról ceannaireachta a lorg i mballraíocht na hÉireann a chur chun cinn.

San réaltfhisic ardfhuinnimh neamhtheirmeach, leanann an rannóg ag baint leas mór as naisc dhomhanda agus as clú an Ollaimh Felix Aharonian, agus as páirtíocht na rannóige i dturgnamh HESS (An Córas Steiréascóipeach Ard-fhuinnimh). Chuir teileascóipeanna atmaisféaracha iomháite Cherenko ag turgnamh HESS atá lonnaithe sa Namaib san Aifric thiar theas tús le réabhlóid i réimse na réalteolaíochta gáma-ghathanna; agus tá fuinneog bhreathnaitheach nua oscailte ag HESS freisin ar an gcruinne ag fuinnimh fíor-arda ar fad. Chun é a chur i gcomhthéacs, sa ghnáthchúrsa, braitheann HESS cáithníní solais (fótóin) le fuinnimh cosúil leo siúd lena ngéaraítear cáithníní san LHC ag CERN (cúpla TeV). Dar le staidéar bibliméadrachta le déanaí, bhí HESS ar cheann de na deich n-áis taighde réalteolaíochta ba mhó thionchar le cúig bliana anuas. I bhforbairt thábhachtach, i rith na bliana, d'éirigh le HESS réaltra réaltroise in aice láimhe NGC253 a bhrath mar fhoinse gháma-ghathach ard-fhuinnimh; rud a dheimhnigh an t-ionchas le fada ón teoiric gur chóir an ráta ard réaltfhoirmíochta mórmhaise, mar aon leis an ráta ard ollnóva ag eascairt astu, i gceann amháin de na réaltraí seo, a nascadh le luasghéarú tréan cáithníní. Cé go leanann HESS ar aghaidh ag soláthar a lán ábhair nua, is léir go bhfuil an fómhar is giorra don talamh bainte nach mór agus gur chóir tabhairt faoi pleanáil dáiríre anois i dtreo ionstraime le híogaireacht agus le taifeach níos airde don chéad ghlúin eile. An tionscnamh Eorpach sa treo seo, tionscadal CAT, a bhfuil an Institiúid páirteach ann, tá an tionscnamh seo curtha isteach anois ar threochlár an Fhóraim Straitéisigh Eorpaigh um Bonneagar Taighde.

South Dome on a Spring day – Dunsink Observatory.

Cruinneachán Theas ar lá earraigh – Réadlann Dhún Sinche.

Tá ionchais spreagúla i ndán don réaltfhisic ard-fhuinnimh freisin leis an gcéad ghlúin eile de theileascóipeanna x-ghathanna, i gcás turgnamh Astro-H na Seapáine go háirithe. Tá sé an-suntasach go bhfuair an tOllamh Aharonian agus an Institiúid ballraíocht i gcuibhreannas Astro-H i rith na bliana agus go bhfuair siad eochairphost sa tionscnamh, rud a rinne siad nuair a d'ainmnigh siad an Dr A. Bamba, an tÁnra nua Schroedinger, chun oibriú le gníomhaireacht spáis na Seapáine. Tá láinseáil Astro-H sceidealaithe i 2014, mar an gcéad chruatheileascóip x-ghathach le gléineacht mhaith speictreascóipeach agus ceaptar go mbeidh sé ina phríomhthurgnamh sa réimse ar feadh deich mbliana ar a laghad. Leis an gcúlra i HESS, páirtíocht i dtionscadal réalteolaíochta Neutrino KM3NeT, páirtíocht i CTA agus ballraíocht in Astro-H, tá an rannóg

extended the mass range of jet forming objects down to so-called brown dwarfs (objects intermediate in mass between stars and planets). A highlight of the year was the first detection of acceleration and deceleration in protostellar jets by newly arrived postdoctoral researcher, Dr. A. Caratti O.Garatti.

Prof Ray is a co-Principal Investigator of the Mid-Infrared Instrument (MIRI) to be installed as a European contribution to the James Webb Space Telescope, the successor to the Hubble Space telescope, due for launch in 2014. The final hard-ware components (filters and beam-splitters) specified and procured by the Institute have now been delivered and the focus of the MIRI work shifted during the year to software development. With the support of Enterprise Ireland and the Prodex programme of the European Space Agency two scientific programmers have been engaged and have started work on producing modules for the data-analysis pipeline and calibration in collaboration with the Space Telescope Science Institute in Baltimore USA. Having this expertise in house will be of great benefit in using MIRI data to maximum effect, especially in the crucial early phase of the mission.

Some of the Solar Telescopes used at the SolarFest 2009 just outside the main door of the Dunsink Observatory.

Roinnt de na Grianteileascóip a úsáideadh ag an SolarFest 2009 díreach lasmuigh de dhoras mór Réadlann Dhún Sinche.

Another longer term project in which the Institute is involved is the international Gould belt survey, which will essentially carry out a complete survey of all nearby star formation regions in our galaxy. Prof Ray is a member of the international Gould belt consortium and this will be a main focus of the activity of another Schroedinger fellow, Dr A Scholz, over the next five years. Thus as in high-energy astrophysics the section is well positioned to remain at the leading edge of star formation research with participation in key projects and facilities.

Essential complements to observation are theory and, increasingly nowadays, computational simulation. It is virtually impossible to do advanced research in modern Astronomy and Astrophysics without access to advanced computational resources. The section was instrumental in setting up the Irish Centre for High-End Computing (ICHEC) under the PRTLI-3 programme Cosmogrid and has continued to invest in developing the national e-Infrastructure under the PRTLI-4 programme e-INIS. It was also able to bring together a unique partnership of ten Irish research organisations (including all seven universities) in the national capability computing initiative which enabled the purchase of two Bluegene systems, named Lanczos and Schroedinger, which are operated by ICHEC and hosted by HEAnet and owned by the Institute. As part of the initiative Dr T Downes has been seconded from DCU to work in the section and has developed a novel and highly efficient code to study ambipolar and Hall diffusion effects in non-ideal magnetohydrodynamics. This code was one of those selected for proto-type testing as part of the European PRACE project to provide continental-scale supercomputing resources in Europe and performed exceptionally well with good scaling on the largest system in Europe, the Jugene computer located in Julich, Germany. The excellent computational resources now available in Ireland are also being exploited under an SFI funded project to run challenging plasma-physics simulations of the processes associated with plasma clouds colliding at relativistic speeds (effects thought to be behind the emission seen from gamma-ray bursts).

suite in áit mhaith ag deireadh na bliana chun leanúint mar phríomhionad domhanda don taighde réaltfhisice ard-fhuinnimh.

D'oibrigh an tOllamh Evert Meurs den chuid is mó i réimse a bhain le staidéir leantacha breathnaitheacha ar roiseanna gháma-ghathanna ag úsáid speictreascóipeacht optúil ardtaifeach chun scrúdú a dhéanamh ar an idirghás idir-réaltach ar an amharclíne go dtí an fhoinse roise i gcéin. Lean sé ag obair freisin ar thuiscint a fháil ar fhoinse na réaltaí OB 'éalaitheacha', mar a thugtar orthu, a fheictear ag druidim amach ó reigiúin réaltfhoirmíochta ag ardluasanna neamhghnáthacha.

Sa phríomhréimse taighde eile, an réaltfhoirmíocht, bhí dul chun cinn suntasach freisin le turgnaimh áirithe á gcríochnú agus tionscnaimh nua á dtosú faoi cheannaireacht fhuinniúil an Ollaimh Tom Ray. Chríochnaigh JETSET, an gréasán Eorpach FP6 ardrathúil dea-mheasta oiliúna taighde, le cruinniú deiridh i mí Eanáir. Ullmhaíodh agus cuireadh isteach togra i rith na bliana le go leanfaí leis an ngréasán faoi FP7, agus, den chéad uair, bhí comhpháirtithe tionsclaíochta ann (rud atá riachtanach anois le haghaidh cistiú ón Eoraip).

Tá treocht san eolaíocht le deich mbliana anuas chun taiscéaladh a dhéanamh ar na scairdeanna agus na heis-sreafaí a bhaineann leis an réaltfhoirmíocht chomh gar agus is féidir don réalta féin, ag úsáid teicnící breathnaitheacha atá ag éirí níos sofaisticiúla an t-am ar fad. Is í an sprioc dheiridh ná déalú a dhéanamh idir na samhlacha teoiriciúla éagsúla le haghaidh seoladh scairdeanna (ceist oscailte san réaltfhisic) agus chun léargas a fháil ar phróiseas foirmíocht plainéad i ndioscaí prótairéaltacha. Bhí Grúpa Bhaile Átha Cliath ar cheann de na chéad dream ar fad a bhraith fianaise speictreascóipeach le haghaidh rothlú scairde; agus leathnaigh siad réimse maise na réad scairdfhoirmíochta síos go dtí abhaic donna (réada a bhfuil mais acu idir réaltaí agus plainéid). Ceann de bhuaiceanna na bliana ba ea an chéad uair a bhraith an taighdeoir iardhochtúireachta nua, an Dr A. Caratti O. Garatti, luasghéarú agus luasmhoilliú i scairdeanna prótairéaltacha.

Tá an tOllamh Ray ina chomhphríomhthaighdeoir ar Ionstraim Mheán-Infridhearg MIRI, atá le cur isteach mar ionchur Eorpach don Spásteileascóp James Webb, a leanfaidh Spásteileascóp Hubble nuair a lainseofar é i 2014. Seachadadh na comhpháirtithe deiridh de na crua-earraí (scagairí agus deighilteoirí léasacha) a shainigh agus a sholáthair an Institiúid agus bhog fócas obair MIRI go forbairt bogearraí i rith na bliana. Le tacaíocht Fhiontraíocht Éireann agus chláir Prodex Gníomhaireachta Spáis na hEorpa, fostaíodh beirt ríomhchláraitheoir eolaíocha atá ag obair ar mhódúil don phíblíne anailís sonraí agus calabrúcháin i gcomhoibriú le hInstitiúid Eolaíochta na Spásteileascóp i mBaltimore, SAM. De bhrí go bhfuil an saineolas seo sa teach bheadh sé an-tairbheach chun an éifeacht is mó a bhaint as úsáid sonraí MIRI, go háirithe i luathbhlianta ríthábhachtacha an mhisin.

Tionscadal fadtéarmach eile a bhfuil an Institiúid páirteach ann is ea suirbhé idirnáisiúnta crios Gould: déanfar, go bunúsach, suirbhé iomlán ar na reigiúin réaltfhoirmíochta uile gar dúinn inár réaltra. Tá an tOllamh Ray ina bhall de chuibhreannas Chrios Gould agus beidh príomhfhócas obair ánra Schroedinger eile, an Dr A Scholz, dírithe air seo sna cúig bliana romhainn. Mar aon leis an réaltfhisic ard-fhuinnimh, mar sin, tá an rannóg fós in áit mhaith cheannaireachta i dtaighde réaltfhoirmíochta agus í in eocharthionscadail agus in eocharshaoráidí.

Comhlánuithe riachtanacha le haghaidh breathnóireachta is ea teoiric, agus níos mó sa lá atá inniu ann, insamhlaithe ríomhaireachtúla. Tá sé beagnach dodhéanta tabhairt faoi ardtaighde i Réalteolaíocht agus i Réaltfhisic ár linne, mura féidir teacht ar áiseanna ardríomhaireachtúla. Ba í seo an rannóg ba shiocair le bunú Ionad na hÉireann don Ard-Ríomhaireacht (ICHEC) faoi Cosmogrid, clár den PRTLI-3, agus lean sí lena hionchur i bhforbairt r-infreastruchtúir náisiúnta faoi e-INIS, clár den PRTLI-4. D'éirigh léi freisin comhpháirtíocht uathúil a thabhairt le chéile de dheich n-eagraíocht taighde Éireannacha (na seacht n-ollscoil uile san áireamh) sa tionscnamh náisiúnta i inniúlacht ríomhaireachta, agus dá bhrí sin bhí sí in ann dhá chóras Bluegene a cheannach, darb ainm Lanczos agus Schroedinger, a oibríonn ICHEC, atá óstáilte ag HEAnet agus gur leis an Institiúid iad. Mar chuid den tionscnaimh, d'fhorbair an Dr T Downes, ag obair sa rannóg ar iasacht ó DCU, cód nua ardéifeachtach chun scrúdú a dhéanamh ar éifeachtaí dépholacha agus éifeachtaí scaipeacha Hall sa mhaighnéadahidridinimic neamhidéalach. Bhí an cód seo ar cheann díobh siúd a roghnaíodh le haghaidh prótathástáil mar chuid de thionscadail Eorpach PRACE chun áiseanna sár-ríomhaireachta ar scála ilchríche a sholáthar san Eoraip agus d'fheidhmigh sé go han-maith le scálú maith ar an gcóras is mó san Eoraip, ríomhaire Jugene ag

A good example of the power of modern simulations was provided during the year by some very beautiful results obtained by J Mackey as part of his PhD thesis under the supervision of Dr A Lim. At the edges of star formation regions long elongated structures, sometimes called elephant trunks, of dense dust and gas are often observed. Perhaps the best know example is the dramatic picture called the "pillars of creation" taken by the Hubble Space Telescope. Using a three-dimensional radiation hydrodynamic simulation of a clumpy medium being photo-ionised by a strongly directional radiation flux (conditions appropriate to the edge of a star forming region) they were able to show that transient elongated structures formed in their simulations with properties very similar to those observed and elucidate the physical processes involved. A few years ago this would have been impossible.

While the focus of the section is very clearly on research and advanced training, public outreach is also an important activity based mainly around Dunsink Observatory. The open-night programme in Dunsink (which actually predates the establishment of the Institute and is thus probably the longest-running science outreach programme in the country) has been considerably expanded with the addition of special events for selected groups and a strong science-week programme aimed at schools. A particular effort was made in 2009 to mark the fact that it was the International Year of Astronomy. In cooperation with Blackrock Castle Observatory in Cork and the Armagh Observatory and Planetarium in Northern Ireland two high profile public speakers, Caroline Porco, PI of the Cassini Mission to Saturn and its moons, and Brother Guy Consolmagno, curator of meteorites at the Vatican observatory, were invited to Ireland to give public lectures in a number of venues including Dunsink.

Scoil na Fisice Cosmaí {ar lean}

Julich sa Ghearmáin. Tá feidhm á baint as na sárshaoráidí ríomhaireachta atá ar fáil in Éirinn anois faoi thionscadal atá á chistiú ag SFI chun ionsamhlúcháin dhúshlánacha fisice plasma a rith de na próisis a bhaineann le himbhuaileadh scamaill plasma faoi luais coibhneasta (éifeachtaí a cheaptar atá taobh thiar den astúchán a bhraitear ó roiseanna gháma-ghathacha).

Sampla maith de chumhacht ionsamhlúcháin nua-aoiseacha ba ea roinnt torthaí áille a fuair J Mackey i rith na bliana mar chuid dá thráchtas PhD faoi stiúradh an Dr A Lim. Ag imill réigiún réaltfhoirmíochta, breathnaítear go minic struchtúir fhada fhadaithe deannaigh agus gáis ar a dtugtar truncaí eilifintí. An sampla is fearr, b'fhéidir, ná an pictiúr drámatúil ar a dtugtar "colúin an cruthaithe" a ghlac Spástheileascóip Hubble. Ag úsáid ionsamhlúchán tríthoiseach radaíochta hidridinimiciúil de mheán tomach á fhóta-ianú ag flosc radaíochta tréantreoch (tosca is cuí d'imeall réigiúin réaltfhoirmíochta) bhí siad in ann a léiriú gur foirmíodh struchtúir fhadaithe dhíomuana ina gcuid ionsamhlúcháin agus go raibh a n-airíonna an-chosúil leo siúd a breathnaíodh, rud a léiríonn na próisis fisiciúla atá ann. Bheadh sé seo dodhéanta roinnt blianta ó shin.

Cé gur léir go bhfuil fócas na rannóige dírithe ar thaighde agus ar an ardoiliúint, is gníomhaíocht thábhachtach í freisin an fhor-rochtain phoiblí atá bunaithe den chuid is mó thart ar Réadlann Dhún Sinche. Forbraíodh go mór an clár oíche oscailte i nDún Sinche (clár atá níos sine ná an Institiúid féin agus dá bhrí sin, b'fhéidir, an clár for-rochtana eolaíochta is sine sa tír) le hócáidí speisialta nua le haghaidh grúpaí roghnaithe agus cuireadh clár láidir seachtaine eolaíochta leis a dhíríonn ar na scoileanna. Rinneadh iarracht faoi leith i 2009 chun Bliain Idirnáisiúnta na Réalteolaíochta a chomóradh. I gcomhoibriú le Réadlann na Dúcharraige i gCorcaigh agus le Réadlann agus Pláinéadlann Ard Mhacha i dTuaisceart Éireann, tugadh cuireadh do bheirt chainteoir iomráiteacha, Caroline Porco, Príomhthaighdeoir Mhisean Cassini go Satarn, agus an Br. Guy Consolmagno, coimeádaí na ndreigítí ag Réadlann na Vatacáine, teacht go hÉireann chun léachtaí poiblí a thabhairt in ionaid éagsúla, Dún Sinche san áireamh.

Dr. Carolyn Porco, leader of the Casinni imaging team at Dunsink Observatory in June 2009.

An Dr. Carolyn Porco, ceannaire ar an bhfoireann íomháithe Casinni ag Réadlann Dhún Sinche sa Mheitheamh 2009.

School of Cosmic Physics

Geophysics

1 General

The most important internal event of the year was the quinntennial review of the School of Cosmic Physics that was conducted in August, 2009. All Geophysics members met the Review Committee. Subsequently, the Chair of the Committee made a verbal report to the Chairman of DIAS's Council and to the Governing Board. The opening statement made by the Review Committee Chair about Geophysics over the period 2004-2009 was "*Dreams Come True!*". The written report of the Review Committee states that "*Through new staffing, the School has become an emerging world leader in electromagnetic geophysics, seismology, marine geophysics and geodynamics.*" The committee made very complimentary remarks about the research activities of Professors Jones, Lebedev and Martinec.

Another important development during 2009 was the acquisition of geophysical and computational hardware through a special allocation from the Department of Education. The Irish National Seismic Network will be expanded from two permanent stations to five, with very broadband seismometers measuring seismic signals to periodicities of 240 seconds at each station. Twenty new portable broadband seismic systems were acquired, to replace the aging fleet of existing equipment. Four more broadband magnetotelluric (BBMT) and twenty long-period magnetotelluric (LMT) systems were acquired, bringing the number of MT systems owned by the Section to ten BBMTs and 22 LMTs – the largest fleet of MT equipment owned by any academic group worldwide. Finally, a data storage system was acquired that will take care of the needs of the Geophysics Section for the next five years.

2 People

The personnel highlight for the year was the arrival in August of Professor Zdenek Martinec from Germany (GeoForschungsZentrum, Potsdam) and the Czech Republic (University of Prague) in the post of Professor of Geophysics. Professor Martinec expands considerably the breadth of activities of the Geophysics Section with his numerical modelling of Earth processes from the surface to the deep mantle.

Dr. Mark Muller accepted the five-year position of Schrödinger Fellow in the Geophysics Section and began in July. Dr. Muller's interests are broadly-based, with lithospheric work in Southern Africa his current focus and with an interest in growing a programme of crustal and lithospheric geophysics in Ireland.

Three Post-Doctoral Fellows started in 2009, all on two-year appointments. Dr. Celine Tirel, an expert on geodynamics of the lithosphere, started in March arriving from Utrecht University to work with Assistant Professor Sergei Lebedev on lithospheric deformation funded on an SFI RFP grant. Dr. Jan Vozar, with skills in large-scale electromagnetic induction, started in May from the Geophysical Institute of the Slovak Academy of Sciences, where he holds a permanent position, to work with Senior Professor Alan Jones on the INDEPTH project Phase IV activities on the northern rim of the Tibetan Plateau, also funded on an SFI RFP grant. Dr. Javier Fullea, a numerical petrophysicist who has developed a programme for modelling surface observables based on the three-dimensional distribution of minerals within the subsurface (LitMod3D), joined DIAS in May from the Earth Sciences Institute in Barcelona to work with Jones on the tectonics of Morocco. Dr. Fullea is funded by an IRCSET grant for Irish contributions to the TOPO-MED Coordinated Research Project under the EUROCORES TOPO-EUROPE programme.

Three PhD students started their studies in 2009. Florian Le Pape, from France, started in January working with Jones on INDEPTH funded on the SFI RFP grant. Andrew Schaeffer, from Canada, started in November working with Lebedev on seismic-velocity structure and dynamics of the North American continent, also funded on an SFI RFP grant. Duygu Kiyan, from Turkey, started in July working with Jones on TOPO-MED funded on the IRCSET grant.

During 2009 the Section saw the Institute's longest serving academic and second longest-serving member, Assistant Professor Peter Readman, retire in April after almost thirty years with the Geophysics Section. Readman came with skills in rock and paleomagnetism, and broadened considerably to work in potential field studies and passive and active seismology. The Section is very pleased that Dr. Readman will continue his work as an Emeritus Professor focussing on the ISUME experiment and supervising a PhD student (Gulten Polat) funded by an SFI RFP grant.

3 General Research Activities

3.1 Irish Geoscience Graduate Programme

The Irish Geoscience Graduate Programme is an All-Ireland initiative from the heads of geoscience schools/departments at five universities and one research institute involved in the

Scoil na Fisice Cosmaí

An Rannóg Geoifisice

1 Ginearálta

Ba é an t-imeacht inmheánach ba thábhachtaí i rith na bliana an léirmheas cúigbhliantúil ar Scoil na Fisice Cosmaí a rinneadh i mí Lúnasa, 2009. Bhuail baill na rannóige Geoifisice go léir leis an gCoiste Athbhreithnithe. Thug Cathaoirleach an Choiste tuairisc ó bhéal ina dhiaidh sin do Chathaoirleach Chomhairle an DIAS agus don Bhord Bainistíochta. Ba é seo ráiteas tosaigh Chathaoirleach an Choiste i leith na Geoifisice don tréimhse 2004-2009: "*Tagann brionglóidí i gcrích!*' Deir tuairisc scríofa an Choiste Athbhreithnithe: "*Le soláthar foirne nua, tá an Scoil ag teacht chun cinn mar cheannaire domhanda sa gheoifisic leictreamaighnéadach, sa tseismeolaíocht, sa gheoifisic mhuirí agus sa gheoidinimic.*" Bhí ráitis an-fhábharacha ón gcoiste i leith gníomhaíochtaí taighde na nOllúna Jones, Lebedev agus Martinec.

Dul chun cinn tábhachtach eile i 2009 ba ea na crua-earraí geoifisice agus ríomhaireachta a fuarthas le leithdháileadh speisialta ón Roinn Oideachais. Forbrófar Líonra Seismeach Náisiúnta na hÉireann ó dhá stáisiún bhuana go cúig cinn, le seismiméadair leathanbhanda ag tomhas comharthaí seismeacha go dtí tréimhsiúlachtaí 240 soicind ag gach stáisiún. Fuarthas fiche córas nua iniompartha leathanbhanda seismeach agus glacfaidh siad áit an trealaimh atá ag dul in aois. Fuarthas ceithre chóras eile leathanbhanda mhaighnéadaiteallúireacha (BBMT) agus fiche córas maighnéadaiteallúireach fadtréimhseach (LMT); seasann líon na gcóras MT is leis an Rannóg anois ag deich BBMT agus 22 LMT – an flít trealaimh is mó is le grúpa acadúil ar bith ar domhan. Mar chríoch, fuarthas córas stórála sonraí a fhreastalóidh ar riachtanais na Rannóige Geoifisice sna cúig bliana romhainn.

2 Daoine

Ba í buaic na bliana ó thaobh pearsanra de teacht an Ollaimh Zdenek Martinec ón nGearmáin (GeoForschungsZentrum, Potsdam) agus ó Phoblacht na Seice (Ollscoil Prague) mar Ollamh Geoifisice i mí Lúnasa. Leathnaíonn an tOllamh Martinec réimse gníomhaíochtaí na Rannóige Geoifisice go mór lena samhaltú uimhriúil ar phróisis an Domhain ón dromchla go dtí an maintlín domhain.

Ghlac an Dr. Mark Muller le post cúig bliana Ánra Schrödinger i Rannóg na Geoifisice agus thosaigh sé ag obair i mí Iúil. Tá réimsí leathana suime ag an Dr. Muller: faoi láthair tá sé ag díriú ar obair liteasféarach i nDeisceart na hAfraice agus tá suim aige freisin i gclár screimhe agus liteasféarach geoifisice a fhorbairt in Éirinn.

Thosaigh triúr Ánra Iardhochtúireachta i 2009, iad go léir ar chonraí dhá bhliana. I mí an Mhárta, thosaigh an Dr. Celine Tirel, ó Ollscoil Utrecht, saineolaí ar gheoidinimic an litisféir, ag obair le hOllamh Cúnta Sergei Lebedev ar dhífhoirmiúcháin litisféireach, cistithe le deontas SFI RFP. I mí na Bealtaine, tháinig an Dr. Jan Vozar a bhfuil post buan aige in Institiúid Geoifisice Acadaimh Eolaíochta na Slóvaice agus scileanna aige san ionduchtú leictreamaighnéadach ar mórscála, agus thosaigh sé ag obair le hOllamh Sinsireach Alan Jones faoin tionscadal INDEPTH Céim 4 ar ghníomhaíochtaí choirre thuaidh ardchláir na Tibéide, obair atá cistithe ag deontas SFI RFP freisin. I mí na Bealtaine, tháinig an Dr Javier Fullea ón Institiúid Domhaneolaíochta, Barcelona, ag obair le Jones ar theicteonaic Mharacó. Eolaí sa pheitrifisic uimhriúil is ea an Dr Fullea agus d'fhorbair sé clár chun inbhraití dromchlaí a shamhlú bunaithe ar dháileadh thríthoisigh mhianraí istigh san fhodhromchla (LitMod3D); tá sé cistithe ag deontas IRCSET le haghaidh ionchuir Éireannacha don Tionscadal Comhordaithe Taighde TOPO-MED faoin gclár EUROCORES TOPO-EUROPE.

Thosaigh triúr mic léinn PhD ar a gcuid staidéar i 2009. I mí Eanáir, thosaigh Florian Le Pape ón bhFrainc ag obair le Jones ar INDEPTH, cistithe ón deontas SFI RFP. I mí na Samhna, thosaigh Andrew Schaeffer ó Cheanada ag obair le Lebedev ar struchtúr agus dinimic threoluas seismeach ilchríche Mheiriceá Thuaidh, cistithe arís ag deontas SFI RFP. I mí Iúil, thosaigh Duygu Kiyan ón Tuirc ag obair le Jones ar TOPO-MED, cistithe ón deontas IRCSET.

Chuaigh an tOllamh Cúnta Peter Readman ar scor i mí Aibreáin tar éis beagnach tríocha bliain leis an Rannóg Geoifisice, tréimhse seirbhíse níos faide ná acadóir ar bith eile san Institiúid agus tréimhse ballraíochta nach bhfuil sáraithe ach ag duine amháin eile. Tháinig Readman le scileanna i gcarraigeacha agus sa phailéamaighnéadas agus leathnaigh sé a chuid oibre amach le staidéir réimse phoiteinsiúil féideartha agus seismeolaíocht éighníomhach agus ghníomhach. Tá an Rannóg an-sásta go leanfaidh an Dr. Readman lena chuid oibre mar Ollamh Emeritus ag díriú ar thurgnamh ISUME agus ag stiúradh mac léinn PhD (Gulten Polat), cistithe ag deontas SFI RFP.

training of post-graduate students in the geosciences. It has a visionary and unique objective, which is to establish a robust, holistic, broad-based training programme for post-graduate students, wherever they are registered for their fourth level degree (primarily PhD) on the island of Ireland.

The IGGP involves the Geophysics Section of DIAS, the Department of Earth and Ocean Sciences of the National University of Ireland Galway, the Department of Geology of Trinity College Dublin, the Department of Geology of University College Cork, the School of Geological Sciences of University College Dublin and the School of Environmental Sciences [Geophysics Group] of the University of Ulster Coleraine as partner institutions. There are linkages with the Geological Survey of Ireland and the Geological Survey of Northern Ireland as well as the School of Geography, Archaeology and Palaeoecology of Queen's University Belfast and the Department of Geography of the National University of Ireland Maynooth. All these institutions have agreed to offer modules [worth from 2.5 to 10 ECTS credits] under the programme.

IGGP was funded by a Griffith Award of the Department of Communications, Energy and Natural Resources to Jones of €416,000 for a period of seven years. These funds are being used for a two-year Co-ordinator, Professor Ben Kennedy, who is tasked with initiating the IGGP, and an Administrator for the remaining five years.

3.2 European Plate Observing System (EPOS)

Europe needs a long-term integrated strategic research infrastructure plan to promote innovative ches for a better understanding of the physical processes controlling earthquakes, volcanic eruptions and tsunamis as well as those driving tectonics and Earth surface dynamics. This plan should aim at integrating the currently scattered, but highly advanced European facilities geared towards studying these topics into one, distributed, but coherent multidisciplinary Research Infrastructure (RI) allowing sustainable long-term Earth science research strategies and an effective coordinated European-scale monitoring facility for the solid Earth dynamics. This integration can and should take full advantage of new e-science opportunities. EPOS is such a Research Infrastructure plan that anticipates a thorough understanding of the dynamic tectonic processes by integrating data and experiments at a wide variety of spatial and temporal scales.

The European Plate Observing System (EPOS: http://www.epos-eu.org) is an initiative in response to the EU policy for a coordinated approach to support and develop research infrastructures. EPOS is a proposal submitted for the update of the European roadmap for research infrastructure coordinated by the European Strategic Forum on Research Infrastructures (ESFRI) in the framework of the Seventh Research Framework Plan (FP7).

Ireland, through the leadership of the Geological Survey of Ireland, is a partner in the EPOS initiative, and Assistant Professor Sergei Lebedev is the National Point of Contact.

4 Specific Research Activities

4.1 Combining Seismology and Electromagnetism – Jones

Both qualitative and quantitative research continued on combining the results from seismological and electromagnetic investigations, primarily of the continental lithospheric mantle (the upper 200 km or so of the Earth's mantle that lies beneath the thin crustal layer). Quantitative comparisons demonstrated that seismic velocity can be reasonably predicted from electrical resistivity for Southern Africa, which implies that the lateral variation in seismic velocity beneath Southern Africa can be explained by thermal variations rather than compositional variations.

Quantitative work on formal joint inversion continued, with modelling of seismic and electrical data for Northern Germany in terms of anisotropic structure. The isotropic version of the genetic algorithm code developed at DIAS by Jones with former student Dr. M. Moorkamp (U. Kiel) has been successfully extended for a 1D anisotropic media, inverted surface wave dispersion curves and long-period magnetotelluric data. This new approach has been tested with synthetics datasets and promising results were obtained, showing that joint inversion has the potential to improve the model resolution in comparison to separate inversions.

Because of existing data and knowledge, Roux, Jones and colleagues have chosen to apply this new joint inversion method to a real dataset from Central Germany. Roux, Jones and colleagues are looking for a 1D anisotropic structure combining seismological and magnetotelluric observations, aiming to improve the resolution of deep structures such as the lithosphere/asthenosphere boundary. This work is still in progress but promising results have been obtained so far and presented in several international conferences.

3 Gníomhaíochtaí Taighde Ginearálta

3.1 Clár Éireannach Geo-eolaíochta do Chéimithe

Tionscnamh uile-Éireannach is ea an Clár Éireannach Geo-eolaíochta do Chéimithe a tháinig ó cheannairí scoileanna/rannóga geo-eolaíochta i gcúig ollscoil agus in institiúid taighde amháin a oileann mic léinn iarchéime sna geo-eolaíochtaí. Tá cuspóir físeach, uathúil aige, is é sin, clár oiliúna láidir, iomlánaíoch, leathan a bhunú do mhic léinn iarchéime, pé áit ar oileán na hÉireann ina bhfuil siad cláraithe dá gcéimeanna ceathrú leibhéal (PhD go príomha).

Tá na Institiúidí seo a leanas comhpháirteach san IGGP le Rannóg Geoifisice DIAS: an Roinn Dhomhaneolaíochta agus Aigéaneolaíochta, Ollscoil na hÉireann, Gaillimh; Roinn Gheolaíochta Choláiste na Tríonóide, Baile Átha Cliath; Roinn Gheolaíochta Choláiste na hOllscoile, Corcaigh; Scoil na nEolaíochtaí Geolaíochta, Coláiste na hOllscoile, Baile Átha Cliath; agus Scoil na nEolaíochtaí Chomhshaoil [Grúpa Geolaíochta] Ollscoil Uladh, Cúil Raithin. Tá naisc le Suirbhéireacht Gheolaíochta na hÉireann agus le Suirbhéireacht Gheolaíochta Thuaisceart Éireann, chomh maith le Scoil na Tíreolaíochta, na Seandálaíochta agus na Pailé-éiceolaíochta, Coláiste na Banríona, Béal Feirste, agus le Roinn na Tíreolaíochta, Ollscoil na hÉireann, Maigh Nuad. Tá na hinstitiúidí seo go léir toilteanach modúil [is fiú 2.5 go 10 gcreidmheas ECTS] a thairiscint faoin gclár.

Cistíodh an IGGP le gradam Griffith na Roinne Cumarsáide, Fuinnimh agus Achmhainní Nádúrtha de €416,000 do Jones thar thréimhse seacht mbliana. Tá na cistí seo á n-úsáid ar Chomhordaitheoir dhá bhliana, an tOllamh Ben Kennedy, chun an IGGP a thionscnamh taobh istigh den tréimhse sin, agus ar Riarthóir do na cúig bliana eile.

3.2 Córas Breathnóireachta Phlátaí na hEorpa (EPOS)

Tá gá ag an Eoraip le plean fadtéarma, comhtháite, straitéiseach ar infreastruchtúr taighde chun modhanna nuálacha a chur chun cinn le tuiscint níos fearr a fháil ar na próisis fisiciúla a rialaíonn creathanna talún, brúchtaí bolcánacha agus súnámaithe, chomh maith leo siúd a thiomáineann teicteonaic agus dinimic dhomchla an Domhain. Ba chóir go ndíreodh an plean seo ar chomhtháthú na n-ardsaoráidí Eorpacha, atá scaipthe faoi láthair, isteach in aon Infreastruchtúr Taighde (RI) idirdhisciplíneach amháin atá dáilte ach comhtháite agus a éascaíonn straitéisí fhadtéarmacha i dtaighde ar dhomhaneolaíocht agus ar shaoráid fhaireacháin éifeachtach ar scála Eorpach le haghaidh dinimic an domhain sholadaigh. Is féidir leis an comhtháthú seo, agus ba chóir gurbh fhéidir leis, leas iomlán a bhaint as deiseanna nua r-eolaíochta. Freagraíonn EPOS an gá lena leithéid de phlean Infreastruchtúr Taighde: réamh-mheasann sé tuiscint chríochnúil ar na próisis dinimice theicteonacha trí chomhtháthú sonraí agus turgnamh ag éagsúlacht leathan scálaí spásúla agus ama.

Is tionscnamh é Córas Breathnóireachta Phlátaí na hEorpa (EPOS: http://www.epos-eu.org) agus tá sé ina fhreagra ar pholasaí an AE le haghaidh cur chuige comhtháite chun infreastruchtúr taighde a thacú agus a fhorbairt. Cuireadh isteach EPOS mar thogra nuashonrúcháin do phlean oibre na hEorpa d'infreastruchtúir taighde, comhordaithe ag Fóram Straitéiseach na hEorpa ar Infreastruchtúir Taighde (ESFRI) i gcreatlach an tSeachtú Creatphlean Taighde (FP7).

Tá Éire ina comhpháirtí i dtionscnamh EPOS faoi cheannas Shuirbhéireacht Gheolaíochta na hÉireann, agus is é Ollamh Cúnta Sergei Lebedev an Pointe Teagmhála Náisiúnta.

4. Gníomhaíochtaí Taighde Faoi Leith

4.1 Seismeolaíocht agus Leictreamaighnéadas a Chomhcheangal – Jones

Lean taighde cáilíochtúil agus taighde cainníochtúil ar cheangal na dtorthaí ó iniúchtaí seismeolaíochta agus leictreamaighnéadacha go háirithe ar an maintlín litisféarach ilchríochach (an 200 km, nó mar sin, is uachtaraí de mhaintlín an Domhain a luíonn faoin sraith screimhe thanaí). Léirigh comparáidí cainníochtúla gur féidir treoluas seismeach a thuar go réasúnta ó fhriotachas leictreach do Dheisceart na hAfraice, a thugann le tuiscint gur féidir an comhathrú cliathánach i dtreoluas seismeach a mhíniú le comhathruithe teirmeacha seachas comhathruithe comhshuímh.

Lean obair chainníochtúil ar chomhinbhéartú foirmeálta le samhaltú sonraí seismeacha agus leictreacha do Thuaisceart na Gearmáine i dtéarmaí struchtúr aineastrópach. D'éirigh le leathnú an leagain iseatrópaigh a d'fhorbair Jones i DIAS leis an iarmhac léinn Dr. M. Moorkamp (Ollscoil Kiel) le haghaidh meáin aineastrópacha aontoiseacha, cuar spréite tonn dhromchla aisiompaithe, agus sonraí maighnéadaiteallúireach fadtréimhseacha. Tástáladh an cur chuige nua seo le tacair sonraí sintéiseacha agus

Besides this 1D anisotropic joint inversion, a possibility of extending this code in 2D is being investigated by Jones with PhD candidate E. Mandolesi. The starting approach has been linking seismic and electrical structure geometrically. This approach was tested with synthetic electromagnetic data keeping fixed the seismic structure and the results were presented at the AGU Fall Meeting.

Finally, intrinsic quantitative modelling and inversion of seismic, thermal, density and electrical parameters is being undertaken in a self-consistent manner through petrophysical modelling of the upper mantle by Post-Doctoral Fellow J. Fullea with Jones, Schrödinger Fellow M. Muller and colleague Dr. J.-C. Afonso (U. Macquarie). Fullea and Afonso's code LitMod3D, which is an interactive 3D software to model the thermal, compositional, density, rheological and seismological structure of the lithosphere and sub-lithospheric upper mantle, has been extended to include the electrical conductivity, based on the equations of state given in a publication by Jones and colleagues Prof. D. Eaton (U. Calgary) and Dr. R. Evans (WHOI).

4.2 Electromagnetic Research – Jones

Research under SAMTEX (Southern African Magnetotelluric Experiment) auspices continued strongly by Jones with Muller, Senior Scholar M. Miensopust and Scholars D. Khoza and P.-E. Share, with colleagues in the U.S.A. and Southern Africa. Muller completed the 2-D electrical resistivity modelling of the KIM-NAM profile across the Kaapvaal Craton, Rehoboth Terrane and Damara Mobile Belt, providing the first deep lithospheric images ever of the latter two terranes, and new electrical images of the Kaapvaal Craton where previously imaged only by seismic methods. Miensopust focussed on investigation of the 600km long ZIM line profile crossing the Zimbabwe Craton (ZC), Magondi Mobile Belt (MMB) and Ghanzi-Chobe Belt (GCB). The MT data modelling showed that the ZC is characterised by thick (>220 km) resistive lithosphere, which is consistent with geochemical and geothermal estimates from kimberlite samples of the Orapa and Letlhakane pipes (>175 km west of the profile). The lithospheric mantle of the GCB is resistive but the lithosphere is only about 180 km thick. The work by Khoza focused specifically on the collisional boundary belt between the Rehoboth terrane (a component of the "Kalahari Craton") and the Angola Craton. The nature and geometrical relationships of the boundary between the two cratons and the Damara orogenic belt is unknown.

Regional-scale resistivity models constructed from two-dimensional inversions of the MT data indicate significant variations in lithospheric resistivity structure along and across strike from the younger orogen to the older adjacent cratons. A somewhat unique component of SAMTEX is the additional work done for the Namibian Power Corporation and being undertaken by Share. In the near future a high-voltage direct current (HVDC) power line will be constructed between the Otjiwarongo and Katima Mulilo regions. The main purposes of the project are to obtain electrical conductivity models of the two areas, to aid in the optimal placement of the HVDC earth electrodes, and to use the two models together with other conductivity models in between and in the vicinity of Otjiwarongo and Katima Mulilo as input to a 3D DC forward modelling code to try to predict the DC current return path.

Two field campaigns were planned for 2009, one in Spring, 2009 in Morocco as part of PICASSO/TopoMed, and the other in Summer, 2009 in China as part of INDEPTH. Both of these were postponed because of the very low solar activity. During 2009 the Sun was the quietest it has been for over one hundred years. Accordingly, the Moroccan survey took place in the Autumn, and the Chinese survey will take place in Summer, 2010.

Research under the PICASSO/TopoMed projects is studying the tectonics of the Western Mediterranean. The TopoMed project's objective is to develop a better understanding of the internal structure of the crust and lithosphere of the Atlas Mountains of Morocco. The first phase of the magnetotelluric (MT) experiment of the project was carried out in Atlas Mountains region from end of September to mid-December 2009. Two different types of MT equipment (broadband MT, BBMT, and long period MT, LMT, recording systems) were used along two profiles. BBMT data were acquired at 23 locations along the MAR profile, with LMT data at 9 of these. The recording of LMT data was extended due to the very low solar activity in 2009 – there were no sunspots observed on 260 days (71%) of the year (NASA Report).

Simultaneously, BBMT data were collected at 20 sites along the southern part of the MEK profile which extends for approximately 500 km from the Rif to the sand dunes of the Sahara. In December 2009, LMT acquisition started at 13 sites on the northern part of the profile from Meknes to the Rif.

fuarthas torthaí rathúla a léirigh go bhfuil poitéinseal ag an gcomhinbhéartú, i gcomparáid le inbhéartaithe faoi leith, chun taifeach na samhla a fheabhsú.

De bharr sonraí agus eolas reatha, shocraigh Roux, Jones agus a gcomhghleacaithe ar an modh nua comhinbhéartaithe seo a chur i bhfeidhm ar thacair fíorshonraí ón nGearmáin Láir. Tá Roux, Jones agus comhghleacaithe ag lorg struchtúr aineastrópach aontoiseach a chomhcheanglaíonn breathnuithe seismeolaíocha agus maighnéadaiteallúireacha d'fhonn feabhsú a dhéanamh ar thaifeach struchtúr domhain mar an teorainn litisféarach/astanaisféarach. Tá an obair seo fós ar siúl ach tá torthaí rathúla faighte go dtí seo a tuairiscíodh ag roinnt comhdhálacha idirnáisiúnta.

Seachas an chomhinbhéartú aineastrópach aontoiseach seo, tá Jones agus iarrthóir PhD E. Mandolesi ag scrúdú an féidir an cód seo a leathnú go 2T. Ba é an chéad chur chuige ná an struchtúr seismeach agus leictreach a nascadh go céimseatúil. Tástáladh an cur chuige seo le sonraí leictreamaighnéadacha sintéiseacha, ag coinneáil an struchtúir sheismigh buan, agus cuireadh na torthaí i láthair ag Cruinniú an Fhómhair an AGU.

Mar chríoch, tá samhaltú cainníochtúil intreach agus inbhéartú de pharaiméadair sheismeacha, theirmeacha, dhlúis agus leictreacha á ndéanamh ar chaoi fhéinchomhsheasmhach trí shamhaltú peitrifisiciúil den mhaintlín uachtarach ag Ánra Iardhochtúireachta J. Fullea, le Jones, Ánra Schrödinger M. Muller, agus comhghleacaí Dr. J-C. Afonso (Ollscoil Macquarie). Tá cód LitMod3D le Fullea agus Afonso, bogearra idirghníomhach 3T chun an struchtúr teirmeach, comhshuímh, dlúis, sreabheolaíoch agus seismeach den litisféar agus den mhaintlín uachtarach fho-litisféarach a shamhailt, leathnaithe chun an tseoltacht leictreach a chur san áireamh, agus tá sé bunaithe ar chothromóidí staide tugtha i bhfoilseacháin ag Jones agus a chomhghleacaithe, an tOllamh D. Eaton (Ollscoil Calgary) agus an Dr. R. Evans (WHOI).

4.2 Taighde Leictreamaighnéadach – Jones

Bhí an taighde faoi choimirce SAMTEX (Turgnamh Maighnéadaiteallúireach na hAfraice Theas) á leanúint go bríomhar ag Jones le Muller, Scoláire Sinsearach M. Miensopust agus Scoláirí D. Khoza agus P.-E. Share, le comhghleacaithe i SAM agus i nDeisceart na hAfraice. Chríochnaigh Muller samhaltú friotachais leictreach 2T den phróifíl KIM-NAM trasna Chratón Kaapvaal, tír-raoin Rehoboth agus Chrios Gluaisteach Damara, a sholáthair na céad íomhánna dhomhainlitisféaracha riamh den dá thír-raon dheireanacha sin agus íomhánna nua leictreach de Chratón Kaapvaal, áit nach raibh íomháite roimhe seo ach le modhanna seismeacha. Dhírigh Miensopust ar iniúchadh phróifíl líne ZIM, 600km ar fad, trasna Chratón Zimbabwe (ZC), Chrios Gluaisteach Magondi (MMB) agus Chrios Ghanzi-Chobe (GCB). Léirigh samhaltú sonraí MT go bhfuil litisféar friotaíoch tiubh (>220 km) ag an ZC atá ar aon dul le measatacháin gheoiceimiceacha agus gheoiteirmeacha ó shamplaí cimbirlítí de phíopaí Orapa agus Letlhakane (>175 km siar ón bpróifíl). Tá maintlín litisféarach an GCB friotaíoch ach níl ach tiús thart ar 180 km sa litisféar. Dhírigh Khoza a chuid oibre ar an gcrios teorann áit a n-imbhuaileann tír-raon Rehoboth (cuid de "Chratón Kalahari") agus Chratón Angola le chéile. Ní fios cineál agus gaolmhaireacht gheoiméadrach na teorann idir an dá chratón agus crios oraigineach Damara. Léiríonn samhlacha friotachais ar scála réigiúnach bunaithe ar inbhéartuithe 2T de na sonraí MT go bhfuil comhathruithe suntasacha i struchtúr friotachais litisféarach ar feadh agus trasna na treoíochta ón oraigin is óige go dtí na cratón níos sine in aice láimhe. Cuid uathúil de SAMTEX is ea obair bhreise Share do Chorporáid Chumhachta na Namaibe. Go luath san am atá le teacht tógfar líne chumhachta a mbeidh sruth díreach ardvoltais (HVDC) aici idir na réigiúin Otjiwarongo agus Katima Mulilo. Is iad príomhchuspóirí an tionscadail ná chun samhlacha seoltachta leictrí a fháil den dá réigiún chun cabhrú le roghnú an tsuímh is fearr do na leictreoidí talún HVDC; agus chun an dá shamhail a úsáid le chéile le samhlacha seoltachta eile idir Otjiwarongo agus Katima Mulilo agus gar dóibh mar ionchur do chód samhaltaithe 3T SD le haghaidh an t-am atá le teacht d'fhonn aisrian an tsrutha dhírigh (DC) a thuar.

Pleanáladh dhá fheachtas allamuigh do 2009, ceann amháin in Earrach 2009 i Maracó, mar chuid de PICASSO/TopoMed, agus an ceann eile i Samhradh 2009 sa tSín mar chuid de INDEPTH. Cealaíodh iad de bharr go raibh gníomhaíocht na gréine an-íseal. I rith 2009 bhí an ghrian níos suaimhní ná mar a bhí sí le breis is céad bliain. Dá bhrí sin, rinneadh suirbhé Mharacó san Fhómhar agus déanfar suirbhé na Síne i Samhradh 2010.

An taighde faoi na tionscadail PICASSO/TopoMed tá sé ag scrúdú theicteonaic na Meánmhuirí iartharaigh. Is é cuspóir thionscadail TopoMed ná chun tuiscint níos fearr a fhorbairt ar struchtúr inmheánach screamh agus litisféar

New data acquisition on Phase IV of the INDEPTH project, InterNational DEep Profiling of Tibet and the Himalaya, was postponed until Summer, 2010, so Post-Doctoral Fellow Dr. J. Vozar and Scholar F. Le Pape re-modelled existing data from Phase III across the central Tibetan Plateau. In anticipation of the upcoming survey, the MT 600-line data were re-analysed and re-modelled. The Kunlun Fault is investigated as a rheological boundary in the middle and lower crust of northern Tibet, between a crust weakened by partial melting and a more stable (dry, cold) crust north of the fault. Two 2D geoelectrical models crossing the Banggong-Nujiang suture roughly, along longitude of 89°E (longer 500 line) and 92°E (shorter 400 line), which separate Qiangtang and Lhasa terrane were inverted from MT INDEPTH data. The models show close-up information about the Banggong-Nujiang suture and its changes in geoelectrical structure between the longitude of 89°E and 92°E. The eastern profile exhibits shallower crustal conductive layer and sharp horizontal jump in conductivity just below the surface trace of the Banggong-Nujiang suture in comparison with western 500 line. The preliminary 3D models of INDEPTH region have been created with deep spherical and shallow planar 3D modelling programs.

Finally, during the 2009 summer field season, the Geological Survey of Canada and DIAS collaborated on collecting magnetotelluric (MT) data from 29 locations along a 300-km-long regional profile across the Melville Peninsula, Nunavut, Canada. The primary objectives of the project are to resolve the nature of first order tectonic boundaries, to understand the structural evolution and tectonic processes from Archean to Phanerozoic times, and to determine the potential for mineral exploration in the region. First order observations of two-dimensional conductivity models derived from the MT data show a strong correlation with geological features mapped at the surface.

4.3 Geodynamics Research – Martinec

Geodynamic research activity was broadened considerably in 2009 in several subjects by hiring Prof. Zdenek Martinec in section of Geophysics. Martinec continued in glacial isostatic adjustment (GIA) modelling, the estimates of present-day mass balances in Antarctica and Greenland, interpreting CHAMP magnetic data and preparing for interpreting SWARM magnetic data by modelling magnetic field induced by ocean circulations and by formulating the adjoint method for downward continuation of magnetic secular variations field from the Earth's surface down to the core-mantle boundary.

The improvement in understanding of dynamic processes in the Earth's mantle demands consideration of a non-linear rheology of mantle material. Whereas this rheology is accepted in the studies of mantle convection, the need of a non-linear material behaviour in modelling of glacial isostatic adjustment is still under discussion. Almost all the predictions of ongoing present-day processes induced by GIA are based on the assumption of a linear Maxwell viscoelastic rheology. To study the influence of non-linear rheology on the GIA-induced motion, Martinec and colleague Dr. J. Klemann (GeoForschungsZentrum Potsdam) implemented a non-linearly stress-dependent rheology in the spectral finite-element formulation of a viscoelastic self-gravitating sphere. The main effect of a non-linear rheology on the GIA-induced motion is for times when a surface ice-mass load is changing most rapidly because of large induced loading stresses.

The Gravity Recovery and Climate Experiment (GRACE) provides important constraints on glacial-isostatic adjustment and present-day ice-mass change. Martinec and colleague Dr. I. Sasgen (GeoForschungsZentrum Potsdam) performed a joint inversion of GRACE gravity data over North America and Greenland and determined the Alaskan and Greenland contribution to sea-level change from the adjusted ice-mass change models. The residual misfit over the GIA-dominated region around the Hudson Bay is interpreted with regard to the mantle viscosities beneath North America by applying forward model calculations of the GIA signal in these regions. They found that the mass change of the Greenland Ice Sheet amounts to 0.5 mm/a equivalent sea-level change and significantly accelerated during the observation period.

Modern modelling approaches to GIA are based on several techniques ranging from purely analytical formulations to fully numerical methods. Various European teams nowadays are independently working on the post-glacial rebound process in order to constrain the rheological profile of the mantle and the extent and chronology of the late-Pleistocene ice sheets which are prerequisites for the determination of the GIA contribution to geodetic observables. Martinec contributed to the benchmark study performed within the Working Group 4 of the ESF COST Action ES0701 "Improved constraints on models of Glacial Isostatic Adjustment".

Shléibhte Atlais Mharacó. Rinneadh céim a haon den tionscadal maighnéadaiteallúireachta (MT) sna Sléibhte Atlais ó dheireadh mhí Dheireadh Fómhair go lár mhí na Nollaig 2009. Úsáideadh dhá chineál trealamh MT (MT BBMT leathanbhanda, agus córas taifeadta fadtréimhseacha MT, LMT) ar feadh dhá phróifíl. Fuarthas sonraí BBMT ag 23 áit ar feadh na próifíle MAR, le sonraí ag naoí gcinn díobh seo. Síníodh tréimhse thaifeadadh na sonraí LMT toisc go raibh gníomhaíochta na gréine an-íseal i 2009 – níor bhreathnaíodh aon ghrianspota ar 260 lá den bhliain (71%) (Tuairic NASA).

Ag an am céanna, bailíodh sonraí ag 20 áit ar feadh na coda deisceartaí den phróifíl MEK, a shíneann ar feadh 500 Km nó mar sin ón Rif go dtí dumhchaí an tSahára. I mí na Nollag 2009, thosaigh bailiú sonraí LMT ag 13 áit ar an gcuid thuaisceartach den phróifíl ó Meknes go dtí an Rif.

Sa tionscadal INDEPTH (próifíliú domhain idirnáisiúnta na Tibéide agus na hImiléithe), cuireadh siar bailiú nua sonraí faoi Chéim IV go dtí Samhradh 2010 agus d'athshamhlaigh an tÁnra Iardhochtúireachta Dr. J. Vozar agus an Scoláire F. Le Pape sonraí a bhí ann ó Chéim III trasna Ardchlár Lár na Tibéide. Ag fanacht leis an suirbhé a bheidh ag teacht aníos, athanailíseadh na sonraí ón MT 600-líne. Imscrúdaítear Éasc Kunlun mar theorainn shreabheolaíoch i screamh láir agus íochtaraigh na Tibéide thuaidh, idir screamh atá lagaithe ag páirtleá agus screamh níos buaine (tirim, fuar) ó thuaidh ón éasc. Rinneadh dhá shamhail gheo-leictreacha 2T trasna uaim Banggong-Nujiang, go garbh ar feadh dhomhanfhaid 89°O (líne níos faide 500) agus 92° O (líne níos giorra 400), a dheighleann Qiangtang agus tír-raon Lhasa, a inbhéartú ó na sonraí MT INDEPTH. Léiríonn na samhlacha gareolas faoin uaim Banggong-Nujiang agus a cuid athruithe struchtúrtha geo-leictreach idir domhanfhaid 89°O agus 92°O. Léiríonn an phróifíl oirthearach sráith screimhe sheoltach níos éadoimhne agus preab ghéar chothrománach sheoltachta díreach faoi rian dhromchla uaim Banggong-Nujiang i gcomparáid leis an líne iartharaigh 500. Cruthaíodh réamhshamhaltacha 3T réigiúin INDEPTH le cláir shamhaltaithe 3T domhainsféarach agus éadomhainphlánach.

Mar fhocal scoir, i rith shéasúir allamuigh an tSamhraidh 2009, chomhoibrigh Suirbhéireacht Gheolaíochta Cheanada agus DIAS i mbailiú sonraí maighnéadaiteallúireachta (MT) ag 29 áit ar feadh próifíle réigiúin 300 km ar fad trasna Leithinse Melville, Nunavut, Ceanada. Is iad bunchuspóirí an tionscadail ná nádúr na dteorainneacha teicteonacha den chéad ord a réiteach, an t-éabhlóid struchtúrach agus na próisis theicteonacha ón ré Aircéach go dtí an ré Fhanarósach a thuiscint, agus póitéinseal mianadóireacht mianraí sa réigiúin a fháil amach. Léiríonn breathnuithe den chéad ord de shamhlacha seoltachta dáthoiseacha, díorthaithe ó na sonraí MT go bhfuil comhghaolú láidir le gnéithe geolaíochta mapáilte ag an dromchla.

4.3 Taighde Geoidinimice – Martinec

Leathnaíodh an taighde geoidinimice go mór i roinnt ábhar i 2009 le fostú an Ollaimh Zdenek Martinec sa rannóg Geoifisice. Lean Martinec le samhaltú de choigeartú iseastatach oighreach (GIA), meastúcháin ar chothromaíochtaí maise in Antartaice agus sa Ghraonlainn inniú, ag baint tátail as sonraí maighnéadacha CHAMP agus ag ullmhú do SWARM trí shamhaltú réimse maighnéadaigh á thosú ag cúrsaíocht aigéanach agus trí mhodh cuingeach a fhoirmliú do leanúint síos de chomhathruithe ciantréimhseacha réimse mhaighnéadaigh ó dhromchla an Domhain síos go dtí teorainn an chroí is an mhaintlin.

Mar gheall ar an bhfeabhas atá ar an tuiscint ar phróisis dinimiciúla i maintlín an Domhain is gá breithniú ar shreabheolaíocht neamhlíneach ábhair maintlín. Cé go nglactar leis an sreabheolaíocht seo i staidéir ar chomhiompar maintlín, tá riachtanas iompraíocht ábhar neamhlíneach fós faoi phlé i samhaltú de choigeartú iseastatach oighreach. Na tuartha go léir, nach mór, i leith phróisis leanúnacha spreagtha GIA inniu tá siad bunaithe ar smaoineamh sreabheolaíocht slaodleaisteach líneach Maxwell. D'fhonn tionchar na heolaíochta neamhlíní ar ghluaisne spreagtha GIA a scrúdú, chuir Martinec agus comhghleacaí Dr. J. Klemann (GeoForschungsZentrum Potsdam) sreabheolaíocht spleách go neamhlíneach ar strus i bhfeidhm i bhfoirmiú na n-eilimintí críochta speictreacha de sféar slaodleaisteach féin-imtharraingthe. Tarlaíonn príomhthionchar sreabheolaíochta neamhlíní ar ghluaisne spreagtha GIA nuair a bhíonn ualach dromchla mais oighir ag athrú ag an ráta is tapúla de bharr mórstruis ualaithe ionduchtaithe.

De bharr an Turgnaimh i nGnóthú Imtharraingthe agus Aeráide (GRACE) tá iallaigh tábhachtacha ar cheartú iseastatach oighreach agus ar athrú mais oighir ár linne. Rinne Martinic agus comhghleacaí Dr. I. Sasgen (GeoForschungsZentrum Potsdam) comhinbhéartú ar shonraí imtharraingthe GRACE os cionn Meiriceá Thuaidh agus na Graonlainne agus fuair siad amach ó na samhaltacha de choigeartú athruithe mais oighir an méid

The oceans play a special role in electromagnetic induction due to their relatively high conductivity and the dynamo effect of ocean currents. The magnetic field by ocean circulation motion can be divided into toroidal and poloidal parts. The toroidal magnetic field is generated by electric currents closing in vertical planes and is estimated to reach 100 nT in amplitude. The much weaker poloidal field, with amplitudes up to 10 nT, results from electric currents closing horizontally. It has a significant vertical component and reaches remote land and satellite locations. Much attention has been given to the periodic magnetic signals of ocean flow which is driven by the lunar tides but no attention has been devoted to the induced toroidal field. Martinec and colleague Dr. J. Dostal (GeoForschungsZentrum Potsdam) developed the matrix propagator technique to compute the toroidal magnetic field inside the Earth and oceans with the aim to generate the secondary poloidal field due to electrical conductivity inhomogeneities in the Earth crust and lithosphere. The first estimate of its strength is up to 10 nT that may be detectable, summed up with the primary poloidal field by future SWARM satellite mission.

4.4 Seismology and Geodynamics Research – Lebedev

Dynamic processes within the deep lithosphere and underlying mantle have shaped and re-shaped the continents on the Earth over the course of its evolution. Our primary means of understanding the deep lithosphere is through geophysical observations, in particular seismic observations. The main activity of the Seismology and Geodynamics group is extracting observational constraints on the physical structure and dynamics of the Earth from seismic data. The other essential activity is geodynamic modelling, aimed, in particular, at quantitative integration of seismic and other geophysical and geological constraints.

The group has continued its work on the development and application of seismic imaging methods. First results have been obtained in the study of the cratons of S Africa (Joanne Adam's PhD project), revealing the layering of seismic anisotropy and rock fabric within the ancient lithosphere. A new PhD project has been started by Andrew Schaeffer, on the structure and dynamics of North America. Lebedev has continued collaborations with colleagues overseas on surface-wave imaging at different scales.

The SFI-funded study of the active deformation of continents has produced its first results in 2009. Within the seismology component of the research, Matthew Agius has focussed primarily on the seismic study of Tibet and East Asia and found strong north-south variations in the thermal structure and thickness of Tibet's lithosphere. The lateral and depth extent of the mid-crust low-velocity layer have also been mapped, with the layer most pronounced in the southern part of the plateau but also present in the northern part, in the 25-45 km depth range.

Further work on continental dynamics was performed by undergraduate summer interns from Dublin universities, co-supervised by Lebedev and seismology PhD students Joanne Adam and Matthew Agius. Paula Keogh (TCD) studied the deep structure and lithospheric dynamics of Tuscany and detected layered seismic anisotropy that characterised the past and present deformation beneath the region. Lithospheric anisotropy, in particular, revealed the deformation and flow associated with the recent extension in the area. Damien Middleton (DCU) focussed on the mechanisms of the Cenozoic uplift and volcanism in the Hangai Dome region (Mongolia). Seismic measurements suggested that these processes were unlikely to have been caused by a hot, active upwelling in the deep mantle, with a lithospheric instability ("drip") being a more likely explanation.

Within the geodynamic component of the continental-deformation research, spearheaded by Dr. Celine Tirel, dynamics of continents has been investigated in different regimes, from diffuse extension to subduction and terrain accretion and to compression. For the Aegean region, in particular, visco-elasto-plastic geodynamic modelling of the lithospheric extension showed how the retreat of the Hellenic subduction zone was driving the pervasive extension and flow of the weakened lithosphere. The large finite strains modelled in the lower crust and lithospheric mantle and associated with the extension and formation of metamorphic core complexes have been shown to be consistent with the anisotropy observed seismically.

4.5 Marine Seismology and Potential Fields – O'Reilly

A study of the seismic structure of the tectonically stretched upper lithosphere beneath the Porcupine Basin was completed during 2009. Two papers on the fine scale structure of the upper lithosphere of southern Ireland and the Celtic Sea region were published. The results indicate that the fine scale velocity structure of the lower crust are most likely related to partial melting and metamorphism

a chuir Alasca agus an Ghraonlainn le hathrú leibhéal na mara. Baintear tátal as an mí-oiriúnacht iarmharach thart ar an reigiún atá clúdaithe le GIA timpeall Bá Hudson maidir leis na slaodachtaí mhaintlín faoi Mheiriceá Thuaidh trí áirimh shamhaltacha teoiriciúla den chomhartha GIA sna réigiúin seo á gcur i bhfeidhm. Fuarthas gurb ionann athrú maise Oighearchlúid na Graonlainne agus 0.5 mm/a i leibhéal athrú na mara agus gur tháinig luas uirthi go suntasach i rith na tréimhse breathnóireachta.

Bunáitear na bealaí nua-aimseartha maidir le samhaltú GIA ar theicnící éagsúla, ó fhoirmithe anailíseacha go modhanna uimhriúla iomlána. Tá foirne Eorpacha éagsúla ag obair go neamhspleách na laethanta seo ar phróiseas an aisphreabtha iar-oighrigh d'fhonn iallach a chur ar phróifíl shreabheolaíochta an mhaintlín agus ar fhairsinge agus ar chroineolaíocht na n-oighearchlúideacha ón Tréimhse Phléistíneach Dhéanach atá riachtanach chun teacht ar ionchur GIA d'inbhraití geodasacha. Chuir Martinec leis an staidéar tagarmhairc a rinneadh i nGrúpa Oibre 4 den ESF COST Action ES0701 "Iallaigh Feabhsaithe ar Shamhaltacha de Choigeartú Iseastatach Oighreach".

Tá ról speisialta san ionduchtú leictreamaighnéadach ag na haigéin toisc a n-ardseoltachta agus an tionchar dineamó atá ag feachtaí. Is féidir an réimse leictreamaighnéadach trí ghluaiseacht chúrsaíochta aigéanach a roinnt in dhá chuid, toróideach agus poloidal. Gineann sruthanna leictreacha an réimse leictreamaighnéadach ag dúnadh i bplánaí ceartingearacha a shroicheann 100 nT aimplitiúide, meastar. Tá réimse poloidial níos laige ann, agus tá aimplitiúidí ann suas go 10 nT, agus sruthanna leictreacha ag dúnadh go cothromach is cúis leis. Tá gné cheartingearach shuntasach aige agus sroicheann sé suíomhanna iargúlta ar thalamh agus i satailítí. Tá aire go leor tugtha do na comharthaí maighnéadacha peiriadach de shreabhadh na haigéine a thiomáineann taoidí na gealaí ach níl aon aire tugtha don réimse spreagtha toróideach. D'fhorbair Martinec agus comhghleacaí Dr. J. Dostal (GeoForschungsZentrum Potsdam) teicníc an fhorleatóra mhaitríse chun an réimse toróideach laistigh den domhan agus sna haigéin a áireamh d'fhonn an réimse poloidial tánaisteach de bharr neamh-aonchineálachtaí seoltachta leictreach i screamh an Domhain agus sa litisféar a ghiniúint. Is é an chéad mheastachán ar a neart ná 10 nT a d'fhéadfadh a bheith so-bhraite, a suimeálfar suas leis an bpríomhréimse poloidial ó mhisean satailíte SWARM amach anseo.

4.4 Taighde Seismeolaíochta agua Geoidinimice – Lebedev

Thar thréimhse a éabhlóide mhúnlaigh agus d'athmhúnlaigh próisis dinimice sa litisféar domhain, agus sa mhaintlín faoi, ilchríocha an Domhain. Go bunúsach, is trí bhreathnuithe geoifisice, breathnuithe seismeacha go háirithe, a fhaighimid tuiscint ar an litisféar domhain. Tá príomhghníomhaíochtaí ag an ngrúpa Seismeolaíochta agus Geoidinimice, is é sin, baineann sé as sonraí seismeacha iallaigh breathnóireachta ar struchtúir fisiciúil agus dinimic an Domhain. Tá gníomhaíocht riachtanach eile ann, is é sin, samhaltú geoidinimice a dhíríonn go háirithe ar chomhtháthú iallaigh sheismeacha agus gheoifisice agus gheolaíochta eile.

Lean obair an ghrúpa ar fhorbairt agus ar fheidhmiú modhanna íomháite seismeacha. Tá na chéad torthaí faighte ó staidéar na gcratón i nDeisceart na hAfraice (tionscadal PhD Joanne Adams) a léiríonn scairiú aniseatrópachta seismí agus fabraic na gcarraigeacha sa litisféar ársa. Tá tús curtha ag Andrew Schaeffer le tionscadal PhD nua ar struchtúr agus dinimic Mheiriceá Thuaidh. Lean Lebedev i gcomhoibriú le comhghleacaithe thar lear ar íomháú tonnta dromchla ag scálaí difriúla.

Fuarthas céad torthaí an staidéir ar dhífhoirmiú gníomhach ilchríoch, cistithe ag Fondúireacht Eolaíochta Éireann i 2009. Sa chuid sheismeolaíochta den taighde, dhírigh Matthew Agius go bunúsach ar staidéar seismeach na Tibéide agus Oirthear na hÁise agus d'aimsigh sé comhathruithe láidre thuaidh-theas i struchtúr teirmeach agus i dtiús litisféar na Tibéide. Mapáladh fairsinge chliathánach agus dhoimhneacht na sraithe láirscreimhe treoluais ísil, tá an tsraith is suntasaí sa chuid dheisceartach den ardchláir ach tá sí ann sa chuid thuaisceartach freisin, i réimse doimhneachta 25-45 km.

Faoi chomhstiúradh Lebedev agus mic léinn PhD Joanne Adam agus Matthew Agius, rinne intéirigh Samhraidh fochéimeacha ó ollscoileanna Bhaile Átha Cliath breis oibre ar dhinimic ilchríoch. Rinne Paula Keogh (TCD) staidéar ar struchtúr domhain agus dinimic litisféireach na Tuscáine agus bhraith sí aniseatrópacht scaireach sheismeach sa dífhoirmiú atá agus a bhíodh faoin réigiúin. Nocht ainiseatrópacht litisféireach, go háirithe, an dífhoirmiú agus an sreabhadh a bhaineann le fairsingiú úrnua an cheantair. Dhírigh Damien Middleton (DCU) ar mheicníochtaí an ardaithe Céineasóigh agus na bolcánachta i réigiún Hangai Dome na Mongóile. Thug tomhais sheismeacha le tuiscint nach cosúil gur tonnach te gníomhach sa mhaintlín

of accreted crust at the end of the Caledonian orogenic cycle. Subsequent Mesozoic extensional deformation of the lithosphere that formed the North Atlantic Mesozoic basin system, which includes the Porcupine Basin, does not seem to have strongly modified the lower crust beneath Ireland.

The comparative numerical and analogue modelling study of the Porcupine Basin was completed. A high resolution series of 2-D numerical simulations using the computational resources provided by the Cosmogrid Consortium were carried out at University College Dublin to investigate in more detail strain localisation within the brittle crust and the effect of strength heterogeneities within the upper lithosphere. These new results were presented at the Atlantic Ireland Conference in November 2009. John Sheehan submitted his thesis on this research during the later part of the year. His presentation of his PhD results won the best poster award at the annual IGRM meeting for its originality.

An integrated study of wide-angle seismic modelling results from the Hatton Basin and Hatton Continental Margin with borehole sonic and lithological information together with high-resolution seismic reflection was finalised. Anne Chabert completed a final draft of her PhD thesis at the end of the year.

As part of passive seismological studies J.P. O'Donnell completed and submitted his PhD thesis on joint inversion of P-wave tomography and gravity using data gathered during the ISLE experiment and a paper on the results was submitted for publication. A detailed analysis of suitable teleseismic data gathered since 2006 was carried out, using the SKS splitting technique, during the year. The results of this analysis strongly support the results obtained from the earlier ISLE experiment, which indicate that a significant amount of seismic anisotropy resides below the Earth's lithosphere.

A new project NAPSA (North Atlantic Petroleum Systems Assessment group) was began during the year with seed funding from the Irish Newfoundland Partnership (INP) of the Department of the Taoiseach. One aim of this project is to investigate and compare the crustal structure of the conjugate North Atlantic margin regions of Newfoundland and Ireland using potential field data and innovative modelling techniques. Dr. Kim Welford from Memorial University, St. John's Newfoundland visited DIAS in July 2009 to discuss the NAPSA project. The draft of a paper about the results of a regional 3-D gravity inversion across the Irish continental margin was finalised during Dr. Welford's visit to DIAS and submitted for publication.

A proposal entitled "Deep-water sediment transport on the margins of Rockall Trough: new interpretation from high-resolution multibeam and sidescan sonar TOBI data" was submitted to INFOMAR (INtegrated Mapping FOr the Sustainable Development of Ireland's MARine Resource). This project was funded (€26,575) in December 2009. The project's objectives are to reprocess multibeam bathymetric data gathered by the Geological Survey of Ireland within the Irish Exclusive Economic Zone and high resolution TOBI backscatter data to develop an improved understanding of the Irish margins.

5 Outreach

A major highlight of the year was the success of the Schools participation in BTYSE in January, 2009 and the awarding of "International Year of Planet Earth Award" and first prize in the "Category Award: Chemical, Physical and Mathematical Sciences: Senior" to Denis Patterson and Shane Curry, for their project entitled, "*Seismic Activity in the British Isles and the Wider World*". They are students at Scoil Chonglais Baltinglass, County Wicklow which participates in Seismology in Schools (Seismeolaíocht sa Scoil) programme.

An extremely successful Seismology in Schools first Workshop for Teachers was held in Burlington Road, Dublin, April 25th, 2009. A selection of international speakers gave very relevant presentations in various aspects of operational seismology and certificates of attendance were awarded to the teachers presented by DIAS Chairman Prof. Dervilla Donnelly.

The inclusion in to the SIS programme of the three schools which won the IYPE prizes in 2009 took place during the year, these schools were, Lucan Secondary School, Dublin, St. Mary's College Rathmines, Dublin 6 and St. Mary's Dundalk, Co. Louth.

The development of the SIS website continued during the year with extensive support from IRIS in the US regarding style and content. Outreach to schools continued at a reduced level due to pressures of work in other areas, personnel issues and the reduced budgetary situation. Upwards of 50 primary and secondary school are now actively participating in the SIS programme.

domhain ba chúis leis na próisis seo, ach gur cosúil gur éagobhsaíocht ("síleadh") litisféarach ba chúis leis.

Sa chuid geoidinimice den taighde ar dhífhoirmiú ilchríoch, a stiúir an Dr. Celine Tirel, iniúchadh dinimic ilchríoch i réisímí éagsúla, ó shíneadh idirleata go fodhuchtú agus fuilleamh tír-raoin agus go comhbhrú. Don réigiún Aeigéach go háirithe, léirigh samhaltú geoidinimice slaodleaisteach-phlaisteach den fhairsingiú litisféireach an tslí a raibh cúlú creasa fodhuchtaithe na Heilléanaí ag tiomáint fairsingiú forleatach agus sreabh an litisféir lagaithe. Na straighneacha móra críochta atá samhaltaithe sa screamh íochtair agus sa mhaintlín litisféarach agus a bhfuil baint acu le fairsingiú agus foirmiú coimpléasc croí-meiteamorfach léiríodh go bhfuil siad ag teacht leis an ainiseatrópacht a breathnaíodh go seismeach.

4.5 Seismeolaíocht na Mara agus Réimsí Poitéinseal – O'Reilly

Críochnaíodh staidéar i 2009 ar struchtúr seismeach sínte teicteonach an litisféir uachtaraigh faoi Imchuach an Torcáin Chraobhaidh. Foilsíodh dhá pháipéar ar struchtúr ar scála mín de litisféar uachtarach dheisceart na hÉireann agus réigiúin na Mara Ceiltí. Léiríonn na torthaí gur dóchúla go bhfuil baint ag struchtúr treoluais ar scála mín na screimhe íochtair le páirtleá agus meiteamorfacht screimhe fhuillte ag deireadh thimthriall an oraiginigh Chaladónaigh. An dífhoirmiú sínte Méiseasóch den litisféar a mhúnlaigh Córas Imchuacha Méiseasóch an Atlantaigh Thuaidh, ina bhfuil Imchuach an Torcáin Chraobhaidh, ní fheictear go ndearna sé athrú mór ar an screamh íochtair faoi Éirinn.

Críochnaíodh an staidéar ar shamhaltú uimhriúil agus analógach Imchuach an Torcáin. Rinneadh sraith ionsamhalúcháin uimhriúla ardtaifeacha 2T i gColáiste na hOllscoile, Baile Átha Cliath, ag úsáid áiseanna ríomhaireachtúla a sholáthair Cuibhreanas Cosmogrid, chun iniúchadh níos mionsonraithe a dhéanamh ar logánú straidhne sa screamh shobhriste agus ar éifeacht na n-ilchineálachtaí nirt laistigh den litisféar uachtarach. Cuireadh na torthaí nua seo i láthair ag Comhdháil na hÉireann Atlantach i mí na Samhna 2009. Chuir John Sheehan a thráchtas isteach ar an taighde seo níos déanaí sa bhliain. Ghnóthaigh cur i láthair dá chuid torthaí PhD an duais don póstaer ab fhearr ag cruinniú bliantúil IGRM as ucht a úrnachta.

Críochnaíodh staidéar comhtháite ar thorthaí samhaltaithe seismeacha leathanuilleacha ó Imchuach Hatton agus ó Imeall Ilchríochach Hatton le faisnéis shonach agus liteolaíoch tollphoill mar aon le frithchaitheamh seismeach ardtaifeach. Chríochnaigh Anne Chabert dréacht deiridh a PhD ag deireadh na bliana.

Mar chuid de staidéir sheismeolaíochta éighníomhacha, chríochnaigh agus chuir J.P. O'Donnell a PhD isteach ar chomhinbhéartú thomagrafaíocht P-thonnta agus ar imtharraingt ag úsáid sonraí ón dtionscadal ISLE agus cuireadh páipéar isteach le foilsiú ar na torthaí. I rith na bliana, rinneadh mionanailís ar shonraí oiriúnacha teiliseismeacha a bailíodh ó 2006 anuas, ag úsáid teicníc scoilte SKS. Tacaíonn torthaí na hanailíse seo go láidir le torthaí tionscadail ISLE a fuarthas níos luaithe, a chuireann in iúl go bhfuil ainiseatrópacht sheismeach shuntasach faoi litisféar an Domhain.

Cuireadh tús i rith na bliana le tionscadal nua, NAPSA (grúpa Measúnóirí ar Chórais Peitriliam an Atlantaigh Thuaidh) le cistiú síl ó Chomhpháirtíocht na hÉireann – Thalamh an Éisc de Roinn an Taoisigh. Cuspóir amháin den scéim seo ná struchtúr screimhe na réigiún ar imeall an Atlantaigh Thuaidh de Thalamh an Éisc agus d'Éirinn a scrúdú agus a chur i gcomparáid, ag baint úsáide as sonraí réimse poitéinseail agus teicnící samhaltaithe nuálacha. Tháinig an Dr. Kim Welford ó Memorial University, St. John's, Talamh an Éisc, ar cuairt go dtí DIAS i mí Iúil 2009 chun tionscadal NAPSA a phlé. Críochnaíodh dréacht de pháipéar ar thorthaí inbhéartaithe 3T réigiúnaigh trasna imeall ilchríochach na hÉireann nuair a bhí an Dr. Welford ar cuairt sa DIAS agus cuireadh faoi bhráid foilsitheoirí é.

Cuireadh togra dar teideal "Iompar an dríodair san uisce domhain ar imeall Umar Rocal: léirléamh nua ó shonraí ardtaifeacha illéasa agus sonóir taobhscanta TOBI" faoi bhráid INFOMAR (léarscáiliú comhtháite um fhorbairt imbhuanaithe acmhainní mara na hÉireann). Cistíodh an tionscadal seo (€26,575) i mí na Nollag 2009. Is iad cuspóirí an tionscadail ná athphróiseáil a dhéanamh ar na sonraí illéasacha bataiméadrach a bhailigh Suirbhéireacht Gheolaíochta na hÉireann taobh istigh de Chrios Eacnamaíoch Eisiach na hÉireann agus sonraí ardtaifeacha cúlscaipthe TOBI d'fhonn tuiscint níos fearr ar imeall na hÉireann a fhorbairt.

5 For-rochtain

Ceann de bhuaicpointí mhóra na bliana ba ea rath pháirteachas na scoileanna i BTYSE i mí Eanáir 2009 agus bronnadh "Gradam Bhliain Idirnáisiúnta an Domhain" agus an chéad duais sa "Chatagóir Ghradaim: Eolaíochtaí

6 The Irish National Seismic Network

The decision to decommission the short period seismic network was taken early in 2009 and this work was completed by June. Following capital acquisition in September for finances to upgrade and expand the existing real time permanent seismic recording network, reconnaissance began to establish the locations for three permanent real-time seismic recording stations. After initial site reconnaissance, three locations were identified and systematic noise tests were undertaken with seismic equipment on loan from BGS Edinburgh, to establish the site suitability for a permanent seismic station location.

The decommissioning of the Q3330 hardware at station DSB occurred during the year and the installation of a state of the art real-time SeisComP data logger with ED digitizer was carried out. After a downtime of approximately nine months, the station was brought back into operation.

7 Comprehensive Test Ban Treaty Organisation

Ireland is one of the State Signatories to the Comprehensive Test Ban Treaty and is the only European country that does not have a National Data Centre. In November, 2009, the School of Cosmic Physics was informed by the Department of Foreign Affairs that it was successful in its bid to assume the role of National Data Centre (NDC) for the Comprehensive Test Ban Treaty (CTBT). Professor Luke Drury, as Director of the School, is the Head of the NDC and Experimental Officer T. Blake is the designated Principal Point of Contact (PPOC).

8 Workshops

Three workshops were organized by Section members during 2009 and held in DIAS offices.

The European Science Foundation Exploratory Workshop on "Defining the Lithosphere-Asthenosphere Boundary Beneath Continents" (DefLAB) brought together geophysicists, geochemists, petrologists and mineral physicists; a total of 31 scientists from 10 European countries (Czech Republic, Denmark, Finland, France, Germany, Ireland, Netherlands, Poland, Spain, United Kingdom), as well as from the United States and Canada, who joined forces to focus on the LAB and its definition over three very full days. The workshop was financially supported by ESF, DIAS, and the International Lithosphere Programme.

An extremely successful first Seismology in Schools workshop for teachers was held in Burlington Road, Dublin on April 25th, 2009. A selection of international speakers gave very relevant presentations in various aspects of operational seismology and certificates of attendance were awarded to the teachers presented by DIAS Chairman Prof. Dervilla Donnelly.

A workshop for members of the INDEPTH (InterNational DEep Profiling of Tibet and the Himalaya) project was held in DIAS in late-October. Seventeen participants came from Europe, North America and China to Dublin to discuss existing results from INDEPTH Phases I-III and future plans for INDEPTH Phase IV.

Ceimiceacha, Fisiceacha agus Matamaitice: Sinsear" ar Denis Patterson agus Shane Curry dá dtionscadal dar teideal "*Gníomhaíocht Sheismeach in Éirinn agus sa Bhreatain Mhór agus sa Domhan Mór*". Is mic léinn iad i Scoil Chonglais, Bealach Conglais, Co. Chill Mhantáin, agus glacann an scoil páirt sa chlár Seismeolaíocht sa Scoil.

Bhí an chéad Cheardlann do Mhúinteoirí ag Seismeolaíocht sa Scoil i mBóthar Burlington, Baile Átha Cliath, ar 25 Aibreán 2009 agus bhí sí an-rathúil go deo. Thug cainteoirí idirnáisiúnta léachtaí an-ábhartha faoi ghnéithe éagsúla den tseismeolaíocht oibríochtúil agus bhronn Cathaoirleach an DIAS, an tOllamh Dervilla Donnelly, teastais tinrimh ar na múinteoirí.

Na trí scoil a bhuaigh duaiseanna IYPE i 2009 cuireadh san áireamh iad sa chlár Seismeolaíocht sa Scoil i rith na bliana: ba iad seo na scoileanna, Meánscoil Leamhcáin, Co. Átha Cliath, Coláiste Naomh Mhuire, Ráth Maonais, Baile Átha Cliath 6, agus Coláiste Naomh Mhuire, Dún Dealgan, Co. Lú.

Lean forbairt an tsuímh Ghréasáin do Sheismeolaíocht sa Scoil i rith na bliana le tacaíocht fhorleathan ó IRIS i SAM maidir le stíl agus ábhar. Lean for-rochtain go dtí na scoileanna ag leibhéal níos ísle de bharr brúanna oibre i réimsí eile, cúrsaí foirne agus buiséad laghdaithe. Tá os cionn 50 bunscoil agus meánscoil páirteach go gníomhach sa chlár Seismeolaíocht sa Scoil anois.

6. Líonra Náisiúnta Seismeach na hÉireann

Go luath i 2009 cinneadh an líonra seismeach gearrthréimhseach a dhíchoimisiúniú agus críochnaíodh an obair seo faoi mhí an Mheithimh. Le fáltas caipitiúil i mí Mheán Fómhair le haghaidh maoiniú d'fhonn an líonra seismeach réad-ama buan a uasghrádú agus a fhorbairt chun taifeadadh a dhéanamh, thosaigh réamhshuirbhé chun suíomhanna do thrí stáisiún sheismeacha bhuana réad-ama a bhunú chun taifeadadh a dhéanamh. Leis an réamhshuirbhé thart, aithníodh trí shuíomh agus rinneadh tástálacha fuaime córasacha le trealamh seismeach ar iasacht ó BGS Dhún Éideann chun oiriúnacht shuíomh seismeach buan stáisiúin a bhunú.

Díchoimisiúnadh na hearraí crua Q3330 ag stáisiún DSB i rith na bliana agus suiteáladh logálaí sonraí úrscothach réad-ama SeisComP le digiteoir ED. Tar éis aga neamhfhónaimh thart ar naoi mí, cuireadh an stáisiún ar ais i bhfeidhm arís.

7 Eagraíocht an Chonartha um Chosc Cuimsitheach ar Thrialacha

Tá Éire ar cheann de Stáit a shínigh an Conradh um Chosc Cuimsitheach ar Thrialacha agus is í Éire an t-aon stát Eorpach gan Ionad Náisiúnta Sonraí. I mí na Samhna 2009, chuir an Roinn Gnóthaí Eachtracha in iúl do Scoil na Fisice Cosmaí gur éirigh lena tairiscint le bheith mar Ionad Náisiúnta Sonraí (INS) don Chonradh um Chosc Cuimsitheach ar Thrialacha (CCCT). Mar Stiúrthóir na Scoile, is é an tOllamh Luke Drury Ceannaire an INS agus is é an tOifigeach Tástála Tom Blake an Príomhphointe Teagmhála (PPT).

8 Ceardlanna

D'eagraigh baill Rannóige trí cheardlann i rith 2009 agus tharla siad in oifigí an DIAS.

Ag Ceardlann Thurgnamhach Fhondúireacht Eolaíochta na hEorpa ar "Shainiú na Teorann Litisféir-Astanaisféir Faoi Ilchríocha" (DefLAB) bailíodh le chéile geoifisiceoirí, geoiceimiceoirí, peitreolaithe agus fisicithe mianraí, 31 eolaithe ar fad ó 10 dtír Eorpacha (Poblacht na Seice, An Danmhairg, An Fhionlainn, An Fhrainc, An Ghearmáin, Éire, An Ísiltír, An Pholainn, An Spáinn, An Ríocht Aontaithe), mar aon leis na Stáit Aontaithe agus Ceanada, bhailigh siad i meitheal a mhair trí lá iomlán chun díriú ar an LAB agus a shainmhíniú. Fuarthas tacaíocht airgid ó ESF, DIAS agus ón gClár Idirnáisiúnta Litisféir.

Bhí an chéad cheardlann do mhúinteoirí ag Seismeolaíocht sa Scoil i mBóthar Burlington, 25 Aibreán, 2009, agus bhí sí an-rathúil. Thug cainteoirí idirnáisiúnta léachtaí an-ábhartha faoi ghnéithe éagsúla den tseismeolaíocht oibríochtúil agus bhronn Cathaoirleach an DIAS, an tOllamh Dervilla Donnelly, teastais tinrimh ar na múinteoirí.

Bhí ceardlann do bhaill INDEPTH (próifíliú domhain idirnáisiúnta na Tibéide agus na hImiléithe) in DIAS go déanach i mí Dheireadh Fómhair. Tháinig 17 rannpháirtithe ón Eoraip, ó Thuaisceart Mheiriceá agus ón tSín chun plé a dhéanamh ar na torthaí a fuarthas ó INDEPTH Céimeanna I-III agus na pleananna do INDEPTH Céim IV.

School of Theoretical Physics

The current financial and banking crisis had a depressing effect on STP, and it is a challenge to survive it without long-term damage. Our major task is to do research on the basic structures of matter at an internationally competitive level, but we also want to make a contribution to the development of a new branch of information and communication technology in Ireland. Reviews by highly regarded international leaders in 2004 and 2009 have confirmed our potential and stated that the school should expand beyond its current three permanent positions. In principle the justification of this demand has been recognized, but already in June 2008, at a meeting of the directors of DIAS and the registrar with representatives of the Department of Education and Science we were told that for the foreseeable future one would have to talk about retrenchments only. In 2009 we have been able to avoid the loss of positions, but we had to reduce our activities to some extent and 2010 will be worse. Faced with the choice to cut essential journals in our library or to greatly reduce our visitor programme we opted for the latter alternative, because it will leave less scars if the crisis can be overcome in a year or two.

Prof. Katrin Wendlan, Dr. Peter Goddard, Prof. Peter Higgs, Margaret Matthews, Registrar, Cecil Keaveney at a conference in honour of Prof. Werner Nahm's 60th Birthday.

An tOll Katrin Wendlan, An Dr. Peter Goddard, An tOll Peter Higgs, Margaret Matthews, Cláraitheoir, An tUas. Cecil Keaveney ag comhdháil ag comóradh 60ú Breithlá an Oll. Werner Nahm.

The other main recommendation of the reviews in 2004 and 2009 is the creation of a single site for DIAS. One immediate consequence would be stronger contacts between the School of Theoretical Physics and the Astronomy and Astrophysics section of the School of Cosmic Physics. This would come at a very favorable time. We know that the bulk of the matter content of the universe consists of unknown particles. Currently there are extensive and promising international efforts both in particle physics and astrophysics to understand this dark matter. Thus joined work between theoretical physics and astrophysics has become a particularly urgent need. This is the one problem which may be easier to resolve due to the crisis. In view of much empty office space in Dublin and of the increasing cost of maintaining the aging building in Burlington Road it would make good financial sense to find a single site for us. Of course we are making efforts to increase contacts between STP and Astrophysics under whatever circumstances, and we hope that we will have something positive to report next year.

In the following, the most conspicuous of our research activities in 2009 will be discussed. For others the full research report should be consulted.

Quantum Computing and Quantum information

It had been said in the 60's and the 80's and it has been repeated in 2009 that DIAS is an anomaly in Ireland and should be dissolved in some university. But universities are under huge pressure to become money-making institutions with short-term goals, and it is hard to imagine that in such an environment we could have the stamina to continue a difficult line of research under adverse circumstances, even when we are convinced that it is necessary and can become very profitable for Ireland. Our efforts in the field of quantum information and quantum computing are exactly of this kind.

Present computers do basically the same things as a child which learns to calculate with his fingers, only much more of it and much, much faster. This is quite adequate when one calculates events which at a basic level behave in the same classical way as our fingers, even when it becomes as complex as air traffic control or weather forecasts. But for many events inside our cells the basic physics is different, since the laws of quantum mechanics take over. They have some rather incredible features as exemplified by the state of Schrödinger's cat in a superposition of life and death. Einstein had hoped that these features would turn

Scoil na Fisice Teoiriciúla

An ghéarchéim reatha in airgeadas agus i mbaincéireacht lagaigh sí SFT agus is dúshlán é teacht aisti gan dochar san fhadtréimhse. Is é ár bpríomhthasc ná taighde a dhéanamh ar bhunstruchtúir ábhair ag leibhéal iomaíoch idirnáisiúnta, ach is mian linn freisin cuidiú le brainse nua teicneolaíocht faisnéise agus cumarsáide a fhorbairt in Éirinn. In 2004 agus 2009 in athbhreithnithe a rinne ceannairí idirnáisiúnta a bhfuil clú mór orthu dearbhaíodh ár gcumas agus moladh go méadófaí an scoil ó na trí phost bhuana reatha. Tá fírinniú an éilimh seo aitheanta i bprionsabal, ach cheana féin, i mí an Mheithimh 2008, ag cruinniú de stiúrthóirí agus chláraitheoir DIAS le hionadaithe na Roinne Oideachais agus Scileanna, insíodh dúinn nach mbeadh ach athdhaingniú le plé go ceann i bhfad. In 2009 d'éirigh linn caillteanas post a sheachaint ach bhí orainn ár gcuid gníomhaíochtaí a laghdú go pointe áirithe agus beidh 2010 níos measa. Bhí rogha le déanamh againn idir irisí riachtanacha dár leabharlann a chealú nó ár gclár cuairteoirí a laghdú go mór, agus ghlacamar leis an dara ceann mar is lú na loirg a fhágfaidh sé más féidir an ghéarchéim a shárú i gceann bliana nó dhó.

In athbhreithnithe 2004 agus 2009 is é an príomh-mholadh go gcruthófaí suíomh amháin le haghaidh DIAS. Toradh láithreach amháin air seo ná go mbeadh naisc níos láidre idir Scoil na Fisice Teoiriciúla agus an rannóg Réalteolaíochta agus Réaltfhisice i Scoil na Fisice Cosmaí. Thiocfadh sé seo ag am tráthúil. Tá a fhios againn go bhfuil an chuid is mó d'ábhar na cruinne comhdhéanta de cháithníní anaithnide. Faoi láthair, i bhfisic na gcáithníní agus sa réaltfhisic, tá iarrachtaí fairsingeacha idirnáisiúnta ar siúl chun tuiscint a fháil ar an damhna dorcha seo, agus seans go mbeidh torthaí maithe ar na hiarrachtaí seo. Mar sin is riachtanas práinneach anois é go mbeidh comhoibriú idir fisic na gcáithníní agus an réaltfhisic. Seo an t-aon fhadhb amháin, b'fhéidir, is fusa a réiteach de bharr na géarchéime. Tá an oiread sin oifigí folamha i mBaile Átha Cliath agus tá méadú i gcostais chothabhála an tseanfhoirgnimh i mBóthar Burlingon, bheadh sé ciallmhar i dtéarmaí airgid, láithreán amháin a aimsiú dúinn. Ar ndóigh, táimid ag iarraidh cur le teagmhalacha idir SFT agus an réaltfhisic is cuma cad é an scéal, agus tá súil againn go mbeidh rud éigin dearfach le tuairisciú againn an bhliain seo chugainn.

Pléifear anseo thíos na gníomhaíochtaí is suntasaí inár gcuid taighde i 2009. Ba chóir breathnú ar an tuairisc thaighde iomlán le haghaidh cinn eile.

Ríomhaireacht Chandamach agus Faisnéis Chandamach

Dúradh sna 60í agus sna 80í agus tá sé athráite i 2009 gur aibhrialtacht í an DIAS in Éirinn agus ba chóir í a nascadh le hollscoil éigin. Ach tá na hollscoileanna faoi bhrú ollmhór bheith ina n-institiúidí a thuilleann airgead le spriocanna gearrthréimhseacha agus i dtimpeallacht mar sin is deacair a shamhlú go mbeimis in ann leanúint le réim taighde deacair faoi imthoscaí diúltacha fiú dá mbeimis dearfa go mbeadh sé indéanta agus tairbhiúil d'Éirinn. Is den chineál seo go beacht iad ár n-iarrachtaí i réimse na faisnéise candamaí agus na ríomhaireachta candamaí.

Go bunúsach, sa lá atá inniu ann, déanann ríomhairí na rudaí ceannann céanna is a dhéanann páiste a fhoghlaimíonn conas áireamh a dhéanamh lena méara ach amháin go ndéanann ríomhaire i bhfad níos tapúla iad agus i bhfad níos mó díobh. Is leor é seo má dhéantar áireamh ar theagmhais a tharlaíonn ag leibhéal bunúsach a leanann nós clasaiceach áireamh ár méar, fiú nuair a éireoidh sí chomh casta le rialú aerthrachta nó le réamhaisnéisí aimsire. Ach i gcás go leor teagmhas taobh istigh dár gcealla, tá an fhisic bhunúsach difriúil, mar tagann dlithe na meicnice candamaí i gceannas. Tá roinnt gnéithe do-chreidte acu mar a léiríonn sampla staid chat Schrödinger i bhforshuíomh beatha agus báis. Bhí súil ag Einstein nach raibh sna gnéithe seo ach mearú súl agus go n-imeoidis, ach níor tharla sin. Tá siad ann agus déanann siad go leor áireamh an-deacair. Bheadh forbairt dhrugaí i bhfad níos éascaí dá bhféadfaí ríomhaire a úsáid chun breathnú ar a himoibrithe leis na lasca agus na gabhdóirí go léir in ár gcorp le feiceáil an ndéanann sí an rud ceart in áit amháin agus nach ndéanann sí scrios in áit éigin eile. Ar an drochuair, níl sé chomh simplí sin. Leanann idirghníomhuithe ceimiceacha rialacha na meicnice candamaí agus tógann gnáthríomhairí an t-uafás ama chun aithris a dhéanamh orthu. Chun an obair seo a dhéanamh go héifeachtach, is gá go mbeadh ríomhairí ann chun feidhm a bhaint as rialacha na meicnice candamaí sna hoibríochtaí is bunúsaí acu. Beidh margadh ollmhór dá leithéid d'innill chomh luath is a bheidh siad ann.

Deir roinnt daoine nach dtarlóidh sé choíche agus nuair a d'eagraíomar Ceardlann Idirnáisiúnta ar an Ríomhaireacht Chandamach Thoipeolaíoch i mí Mheán Fómhair 2007 ag Institiúid Matamaitice Hamilton, dúirt Fondúireacht Eolaíochta Éireann linn nach n-infheisteoidis go deo sa treo seo. Caithfear a admháil go n-imíonn gach saghas ruda amú i gcás tromlach na gcóras fisiciúil má iarrtar rialacha na meicnice candamaí a

out to be a mirage and go away, but it did not happen. They are there and make many calculations very difficult. The development of drugs would be far easier, if one just could use a computer to look at its interactions with all the many switches and receptors in our body to check if it does the right thing in one place and does not cause havoc at some other. Unfortunately, it is not that simple. Chemical interactions follow the rules of quantum mechanics, and ordinary computers need inordinate amounts of time to imitate them. To do this work efficiently, one needs computers which exploit the laws of quantum mechanics in their most basic operations. There will be a huge market for such machines, once they exist.

Some say that will never happen, and when we organized an International Workshop on Topological Quantum Computing in September 2007 at the Hamilton Mathematics Institute, Science Foundation Ireland told us that they never would invest in this direction. Admittedly, for most physical systems all kinds of things go wrong, when you try to use the laws of quantum mechanics at the scale of computer parts instead of the scale of molecules. Our experience with certain kinds of quantum field theories tells us, however, that there is an exception. When quantum mechanical features are encoded in a topological way, we are certain that they can be used at the required scale.

Such systems might be constructed from scratch using Josephson junctions, but progress would be more rapid, if they could be found ready made in nature. The best candidates are certain fractional quantum Hall states. At the moment research concentrates on the state with conductivity 5/2. If it shows the predicted topological features, it can be used to provide optimal protection for the transmission of information, though it will not allow full quantum computation. For the latter one would need to control the state with conductivity 12/5, which will be more difficult. Our Schrödinger fellow Joost Slingerland has written a paper on the 12/5 state, but practical applications will have to wait. Even progress on the 5/2 state is slow. Currently only one physicist in the wide world (L. Pfeiffer) can make systems of the required reliability and purity. He worked at Bell Labs, but had to move to Princeton, when basic research at the labs was cut down. The only other group which comes close is at the Weizmann Institute in Israel, but their samples do not seem to be quite adequate yet. The most significant work done at DIAS in 2009 may have been the one by Slingerland together with coworkers in the USA. They showed that certain experiments published by Willett (still at Bell Labs), Pfeiffer and West give very strong indications that the fractional excitations observed in the 5/2 state have indeed the predicted topological features. By now Slingerland has left DIAS to become a lecturer at Maynooth, where Jiri Vala already leads a group working in this field. We will keep close contacts.

The European researchers in the area of topological quantum computing have joined forces and our group at NUIM and DIAS has a leading role, but for the moment, the crisis has dashed our hopes for a significant development of quantum computation in Ireland. Fionn Murtagh of Science Foundation Ireland has been helpful, but his possibilities are of course limited. We made our second application for funding from Brussels, in the context of the Seventh Framework Programme (FP7), but we failed again. We made the physics threshold, but were downgraded on implementation. The reasons given are of interest:

> "The proposed implementation is fair. The governance structure is problematic. For example the General Assembly would give veto power to partners, which would prove unwieldy in the case of conflict or need to shift strategic direction. The Advisory Committee should be at arms length to be effective. Risk assessment is naive: TopQIFT claims that there is no risk in the research plan because the work is fundamental every potential outcome can be interpreted as a success, especially because the best researchers are in the proposed project.
>
> The experimental partners are working on TQC and on QIPC in general but not for long, although they have acquired relevant experience. They are Europe's leading experts in fractional quantum Hall effect. The theory partners cover a range from mathematical physics to theory for the experimental systems. The partners have access to good experimental and computational facilities. One has to mention that the field was pioneered in the USA, and Europe is behind. The consortium plans to close this gap. Participation by the American partner Microsoft Station Q is justified, although it is more of a fundamental research group than an industrial partner.
>
> The consortium covers experimental, theoretical and numerical aspects of this research area. Expertise on such a high level cannot be reached on a national level

úsáid ag scála páirteanna ríomhaire in ionad ag scála móilíní. Ach léiríonn ár dtaithí le cineálacha áirithe réimsetheoirice candamaí go bhfuil eisceacht ann. Nuair a ionchódaítear gnéithe meicnice candamaí ar bhealach toipeolaíoch, táimid cinnte gur féidir iad a úsáid ag an scála riachtanach.

D'fhéadfaí córais dá leithéid a thógáil ón tús ag úsáid cumair Josephson ach bheadh an dul chun cinn níos tapúla dá bhféadfaí teacht orthu réamhdhéanta sa nádúr. Is iad staideanna codánacha candamacha áirithe Hall na féidearthachtaí is fearr. Faoi láthair díríonn taighde ar an staid a bhfuil seoltacht 5/2 aici. Má léiríonn sí na gnéithe toipeolaíochta atá tuartha, is féidir í a úsáid chun an chosaint optamach do tharchur eolais a sholáthar, cé nach ligeann sí do ríomh candamach iomlán. Chuige sin, bheadh sé riachtanach an staid a rialú le seoltacht 12/5, agus bheadh sé níos deacra. Tá páipéar ar an staid 12/5 scríofa ag ár nÁnra Schrödinger Joost Slingerland ach caithfear cur i bhfeidhm praiticiúil a chur ar leataobh. Faoi láthair, níl ach fisiceoir amháin ar domhan (L. Pfeiffer) gur féidir leis córais den iontaofacht agus den íonacht riachtanach a dhéanamh. D'oibrigh sé i mBell Labs ach bhí air bogadh go Princeton nuair a gearradh siar ar an taighde bunúsach sna saotharlanna. Is ag Institiúid Weizmann san Iosrael atá an t-aon ghrúpa amháin eile a thagann i ngiorracht ach dealraíonn sé go bhfuil a gcuid samplaí uireasach go fóill. Seans gurb í an obair ba shuntasaí a rinneadh ag DIAS i 2009 ná an obair a rinne Slingerland le comhoibreoirí i SAM. Léirigh siad go dtugann turgnaimh áirithe – a d'fhoilsigh Willett (atá fós ag Bell Labs), Pfeiffer agus West – le fios go láidir go bhfuil na gnéithe toipeolaíochta tuartha go deimhin ag na floscthaí codánacha a breathnaíodh sa staid 5/2. D'fhág Slingerland an DIAS le bheith ina léachtóir i Maigh Nuad, áit a bhfuil Jiri Vala ina cheannaire ar ghrúpa sa réimse seo cheana féin. Beimid i ndlúthchaidreamh leo.

Tá na taighdeoirí Eorpacha i réimse na ríomhaireachta toipeolaíche candamaí tagtha le chéile agus tá ról ar thús cadhnaíochta ag ár ngrúpa ag NUIM agus DIAS, ach ag an bpointe seo tá ár ndóchas scriosta ag an ngéarchéim maidir le forbairt shuntasach sa ríomhaireacht chandamach in Éirinn. Chabhraigh Fionn Murtagh ó Fhondúireacht Eolaíochta Éireann ach tá a chuid féidearthachtaí srianta ar ndóigh. Chuireamar an dara iarratas againn isteach ar chistiú ón mBruiséal i gcomhthéacs an Seachtú Creat-Chlár (CC7) ach theip orainn arís. D'éirigh linn ag an dtairseach fhisice ach íosghrádaíodh sinn maidir le cur i bhfeidhm. Tá na fáthanna a tugadh suimiúil:

"An cur i bhfeidhm atá molta tá sé maith go leor. Tá an struchtúr rialachais fadhbúil. Mar shampla, thabharfadh an Comhthionól Ginearálta cumhachtaí crosta do chomhpháirtithe, rud a bheadh anásta i gcás coimhlinte nó riachtanais chun treo straitéiseach a bhogadh. Bá chóir don Choiste Comhairleach coinneáil fad rí le bheith éifeachtach. Tá measúnú an riosca saonta: maíonn TopQIFT nach bhfuil aon riosca sa phlean toisc gur obair bhunúsach atá ann agus gur féidir gach toradh a léamh mar thoradh rathúil, go háirithe toisc go bhfuil scoth na dtaighdeoirí sa tionscadal molta.

Tá na comhpháirtithe turgnamhacha ag obair ar TQC agus ar QIPC go ginearálta ach ní le rófhada cé go bhfuil taithí ábhartha faighte acu. Is iad príomhshaineolaithe na hEorpa iad in iarmhairt chandamach chodánach Hall. Clúdaíonn na comhpháirtithe teoirice réimse ón bhfisic mhatamaiticiúil go dtí teoric le haghaidh córais turgnamacha. Is féidir leis na comhpháirtithe teacht ar shaoráidí maithe turgnamhacha agus ríomhaireachta. Caithfear a lua gur i SAM a rinneadh an ceannródaíocht sa réimse agus go bhfuil an Eoraip taobh thiar. Tá pleananna ag an gcuibhreannas chun an bhearna seo a líonadh. Is ceart go bhfuil an comhpháirtí Meiriceánach Microsoft Station Q páirteach, cé gur ghrúpa iad le haghaidh taighde bunúsach níos mó ná comhpáirtí tionsclaíoch.

Dr. Peter Goddard, Prof. Ludwig Faddeev, Chairman of Council, Prof. Dervilla Donnelly at a conference in honour of Prof. Werner Nahm's 60th Birthday.

An Dr. Peter Goddard, An tOll. Ludwig Faddeev, Cathaoirleach na Comhairle, An tOll. Dervilla Donnelly ag comhdháil ag comóradh 60ú Breithlá an Oll. Werner Nahm.

but clearly underlines the necessity of a European effort. However, there is some imbalance between experimental and theoretical work. Computer scientists could be a valuable addition to research on quantum algorithms.

The goals and tasks are clearly defined and the distribution of resources is good in general (in particular the distribution between experimental and theoretical partners is balanced), but the resource allocation is difficult to judge as the workplan is deficient.

The partners have made appropriate commitments to contribute considerable resources."

We think that this referee report makes it clear that our project holds a considerable promise for the future of Information and Communication Technology in Europe and in particular in Ireland, but the rejection indicates that we need more high level Irish support to succeed in Brussels. There are limited possibilities for the request of a redress and we judged that it would be useless.

Prof. Luke Drury, Dr. Peter Goddard, Prof. Werner Nahm, Chairman STP Board, Prof. Arthur Jaffe at a conference in honour of Prof. Werner Nahm's 60th Birthday.

An tOll. Luke Drury, An Dr. Peter Goddard, An tOll.Werner Nahm, Cathaoirleach an Bhoird STP, Prof. Arthur Jaffe ag comhdháil ag comóradh 60ú Breithlá an Oll. Werner Nahm.

We probably need a better climate to renew our efforts, but DIAS maintains at least a favorable basis. Tony Dorlas, Werner Nahm and Joost Slingerland continued the supervision of PhD theses in the field of quantum information, so there always is hope for the future.

Energy

STP is of course far too small to engage in original research concerning energy issues, but we have potentially useful international connections and can at least weigh in with independent opinions on physical arguments. In September Tony Dorlas published an article 'On Global Warming', in which he distinguished between those aspects which can be checked directly by everyone with a good physics education and those which depend on complex computer modelling which only can be done at specialised institutions. This should be a good reference point for some of the current controversies.

String Theory, Quantum Field Theory and Integrable Systems

We all wait for the data from CERN, which is scheduled to collide protons at 7 TeV on March 30, 2010. In the meantime, theoretical particle physicists only can proceed with the mathematical investigation of the current models for the basic structures of spacetime and matter. String theory is still the only model which can incorporate what we know so far (the standard model and Einstein's theory of gravity), though there are other theories around which one day may reach that level, too. In string theory the most significant advance of the past twelve years was the discovery and partial confirmation of the AdS/CFT correspondence between string theory on particular curved spaces and conformally invariant quantum field theories in one dimension less. If this correspondence is true (which is very probable) one can use information from one side to get new knowledge on the other. An unexpected consequence, string theory became relevant for experimentalists studying the quark gluon plasma, since the latter is close enough to conformal invariance. At STP a new IRCSET fellow studies what happens when such a system is placed in a strong magnetic field (two publications in 2009). The resulting physics is very rich and the work has strengthened the relation between strings and the real world.

Clúdaíonn an cuibhreannas gnéithe turgnamhacha, teoiriciúla agus ríomhaireachta den réimse taighde seo. Ní féidir saineolas ag an ardleibhéal seo a shroicheadh ag leibhéal náisiúnta ach béimíonn sé go soiléir an riachtanas atá le hiarracht Eorpach. Ach tá éagothroime áirithe idir an obair thurgnamhach agus an obair theoiriciúil. D'fhéadfadh ríomheolaithe a bheith luachmhar don taighde ar algartaim candamaigh.

Tá na spriocanna agus na tascanna sainmhínithe go soiléir agus tá dáileadh na n-achmhainní go maith den chuid is mó (go háirithe an dáileadh idir comhpháirtithe turgnamacha agus comhpháirtithe teoiriciúla), ach is deacair breith a thabhairt ar an leithdháileadh achmhainní toisc an plean oibre a bheith easnamhach.

Tá ceangaltais chuí déanta ag na comhpháirtithe chun acmhainní suntasacha a chur isteach."

Ceapaimid go soiléiríonn tuairisc an réiteora seo go bhfuil gealladh suntasach faoinár dtionscadal don teicneolaíocht faisnéise agus cumarsáide san Eoraip amach anseo, agus in Éirinn go háirithe, ach léiríonn an diúltú gur ghá tacaíocht bhreise Éireannaí ag ardleibhéal chun toradh rathúil a fháil sa Bhruiséil. Tá na féidearthachtaí teoranta maidir le hiarratas chun é a chur ina cheart agus is í ár mbreith nárb fhiú é a thriail.

Is dócha go mbeadh timpeallacht níos fearr ag teastáil uainn chun ár n-iarrachtaí a athnuachan, ach ar a laghad tá bonn fabhrach á choinneáil ag DIAS. Lean Tony Dorlas, Werner Nahm agus Joost Slingerland ag stiúradh tráchtais PhD i réimse na faisnéise candamaí; mar sin, tá dóchas don todhchaí ann i gcónaí.

Fuinneamh

Ar ndóigh, tá SFT róbheag chun buntaighde a dhéanamh ar chúrsaí fuinnimh, ach tá naisc idirnáisiúnta againn a d'fhéadfadh a bheith úsáideach agus is féidir linn, ar a laghad, tuairimí neámhspleácha a thabhairt in argóintí fisice. I mí Dheireadh Fómhair, d'fhoilsigh Tony Dorlas 'On Global Warming', alt inar idirdhealaigh sé na gnéithe sin den téamh domhanda gur féidir le haon duine a bhfuil oideachas maith fisice air a sheiceáil go díreach ó na gnéithe siúd a bhraitheann ar shamhaltú coimpléascach ar ríomhaire nach féidir a dhéanamh ach amháin in institiúidí speisialaithe. Ba chóir go mbeadh sé ina phointe tagartha maith i gcuid de na conspóidí reatha.

An tSreangtheoiric, Réimsetheoiric Chandamach agus Córais Insuimeálaithe

Táimid go léir ag feitheamh ar na sonraí ó CERN, atá sceidealaithe chun prótóin a imbhualadh ag 7 TeV ar 30 Márta 2010. San idirlinn, níl de rogha ag fisiceoirí cáithníní ach leanúint le hiniúchadh matamataiciúil ar na samhlacha reatha de bhunstruchtúir spás-ama agus damhna. Is í an tsreangtheoiric fós an t-aon samhail amháin gur féidir gach a bhfuil ar eolas againn go dtí seo (an tsamhail chaighdeánach agus teoiric choibhneasachta Einstein) a chomhshnaidhmiú, cé go bhfuil teoiricí eile ann freisin a shroichfidh an leibhéal sin lá éigin, b'fhéidir. Sa tsreangtheoiric, ba é an dul chun cinn ba shuntasaí le dosaen bliain anuas fionnachtain agus páirtdaingniú an chomhfhreagartha AdS/CFT idir an tsreangtheoiric ar spásanna cuartha áirithe agus réimsetheoiricí candamacha do-athraithigh comhfhoirmiúla i dtoise amháin níos lú. Má tá an chomhfhreagairt seo fíor (agus tá cuma láidir uirthi go bhfuil) is féidir eolas ó thaobh amháin a úsáid chun eolas nua a fháil ón taobh eile. Mar thoradh nach raibh coinne leis, bhí an tsreangtheoiric ábhartha do thurgnamhóirí ag scrúdú plasma glúóin cuairc, ó tá an ceann deiridh seo gar go leor do dho-athraitheacht chomhfhoirmiúil. Ag SFT, scrúdaíonn ánra nua IRCSET cad a tharlaíonn nuair a chuirtear a leithéid de chórais i réimse maighnéadnach láidir (dhá fhoilseachán i 2009). Tá an-saibhreas san fhisic a tháinig amach agus threisigh an obair an ghaol idir sreanga agus an domhan.

Go bunúsach, tá an tsreangtheoiric céimseatúil, cé go n-úsáideann sí struchtúir céimseatúla suas go dtí aon toise déag, cuid acu ríofa ag ár n-ánra Schrödinger Volker Braun. I gcodarsnacht leis seo, tá Denjoe O'Connor ag obair ar mhodhanna oibre i dtaobh spás-ama a bhreathnaíonn ar chéimseata an spás-ama mar theorainn lagfhuinnimh de struchtúr matamaiticiúil atá níos teibí, an modh oibre tacair cúisíoch do dhomhantharraingt chandamach. I mí na Nollag, d'eagraigh an tOllamh O'Connor ceardlann ag DIAS, ina raibh fisiceoirí ón Eoraip, ón India agus ó Thuaisceart Mheiriceá, agus phléigh siad an dul chun cinn is déanaí. I mí na Samhna i gcéardlann ag DIAS, iniúchadh ceisteanna gaolmhara ó dhearcadh níos matamaiticiúla ar Neamhchomhalartacht agus Samhlacha Mhaitríse. D'fhoilsigh an tOllamh O'Connor páipéar freisin ar bhealach níos fearr chun athnormalú a úsáid i réimsetheoiric chandamach ghnáthúil.

String theory is basically geometrical, though it uses geometrical structures in up to eleven dimensions, some of them calculated by our Schrödinger fellow Volker Braun. In contrast, Denjoe O'Connor is working on approaches to spacetime which view the geometry of spacetime as a low-energy limit of a more abstract mathematical structure, the causal set approach to quantum gravity. In December he organized a workshop at DIAS, where physicists from Europe, India and North America discussed the latest progress. A workshop on Noncommutativity and Matrix Models, which explored related issues from a more mathematical point of view, took place at DIAS in November. O'Connor also published a paper on a better way to use renormalization in a conventional quantum field theory.

Physical systems come in two varieties, integrable and chaotic. Loosely speaking, integrability means that one can calculate oneself, otherwise one largely depends on number crunching computers, as for weather forecasts. The theory of strings in AdS has many integrable features, which are investigated by our new Schrödinger fellow Stefano Kovacs. Other integrable systems were studied by W. Nahm, with the intention to build a firmer bridge between mathematics and the physics of quantum fields and strings.

Outreach

We keep close links with the theoretical physicists in all of Ireland, and take turns in organising the Irish Quantum Field Theory meetings with the leading universities. The annual John Lewis lectures jointly organised by HMI and DIAS were given in May by N. Reshetikhin. On the occasion of the 60th birthday of W. Nahm a conference on Advances in Theoretical Physics took place in November. The annual statutory public lecture was given by P. Goddard, director of the Institute for Advanced Study in Princeton, the first institute of this type in the world. DIAS was the second, others have followed, some important ones in recent years. In many countries they are perceived as one of the most valuable assets in research. It seems odd that in 2009 we had to live under a threat. In spite of the worsening financial situation we hope that the environment will become more conducive to the use of our potential.

Tá dhá chineál struchtúr fisice ann, insuimeálaithe agus anordúil. Go ginearálta, ciallaíonn insuimeálaithe gur féidir leis an duine féin na háirimh a dhéanamh; murach sin, caithfear brath, cosúil le réamhfhaisnéisí aimsire, ar ríomhairí mar bhrúisceoirí uimhreacha. Tá a lán gnéithe insuimeálaithe ag an tsreangtheoiric in AdS a iniúchann ár n-ánra nua Schrödinger, Stefano Kovacs. Scrúdaigh an tOllamh W. Nahm córais insuimeálaithe eile d'fhonn droichead níos daingne a thógáil idir réimsí candamacha agus sreanga sa mhatamaitic agus san fhisic.

For-rochtain

Coinnímid dlúthnaisc le fisiceoirí teoiriciúla ar fud na hÉireann uile agus, ar sealaíocht, eagraímid na cruinnithe ar Réimsetheoiric Chandamach na hÉireann leis na príomhollscoileanna. I mí na Bealtaine, thug N. Reshetikhin léachtaí bliantúla John Lewis, comheagraithe le HMI i DIAS. I mí na Samhna, ar ócáid bhreithlá 60 bliain W. Nahm, bhí comhdháil ar Dhul Chun Cinn san Fhisic Theoiriciúil. Thug P. Goddard an léacht phoiblí reachtúil; is eisean stiúrthóir na hInstitiúide Ard-Léinn, Princeton, an chéad institiúid den chineál seo ar domhan. Is í DIAS an dara ceann; bunaíodh cinn eile ó shin, agus roinnt cinn thábhachtacha le blianta beag anuas. Ina lán tíortha, feictear orthu mar cheann de na tairbhí is luachmhaire i réimse na taighde. Nach ait é go raibh orainn maireachtáil faoi bhagairt i 2009. D'ainneoin an choir chun donais i gcúrsaí airgeadais, tá súil againn go mbeidh timpeallacht a bheidh níos fabhraí d'úsáid ár n-acmhainneachta.

Registrar, Cecil Keaveney, Prof. Peter Higgs, Chairman of Council, Prof. Dervilla Donnelly at a conference in honour of Prof. Werner Nahm's 60th Birthday."

Cláraitheoir, An tUas. Cecil Keaveney, An tOll Peter Higgs, Cathaoirleach na Comhairle, An tOll. Dervilla Donnelly ag comhdháil ag comóradh 60ú Breithlá an Oll. Werner Nahm.

Administration and Finance

Administration Section

The central administration section provides secretarial support to Council, the School Governing Boards and associated Committees. It is also responsible for Human Resources, General governance/compliance, Public Relations, Accommodation and Maintenance, Health and Safety.

An external review of the work of the three Schools of the Institute was undertaken during the year and this was co-ordinated by the Registrar's Office. Members of the international review panels spent a few days in the Schools overseeing the work of the school and interviewing staff.

Support was provided for a number of high profile events hosted by the Schools of the Institute during the year.

The Institute also hosted a visit by the Minister for Science & Technology and the German Ambassador.

Work commenced on redesigning the Institute's website at the end of the year.

Registrar, Mr. Cecil Keaveney, Chairman of Council, Prof. Dervilla Donnelly, Dr. Jimmy Devins, Minister of State for Science and Innovation, Dept of Enterprise, Trade and Employment, Visit to DIAS on 3 March 2009.

An Cláraitheoir, An tUas. Cecil Keaveney, Cathaoirleach na Comhairle, An tOll. Dervilla Donnelly, An Dr. Jimmy Devins, Aire Stáit Eolaíochta agus Nuálaíochta, An Roinn Fiontar, Trádála agus Fostaíochta. Cuairt ar DIAS ar 3 Márta 2009.

Finance

The attached financial statements report a surplus of €174,809 for the year.

This compares with a surplus of €329,698 in the year to 31st December 2008.

Total income for the Institute increased from €14,952,771 in 2008 after adjusting for pensions to €15,824,018 for 2009.

This represents an increase of €871,247 or 5.83% and the main increase occurred in oireachtas grants.

In 2009 a significant capital grant of €1,200,000 was allocated to the Institute to invest in the up-grade of seismic equipment in the School of Geophysics.

The Institute's total costs, after adjusting for the transfer to the capital reserves, also increased from €14,623,073 in 2008 to €15,649,209 in 2009 i.e. an increase of €1,026,136 or 7.02%.

The significant movements in costs took place in pension, project and capital.

Riarachán agus Airgeadas

An Rannóg Riaracháin

Soláthraíonn an phríomhrannóg riaracháin tacaíocht rúnaíochta don Chomhairle, do Bhoird Bainistíochta na Scoileanna agus do Choistí gaolmhara. Tá sí freagrach freisin as Acmhainní Daonna, Rialachas/Comhlíonadh Ginearálta, Caidreamh Poiblí, Cóiríocht agus Cothabháil, Sláinte agus Sábháilteacht.

Rinneadh athbhreithniú seachtrach ar obair na dtrí Scoil san Institiúid i rith na bliana agus rinne Oifig an Chláraitheora comhordú air seo. Chaith comhaltaí na bpainéal idirnáisiúnta athbhreithnithe roinnt laethanta sna Scoileanna ag faire ar obair na scoile agus ag cur na foirne faoi agallamh.

Soláthraíodh tacaíocht do roinnt ócáidí iomráiteacha a d'óstáil Scoileanna na hInstitiúide i rith na bliana.

D'óstáil an Institiúid freisin cuairt ón Aire Eolaíochta agus Theicneolaíochta agus ó Ambasadóir na Gearmáine.

Thosaigh obair ar athdhearadh shuíomh Gréasáin na hInstitiúide ag deireadh na bliana.

Airgeadas

Tuairiscíonn na ráitis airgeadais ag gabháil leis seo barrachas €174,809 don bhliain.

Is féidir seo a chur i gcomparáid le barrachas €329,698 sa bhliain go dtí 31 Nollaig 2008.

Tar éis coigeartú le haghaidh pinsean, mhéadaigh ioncaim iomlán na hInstitiúide ó €14,952,771 in 2008 go €15,824,018 in 2009.

Seo méadú €871,247 nó 5.83% agus bhí an príomhméadú i gcás dheontas an Oireachtais.

Leithdháileadh deontas suntasach caipitil €1,200,000 don Institiúid i 2009 d'fhonn infheistíocht a dhéanamh in uasghrádú an trealaimh seismeolaíochta i Scoil na Geoifisice.

Tar éis coigeartú d'aistriú chuig cúlchistí caipitil, mhéadaigh costais iomlána na hInstitiúide freisin ó €14,623,073 in 2008 go €15,649,209 in 2009, .i. méadú €1,026,136 nó 7.02%.

Tharla na hathruithe suntasacha costas i bpinsean, i dtioncadal agus i gcaipiteal.

Institute Staff

Council of the Institute

Chairman

D. Donnelly

Ex-Officio Members

H. Brady, President, UCD

N. Canny, President, RIA

J. Hegarty, Provost, TCD

Members Appointed by the Governing Boards of Constituent Schools

G. Wrixon

A. Jaffe

A. Ahlqvist

W. Nahm

L. Drury

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 hUigínn

E. Ní Dhea

A. Bourke

K. Simms

N. Ó Muraíle

L. Mac Mathúna

Governing Board of the School of Theoretical Physics

Chairman

A. Jaffe

Senior Professors

T. Dorlas

D. O'Connor

W. Nahm

Appointed Members

A. Breslin

S. Ryan

H. Nicolai

M. Grünewald

M. Tuite

P. Knight

L. Hau

R. Dijkgraaf

S. Shatashvili

Governing Board of the School of Cosmic Physics

Chairman

G. Wrixon

Senior Professors

L. Drury

E. Meurs

A. Jones

Appointed Members

A. Khan

O. Glaser

C. Stehlé-Cojan

L. Enright

R. Perrott

L. Hanlon

M. Fowler

Administrative Staff of the Institute 2009

Registrar

C. Keaveney

Finance Officer

G. Forkin

Senior Administrative Officer

M. Burke

Assistant Finance Officer

R. Byrne

Clerks

T. Broderick (to 1st August)

M. Loughman

H. Moynihan

E. Barrett

M. Brennan

Senior Administrator

M. Ó Gliasáin

Principal Administrator

M. Seoighe (on leave of absence)

HR Manager (part-time)

B. O'Donnell (contract) (to 28th February)

Support Staff

G. Casey

R. Jones

B. Judge

P. McDonald

C. Doyle

T. Ó Gríofa

K. Earley

P. Wynne

B. Migas (contract) (to 9th April)

Staff and Scholars of the School of Celtic Studies 2009

Senior Professors

F. Kelly (Director to 18th November)

P. Breatnach (Director from 19th November)

L. Breatnach

Professors

M. McKenna

P. Ó Macháin

Assistant Professors

A. Nic Dhonnchadha

M. O Riordan

Dialectologist

B. Ó Curnáin

Assistant Librarian

M. Kelly

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 (contract)

Bergin Fellows

R. McLaughlin

C. Downey

Scholars

N. White (Ireland)

G. Ó Riain (Ireland)(to 6th August)

F. Verstraten (Holland)

E. O'Flynn (Ireland)

A. Matheson (Canada) (from 1st October)

H. Imhoff (Germany) (from 1st November)

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

G. Manning (Ireland) (to 31st August)

Professor Emeritus

M. Ó Murchú

Vacation Students

S. Rousseau (from 6th July to 28th August)

C.Cleary (from 4th August to 28th August)

Staff and Scholars of the School of Theoretical Physics 2009

Senior Professors

W. Nahm (Director)

T. Dorlas

D. O'Connor

Librarian

A. Goldsmith

School Administrator

M. Matthews

Systems Administrator

J. Bucas (contract)

Pre-Doctoral Scholars

C. Morgan (Ireland) (to 31st December)

A. Ghesquiere (France) (to 31st December)

P. Abramski (Russia)

O. Smits (Netherlands) (from 2nd March)

T. Kaltenbrunner (Austria) (from 1st September to 30th September)

Schrödinger Fellows

A. Povolotsky (Russia) (to 31st May)

J. Slingerland (Netherlands) (to 31st August)

V. Braun (Germany)

S. Kovacs (Italy) (from 1st April)

I. Lyberg (Sweden) (from 5th May)

Project Staff

M. Samsonov (Russia) (to 31st March) "*Mathematical Analysis of the Bethe Ansatz Solution of Spin Models*"

T. Kaltenbrunner (Austria) (from 1st October) Marie Curie *Non-Commutative Geometry*

M. Vachovski (Bulgaria) (from 1st October) Marie Curie *Non-Commutative Geometry*

Embark Initiative Postdoctoral Research Fellows

B. Qureshi (Pakistan) "*Noncommutative Spacetime Physics, Matrix Models and Hopf Algebras*" (to 13th December)

V. Filev (Bulgaria) "*Holographic Study of the Phase Structure and Universal Properties of Strongly Coupled, Flavoured, Large N Yang-Mills Gauge Theory*"

V. Dotsenko (Russia) "Algebra and Representation Theory of Compatible Algebraic Structures"

Staff and Scholars of the School of Cosmic Physics 2009

Senior Professors

L. Drury (Director)

A. Jones

E. Meurs

Professors

T. Ray

F. Aharonian

Z. Martinec (from 1st August)

Assistant Professors

S. Lebedev

B. O'Reilly

P. Readman (to 26th April)

Fellows

C. del Burgo (Spain) (to 30th September)

A. Lim (England) (to 30th November)

M. Chernyakova (Russia)

M. Muller (South Africa) (from 1st July)

A. Bamba (Japan) (from 1st November)

A. Scholz (Germany) (from 1st November)

Experimental Officers

T. Blake

S. Dudzinski

Senior Technical Assistants

C. Horan

M. Smyth

G. Wallace

Technical Assistants

E. Flood

A. Grace

H. O'Donnell

L. Collins

C. Hogg

IT Technician

S. O'Sullivan

Clerical Staff

P. Daly

A. Sewielska (contract)

Scholars

M. Miensopust (Germany)

J. Mackey (Ireland)

J. Schmoldt (Germany)

S. Delaney (Ireland)

D. Malyshev (Ukraine)

P. Share (South Africa)

D. Khoza (South Africa)

L. Fallon (Ireland)

G. Polat (Turkey)

L. Barreyre (France)

J. Buckenmeyer (France)

E. Mandolesi (Italy)

M. Agius (Malta)

N. Nooraee (Iran)

F. le Pape (France) (from 5th January)

D. Kiyan (Turkey)

G. Costigan (Ireland) (from 1st October)

A. Schaeffer (Canada) (from 1st November)

Project Staff

M. Muller SFI project (to 28th February)

E. Whelan JETSET (to 28th February), IRCSET (from 1st September)

J. Gracia JETSET (to 31st January)

P. Dempsey IRCSET (to 28th August)

L. Podio IRCSET (to 16th December)

S. Gabici COSMIC RAY ORIGIN (to 30th September)

E. Roux SFI project

M. Kennedy IGGP

K. Rochford e-INIS

P. Rammos JETSET (to 31st January)

D. Coffey IRCSET

G. Murphy SFI project (from 15th January)

A. Caratti O. Garatti SFI project (from 12th January)

C. Tirel SFI project (from 2nd March)

J. Fullea TOPOMED (from 5th May)

J. Vozar SFI project (from 1st May)

J. Morin MIRI (from 9th November)

A. Scaife MIRI (from 1st December)

Professor Emeritus

P. Readman (from 27 April)

D. O'Sullivan

A. Thompson

Vacation Students

D. Middleton (from 24th June to 10th September)

P. Keogh (from 24th June to 11th September)

Temporary Support Staff

Nede Valteryte (from 2nd March to 13th March)

Mairead O'Connor (from 16th March)

Financial Statements for year ended 31 December 2009

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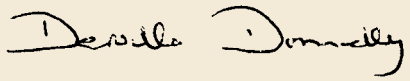
Statement of Responsibilities of the Council

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 & Science 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.



Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
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 and Internal Auditor. In 2009, the Audit Committee met on three occasions.

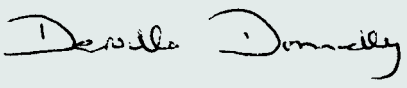
In addition, the 2009 report on internal control systems as provided by the Internal Auditor has been made available to Members of Council.

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 2009 Council conducted a review of the effectiveness of the internal financial controls of the Institute.

Signed on behalf of the Council of the Institute



Dervilla Donnelly
Chairman – Council of the Institute

29th June 2010

Report of the Comptroller and Auditor General for presentation to the Houses of the Oireachtas

I have audited the financial statements of Dublin Institute for Advanced Studies for the year ended 31 December 2009 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.

Respective Responsibilities of the Council and the Comptroller and Auditor General

The Council is responsible for preparing the financial statements in accordance with the Institute for Advanced Studies Act, 1940, and for ensuring the regularity of transactions. The Council prepares the financial statements in accordance with Generally Accepted Accounting Practice in Ireland. The accounting responsibilities of the Members of the Council are set out in the Statement of Responsibilities of the Council.

My responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements and International Standards on Auditing (UK and Ireland).

I report my opinion as to whether the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland. I also report whether in my opinion proper books of account have been kept. In addition, I state whether the financial statements are in agreement with the books of account.

I report any material instance where moneys have not been applied for the purposes intended or where the transactions do not conform to the authorities governing them.

I also report if I have not obtained all the information and explanations necessary for the purposes of my audit.

I review whether the Statement on Internal Financial Control reflects the Institute's compliance with the Code of Practice for the Governance of State Bodies and report any material instance where it does not do so, or if the statement is misleading or inconsistent with other information of which I am aware from my audit of the financial statements. I am not required to consider whether the Statement on Internal Financial Control covers all financial risks and controls, or to form an opinion on the effectiveness of the risk and control procedures.

I read other information contained in the Annual Report, and consider whether it is consistent with the audited financial statements. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements.

Basis of Audit Opinion

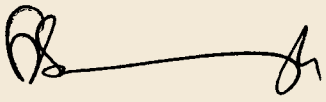
In the exercise of my function as Comptroller and Auditor General, I conducted my audit of the financial statements in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board and by reference to the special considerations which attach to State bodies in relation to their management and operation. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures and regularity of the financial transactions included in the financial statements. It also includes an assessment of the significant estimates and judgments made in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Institute's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations that I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion

In my opinion, the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland, of the state of the Institute's affairs at 31 December 2009 and of its income and expenditure for the year then ended.

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



Gerard Smyth
For and on behalf of the Comptroller and Auditor General

30th June 2010

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 receivable basis.

3. Fixed Assets

Fixed Assets comprise the furniture, equipment, computers, supercomputer 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%
Supercomputer	33.3%

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 Science 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 Science.

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 Science.

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.

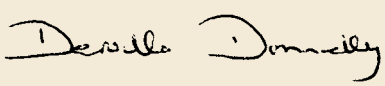
Income and expenditure on projects is reflected in the financial statements in the year to which they relate. A surplus or deficit on a project is reflected in the financial statements when realised.

Income and Expenditure Account

	Notes	2009	2008
		€	€
Income			
Oireachtas Grant		9,161,302	8,044,000
Net deferred funding for pensions	11.c	1,955,026	1,521,928
Sales of Publications		52,515	58,288
Projects	2	4,096,104	4,662,941
Other	3	103,071	209,614
Contribution-Hosting of Bluegene		456,000	456,000
		15,824,018	14,952,771
Transfer (to)/from Capital Reserve	5	(435,988)	821,436
		15,388,030	15,774,207
Expenditure	1		
School of Celtic Studies		1,687,431	1,725,771
School of Theoretical Physics		1,297,841	1,342,934
School of Cosmic Physics		6,014,710	6,612,548
Administration		6,213,239	5,763,256
		15,213,221	15,444,509
Surplus for year		**174,809**	**329,698**
Balance at 1 January		1,042,362	712,664
Balance at 31 December		**1,217,171**	**1,042,362**

Statement of Total Recognised Gains and Losses		**2009**	**2008**
Surplus for the year		174,809	329,698
Experience (gains)/losses on pension scheme liabilities		(328,000)	(1,258,000)
Changes in assumptions underlying the present value of pension scheme liabilities		2,445,000	(226,000)
Actuarial Loss on Pension Liabilities	**11.b**	**2,117,000**	**(1,484,000)**
Adjustment to Deferred Pension Funding		**(2,117,000)**	**1,484,000**
Total Recognised Gain for the Year		**174,809**	**329,698**

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



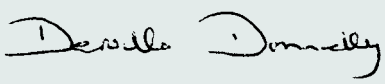
Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
Council Member

Balance Sheet

	Notes	2009	2008
		€	€
Assets			
Fixed Assets	4	3,114,643	2,678,655
Current Assets:			
Cash on Hand and at Bank		6,384,589	4,090,233
Debtors and Prepayments	7	392,143	693,166
Project Debtors	2	54,903	101,330
Total Assets		**9,946,278**	**7,563,384**
Less Liabilities			
Creditors – Amounts falling due within one year			
Creditors and Accruals		1,264,714	994,592
Project Creditors	2	4,288,269	2,787,439
Creditors – Amounts falling due after one year	6	61,481	60,336
Total Liabilities Before Pensions		**5,614,464**	**3,842,367**
Assets Less Liabilities Before Pensions		**4,331,814**	**3,721,017**
Deferred Pension funding	11.c	32,556,000	32,718,000
Pension Liabilities	11.b	(32,556,000)	(32,718,000)
Net Assets		**4,331,814**	**3,721,017**
Financed by:			
Income and Expenditure Account		1,217,171	1,042,362
Capital Reserve	5	3,114,643	2,678,655
		4,331,814	**3,721,017**

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



Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
Council Member

Cash Flow Statement

	Notes	2009	2008
		€	€
Reconciliation of Operating Surplus to Net Cash Inflow from Operating Activities			
Surplus for Year		**174,809**	**329,698**
Interest Received	3	(89,415)	(175,063)
Increase in Creditors		218,303	500,253
Decrease in Debtors		301,023	(341,903)
Net Increase in Research Programmes and Fees		1,600,221	(478,807)
Depreciation	4	1,084,465	1,073,385
Capital Reserve Transfer	5	435,988	(821,436)
Loss on Disposal		25	(1,519)
Net Cash Inflow from Operating Activities		3,725,419	84,607
Cash Flow Statement			
Net Cash Inflow from Operating Activities		3,725,419	84,607
Returns on Investments and Servicing of Finance			
Bank Interest Received	3	89,415	175,063
Capital Expenditure			
Purchase of Tangible Assets	4	(1,520,478)	(250,430)
Increase in Cash		**2,294,356**	**9,241**
Reconciliation of Net Cash Flow to Movement in Net Funds			
Increase in Cash		2,294,356	9,241
Net Funds at 1 January		4,090,233	4,080,992
Net Funds at 31 December		**6,384,589**	**4,090,233**

Analysis of Change in Net Funds	Cash at bank and in hand	Total
	€	€
At Beginning of Year 2009	4,090,233	4,090,233
Cash Flows	2,294,356	2,294,356
At End of Year 2009	**6,384,589**	**6,384,589**

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

Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
Council Member

Notes to the Financial Statements

For the year ended 31/12/2009

1 Detailed Analysis of Income & Expenditure for the year ended 31/12/2009

	Notes	School of Celtic Studies	School of Theoretical Physics	School of Cosmic Physics	Adminis-tration	2009 Total	2008 Total
		€	€	€	€	€	€
INCOME							
Oireachtas Grants		2,009,555	1,209,306	4,183,214	1,759,227	9,161,302	8,044,000
Net Deferred Funding for Pensions	11.c	(364,894)	(81,160)	(627,243)	3,028,323	1,955,026	1,521,928
Sales of Publications		52,515	–	–	–	52,515	58,288
Project Income	2.a	26,079	176,800	3,684,627	208,598	4,096,104	4,662,941
Other	3	–	3,101	10,340	89,630	103,071	209,614
Contribution-Hosting of Bluegene		–	–	–	456,000	456,000	456,000
		1,723,255	1,308,047	7,250,938	5,541,778	15,824,018	14,952,771
Transfer (to)/from Capital Reserve					(435,988)	(435,988)	821,436
		1,723,255	1,308,047	7,250,938	5,105,790	15,388,030	15,774,207
EXPENDITURE							
Payroll Costs	8	1,562,811	1,018,943	2,165,224	791,317	5,538,295	5,489,380
Pension Costs	11.a	(50,266)	(43,585)	(77,355)	3,113,369	2,942,163	2,430,953
Pension Project Costs	11.a	(887)	(2,528)	(15,746)	–	(19,161)	(12,896)
Project Costs	2.a	26,966	179,329	3,697,804	–	3,904,099	4,611,756
Hosting Costs Bluegene		–	–	–	298,835	298,835	341,211
Library and Book Storage		38,000	101,933	67,609	12,720	220,262	251,114
Depreciation	4	–	–	–	1,084,465	1,084,465	1,073,385
Rent, Rates and Insurance		–	–	–	176,030	176,030	173,425
General Expenses	9	7,555	5,488	38,189	209,343	260,575	243,020
Travel and Seminar Expenses		26,800	21,416	89,068	10,657	147,941	166,446
Premises Maintenance and Security		–	–	–	238,513	238,513	230,591
Computer and Internet Expenses		6,425	3,579	33,653	50,616	94,273	106,123
Fuel Light and Power		–	–	–	158,280	158,280	146,347
Postage and Telephone		–	–	–	37,948	37,948	48,439
Stationery		10,161	1,257	6,122	22,581	40,121	54,439
Publications		51,993	–	1,502	–	53,495	47,545
Advertising		250	486	624	2,474	3,834	15,092
Minor Office Equipment		7,623	11,523	8,016	6,066	33,228	29,658
Loss on Disposal		–	–	–	25	25	(1,519)
		1,687,431	1,297,841	6,014,710	6,213,239	15,213,221	15,444,509
SURPLUS/(DEFICIT) FOR YEAR		**35,824**	**10,206**	**1,236,228**	**(1,107,449)**	**174,809**	**329,698**
Balance at 1 January		276,886	101,666	(273,382)	937,191	1,042,362	712,664
Balance at 31 December		**312,710**	**111,872**	**962,846**	**(170,258)**	**1,217,171**	**1,042,362**

2.(a) Projects

	2009	2008
	€	€
Opening Balances	2,686,109	3,164,916
Receipts	5,643,361	4,184,134
	8,329,470	7,349,050
Closing Balances (Project Debtors €54,903 Project Creditors €4,288,269)	(4,233,366)	(2,686,109)
Applied as Income	4,096,104	4,662,941

Income Allocation

School of Celtic Studies	26,079	57,295
School of Theoretical Physics	176,800	220,173
School of Cosmic Physics	3,684,627	4,316,190
	3,887,506	4,593,658
Administration	208,598	69,283
Total Project Income	4,096,104	4,662,941

Project Costs

	Celtic Studies	Theoretical Physics	Cosmic Physics	2009 Total	2008 Total
	€	€	€	€	€
Payments to Partners/Associates	–	–	2,653,984	2,653,984	3,186,196
Salaries/Scholarships	24,499	141,877	790,347	956,723	977,491
Travel	–	36,786	195,094	231,880	202,112
Other	2,467	666	58,379	61,512	245,957
Total Project Costs	26,966	179,329	3,697,804	3,904,099	4,611,756

2.(b) Project Detail

	Opening Balance	Receipts	Refunds	Recurrent & Capital Expenditure	Applied as Income (including Capital)	Closing Balance
	€	€	€		€	€
School of Celtic Studies						
Irish Script on Screen	20,554	–	–	2,467	2,467	18,087
Irchss G Manning Award	11,923	17,581	–	24,499	23,612	5,892
Celtic Summer School	2,016	–	–	–	–	2,016
Total Celtic Studies	**34,493**	**17,581**	–	**26,966**	**26,079**	**25,995**

2.(b) Project Detail {continued}

	Opening Balance	Receipts	Refunds	Recurrent & Capital Expenditure	Applied as Income (including Capital)	Closing Balance
	€	€	€		€	€
School of Theoretical Physics						
S Ni Chiagain – Ircset	2,944	–	–	–	–	2,944
Seckin Kurkcuonglu	1,852	–	–	–	–	1,852
Subrata Bal – Fellow	9,974	–	–	–	–	9,974
Francis Dolan – IrcSet Fellow	9,874	–	–	–	–	9,874
Oliver Rosten – IrcSet Fellow	9,608	–	–	–	–	9,608
SFI Bethe Ansatz	69,784	–	(36,470)	7,847	7,530	25,784
Non-Commutative Geometry	102,765	58,898	–	31,067	30,202	131,461
TopQUIC	13,140	–	(5,513)	7,627	7,627	–
Veselin Filev – IrcSet Fellow	20,345	51,938	–	42,325	41,021	31,262
V Dotsenko – IrcSet Fellow	21,219	51,937	–	43,082	41,519	31,637
T Tchrakian SFI 07 award	–	107,196	–	611	611	106,585
Babar Qureshi – IrcSet Fellow	33,679	12,038	–	46,770	48,290	(2,573)
Total Theoretical Physics	**295,184**	**282,007**	**(41,983)**	**179,329**	**176,800**	**358,408**
School of Cosmic Physics						
Gamma Ray Bursts	25,284	–	(1,200)	100	100	23,984
Total Astronomy	**25,284**	–	**(1,200)**	**100**	**100**	**23,984**
Dos Max	12,814	–	–	965	965	11,849
PRTLI-CosmoGrid	914,800	–	–	–	6,324	908,476
Nam Conference	17,218	–	–	334	334	16,884
Jet 4 (Central Engines…stars)	22,217	–	(5,804)	15,172	15,172	1,241
Jetset	(80,951)	394,751	–	293,170	293,170	20,630
Jonathan Mackey – IrcSet Postgrad	3,539	12,002	–	14,589	14,589	952
SFI Felix GNM	63,321	53,802	–	44,126	44,126	72,997
SFI Cores to Disks	46,481	144,022	–	65,154	63,998	126,505
Paul Dempsey – IRCSET Fellow	33,936	12,038	–	26,283	28,098	17,876
E-Inis – PRTLI Cycle 4	578,157	3,776,546	–	2,414,772	2,550,178	1,804,525
Linda Podio – IRCSET Fellow	31,177	24,075	–	43,966	42,603	12,649
Pic Simulations Ldrury SFI 08	87,900	81,250	–	56,592	58,137	111,013
D Coffey IrcSet Fellow	1,774	95,213	–	54,456	53,020	43,967
KM3Net – PP	–	9,600	–	1,623	1,623	7,977
E-Whelan Inspire	–	133,268	–	23,167	23,913	109,355
NGST Project	(14,791)	14,315	–	19,655	22,320	(22,796)
Cosmic Ray Origin	6,563	29,075	–	47,757	47,757	(12,119)
Dobies	(3,270)	6,363	–	6,055	6,055	(2,962)
KVM3Net – Design Study	(830)	7,000	–	7,015	7,015	(845)
Total Astrophysics	**1,720,055**	**4,793,320**	**(5,804)**	**3,134,851**	**3,279,397**	**3,228,174**

2.(b) Project Detail {continued}

	Opening Balance	Receipts	Refunds	Recurrent & Capital Expenditure	Applied as Income (including Capital)	Closing Balance
	€	€	€		€	€
Hades Project/c Ravaut	24,953	–	–	39,000	24,953	–
Nabask	15,490	–	–	–	15,490	–
Samtex	86,984	–	–	5,535	5,535	81,449
SFI Samtex	33,121	–	–	20,203	20,203	12,918
Geo External Funds	37,897	12,901	–	11,394	14,735	36,063
Marem SFI – X Garcia/NUIG	1,632	–	–	–	–	1,632
SFI Joint RFP	84,496	105,321	–	74,713	73,969	115,848
SFI Isle 2 P. Readman	48,939	79,911	–	31,109	31,109	97,741
Geophysics Schools Seismology	6,840	15,355	–	10,561	10,561	11,634
D Khosa – BHP Bill Support	22,095	26,000	–	21,829	21,829	26,266
Dynamics of Cont. SFI Lebedev	64,709	100,791	–	74,483	81,635	83,865
Indepth4 SFI A. Jones	63,662	127,993	–	58,754	72,125	119,530
B.O'Reilly INP Grant	–	3,500	–	2,375	3,500	–
TopoMed	–	92,111	–	73,270	83,283	8,828
Regional Seismic SFI 09 lebedev	–	23,400	–	4,840	8,758	14,642
SFI Picasso	58,919	–	–	54,312	65,568	(6,649)
Irish Geoscience Graduate Programme	62,845	–	–	63,051	63,051	(206)
Pieter Share – CSIR Support	(1,489)	12,157	–	17,424	17,424	(6,756)
Total Geophysics	**611,093**	**599,440**	–	**562,853**	**613,728**	**596,805**
Total Cosmic Physics	**2,356,432**	**5,392,760**	**(7,004)**	**3,697,804**	**3,893,225**	**3,848,963**
Total DIAS	**2,686,109**	**5,692,348**	**(48,987)**	**3,904,099**	**4,096,104**	**4,233,366**

3. Other Income

	2009	2008
	€	€
Bank Interest	89,415	175,063
Fees and Grants	3,201	3,300
Other	10,455	31,251
Total	**103,071**	**209,614**

4. Fixed Assets

	Furniture & Equipment	Motor Vehicles	Computers	Total
	€	€	€	€
Cost				
Opening Balance 1/1/2009	2,350,217	53,200	3,970,315	6,373,732
Additions	1,187,351	–	333,127	1,520,478
Disposals	(2,581)	–	(16,884)	(19,465)
	3,534,987	53,200	4,286,558	7,874,745
Depreciation				
Opening Balance 1/1/2009	1,617,215	39,204	2,038,658	3,695,077
Charge 2009	122,958	13,261	948,246	1,084,465
Disposals	(2,556)	–	(16,884)	(19,440)
	1,737,617	52,465	2,970,020	4,760,102
Net book value 31/12/2009	1,797,370	735	1,316,538	3,114,643
Net book value 31/12/2008	733,002	13,996	1,931,657	2,678,655

5. Capital Reserve

	2009	2008
	€	€
Balance at 1 January	2,678,655	3,500,091
Transfer from/(to) Income and Expenditure Account		
Income allocated to acquire fixed assets	1,520,478	250,430
Amortisation in line with asset depreciation	(1,084,465)	(1,073,385)
Amount released on disposals	(25)	1,519
	435,988	(821,436)
Balance at 31 December	**3,114,643**	**2,678,655**

6. Creditors

Creditors due within twelve months	2009	2008
	€	€
Trade Creditors	457,927	310,239
Accruals	559,331	426,534
Sundry	514	462
VAT	20,672	44,298
Revenue Creditors	169,270	156,059
Deferred Income	57,000	57,000
	1,264,714	994,592

Creditors due after twelve months		2009	2008
		€	€
These comprise:	Vernam Hull Bequest	59,021	57,891
	Carmody Fund	2,460	2,445
		61,481	60,336

The funds relating to the above are held on deposit. No amounts were utilised during the year.

7. Debtors

	2009	2008
	€	€
Prepayments	208,375	528,929
Contributions to Bluegene	142,616	57,000
Book Sales Debtors	5,813	7,433
Sundry	20,378	22,804
Accrued Income	14,961	77,000
	392,143	**693,166**

8. Payroll Costs

	Celtic Studies	Theoretical Physics	Cosmic Physics	Admin.	2009 Total	2008 Total
	€	€	€	€	€	€
Salaries/Wages	1,442,002	892,775	1,988,783	791,317	5,114,877	4,972,532
Scholarships	101,570	56,314	91,320	–	249,204	291,325
Visitors	19,239	69,854	85,121	–	174,214	225,023
Honoraria	–	–	–	–	–	500
	1,562,811	**1,018,943**	**2,165,224**	**791,317**	**5,538,295**	**5,489,380**

9. General Expenses

	Celtic Studies	Theoretical Physics	Cosmic Physics	Admin.	2009 Total	2008 Total
	€	€	€	€	€	€
Miscellaneous	3,417	2,715	24,933	110,757	141,822	123,821
Promotions/Lunches	3,828	2,673	8,012	6,248	20,761	30,607
Professional Fees	–	–	–	40,118	40,118	46,977
Training	310	100	5,149	7,880	13,439	8,398
Audit Fee	–	–	–	17,672	17,672	18,800
Bank Charges	–	–	–	3,289	3,289	4,349
Bad Debt W/O	–	–	–	17,861	17,861	–
Health & Safety	–	–	95	5,518	5,613	10,068
	7,555	**5,488**	**38,189**	**209,343**	**260,575**	**243,020**

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 87 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 2010 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

11. Pension Costs

a) Analysis of total pension costs charged to Expenditure	2009 (€'000)	2008 (€'000)
Current service cost	1,239	1,005
Interest on Pension Scheme Liabilities	1,902	1,658
Employee Contributions	(218)	(245)
	2,923	2,418
b) Movement in Net Pension Liability during the financial year		
Net Pension Liability at 1 January	(32,718)	(29,712)
Current Service Cost	(1,239)	(1,005)
Interest Costs	(1,902)	(1,658)
Actuarial loss/(gain)	2,117	(1,484)
Pensions paid in the year	1,186	1,141
Net Pension Liability at 31 December	**(32,556)**	**(32,718)**

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 Science, 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:

	2009 (€'000)	2008 (€'000)
Funding recoverable in respect of current year pension costs	3,141	2,663
State Grant applied to pay pensioners	(1,186)	(1,141)
	1,955	1,522

The deferred funding asset for pensions as at 31 December 2009 amounted to €32.6 million (2008: €32.7 million).

d) History of defined benefit obligations	2009 (€'000)	2008 (€'000)	2007 (€'000)
Defined benefit obligations	32,556	32,718	29,712
Experience (gains)/losses on Scheme Liabilities amount.	(328)	(1,258)	85
Percentage of Scheme Liabilities.	(1.01%)	(3.84%)	0.29%

The cumulative actuarial (gain)/loss recognised in the Statement of Total Recognised Gains and Losses amounts to (€5,523,000).

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 2009.

The principal actuarial assumptions were as follows:

	At 31/12/09	At 31/12/08	At 31/12/07
Rate of increase in salaries	4.00%	4.00%	4.00%
Rate of increase in pensions in payment	4.00%	4.00%	4.00%
Discount Rate	6.00%	5.70%	5.50%
Inflation Rate	2.25%	2.25%	2.25%

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 2009 and 2034.

Year of attaining age 65	2009	2034
Life expectancy – male	86.7	87.7
Life expectancy – female	89.7	90.7

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.

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

	Total Remuneration €	Total Expenses €
Council Member		
Professor Dervilla Donnelly	–	1,621
Members Appointed by the Governing Boards of Constituent Schools		
Professor Gerry Wrixon	–	2,887
Professor Arthur Jaffe	–	2,116
Professor Anders Ahlqvist	–	12,473
Professor Werner Nahm	–	267
Professor Luke Drury	–	8,612
Professor Fergus Kelly	–	1,210
Registrar		
Mr. Cecil Keaveney *	105,958	1,695

*** Note**

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 14th June 2010.

Ráitis Airgeadais don bhliain dár críoch 31 Nollaig 2009

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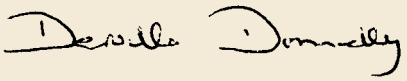
Ráiteas Freagrachtaí na Comhairle

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 comhthoiliú an Aire Airgeadais. Agus an Chomhairle ag ullmhú na ráitis airgeadais sin éilítear uirthi:

- polasaithe chuntasaíochta 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 chuntasaíochta infheidhme a nochtadh agus a mhíniú

Tá freagracht ar an gComhairle leabhair chuntais chearta a choinneáil a nochtaíonn 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 chalaois agus ar neamhrialtachtaí eile agus iad a aimsiú.



Dervilla Donnelly
Cathaoirleach-Comhairle Na hInstitiúide

Werner Nahm
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 thuairisciú 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 thuairiscí 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.

Lean ann an Coiste Iniúchta ag déanamh athbhreithniú (Tá an Coiste Iniúchta ag leanúint ag déanamh athbhreithniú) ar shaincheisteanna rialaithe inmheánaigh agus saincheisteanna a d'ardaigh an tArd-Reachtaire Cuntas agus Ciste.

I 2009, bhuail an Coiste Iniúchta le chéile ar tri ócáid.

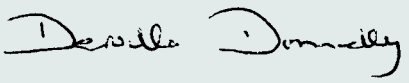
Ina theannta sin, cuireadh tuarascáil an Reachtaire inmheánaigh ar chórais rialaithe inmheánaigh don bhliain 2009 ar fáil do bhaill na Comhairle.

Tá monatóireacht agus athbhreithniú na Comhairle ar éifeachtúlacht an chórais rialaithe airgeadais inmheánaigh coinnithe ar an eolas trí obair an iniúchóra 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 thuairimí a dhéanann an Coiste Iniúchta agus an tArd-Reachtaire Cuntas agus Ciste ina litir bhainistíochta no i dtuairiscí 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 2009.

Sínithe thar ceann Chomhairle na hInstitiúide



Dervilla Donnelly
Cathaoirleach-Comhairle Na hInstitiúide

29 Meitheamh 2010

Tuarascáil an Ard-Reachtaire Cuntas agus Ciste le cur i láthair Thithe an Oireachtais

Tá ráitis airgeadais Institiúid Ard-Léinn Bhaile Átha Cliath don bhliain dar críoch 31 Nollaig 2009 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 Caillteanas Aitheanta Iomlán, an Clár Comhardaithe, an Ráiteas ar Shreabhadh Airgid, agus na nótaí gaolmhara.

Freagrachtaí na Comhairle agus an Ard-Reachtaire Cuntas agus Ciste faoi seach

Tá an Chomhairle freagrach as na ráitis airgeadais a ullmhú de réir an Achta Um Institiúid Ard-Léinn, 1940, agus as rialtacht na n-idirbheart a chinntiú. Ullmhaíonn an Chomhairle na ráitis airgeadais de réir Cleachtais Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn. Tá freagrachtaí cuntasaíochta Chomhaltaí na Comhairle leagtha amach sa Ráiteas um Fhreagrachtaí na Comhairle.

Is é m'fhreagrachtsa ná na ráitis airgeadais a iniúchadh de réir cheanglas ábhartha dlí agus rialúcháin agus Caighdeán Idirnáisiúnta maidir le hIniúchóireacht (Ríocht Aontaithe agus Éire).

Tuairiscím mo thuairim maidir le cibé an dtugann na ráitis airgeadais léargas fíorcheart, de réir Cleachtais Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn. Tuairiscím freisin cibé, dar liom, an raibh leabhair chuntais chuí coinnithe. Lena chois sin, deirim cibé an dtagann na ráitis airgeadais leis na leabhair chuntais.

Tuairiscím ar aon chás ábhartha nár feidhmíodh suimeanna airgid chun na gcríoch a bhí beartaithe nó sa chás nach leanann na hidirbhearta do na húdaráis a rialaíonn iad.

Tuairiscím freisin mura bhfuil an fhaisnéis agus na mínithe ar fad faighte agam agus atá riachtanach chun críocha m'iniúchta.

Scrúdaím an Ráiteas maidir le Rialú Inmheánach Airgeadais le féachaint an léirítear ann gur chomhlíon an Institiúid an Cód Cleachtais maidir le Rialachas Comhlachtaí Stáit agus tuairiscím ar aon chás ábhartha nach ndéanann sé amhlaidh, nó más rud é go bhfuil an ráiteas míthreorach nó nach dtagann sé le faisnéis eile atá ar eolas agam de bharr na ráitis airgeadais a bheith iniúchta agam. Ní cheanglaítear orm a bhreithniú cibé an gclúdaíonn an Ráiteas maidir le Rialú Inmheánach Airgeadais gach priacal agus rialú airgeadais, ná teacht ar thuairim maidir le héifeachtacht na nósanna imeachta maidir le priacail agus rialú.

Léim faisnéis eile atá sa Tuarascáil Bhliantúil, agus breithním cibé an dtagann sé leis na ráitis airgeadais iniúchta. Breithním na himpleachtaí do mo thuarascáil má thagaim ar an eolas faoi aon rud atá, de réir cosúlachta, ina mhíráiteas nó ina neamhréireacht ábhartha leis na ráitis airgeadais.

An Bunús atá le mo Thuairim ar na Ráitis

I mbun m'fheidhme mar Ard-Reachtaire Cuntas agus Ciste, rinne mé m'iniúchadh ar na ráitis airgeadais de réir Caighdeán Idirnáisiúnta maidir le hIniúchóireacht (Ríocht Aontaithe agus Éire) arna n-eisiúint ag an mBord um Chleachtais Iniúchóireachta agus trí thagairt a dhéanamh do na nithe ar leith is gá a chur san áireamh i ndáil le cúrsaí bainisteoireachta agus oibriúcháin a ghabhann le comhlachtaí Stáit. Déantar scrudú mar chuid den iniúchadh, ar bhonn tástála, ar fhianaise a bhaineann le suimeanna agus rialtacht na n-idirbheart airgeadais a chuirtear san áireamh sna ráitis airgeadais, agus leis na hidirbhearta a fhoilsítear iontu. Chomh maith leis sin, cuimsíonn an t-iniúchadh measúnacht ar na meastacháin agus ar na breitheanna suntasacha a rinneadh agus na ráitis airgeadais á n-ullmhú, agus measúnacht le féachaint 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.

Phleanáil mé agus rinne mé m'iniúchadh sa chaoi is go bhfaighinn an fhaisnéis agus na mínithe ar fad a mheas mé a bheith riachtanach ionas go mbeadh leordhóthain fianaise agam a d'fhágfadh cinnteacht réasúnach ann go bhfuil na ráitis airgeadais saor ó mhíráiteas ábhartha, cibé acu calaois nó neamhrialtacht eile nó earráid is cúis leis sin. I dteacht ar mo thuairim, rinne mé meastóireacht ar a shásúla is a cuireadh faisnéis i láthair sna ráitis airgeadais san iomlán freisin.

Tuairim

Is é mo thuairim go dtugann na ráitis airgeadais léargas fíorcheart, de réir Cleachtais Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn, ar riocht ghnóthaí na hInstitiúide ag 31 Nollaig 2009 agus ar a hioncam agus ar a caiteachas don bhliain dar críoch sin.

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

Gerard Smyth
Le haghaidh agus thar ceann an Ard-Reachtaire Cuntas agus Ciste
30 Meitheamh 2010

Polasaithe Chuntasaíochta

GINEARÁLTA

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

Áirítear ar a cuid feidhmeanna saoráidí a sholáthar le hard-léinn a chur chun cinn tuilleadh agus le taighde a dhéanamh i mbrainsí speisialtachta 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 fabhraithe faoin gcoinbhinsiún costais stairiúil agus de réir chleachtas cuntasaíochta a nglactar leo tríd is tríd. Glactar le Caighdeáin 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%
Sár-ríomhaire	33.3%

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

4. Cúlchiste Caipitil

Léiríonn cúltaca caipitiúil luach neamh-amúchta ioncaim a úsáidtear le Sócmhainní Seasta a cheannach.

5. Leabharlann

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

6. Foilseacháin

Díscríobhtar caiteachas ar fhoilseacháin sa bhliain a dtabhaítear é.

7. Aoisliúntas

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 Eolaíochta ar fáil agus ó ranníocaíochtaí a asbhaintear ó thuarastail foirne.

Léirionn 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 Eolaíochta.

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 Eolaíochta.

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 tionscadal.

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

	Nótaí	2009	2008
		€	€
Ioncam			
Deontas Oireachtais		9,161,302	8,044,000
Glan-mhaoiniú iarchurtha do phinsin	11.c	1,955,026	1,521,928
Díolacháin Foilseachán		52,515	58,288
Tionscadail	2	4,096,104	4,662,941
Eile	3	103,071	209,614
Ranníocaíocht-Óstáil Bluegene		456,000	456,000
		15,824,018	14,952,771
Aistriú (chuig)/ó Cúlchiste Caipitil	5	(435,988)	821,436
		15,388,030	15,774,207
Caiteachas	1		
Scoil an Léinn Cheiltigh		1,687,431	1,725,771
Scoil na Fisice Teoiriciúla		1,297,841	1,342,934
Scoil na Fisice Cosmaí		6,014,710	6,612,548
Riarachán		6,213,239	5,763,256
		15,213,221	15,444,509
Barraíocht don bhliain		**174,809**	**329,698**
Iarmhéid amhail an 1 Eanáir		1,042,362	712,664
Iarmhéid amhail an 31 Nollaig		**1,217,171**	**1,042,362**

Ráiteas ar Ghnóthachain agus Caillteanais Aitheanta		**2009**	**2008**
Barrachas don bhliain		174,809	329,698
Caillteanais/(gnóthachain) iarbhíre ar dhliteanais na scéime pinsin		(328,000)	(1,258,000)
Athruithe i dtoimhdí is bonn do luach reatha dhliteanais na scéime pinsin		2,445,000	(226,000)
Caillteanas/(gnóthachan) achtúireach ar Dhliteanais Phinsin	**11.b**	**2,117,000**	**(1,484,000)**
Coigeartú ar Mhaoiniú an Phinsin Iarchurtha		**(2,117,000)**	**1,484,000**
Gnóthachan iomlán aitheanta don bhliain		**174,809**	**329,698**

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

Dervilla Donnelly
Cathaoirleach – Comhairle na hInstitiúide

Werner Nahm
Comhalta den Chomhairle

Clár Comhardaithe

	Nótaí	2009	2008
		€	€
Sócmhainní			
Sócmhainní Seasta	4	3,114,643	2,678,655
Sócmhainní Reatha:			
Airgead sa Lámh agus ag an mBanc		6,384,589	4,090,233
Féichiúnaithe agus Réamhíocaíochtaí	7	392,143	693,166
Féichiúnaithe Tionscadal	2	54,903	101,330
Sócmhainní Iomlána		**9,946,278**	**7,563,384**
Lúide Dliteanais			
Creidiúnaithe – Méideanna atá dlite laistigh de bhliain amháin			
Creidiúnaithe agus Fabhruithe		1,264,714	994,592
Creidiúnaithe Tionsadáil	2	4,288,269	2,787,439
Creidiúnaithe – méideanna atá dlite tar éis bliana amháin	6	61,481	60,336
Dliteanais Iomlána Roimh Phinsin		**5,614,464**	**3,842,367**
Sócmhainní (Glana) lúide dliteanais Roimh Phinsin		**4,331,814**	**3,721,017**
Maoiniú an Phinsin Iarchurtha	11.c	**32,556,000**	**32,718,000**
Dliteanais Phinsin	11.b	(32,556,000)	(32,718,000)
Sócmhainní Glana		**4,331,814**	**3,721,017**
Maoinithe ag:			
Cuntas Ioncaim agus Caiteachais		1,217,171	1,042,362
Cúlchiste Caipitil	5	3,114,643	2,678,655
		4,331,814	**3,721,017**

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

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Comhalta den Chomhairle

Ráiteas Sreabhadh Airgid

	Nótaí	2009	2008
		€	€
Réiteach barrachais oibríochta chuig glan-insreabhadh airgid ó ghníomhaíochtaí oibríochta			
Barrachas don bhliain		**174,809**	**329,698**
Ús infhaighte	3	(89,415)	(175,063)
Ardú i gCreidiúnaithe		218,303	500,253
Ardú i bhFéichiúnaithe		301,023	(341,903)
Glan-ardú i gCláir Thaighde agus Táillí		1,600,221	(478,807)
Dímheas	4	1,084,465	1,073,385
Aistriú Cúlchiste Caipitil	5	435,988	(821,436)
Caillteanas ar dhiúscairt		25	(1,519)
Glaninsreabhadh Airgid tirim ó ghníomhaíochtaí oibríochta		3,725,419	84,607
Ráiteas Sreabhadh Airgid			
Glaninsreabhadh airgid ó ghníomhaíochtaí oibríochta		3,725,419	84,607
Aischuir ar infheistíochtaí agus seirbhísiú airgeadais			
Ús Bainc Infhaighte	3	89,415	175,063
Caiteachas Caipitiúil			
Ceannach Sócmhainní Inláimhsithe	4	(1,520,478)	(250,430)
Ardú ar Airgead		**2,294,356**	**9,241**
Réiteach glaninsreabhadh airgead tirim chuig gluaiseacht i nglanchistí			
Ardú ar Airgead Tirim		2,294,356	9,241
Iarmhéid faoin 1 Eanáir		4,090,233	4,080,992
Iarmhéid faoin 31 Nollaig		**6,384,589**	**4,090,233**

Anailís ar athrú i nglanchistí	Airgead infhaighte sa Bhanc	Iomlán
	€	€
I dtús na bliana 2008	4,090,233	4,090,233
Sreabhadh Airgid	2,294,356	2,294,356
Ag deireadh na bliana 2008	**6,384,589**	**6,384,589**

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

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Werner Nahm
Comhalta den Chomhairle

Nótaí do na Ráitis Airgeadais

1 Anailís Shonraithe d'Ioncam & Caiteachas don bhliain dár críoch 31/12/2009

	Nótaí	Léann Cheilteach	Fisic Theoiriciúil	Fisic Chosmach	Riarachán	2009 Iomlán	2008 Iomlán
		€	€	€	€	€	€
IONCAM							
Deontais Oireachtais		2,009,555	1,209,306	4,183,214	1,759,227	9,161,302	8,044,000
Glan-mhaoiniú iarchurtha do phinsin	11.c	(364,894)	(81,160)	(627,243)	3,028,323	1,955,026	1,521,928
Díolacháin Foilseachán		52,515	–	–	–	52,515	58,288
Ioncam Tionscadail	2.a	26,079	176,800	3,684,627	208,598	4,096,104	4,662,941
Ioncam Eile	3	–	3,101	10,340	89,630	103,071	209,614
Ranníocaíocht-Óstáil Bluegene		–	–	–	456,000	456,000	456,000
		1,723,255	1,308,047	7,250,938	5,541,778	15,824,018	14,952,771
Aistriú (chuig) ó Chúlchiste Caipitil*		–	–	–	(435,988)	(435,988)	821,436
		1,723,255	1,308,047	7,250,938	5,105,790	15,388,030	15,774,207
CAITEACHAS							
Costais Phárolla	8	1,562,811	1,018,943	2,165,224	791,317	5,538,295	5,489,380
Costais phinsin	11.a	(50,266)	(43,585)	(77,355)	3,113,369	2,942,163	2,430,953
Costais Tionscnaimh Pinsin	11.a	(887)	(2,528)	(15,746)	–	(19,161)	(12,896)
Costais Tionscnamh	2.a	26,966	179,329	3,697,804	–	3,904,099	4,611,756
Costais Óstála Bluegene		–	–	–	298,835	298,835	341,211
Stóráil Leabharlainne agus Leabhar		38,000	101,933	67,609	12,720	220,262	251,114
Dímheas	4	–	–	–	1,084,465	1,084,465	1,073,385
Cíos, Rátaí agus Árachas		–	–	–	176,030	176,030	173,425
Costais Ghinearálta	9	7,555	5,488	38,189	209,343	260,575	243,020
Costais Taistil agus Seimineáir		26,800	21,416	89,068	10,657	147,941	166,446
Cothabháil Áitribh agus Slándáil		–	–	–	238,513	238,513	230,591
Costais ríomhairí agus Idirlín		6,425	3,579	33,653	50,616	94,273	106,123
Breosla Solas agus Cumhacht		–	–	–	158,280	158,280	146,347
Post agus Teileafón		–	–	–	37,948	37,948	48,439
Páipéarachas		10,161	1,257	6,122	22,581	40,121	54,439
Foilseacháin		51,993	–	1,502	–	53,495	47,545
Fógraíocht		250	486	624	2,474	3,834	15,092
Mion Trealamh Oifige		7,623	11,523	8,016	6,066	33,228	29,658
(Gnóthachan)/Caillteanas ar dhiúscairt		–	–	–	25	25	(1,519)
		1,687,431	1,297,841	6,014,710	6,213,239	15,213,221	15,444,509
BARRAÍOCHT/(EASNAMH) DON BHLIAIN		**35,824**	**10,206**	**1,236,228**	**(1,107,449)**	**174,809**	**329,698**
Iarmhéid amhail an 1 Eanáir		276,886	101,666	(272,382)	937,191	1,042,362	712,664
Iarmhéid amhail an 31 Nollaig		**312,710**	**111,872**	**962,846**	**(170,258)**	**1,217,171**	**1,042,362**

2. Tionscadail

	2009	2008
	€	€
Iarmhéideanna Tosaigh	2,686,109	3,164,916
Admhálacha	5,643,361	4,184,134
	8,329,470	7,349,050
Iarmhéideanna Deiridh (Féichiúnaithe €54,903 Creidiúnaithe €4,288,269)	(4,233,366)	(2,686,109)
Curtha i bhfeidhm mar ioncam	4,096,104	4,662,941
Leithroinnt Ioncaim		
Scoil an Léinn Cheiltigh	26,079	57,295
Scoil na Fisice Teoiriciúla	176,800	220,173
Scoil na Fisice Cosmaí	3,684,627	4,316,190
	3,887,506	4,593,658
Riarachán	208,598	69,283
Ioncam Iomlán Thionscadal	4,096,104	4,662,941

Costais Tionscadal

	Léann Cheilteach	Fisic Theoiriciúil	Fisic Chosmach	2009 Iomlán	2008 Iomlán
	€	€	€	€	€
Íocaíochtaí chuig Páirtithe/ Comhlachais	–	–	2,653,984	2,653,984	3,186,196
Tuarastail/Scoláireachtaí	24,499	141,877	790,347	956,723	977,491
Taisteal	–	36,786	195,094	231,880	202,112
Eile	2,467	666	58,379	61,512	245,957
Costas Iomlán Tionscadal	26,966	179,329	3,697,804	3,904,099	4,611,756

2.(b) Sonraí Tionscadail

	Iarmhéid Tosaigh	Admhálacha	Aisíocaíochtaí	Caiteachas Athfhillteach Caipitiúil	Curtha I bhfeidhm mar Ioncam (Caipteal san áireamh)	Iarmhéid Deiridh
	€	€	€		€	€
Scoil an Léinn Cheiltigh						
ISOS	20,554	–	–	2,467	2,467	18,087
Irchss G Manning Award	11,923	17,581	–	24,499	23,612	5,892
Celtic Summer School	2,016	–	–	–	–	2,016
Iomlán-Leánn Ceilteach	**34,493**	**17,581**	**–**	**26,966**	**26,079**	**25,995**

2.(b) Sonraí Tionscadail {ar lean}

	Iarmhéid Tosaigh	Admhálacha	Aisíocaíochtaí	Caiteachas Athfhillteach Caipitiúil	Curtha I bhfeidhm mar Ioncam (Caipteal san áireamh)	Iarmhéid Deiridh
	€	€	€		€	€
Scoil na Fisice Teoiriciúla						
S Ni Chiagain – Ircset	2,944	–	–	–	–	2,944
Seckin Kurkcuonglu	1,852	–	–	–	–	1,852
Subrata Bal – Fellow	9,974	–	–	–	–	9,974
Francis Dolan – IrcSet Fellow	9,874	–	–	–	–	9,874
Oliver Rosten – IrcSet Fellow	9,608	–	–	–	–	9,608
SFI Bethe Ansatz	69,784	–	(36,470)	7,847	7,530	25,784
Non-Commutative Geometry	102,765	58,898	–	31,067	30,202	131,461
TopQUIC	13,140	–	(5,513)	7,627	7,627	–
Veselin Filev – IrcSet Fellow	20,345	51,938	–	42,325	41,021	31,262
V Dotsenko – IrcSet Fellow	21,219	51,937	–	43,082	41,519	31,637
T Tchrakian SFI 07 award		107,196	–	611	611	106,585
Babar Qureshi – IrcSet Fellow	33,679	12,038	–	46,770	48,290	(2,573)
Iomlán-FisicTheoiriciúil	**295,184**	**282,007**	**(41,983)**	**179,329**	**176,800**	**358,408**
Scoil na Fisice Cosmaí						
Gamma Ray Bursts	25,284	–	(1,200)	100	100	23,984
Iomlán-Réalteolaíocht	**25,284**	**–**	**(1,200)**	**100**	**100**	**23,984**
Dos Max	12,814	–	–	965	965	11,849
PRTLI-CosmoGrid	914,800	–	–	–	6,324	908,476
Nam Conference	17,218	–	–	334	334	16,884
Jet 4 (Central Engines…stars)	22,217	–	(5,804)	15,172	15,172	1,241
Jetset	(80,951)	394,751	–	293,170	293,170	20,630
Jonathan Mackey – IrcSet Postgrad	3,539	12,002	–	14,589	14,589	952
SFI Felix GNM	63,321	53,802	–	44,126	44,126	72,997
SFI Cores to Disks	46,481	144,022	–	65,154	63,998	126,505
Paul Dempsey – IRCSET Fellow	33,936	12,038	–	26,283	28,098	17,876
E-Inis – PRTLI Cycle 4	578,157	3,776,546	–	2,414,772	2,550,178	1,804,525
Linda Podio – IRCSET Fellow	31,177	24,075	–	43,966	42,603	12,649
Pic Simulations Ldrury SFI 08	87,900	81,250	–	56,592	58,137	111,013
D Coffey IrcSet Fellow	1,774	95,213	–	54,456	53,020	43,967
KM3Net – PP	–	9,600	–	1,623	1,623	7,977
E-Whelan Inspire	–	133,268	–	23,167	23,913	109,355
NGST Project	(14,791)	14,315	–	19,655	22,320	(22,796)
Cosmic Ray Origin	6,563	29,075	–	47,757	47,757	(12,119)
Dobies	(3,270)	6,363	–	6,055	6,055	(2,962)
KVM3Net – Design Study	(830)	7,000	–	7,015	7,015	(845)
Iomlán-Réaltfhisic	**1,720,055**	**4,793,320**	**(5,804)**	**3,134,851**	**3,279,397**	**3,228,174**

2.(b) Sonraí Tionscadail {ar lean}

	Iarmhéid Tosaigh	Admhálacha	Aisíocaíochtaí	Caiteachas Athfhillteach Caipitiúil	Curtha I bhfeidhm mar Ioncam (Caipiteal san áireamh)	Iarmhéid Deiridh
	€	€	€		€	€
Hades Project/c Ravaut	24,953	–	–	39,000	24,953	–
Nabask	15,490	–	–	–	15,490	–
Samtex	86,984	–	–	5,535	5,535	81,449
SFI Samtex	33,121	–	–	20,203	20,203	12,918
Geo External Funds	37,897	12,901	–	11,394	14,735	36,063
Marem SFI – X Garcia/NUIG	1,632	–	–	–	–	1,632
SFI Joint RFP	84,496	105,321	–	74,713	73,969	115,848
SFI Isle 2 P. Readman	48,939	79,911	–	31,109	31,109	97,741
Geophysics Schools Seismology	6,840	15,355	–	10,561	10,561	11,634
D Khosa – BHP Bill Support	22,095	26,000	–	21,829	21,829	26,266
Dynamics of Cont. SFI Lebedev	64,709	100,791	–	74,483	81,635	83,865
Indepth4 SFI A. Jones	63,662	127,993	–	58,754	72,125	119,530
B.O'Reilly INP Grant	–	3,500	–	2,375	3,500	–
TopoMed	–	92,111	–	73,270	83,283	8,828
Regional Seismic SFI 09 lebedev	–	23,400	–	4,840	8,758	14,642
SFI Picasso	58,919	–	–	54,312	65,568	(6,649)
Irish Geoscience Graduate Programme	62,845	–	–	63,051	63,051	(206)
Pieter Share – CSIR Support	(1,489)	12,157	–	17,424	17,424	(6,756)
Iomlán-Geoifisic	**611,093**	**599,440**	–	**562,853**	**613,728**	**596,805**
Iomlán Fisic Chosmach	**2,356,432**	**5,392,760**	**(7,004)**	**3,697,804**	**3,893,225**	**3,848,963**
Iomlán DIAS	**2,686,109**	**5,692,348**	**(48,987)**	**3,904,099**	**4,096,104**	**4,233,366**

3. Ioncam Eile

	2009	2008
	€	€
Ús bainc	89,415	175,063
Táillí & Deontais	3,201	3,300
Eile	10,455	31,251
Iomlán	**103,071**	**209,614**

4. Sócmhainní Seasta

	Troscán & Trealamh	Mótarfheithiclí	Ríomhairí	Iomlán
	€	€	€	€
Costais				
Iarmhéid Tosaigh 1/1/2009	2,350,217	53,200	3,970,315	6,373,732
Breiseanna	1,187,351	–	333,127	1,520,478
Riartha	(2,581)	–	(16,884)	(19,465)
	3,534,987	53,200	4,286,558	7,874,745
Dímheas				
Iarmhéid Tosaigh 1/1/2009	1,617,215	39,204	2,038,658	3,695,077
Muirear 2009	122,958	13,261	948,246	1,084,465
Riartha	(2,556)	–	(16,884)	(19,440)
	1,737,617	52,465	2,970,020	4,760,102
Luach glan de réir na leabhar 31/12/2009	1,797,370	735	1,316,538	3,114,643
Luach glan de réir na leabhar 31/12/2008	733,002	13,996	1,931,657	2,678,655

5. Cúlchiste Caipitil

	2009	2008
	€	€
Iarmhéid amhail an 1 Eanáir	2,678,655	3,500,091
Aistriú ó/(chuig) Cuntas Ioncaim agus Caiteachais		
Ioncam leithroinnte le sócmhainní seasta a fháil	1,520,478	250,430
Amúchadh ag teacht le dímheas sócmhainní	(1,084,465)	(1,073,385)
Méid scaoilte ar dhiúscairtí	(25)	1,519
	435,988	(821,436)
Iarmhéid amhail an 31 Nollaig	**3,114,643**	**2,678,655**

6. Creidiúnaithe

Méideanna atá dlite laistigh de bhliain amháin		2009	2008
		€	€
Creidiúnaithe Trádála		457,927	310,239
Fabhruithe		559,331	426,534
Ilnithe		514	462
CBL		20,672	44,298
Creidiúnaithe Ioncaim		169,270	156,059
Ioncam Iarchurtha		57,000	57,000
		1,264,714	994,592

Méideanna atá dlite tar éis bliana amháin		2009	2008
		€	€
Comhdhéanta as:	Vernam Hull Bequest	59,021	57,891
	Carmody Fund	2,460	2,445
		61,481	60,336

Tá an t-airgead a bhaineann leo seo sealbhaithe mar éarlais. Níor baineadh úsáid as aon mhéideanna le linn na bliana.

7. Féichiúnaithe

	2009	2008
	€	€
Réamhíocaíochtaí	208,375	528,929
Ranníocaíocht-Óstáil Bluegene	142,616	57,000
Féichiúnaithe-Díolacháin Leabhar	5,813	7,433
Ilnithe	20,378	22,804
Ioncam Fabhraithe	14,961	77,000
	392,143	**693,166**

8.Costais Phárolla

	Léann Ceilteach	Fisic Theoiriciúil	Fisic Chosmach	Riar.	2009 Iomlán	2008 Iomlán
	€	€	€	€	€	€
Tuarastal/Pá	1,442,002	892,775	1,988,783	791,317	5,114,877	4,972,532
Scoláireachtaí	101,570	56,314	91,320	–	249,204	291,325
Cuairteoirí	19,239	69,854	85,121	–	174,214	225,023
Honoraria	–	–	–	–	–	500
	1,562,811	**1,018,943**	**2,165,224**	**791,317**	**5,538,295**	**5,489,380**

9. Costais Ghinearálta

	Léann Ceilteach	Fisic Theoiriciúil	Fisic Chosmach	Riar.	2009 Iomlán	2008 Iomlán
	€	€	€	€	€	€
Ilghnéitheach	3,417	2,715	24,933	110,757	141,822	123,821
Tionscnaimh cur chun cinn/Lóin	3,828	2,673	8,012	6,248	20,761	30,607
Táillí Gairmiúla	–	–	–	40,118	40,118	46,977
Oiliúint	310	100	5,149	7,880	13,439	8,398
Táille Iniúchta	–	–	–	17,672	17,672	18,800
Muirir Bhainc	–	–	–	3,289	3,289	4,349
Drochfhiach DíscrIobh	–	–	–	17,861	17,861	–
Sláinte & Sábháilteacht	–	–	95	5,518	5,613	10,068
	7,555	**5,488**	**38,189**	**209,343**	**260,575**	**243,020**

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-airítear ná Réadlann Dhún Sinche, 5 Cearnóg Mhuirfean, 9-10 Bóthar Burlington agus 31Plás Mhic Liam.

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

Is é tiomantas ar bhonn léasanna den sórt sin maidir le 2010 na €113,609.

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

11. Costais Pinsean

a) Anailís ar na costais iomlána pinsin curtha chun dochair do Chaiteachas	**2009 (€'000)**	**2008 (€'000)**
Costas seirbhíse reatha	1,239	1,005
Ús ar Dhliteanais na Scéime Pinsin	1,902	1,658
Ranníocaíochtaí Fostaí	(218)	(245)
	2,923	2,418
b) Gluaiseacht i nGlan-Dliteanas Pinsin i rith na bliana airgeadais		
Glan-Dliteanas Pinsin amhail an 1 Eanáir	(32,718)	(29,712)
An Costas Seirbhíse Reatha	(1,239)	(1,005)
Costais Úis	(1,902)	(1,658)
Caillteanas/(gnóthachan) achtúireach	2,117	(1,484)
Pinsin íoctha sa bhliain	1,186	1,141
Glan-Dliteanas Pinsin amhail an 31 Nollaig	**(32,556)**	**(32,718)**

c) Cistiú Iarchurtha 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 scéim 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 measatachán bliantúil. Cé nach bhfuil aon socrú foirmiúil maidir leis na méideanna sonracha seo déanta leis an Roinn Oideachais agus Eolaíochta, níl aon fhianaise ag DIAS nach leanfaidh an polasaí maoinithe seo de bheith ag freastal ar a leithéid de shuimeanna de réir an chleachtais reatha.

Sa Chuntas Ioncaim agus Caiteachais, aithníodh an Glan-Mhaoiniú Iarchurtha do Phinsin sa bhliain mar seo leanas:

	2009 (€'000)	**2008 (€'000)**
Maoiniú inaisghabhála i ndáil le costais phinsin na bliana reatha	3,141	2,663
Deontas Stáit feidhmithe chun pinsinéirí a íoc	(1,186)	(1,141)
	1,955	1,522

Ba í €32.6 milliún (2008: €32.7 milliún) an tsócmhainn mhaoinithe iarchurtha do phinsin amhail an 31 Nollaig 2009.

d) Stair na nOibleagáidí faoin scéim shochair shainithe.	**2009 (€'000)**	**2008 (€'000)**	**2007 (€'000)**
Oibleagáidí shochair shainithe.	32,556	32,718	29,712
(Gnóthachain)/caillteanais iarbhíre ar dhliteanais na scéime.	(328)	(1,258)	85
Céatadán de luach dhliteanais na scéime.	(1.01%)	(3.84%)	0.29%

Tá (gnóthachan)/caillteanas achtúireach carnach (€5,523,000) aitheanta sa Ráiteas d'Iomlán na nGnóthachan agus na gCaillteanas Aitheanta.

11. Costais Pinsean {ar lean}

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 2009 a mheasúnú.

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

	Ar 31/12/09	Ar 31/12/08	Ar 31/12/07
Ráta na nArduithe Tuarastail	4.00%	4.00%	4.00%
Ráta na nArduithe Pinsin atá á n-íoc	4.00%	4.00%	4.00%
Ráta Lascaine	6.00%	5.70%	5.50%
Ráta Boilscithe	2.25%	2.25%	2.25%

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 2009 agus in 2034.

Aois 65 sa bhliain	2009	2034
Ionchas saoil – fir	86.7	87.7
Ionchas saoil – mná	89.7	90.7

12. Nochtadh Idirbheartaíochtaí

Glacann Comhairle na hInstitiúide le nósanna imeachta de réir threoirlínte atá eisithe ag an Roinn Airgeadais maidir le leasanna a nochtaíonn 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

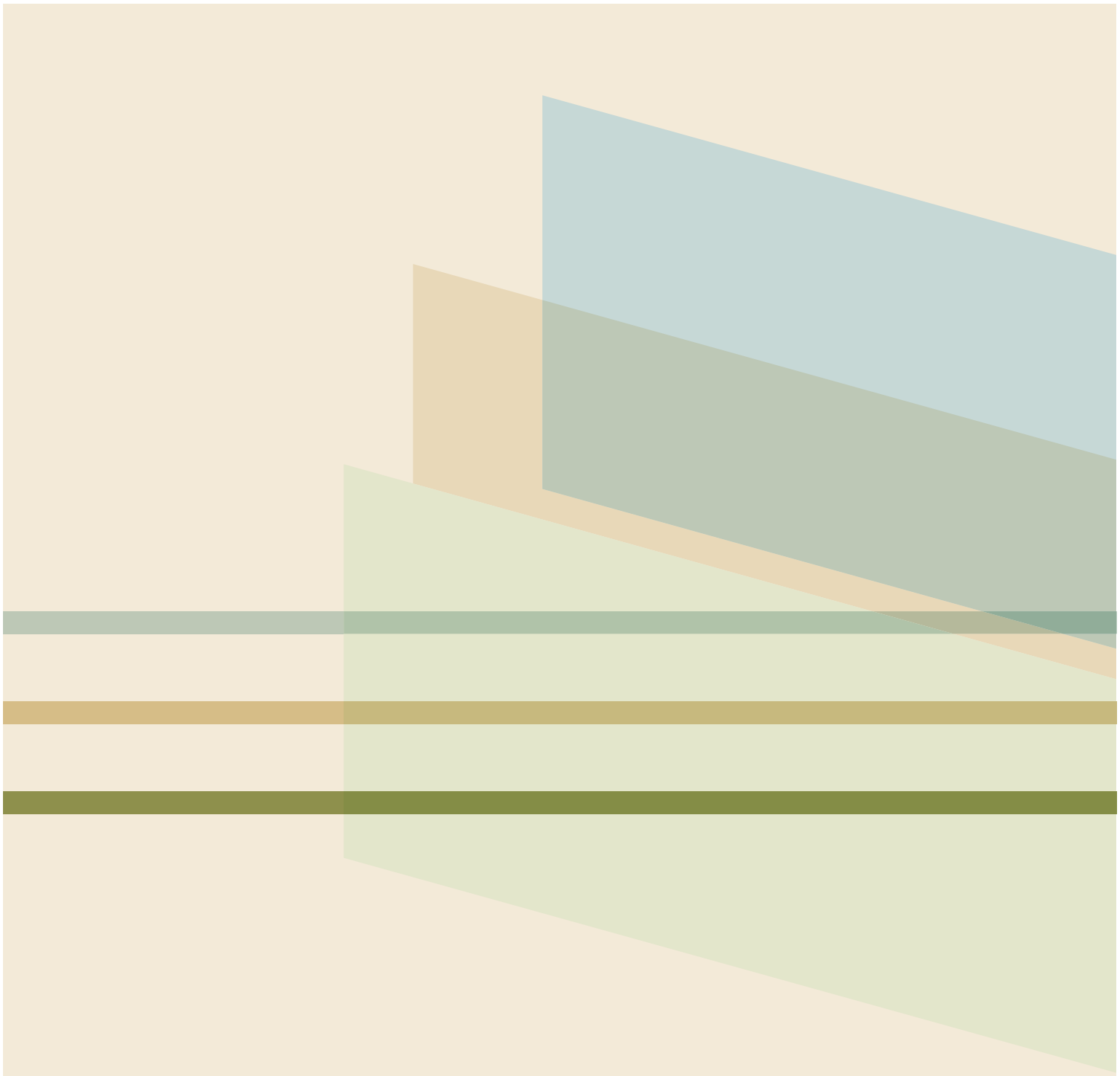
	Tuarastal	Costais Iomlán
	€	€
Comhalta den Chomhairle		
An tOllamh Dervilla Donnelly		1,621
Comhaltaí Ceaptha ag Boird Rialacháin na gComhscoileanna		
An tOllamh Gerry Wrixon		2,887
An tOllamh Arthur Jaffe		2,116
An tOllamh Anders Ahlqvist		12,473
An tOllamh Werner Nahm		267
An tOllamh Luke Drury		8,612
An tOllamh Fergus Kelly		1,210
Cláraitheoir		
An tUas Cecil Keaveney *	105,958	1,695

*** Nóta**

Ní sháraíonn teidlíochtaí pinsin an Chláraitheora gnáththeidlíochtaí scéim aoisliúntais le sochar sainithe na hearnála poiblí.

14 Ceadú Cuntais

Cheadaigh an Chomhairle na Ráitis Airgeadais ar an 14 Meitheamh 2010.



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