DAIR
DIAS Access to Institutional Repository

DIAS
Institiúid Ard-Léinn Bhaile Átha Cliath | Dublin Institute for Advanced Studies

Title	DIAS Annual Report 2005
Creators	DIAS, Council
Date	2005
Citation	DIAS, Council (2005) DIAS Annual Report 2005. Communications of the Dublin Institute for Advanced Studies.
URL	https://dair.dias.ie/id/eprint/114/

Dublin Institute for Advanced Studies

Institiúid Ard-Léinn Bhaile Átha Cliath

ANNUAL REPORT **2005** TUAIRISC BHLIANTÚIL

Contents/Clár Ábhair

Chairman's Introduction 2

School of Celtic Studies 4

School of Cosmic Physics 6

School of Theoretical Physics 28

Administration and Finance 33

Institute Staff 34

Financial Statements 38

Réamhrá an Chathaoirligh 2

Scoil an Léinn Cheiltigh 4

Scoil na Fisice Cosmaí 6

Scoil na Fisice Teoiriciúla 28

Riarachán agus Airgeadas 33

Ráitis Airgeadais 54

Chairman's Statement

Réamhrá an Chathaoirligh

The results of our research work carried out in 2005 shows that progress continues to be the hallmark of the Institute. The atmosphere, the hunger and the excitement for the research reinforces our belief that the scientists and scholars of the Dublin Institute for Advanced Studies (DIAS) are capable of creating innovation, of seeing the potential application of new technologies and working collaboratively to make progress possible. We can through science both in Cosmic and in Theoretical Physics and in the humanities through 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 are able to make our strong international contacts and networks available to their researchers. Under the auspices of our visitors programme this year we attracted to our shores the Nobel laureate Professor Jurg Frohlich from Zurich who presented four lectures under the John Lewis lecture series, a collaborative programme with the Hamilton Mathematical Institute. The Institute through the School of Cosmic Physics hosted the IAU Symposium in Dublin Castle on "Populations of high energy sources in galaxies" during which the renowned astrophysicist Professor Geoffrey Burbidge gave a public lecture.

The many challenging problems posed by the growing importance of applied computing causes one to focus and motivate research in mathematics and computer science. 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. The DIAS and Cosmogrid are founding members of the consortium which established the Irish Centre for High End Computing.

The Statutory Public Lecture of the School of Celtic Studies held this year in conjunction with Tionol was given by the present Director Professor Liam Breatnach who earlier in the year published volume five of the Early Irish Law Series *A Companion to the Corpus Iuris Hibernici*, an important work with relevance to legal scholars, historians and linguists. The School's website continues to be an invaluable service to scholars worldwide and this year has in collaboration with Dr Katharine Simms of Trinity College expanded the database of Bardic Poetry.

In 2005 the Institute researchers had increased success in their applications for research funding thus expanding in a dramatic way the research output. It was found necessary to request an increase in our current space allocation from the Department

Léiríonn na torthaí den obair thaighde a rinneadh sa bhliain 2005 go bhfuil an dul chun cinn go fóill ina chomhartha sóirt den Institiúid. Treisíonn an t-atmaisféar, an dúil agus an spreagadh sa taighde ár gcreideamh go bhfuil ar chumas eolaithe agus scoláirí Institiúid Ard-Léinn Bhaile Átha Cliath (DIAS) an nuáil a chruthú, feidhmiú féideartha na dteicneolaíochtaí nua a fheiceáil agus oibriú i gcomhar chun go bhféadfar an dul chun cinn a dhéanamh. Is féidir linn tríd an eolaíocht i bhFisic Chosmach agus i bhFisic Theoiriciúil agus sna daonnachtaí tríd an léann Ceilteach tionchar a bheith againn ar Éirinn dá bhfónaimid, agus a bheith ábhartha di, go speisialta trínár gcaidreamh láidir leis na hOllscoileanna agus le hInstitiúidí tríú leibhéal eile dá bhfuileamar in ann ár dteagmhálacha agus ár líonraí láidre idirnáisiúnta a chur ar fáil dá dtaighdeoirí. Faoi choimirce ár gclár cuairteoirí i mbliana, mheallamar an Laureate Nobel, An tOllamh Jurg Frohlich as Zürich chuig an tír seo, agus chuir sé ceithre léacht i láthair faoi shraith léachtanna John Lewis, clár comhoibritheach le hInstitiúid Matamaitice Hamilton. D'óstaigh an Institiúid trí Scoil na Fisice Cosmaí Siompóisiam IAU i gCaisleán Bhaile Átha Cliath ar "Pobail foinsí ard-fhuinnimh i réaltraí" ar thug an t-astrafisiceoir cáiliúil, an tOllamh Geoffrey Burbidge, léacht poiblí lena linn.

Tugann an iliomad dúshláin a chruthaítear leis an méadú atá ag teacht ar an tábhacht a bhaineann le ríomhaireacht fheidhmeach ar dhuine taighde i matamaitic agus in eolaíocht ríomhaireachta a fhócasú agus a spreagadh. Beidh taighdeoirí oilte a bheidh ag tabhairt faoi na hábhair sin de dhíth ar na disciplíní eolaíochta amach anseo. Tá foireann na hInstitiúide a bhfuil sainordú acu díriú isteach ar réimsí taighde bunaidh agus ar réimsí taighde amach anseo i sainréimsí i ndea-riocht glacadh leis na dúshláin sin. Is comhaltaí bunaithe iad DIAS agus Cosmogrid den chuibhreannas a bhunaigh Ionad na hÉireann don Ard-Ríomhaireacht.

Is é an Stiúrthóir reatha, An tOllamh Liam Breatnach, a d'fhoilsigh imleabhar a cúig den Shraith Luath-Dhlí na hÉireann *A Companion to the Corpus Iuris Hibernici*, saothar tábhachtach atá ábhartha do scoláirí dlí, staraithe agus teangeolaithe, a thug Léacht Reachtúil Poiblí Scoil an Léinn Cheiltigh a tionóladh i mbliana i gcomhar le Tionól. Leanann láithreán gréasáin na Scoile de bheith ina sheirbhís róluachmhar do scoláirí ar fud an domhain agus rinneadh leathnú i mbliana, i gcomhar leis an Dr Katherine Simms as Coláiste na Tríonóide, ar bhunachar sonraí Fhilíocht na mBard.

of Education and Science The Fellowship Programme has as forecast, proved to be very attractive The new Schroedinger Fellow Dr Oleg Lisovyy is established in Theoretical Physics and Dr Roisin McLaughlin is the first Bergin Fellow in Celtic Studies.

The Government declared 2005 "Hamilton Year celebrating Irish Science". There was special significance given to the annual Hamilton walk from Dunsink to Broome Bridge on this the bi-centenary of his birth. The Institute arranged for an Irish oak tree to be planted at Dunsink by Hamilton's closest known living descendant John O 'Regan who was accompanied by the Nobel laureate Professor Stephen Weinberg.

The last few years have at times been challenging. I wish to thank the staff, the management, the scientists and scholars who have played such an active role in making this success story in such a competitive market place.

There have been key changes in the membership of Council and the Boards in 2005. On behalf of Council I want to make public our thanks to the outgoing Chairmen Professor Breandán Ó Madagáin, Professor Sir Michael Atiyah and Professor Gerry Wrixon President University College Cork for their contribution to the Institute over the last five years and for leading the academic work of the respective Schools. We wish them well for the future.

In June 2005 Council welcomes the incoming Chairmen Professor Arthur Jaffe of Harvard University who will lead the School of Theoretical Physics and Professor Ahlqvist School of Celtic Studies and it is pleased to welcome back Professor Gerry Wrixon to lead the academic work of the School of Cosmic Physics.

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

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

The Indian ambassador on a visit to the Institute to discuss a lecture series.

Ambasadóir na hIndia ar cuairt san Institiúid chun sraith léachtaí a phlé.

Ba mhó an rath a bhí ar thaighdeoirí na hInstitiúide ina n-iarratais ar mhaoiniú taighde sa bhliain 2005 agus ar an tslí sin tháinig leathnú an-mhór ar an aschur taighde. Measadh go mba ghá ardú ar ár n-allúntas reatha spáis a iarraidh ar an Roinn Oideachais agus Eolaíochta. Chruthaigh an Clár Ánrachta, mar a tuaradh, a bheith an-tarraingteach. Tá an tÁnra Schroedinger nua, an Dr Oleg Losovyy, socraithe isteach i bhFisic Theoiriciúil agus is í an Dr Róisín McLaughlin an chéad Ánra Bergin sa Léann Ceilteach.

D'fhógair an Rialtas gurbh é 2005 "Bliain Hamilton mar chomóradh ar Eolaíocht na hÉireann". Bhí tábhacht speisialta ag gabháil le siúlóid bhliantúil Hamilton ó Dhún Since go dtí Droichead Broome ar chomóradh seo dhá chéad bliain a bhreithe. Rinne an Institiúid socrú go gcuirfeadh an duine is gaire gaoil de shliocht Hamilton, John O'Regan, a raibh an laureate Nobel, Stephen Weinberg, ina theannta, crann darach Éireannach ag Dún Since.

Ba thréimhse dhúshlánach a bhí sna blianta beaga deiridh. Ba mhaith liom buíochas a ghlacadh leis an bhfoireann, leis an mbainistíocht, leis na heolaithe agus leis na scoláirí a raibh ról chomh gníomhach sin acu chun go mbeadh rath sin orainn i margadh atá chomh hiomaíoch sin.

Rinneadh athruithe lárnacha i gcomhaltas na Comhairle agus na mBord i 2005. Thar ceann na Comhairle, ba mhaith liom ár mbuíochas a ghlacadh go poiblí leis an gCathaoirleach atá ag éirí as, an tOllamh Breandán Ó Madagáin, an tOllamh Sir Michael Atiyah agus an tOllamh Gerry Wrixon, Uachtarán Choláiste na hOllscoile, Corcaigh as a gcuidiú leis an Institiúid le hos cionn cúig bliana anuas agus as a bheith i gceannas ar obair acadúil na Scoileanna faoi seach. Ba mhaith linn gach rath a ghuí orthu don todhchaí.

I Meitheamh 2005, fáiltíonn an Chomhairle roimh an gCathaoirleach nua, an tOllamh Arthur Jaffe ó Ollscoil Harvard, a bheidh i gceannas ar Scoil na Fisice Teoiriciúla agus an tOllamh Ahlqvist, Scoil an Léinn Cheiltigh agus tá áthas orainn fáilte ar ais a chur roimh an tOllamh Gerry Wrixon le bheith i gceannas ar obair acadúil Scoil na Fisice Cosmaí.

Leanann an Chomhairle de bheith ag déanamh dul chun cinn i bhfeabhas a chur ar a próisis agus a córais bhainistiú agus rialú riosca. Ba mhian leis an gComhairle aitheantas a thabhairt don Choiste Iniúchta agus dá Chathaoirleach an tOllamh David Spearman, agus buíochas a ghlacadh leo.

Glacann an Chomhairle buíochas leis an Roinn Oideachais agus Eolaíochta as an spéis leanúnach a léiríonn siad i saothar na hInstitiúide.

School of Celtic Studies
Scoil an Léinn Cheiltigh

The year 2005 saw the publication of two books, *A Companion to the Corpus Iuris Hibernici* by Liam Breatnach, and *Breudwyt Maxen Wledic* by Brynley F. Roberts. The first forms volume five of the Early Irish Law Series; it is of special interest to legal scholars but is also of relevance to historians and linguists. The second forms volume eleven of the Medieval and Modern Welsh Series, and will be of great importance to scholars of medieval Welsh language and literature.

The ongoing demand for our publications made it necessary to reprint a number of books this year. These were: F. Kelly, *A Guide to Early Irish Law*, E. Knott, *An Introduction to Irish Syllabic Poetry*, M. A. O'Brien, *Corpus Genealogiarum Hiberniae*, L. Bieler, *Four Latin Lives of St. Patrick and I. P.* Sheldon-Williams, *Iohannis Scotti Eriugenae Periphyseon, Liber Tertius*.

The Irish Script on Screen (ISOS) project continued under the direction of Professor Pádraig Ó Macháin. Digitisation was completed on the Franciscan Collection of Irish Manuscripts in UCD; these have now been processed and are on display on the ISOS website. Mac Fhirbhisigh's Book of Genealogies, held in UCD Library (Additional Irish MS 14) was also digitised, and is now on display. Work began on upgrading the huge database and archive of digitised material held by ISOS.

The School's website (**www.celt.dias.ie**), managed by Professor Ó Macháin and Andrew McCarthy, continued to grow in 2005. There was an increase of 40% on the number of visitors to the site. The main development this year was the inclusion on the site of the Database of Bardic Poetry, compiled over many years by Dr Katharine Simms of Trinity College, Dublin and generously made available to the School by her.

Under the direction of the Academic Librarian, Dr Siobhán Ní Laoire, current and retrospective cataloguing of the library continued and records were made available on the Online Public Access Catalogue. Acquisitions continued in subject areas relevant to the research needs of the School. Regular updates on recent accessions and current periodicals were issued and research and bibliographic queries from members of the School and from visitors were dealt with.

Sa bhliain 2005 foilsíodh dhá leabhar, *A Companion to the Corpus Iuris Hibernici* le Liam Breatnach, agus *Breudwyt Maxen Wledic* le Brynley F. Roberts. Imleabhar a cúig den tsraith *Early Irish Law Series* is ea an chéad leabhar; beidh suim ar leith ag scoláirí dlí ann, ach freisin baineann sé le hábhar léinn staraithe agus teangeolaithe. Imleabhar a haon déag den tsraith *Medieval and Modern Welsh Series* is ea an dara ceann, a mbainfidh scoláirí teanga agus litríocht na Breatnaise sa Mheánaois leas mór as.

Mar gheall ar an éileamh leanúnach a bhíonn ar ár gcuid foilseachán caitheadh na leabhair seo leanas a chur i gcló arís sa tréimhse seo: F. Kelly, *A Guide to Early Irish Law*, E. Knott, *An Introduction to Irish Syllabic Poetry,* M. A. O'Brien, *Corpus Genealogiarum Hiberniae*, L. Bieler, *Four Latin Lives of St. Patrick* and I. P. Sheldon-Williams, *Iohannis Scotti Eriugenae Periphyseon, Liber Tertius.*

Lean an tionscnamh Meamram Páipéar Ríomhaire (MPR) ar aghaidh faoi stiúrú an Ollaimh Pádraig Ó Macháin. Críochnaíodh digitiú bailiúchán na bProinsiasach de lámhscríbhinní Gaeilge i Roinn na gCartlann, An Coláiste Ollscoile, Baile Átha Cliath. Rinneadh próiseáil orthu seo, agus tá siad anois curtha ar taispeáint ar shuíomh idirlín MPR. Rinneadh digitiú freisin ar Leabhar Mór na nGenealach le Mac Fhirbhisigh atá i Leabharlann An Choláiste Ollscoile, Baile Átha Cliath, agus tá sé seo anois ar taispeáint. Cuireadh tús le huasghrádú bunachar agus cartlann ollmhór an ábhair dhigitigh atá i dtaisce ag MPR.

Lean suíomh idirlín na Scoile (**www.celt.dias.ie**) ag fás faoi stiúrú Phádraig Uí Mhacháin agus Andrew McCarthy sa bhliain 2005. Tháinig méadú 40% ar líon na gcuairteoirí ar an suíomh. B'é an príomh-fhorás i mbliana ná Bunachar Fhilíocht na Scol ar chaith an Dr Katharine Simms, Coláiste na Tríonóide, Baile Átha Cliath, blianta fada ag obair air, agus a chuir sí go fial flaithiúil ar fáil don Scoil.

Faoi stiúrú an Leabharlannaí Acadúil, an Dr Siobhán Ní Laoire leanadh le catalógú reatha agus aisbhreathnaitheach na leabharlainne, agus cuireadh taifid ar fáil ar an gCatalóg Rochtana Poiblí ar Líne. Leanadh ag cur le líon na bhfoilseachán i réimsí a bhaineann le hobair taighde na Scoile. Soláthraíodh nuashonraí rialta faoi nuashealbhacháin agus irisí reatha, agus

Professor Brynley F. Roberts, Réiltín Bean Mhic Cana and Professor Liam Breatnach at a reception in commemoration of Proinsias Mac Cana on the 20th October 2005, at which *Breudwyt Maxen Wledic* by Brynley F. Roberts, volume 11 of the Medieval and Modern Welsh Series was launched.

An tOllamh Brynley F. Roberts, Réiltín Bean Mhic Cana, agus an tOllamh Liam Breatnach ag ócáid in ómós do Phroinsias Mac Cana ar an 20ú Deireadh Fómhair 2005, nuair a seoladh *Breudwyt Maxen Wledic* le Brynley F. Roberts, imleabhar 11 den Medieval and Modern Welsh Series.

Professor Malachy McKenna and Dr Brian Ó Curnáin continued their work on Modern Irish dialect studies, respectively carrying out field-work in Counties Donegal and Galway. Alexandre Guilarte began working on the Bibliography of Irish Linguistics and Literature Project. In the area of Early Irish law Professor Liam Breatnach continued his series of seminars on the Old Irish law tract *Córus Bésgnai*, an edition of which he intends to publish in the Early Irish Law Series, and completed work on his *Companion to the Corpus Iuris Hibernici* which was published in June. Professor Fergus Kelly continued work on his edition of the thirteenth-century *Legal Treatise* by Giolla na Naomh Mac Aodhagáin, again for publication in the Early Irish Law Series.

Roisín McLaughlin, the new Bergin Fellow, began a series of seminars on metrics in the Autumn.

This year's Tionól again attracted a very wide audience, with speakers from Ireland, England, Finland, Austria, Wales, The United States and Australia. Attendance was particularly high, with audiences on the second day varying between eighty and one hundred people.

The Statutory Public Lecture held in conjunction with the Tionól, was delivered in Trinity College Dublin by Professor Liam Breatnach, Director of the School, under the title 'Mediaeval Irish Law and Mediaeval Irish Literature'. The audience was in excess of one hundred and twenty five people.

In addition the School organised and hosted the ninth conference of *Teangeolaíocht na Gaeilge*, held on the 9th of April, as well as organising (in cooperation with Cumann Merriman) and hosting a lecture on the 1st of December as part of the bicentennial commemoration of Brian Merriman.

For their part, members of the School gave lectures at conferences in Dublin, Kilkenny, Limerick, Maynooth and Mullinahone, as well as in Berkeley, London, Paris and Reading.

The Hon Mrs Justice Susan Denham with the author, Professor Liam Breatnach, at the launch of *A Companion to the Corpus Iuris Hibernici*, volume 5 of the Early Irish Law Series, on the 16th June 2005.

An tOnórach Susan Denham, Breitheamh den Chúirt Uachtarach, leis an údar, an tOllamh Liam Breatnach, ag seoladh *A Companion to the Corpus Iuris Hibernici*, imleabhar 5 den Early Irish Law Series, ar an 16ú Meitheamh 2005.

déileáladh le ceisteanna taighde agus bibleagrafaíochta ó bhaill na Scoile agus ó chuairteoirí.

Lean an tOllamh Malachy McKenna agus an Dr Brian Ó Curnáin ar thaighde ar chanúintí na Nua-Ghaeilge, agus rinne siad obair pháirce i gContae Dhún na nGall agus i gContae na Gaillimhe faoi seach. Thosnaigh Alexandre Guilarte ag obair ar thionscnamh Bhibleagrafaíocht Theangeolaíocht is Litríocht na Gaeilge.

Maidir le sean-dlithe na hÉireann, lean an tOllamh Liam Breatnach lena shraith seimineár ar an dtéacs dlí Sean-Ghaeilge *Córus Bésgnai*, téacs a bhfuil sé i gceist aige eagrán de a fhoilsiú san *Early Irish Law Series*, agus chríochnaigh sé a leabhar, *A Companion to the Corpus Iuris Hibernici*, a foilsíodh sa Mheitheamh. Choinnigh an tOllamh Fergus Kelly air ag obair ar eagrán den *Tráchtas Dlí* de chuid Giolla na Naomh Mhic Aodhagáin, a bhaineann leis an 13ú haois; arís is san *Early Irish Law Series* atá sé seo le foilsiú.

Thosnaigh Roisín McLaughlin, a ceapadh mar Chomhalta Uí Aimhirgín i mbliana, ar shraith seimineár ar chúrsaí meadarachta sa bhFómhar.

Tharraing Tionól na bliana seo lucht éisteachta fairsing, le cainteoirí as Éirinn, Sasana, an Fhionlainn, an Ostair, an Bhreatain Bheag, Na Stáit Aontaithe agus an Astráil. Is suntasach an líon mór daoine a bhí i láthair; ar an dara lá mhalartaigh an lucht éisteachta idir ochtó agus céad duine.

Tugadh an Léacht Reachtúil in éineacht leis an dTionól i gColáiste na Tríonóide, Baile Átha Cliath, nuair a labhair an tOllamh Liam Breatnach, Stiúrthóir na Scoile, faoin teideal *'Mediaeval Irish Law and Mediaeval Irish Literature'*. Bhí breis is 125 duine i láthair.

Dhá ócáid eile i mbliana ab ea eagrú agus óstaíocht an 9ú comhdháil de *Theangeolaíocht na Gaeilge*, ar an 9ú Aibreán, agus eagrú (i gcomhpháirt le Cumann Merriman) agus óstaíocht léachta ar an 1ú Nollaig mar chuid de chomóradh dhá chéad bliain Brian Merriman.

Ar an dtaobh eile, thug baill den Scoil léachtanna ag comhdhálacha in Baile Átha Cliath, Cill Choinnigh, Luimneach, Maigh Nuad agus Muileann na hUamhan, chomh maith le Berkeley, Londain, Páras agus Reading.

School of Cosmic Physics Astronomy and Astrophysics

Scoil na Fisice Cosmaí Réalteolaíocht agus Réaltfhisic

IAU Symposium 230

Activities in Astronomy were dominated throughout the first half of the year by the preparations for IAU Symposium No 230, then the Symposium itself in the 3rd week of August (held in Dublin Castle with the kind support of the Minister for Education and Science), and subsequently by the editing of the Proceedings. The Symposium, on `Populations of high energy sources in galaxies' was regarded by the participants as highly successful and the proceedings are expected to become a valuable reference work. A well-attended public talk was given by the renowned astrophysicist, Prof. Geoffrey Burbidge, on the Tuesday evening of the week of the Symposium, organized by the Symposium's Local Organizing Committee in collaboration with the Royal Irish Academy and the Irish Times.

Gamma-Ray Bursts and the REM telescope

Work on Gamma Ray Bursts, the most energetic explosive events in the Universe, has now become a well-established research activity within the School. Students have regularly supervised the operation of the automatic REM telescope in La Silla, working from Dunsink Observatory as well as from their homes (since night alerts have to be monitored as soon as possible). Gamma Ray Burst alerts come currently mostly from the dedicated `Swift' high-energy satellite. Besides Gamma Ray Burst follow-up observations, the REM telescope carries out regular monitoring observations, for instance of specific types of galaxies with active nuclei in their centres.

Gamma Ray Bursts for which a so-called Afterglow is detected, lasting for days to months after the burst itself, are in some cases so bright that high-resolution (`echelle'-) spectroscopy can be performed. This provides us with the means to probe the circumburst environment in great detail, showing generally a clumped gas distribution with various velocities relative to the burst itself. This provides highly interesting diagnostics for the possible progenitor stars that exploded in a Gamma Ray Burst. New data for another couple of bright Afterglows have been secured during the year.

Siompósiam 230 an IAU

Ba iad na hullmhúcháin do Shiompósiam Uimh. 230 an IAU, ansin an Siompósiam féin an 3ú seachtain de Lúnasa (a tionóladh i gCaisleán Bhaile Átha Cliath le caoin-thacaíocht an Aire Oideachais agus Eolaíochta), agus ina dhiaidh sin eagarthóireacht ar na hImeachtaí ba mhó a bhí i gceist sa chéad leath den bhliain ó thaobh gníomhaíochtaí sa Réalteolaíocht. Mheas na rannpháirithe sa Siompósaim ar 'Pobail foinsí ard-fhuinnimh i réaltraí' gur éirigh an-mhaith leis agus táthar ag súil go mbeidh na hImeachtaí ina saothar fiúntach tagartha. Thug an t-astrafisiceoir mór le rá, an tOllamh Geoffrey Burbidge, caint phoiblí a raibh go leor ag freastal uirthi an tráthnóna Mháirt de sheachtain an tSiompóisiam, a bhí eagraithe ag Coiste Eagraithe Áitiúil an tSiompóisiam i gcomhar leis an RIA agus an *Irish Times*.

Roiseanna Gáma-Gha agus an teileascóp REM

Is gníomhaíocht taighde sean-bhunaithe anois sa Scoil é an obair ar Roiseanna Gáma-Gha, na teagmhais phléascacha is mó fuinnimh sa Chruinne. Rinne na mic léinn maoirseacht go rialta ar oibriú an teileascóip uathoibríoch REM i La Silla, ag obair ó Réadlann Dhún Since chomh maith le bheith ag obair óna mbaile féin (mar go gcaitear monatóireacht a dhéanamh ar fhógraí oíche chomh luath agus is féidir). Tagann fógraí faoi Roiseanna Gáma-Gha i láthair na huaire den chuid is mó ón satailít ard-fhuinnimh tiomanta 'Swift'. Seachas breathnú iardain ar Roiseanna Gáma-Gha, déanann an teileascóp REM breathnuithe monatóireachta rialta, mar shampla, ar chineálacha sainiúla réaltraí a bhfuil núicléis ghníomhacha ina lár.

Bíonn Roiseanna Gáma-Gha dá mbraitear an tIarlaom, mar a thugtar air, a mhaireann laethanta nó míonna tar éis na roise féin, i roinnt cásanna chomh geal gur féidir speictreascpópacht ardtaifeach ('éisleach') a dhéanamh. Tugann sé sin an deis dúinn fiosrú a dhéanamh ar an timpeallacht imroise go mion, ag taispeáint go ginearálta dáileadh gáis le chéile a bhfuil treoluasanna éagsúla acu i gcoibhneas leis an rois féin. Tugann sé sin diagnóisic an-suimiúil ar a bhféadfadh a bheith ina réaltaí sinsir a phléasc sa Rois Gáma-Gha. Fuarthas sonraí nua do chúpla Iarlaom geal eile i rith na bliana.

Neutron star studies

In a feasibility study regarding the upcoming astrometric `Gaia' satellite, it was shown that for roughly one-tenth of the known X-ray binaries (stellar systems consisting of a normal and collapsed companion, a so-called neutron star), it can be expected to infer the presence of the compact companion from the orbital wobble observed for the normal star in the system (due to the two stars being in orbit around each other). This will open the way to accurate mass determinations for the neutron stars in these binaries, as well as precise orbital parameters for the systems as such. This work emerged naturally from a project on the production mechanisms for `runaway' stars, massive stars that have acquired a substantial velocity within our Galaxy. One such method concerns the Supernova explosions in which neutron stars are born to impart substantial velocities to the system. In a general approach, dynamical simulations of small stellar groups were carried out with advanced computer codes, together with consideration of the evolutionary development of the stars involved.

A particularly interesting star, which has featured notable periods of X-ray emission, has been studied with optical spectroscopy. Some emission lines in its spectrum, and the pattern of variation of these lines, suggest that the X-ray emission is due to an associated compact companion (neutron star) around which material ejected from the optically visible star settles as a so-called accretion disk. The inner parts of these disks become very hot and can emit the X-rays. Further spectroscopic data on this object have been collected during the year, leading amongst other things to reconsidering a proposed classification of this star as a particular sub-type of Be stars (stars of spectral type B that exhibit emission lines in their spectra).

Magnetic Fields in Star Forming Regions

Molecular clouds are observed to exist well beyond free-fall timescales, suggesting they have some form of support preventing them from collapse (at least initially). Thermal pressure is too weak in comparison to the gravitational stresses in the cloud, and current theory predicts that the support may come from the magnetic field that permeates the gas, and/or the pressure of turbulent eddies - indeed it is likely that these two mechanisms are coupled. We have used a combination

Stáidéir ar Neodrónréaltaí

I staidéar féidearthachta maidir leis an satailít réaltmhéadrach 'Gaia' atá ar na bacáin, taispeánadh do thart ar an deichiú cuid de na déréaltaí x-ghathacha ar fios fúthu (córais réaltacha atá comhdhéanta de chompánach normálta agus imphléasctha, neodrónréalta mar a thugtar air), gur féidir a bheith ag súil tát a bhaint as compánach imphléasctha a bheith i láthair ón longadán fithiseach a bhreathnaítear don ghnáthréalta sa chóras (mar gheall ar an dá réalta a bheith i bhfithis timpeall ar a chéile). Cruthóidh sé seo an bealach chun cinntitheachtaí maise cruinne a dhéanamh do na neodrónréaltaí sna déréaltaí seo, chomh maith le paraiméadair fhithiseacha chruinne a dhéanamh do chórais den sórt sin. Tháinig an obair seo chun cinn go nádúrtha ó thionscadal ar shásraí táirgthe do réaltaí 'éalaitheacha', réaltaí ollmhóra a bhfuil treoluas substaintiúil bainte amach acu laistigh dár Réaltra. Baineann modh amháin den sórt sin le pléascadh Ollnóva ina gcruthaítear neodrónréaltaí chun treoluasanna substaintiúla a chur ar an gcóras. I gcur chuige ginearálta, rinneadh insamhlú dinimiciúil ar ghrúpaí beaga réaltacha le hard-chóid ríomhaireachta, mar aon le breithniú ar fhorbairt éabhlóideach na réaltaí a bhí i gceist.

Rinneadh staidéar le speictreascópacht optach ar réalta an-spéisiúil, a léirigh tréimhsí suntasacha d'astú X-gha. Tugann cuid de na línte astúcháin ina speictream, agus patrún an chomhathraithe sna línte sin, le tuiscint gur ann don astú X-gha mar gheall ar chompánach dlúth gaolmhar (neodrónréalta) a bhfuil ábhar teilgthe ón réalta atá le feiceáil go hoptach ag socrú timpeall air mar dhiosca fuillimh, mar a thugtar air. Faigheann na páirteanna istigh de na dioscaí sin an-te agus is féidir leo X-ghathanna a astú. Bailíodh tuilleadh sonraí speictreascópacha ar an réad sin i rith na bliana, as a ndearnadh, i measc rudaí eile, athmhachnamh ar an aicmiú beartaithe don réalta sin mar fhochineál de B-réaltaí (réaltaí d'aicme speictreach B a léiríonn línte astúcháin ina speictrim).

Réimsí Maighnéadacha i Réigiúin ina nDéantar Réaltaí

Feictear gur ann do scamaill mhóilíneacha go maith níos faide ná na hamscálaí saorthitime, ag tabhairt le tuiscint go bhfuil cineál éigin tacaíochta acu a choscann iad ó imphléascadh (i dtús báire ar a laghad). Tá an brú teirmeach ró-lag i gcomparáid leis na struis imtharraingte sa scamall, agus

of observations and modelling to assess the contributions of the magnetic field and turbulence to the support of clouds.

One of the most direct methods of detecting a magnetic field is to observe the polarised thermal emission from cold dust grains that have been aligned by the field, thus mapping its morphology in the plane of the sky. This method has been used to study the magnetic field of star forming regions like DR21(OH) in detail, using our polarimetry data from the James Clark Maxwell Telescope in conjunction with Zeeman measurements of the (line-of-sight) magnetic field strength and intermediate resolution polarisation maps observed with the Berkeley-Illinois-Maryland-Association (BIMA) interferometer array. This has enabled a 3-dimensional impression of the magnetic field throughout the cloud to be gained. The magnetic field is found to lie predominantly in the plane-of-the-sky, in an East-West direction (perpendicular to the major-axis of the star-forming region, which has a North-South morphology). The field also remains remarkably uniform throughout the cloud. These two factors may hint at an initially strong field and collapse via ambipolar diffusion. However, analysis of the critical mass-to-flux ratio for this morphology of cloud/magnetic field indicates that the magnetic field is unable to prevent collapse.

Molecular Cores

Modelling of over twenty cores has been carried out using both Bonner-Ebert (BE) hydrostatic sphere and Penston-Larson infall models. This was done by fitting their azimuthally averaged radial density profiles. Current wisdom states that caution should be used when fitting hydrostatic models, as even dynamically evolving cores can appear in "hydrostatic disguise" and fit BE models well. Nevertheless, the central densities, scale radii and core radii (the extent of the fit) can be used as a common metric for both modellers and observers to characterise the cores. Analysis of the line-of-sight velocity dispersions calculated from the fit indicates in most cases larger velocity dispersions than are usually measured in typical high-mass star forming regions. Observations to measure the velocity dispersions in a sub-sample of these cores were recently carried out.

tuarann an teoiric reatha go bhféadfadh an tacaíocht teacht ón réimse maighnéadach a leathann ar fud an gháis, agus/nó an brú ar ghuairneáin shuaite – go deimhin is é is dóichí go bhfuil an dá shásra sin ann i dteannta a chéile. Tá teaglaim de bhreathnuithe agus de shamhlacha úsáidte againn chun gach a gcuireann an réimse maighnéadach agus an tsuaiteacht le tacú na scamall sin a mheas.

Ceann de na bealaí is dírí le réimse maighnéadach a bhrath ná breathnú ar an astú teirmeach polaraithe ó ghráinní fuara deannaigh a bhíonn ailínithe ag an réimse, ar an tslí sin ag mapáil a mhoirfeolaíochta i bplána na spéire. Baineadh úsáid as an modh sin chun staidéar mion a dhéanamh ar réimse maighnéadach réigiúin ina ndéantar réaltaí ar nós DR21(OH), ag baint úsáide as ár gcuid sonraí polaraiméadrachta ó Theileascóp James Clark Maxwell i gcomhar le tomhais Zeeman ar láidreas an réimse mhaighnéadaigh (líne amhairc) agus mapaí polaraithe taifigh idirmheánacha a breathnaíodh le heagar trasnamhéadair Berkely-Illinois-Maryland-Association (BIMA). Leis sin bhíothas in ann imprisean 3-thoiseach den réimse maighnéadach ar fud an scamaill a fháil. Bíonn an réimse maighnéadach suite den chuid is mó i bplána na spéire, i dtreo Soir-Siar (ingearach le mór-áis an réigiúin ina ndéantar réaltaí, a bhfuil moirfeolaíocht Thuaidh-Theas aige). Tá an réimse freisin sách aonfhoirmeach ar fud an scamaill. Tugann an dá fhachtóir sin an leide gur réimse láidir a bhí ann ar dtús agus gur imphléasc sé trí idirleathadh dépholach. Mar sin féin, tugann anailís ar an gcóimheas mais chriticiúil le flosc don mhoirfeolaíocht seo an scamaill/réimse mhaighnéadaigh le tuiscint nach bhfuil ar chumas an réimse mhaighnéadaigh imphléascadh a chosc.

Croíthe Móilíneacha

Rinneadh samhlú ar os cionn fiche croí ag baint úsáide as samhail sféar hidreastatach Bonner-Ebert (BE) agus samhail intitime Penston-Larson. Rinneadh é sin trína bpróifílí dlúis ghathaigh a bhfuarthas a meán go hasamatach a oiriúnú. De réir an tsaineolais reatha ba chóir cúram a ghlacadh nuair a bhítear ag oiriúnú samhlacha hidreastatacha, mar go bhféadfadh an dealramh a bheith ar chroíthe a bhíonn ag éabhlú go dinimiciúil a bheith i "mbréagriocht hidreastatach" agus go n-oirfeadh siad go maith do shamhlacha BE. Mar sin féin, is féidir na dlúis lárnacha, gathanna scála agus gathanna

Spitzer Space Telescope

Spásteileascóp Spitzer

Spitzer Observations of Weak-line T Tauri Stars

We have acquired data from the Cores to Disk (c2d) Legacy Program, carried out by the Spitzer Space Telescope, to search for disks around weak-line T Tauri stars (WTTS). These stars are thought to be analogues of the young Sun during the first few million years of its life. The emphasis has been on reducing Multi-band Imaging Photometer for Spitzer (MIPS) data at 24 and 70 microns. Combining these new data with optical and near-infrared observations, we have constructed spectral energy distributions of the WTTS to look for infrared excess emission, tell-tail signatures of disks. Evidence has been found for circumstellar disks in 20% of the stars (of a total sample of 30). Interestingly WTTS selected by their X-ray emission do not posses disks while those chosen on the basis of their optical emission do. Thus X-ray selected WTTS are devoid of circumstellar matter in contrast to their optically selected counterparts. This is contrary to the commonly held belief that *all* WTTS do not possess disks.

Measuring Interstellar Extinction from Star Counts

We have studied the distribution of gas and dust in several star forming regions by means of near-infrared (NIR) extinction maps. One important property of dust is how extinction depends on wavelength. Knowing the so-called reddening law allows us to use stellar colours to determine extinction and to measure the mass of gas and dust in a cloud. We have developed methods to determine the extinction law based on star counts and colour excess maps. Those methods have been applied to clouds in Cepheus and Ophiuchus. A dependence of the extinction law on the column density of gas and dust was found. This is of significance for radial density profile analysis of dark clouds.

croí (méid an oiriúnaithe) a úsáid mar mhéadrach coitianta do shamhlóirí agus do bhreathnadóirí araon chun tréithe na gcroíthe a aicmiú. Tugann an anailís ar na heasruithe treoluais líne amhairc a ríomhadh ón oiriúnú le tuiscint i bhformhór na gcásanna gur ann d'easruithe treoluais níos mó ná a thomhastar de ghnáth i ngnáthréigiúin ina ndéantar réaltaí ard-mhaise. Rinneadh breathnuithe le gairid chun na heasruithe treoluais i bhfoshampla de na croíthe sin a thomhas.

Breathnuithe Spitzer ar Réaltaí T Tauri líne lag

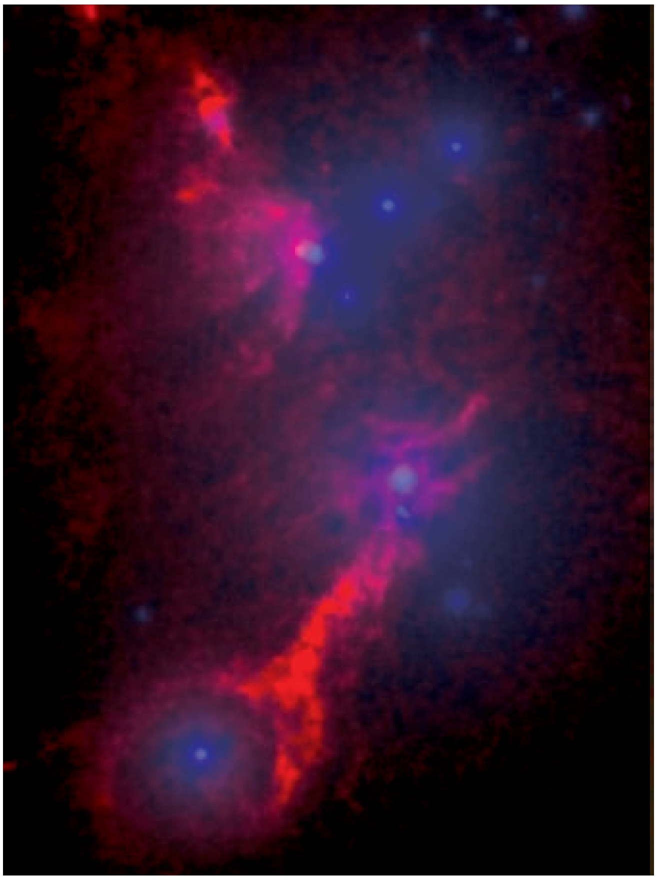
Fuaireamar sonraí ó Chlár Leagáide Croíthe go Diosca (c2d), atá déanta ag Spásteileascóp Spitzer, chun dioscaí a chuardach timpeall ar réaltaí T Tauri líne lag (WTTS). Ceaptar go bhfuil na réaltaí sin ar aon dul leis an óg-Ghrian i rith an chéad chúpla milliún bliain dá ré. Bhí an bhéim ar shonraí Fhótaiméadar Íomhaithe Ilbhanda don Spitzer (MIPS) a laghdú ag 24 agus 70 miocrón. Trí na sonraí nua sin a nascadh le breathnuithe optacha agus neas-infridhearg, tá dáiltí fuinnimh speictrim den WTTS tógtha againn chun barraíocht astúcháin infridheirg, comharthaí gur ann do dhioscaí, a chuardach. Fuarthas fianaise do dhioscaí timréaltacha i 20% de na réaltaí (de shampla iomlán de 30). Suimiúil go leor, níl aon dioscaí ag WTTS a roghnaíodh de réir a n-astú X-gha ach tá ag na cinn a roghnaíodh bunaithe ar a n-astachán optach. Is é sin le rá, níl aon damhna timréaltach in WTTS a roghnaíodh mar gheall ar X-gha i gcodarsnacht leis na WTTS a roghnaíodh go hoptach. Tá sé sin ag teacht salach ar an tuiscint choitianta nach bhfuil dioscaí ag na WTTS *go léir*.

Díobhadh Idir-réaltach a thomhas ó Réalt-Áirimh

Tá staidéar déanta againn ar dháileadh gáis agus deannaigh i roinnt réigiún ina ndéantar réaltaí trí mhapaí díobhtha neas-infridhearga (NIR). Airí tábhachtach amháin atá ag deannach ná go mbíonn díobhadh ag brath ar thonnfhad. Trí eolas ar an dlí deargtha, mar a thugtar air, is féidir linn úsáid a bhaint as dathanna réaltaí chun díobhadh a dhéanamh amach agus chun mais an gháis agus an deannaigh i scamall a thomhas. Tá modhanna forbartha againn chun an dlí díobhtha a dhéanamh amach bunaithe ar réaltáirimh agus ar mapaí barraíochta datha. Tá na modhanna sin curtha i bhfeidhm ar scamaill i gCeiféas agus in Ophiuchus. Fuarthas amach go raibh an dlí díobhtha ag brath ar dhlús colúin gáis agus deannaigh. Tá sé seo tábhachtach don anailís próifíle dlúis ghathaigh ar scamaill dhubha.

Extinction (red) in the Orion Region from Star Counts

Díobhadh (dearg) i Réigiún Orion ó Réalt-Áirimh



The Youngest Stars

During the earliest stage of star formation (Class 0) protostars gain most of their final mass. We have investigated how well current models are able to predict the observational properties of these objects. Numerically derived mass accretion rates from gravo-turbulent simulations were combined with an evolutionary model of the envelope structure to obtain model evolutionary tracks for the three main observables (envelope mass, bolometric temperature and luminosity). A three dimensional Kolmogorov-Smirnov test was then applied to quantify the agreement between model predictions and observation. Monte-Carlo methods were used to constrain free model parameters. In general rather poor agreement (70%) of models and observations was found. However, we can conclude from our investigations that star formation is in essence a localised and stochastic process, governed in the majority of regions by turbulence rather than by ambipolar diffusion and that the Class 0 phase lasts between 20 and 60 thousand years.

Na Réaltaí is Óige

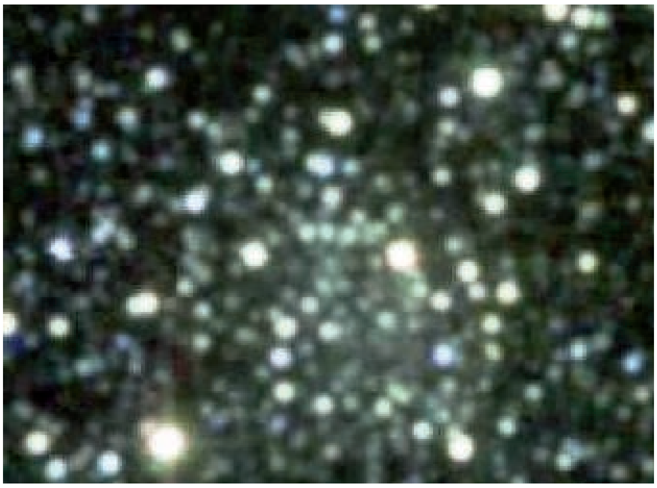
Sa chéim is túisce de dhéanamh réaltaí (Aicme 0) faigheann prótairéaltaí formhór dá mais chríochnaitheach. Tá imscrúdú déanta againn ar chomh maith atá na samhlacha reatha in ann airíonna breathnaithe na réada sin a thuar. Rinneadh rátaí fuillimh maise ar thángthas orthu go huimhriúil ó insamhlúcháin imtharraingt-suaiteachta a chónascadh leis an tsamhail éabhlóideach den struchtúr clúdaithe chun samhailrianta eabhlóideachta a fháil don trí phríomhní breathnaithe (mais clúdaigh, teocht bólaiméadrach agus lonrachas). Cuireadh tástáil tríthoiseach Kolmogorov-Smirnov i bhfeidhm ansin chun cainníocht a thabhairt don chomhaontú idir na samhail-tuair agus breathnú. Baintear úsáid as modhanna Monte-Carlo chun teorainn a chur le paraiméadair saor-shamhala. Tríd is tríd, fuarthas comhaontú sách lag (70%) idir na samhlacha agus na breathnuithe. Mar sin féin, is féidir linn an tát a bhaint as ár n-imscrúduithe gur próiseas logánta agus stócastach go bunúsach é déanamh réaltaí, a bhíonn rialaithe i bhformór na réigiún ag suaiteacht seachas ag aon idirleathadh dépholach agus go maireann céim Aicme 0 idir 20 agus 60 míle bliain.

Braislí Folaithe a Fháil

Is i mbraislí a dhéantar formhór na réaltaí, iad neadaithe i scamaill de ghás agus de dheannach. Tá úsáid bainte againn as réaltáirimh bunaithe ar chatalóg poncfhoinse Shuirbhé na Spéire Uile 3 Mhiocrón (2MASS) chun sampla iomlán a fháil de na braislí réaltaí go léir i bPlána an Réaltra le $|b|<20^{\circ}$. Sainaithníodh 1788 ar an iomlán a d'fhéadfadh a bheith ina mbraisle agus a raibh eolas cheana ar 86 braisle réaltrach agus 610 braisle oscailte díobh. Dá réir sin fuaireamar 1092 nua a d'fhéadfadh a bheith ina mbraislí. Déantar próifílí réaltdlúis ghathaigh a oiriúnú do na réada go léir chun méid, réaltdlús agus an líon réaltaí sa bhraisle a fháil. Baintear úsáid as na hairíonna sin ansin chun tomhas a fháil a rangóidh na cinn nua inár sampla a d'fhéadfadh a bheith ina mbraislí. Fuarthas amach gur braislí oscailte go deimhin iad thart ar leath na gcinn nua. Chomh maith leis sin, fuaireamar amach go bhfuil braislí réaltaí iad féin braislithe ar scálaí de thart ar 0.7°. Comhfhreagraíonn sé sin do dhóchúlacht mhéadaithe de 10-25 faoin gcéad go bhfaighfí braislephéirí ar scálaí spásúla, thart ar méid ghnáthscamaill mhóilíneacha sa Réaltra.

A Newly Discovered Cluster in the Milky Way

Braisle Nua-Fhionnta i mBealach na Bó Finne



Finding Hidden Clusters

Most stars form in clusters, embedded in clouds of gas and dust. We have used star counts based on the 2 Micron All Sky Survey (2MASS) point source catalogue to obtain a complete sample of all star clusters in the Galactic Plane with $|b|<20°$. In total 1788 cluster candidates were identified of which 86 galactic and 610 open clusters were already known. Thus we have found some 1092 new cluster candidates. For all objects radial star density profiles were fitted to obtain the size, stellar density and number of stars in the cluster. Those properties were then used to obtain a measure to classify the new candidates in our sample. It was found that about half of our new candidates are indeed new open clusters. Furthermore we found that star clusters are themselves clustered on scales of about 0.7°. This corresponds to an increased probability of finding cluster pairs on spatial scales of 10-25pc, about the size of typical molecular clouds in the Galaxy.

Searching for Outflows from Brown Dwarfs

Brown dwarfs (BDs) are often referred to as "failed stars" because their mass is insufficient to ignite hydrogen in their cores: These objects never join the Main Sequence. At the same time evidence has been growing that these objects accrete while young just like ordinary protostars. Moreover it was noticed that in some cases BD spectra contain weak forbidden lines e.g. the [OI] doublet, lines that are traditional tracers of outflow activity. Theoretically however we expected any jet or outflow from a BD to be small in angular size and to be very faint. For these reasons, we applied the novel technique of spectro-astrometry to the emission lines to

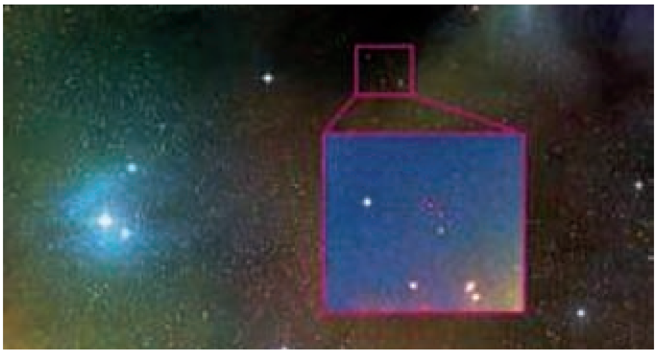
Eis-sreabhadh ó Abhaic Dhonna a Lorg.

Tagraítear d'abhaic dhonna (BDanna) go minic mar "réaltaí ar theip orthu" mar gheall nach leor a mais chun an hidrigin ina gcroíthe a adhaint: Ní théann na réada sin riamh leis an bPríomh-Sheicheamh. Ag an am céanna tá méadú ag teacht ar an bhfianaise a léiríonn go bhfuillíonn na réada sin nuair a bhíonn siad óg díreach ar nós gnáth-phrótairéaltaí. Chomh maith leis sin, tugadh faoi deara i roinnt cásanna go mbíonn línte toirmiscthe laga m.sh. an dúibléad [OI], i speicrim BD, línte ar rianadóirí traidisiúnta ar ghníomhaíocht eis-sreafa iad. Go teoiriciúil, áfach, bhíomar ag súil go mbeadh aon scaird nó eis-sreabhadh ó BD beag ó thaobh méid na huillinne de nó go mbeadh siad an-lag. Ar na cúiseanna sin, chuireamar an teicníc nua de speictriréalteolaíocht i bhfeidhm ar na línte astúcháin chun eis-sreabhadh a lorg. Ba é an sprioc a bhí againn ná ρ-Oph 102, BD óg (cúpla milliún bliain d'aois) de thart ar 60 mais Iúpatair atá neadaithe i réigiún ina ndéantar réaltaí. Ag baint úsáide as an Teileascóp Ollmhór (VLT) sa tSile, bhíomar in ann a léiriú go raibh scaird á tiomáint ag an BD seo cosúil leis na cinn a facthas ó réaltaí T Tauri, cé go raibh siad ar scála i bhfad níos lú. Ba é seo an chéad deimhniú go bhféadfadh BDanna eis-sreabhanna a thiomáint agus as sin foilsíodh páipéar Nádúir i Meitheamh 2005. Tá tús curtha, i dteannta le Ray Jayawardhana ag Ollscoil Toronto, le tionscadal comhoibre chun féachaint ar iarrthóirí eis-sreafa BD eile. D'éirigh le moltaí chun breathnú ar BDanna eile leis an VLT agus tá sé beartaithe na breathnuithe a dhéanamh i 2006.

Speictreascópacht Slánréimse Eis-Sreabhanna Réalta T Tauri

Fuarthas breathnuithe ar roinnt eis-sreabhanna ó réaltaí clasaiceacha T Tauri (m.sh. DG Tau agus RW Aur) leis an speictriméadar slánréimse OASIS ar Theileascóp William Herschel i La Palma. Fuarthas na breathnuithe faoi fheiceáil mhaith agus ag baint úsáide as an gcóras optach inoiriúnaithe, ionas go raibh taifeach spásúil an-ard a roinnt leo. Bainfear úsáid as na sonraí go príomha chun faisnéis chuí gluaisne a sholáthar, i.e. a fheiceáil mar a éabhlaíonn an córas in imeacht ama chun comparáid a dhéanamh le samhlacha.

search for an outflow. Our target was ρ-Oph 102, a young (few million years old) BD of about 60 Jupiter masses deeply embedded in a star formation region. Using data from the Very Large Telescope (VLT) in Chile, we were able to demonstrate that this BD was in fact driving a jet like those seen from T Tauri stars albeit on a much smaller scale. This was the first confirmation that BDs could drive outflows and resulted in a Nature paper published in June 2005. A collaborative project to look at other BD outflow candidates has commenced with Ray Jayawardhana at the University of Toronto. Proposals to observe more BDs with the VLT were successful and the observations are scheduled to be carried out in 2006.



Discovery of the First Jet from a Brown Dwarf Oph 102 (circled)

An Chéad Scaird atá Fionnta ó Abhac Donn Oph 102 (sa chiorcal)

Integral Field Spectroscopy of T Tauri Star Outflows

Observations of a number of outflows from classical T Tauri stars (e.g. DG Tau and RW Aur) were obtained with the the integral field spectrometer OASIS on the William Herschel Telescope on La Palma. The observations were obtained under good seeing and utilizing the adaptive optic system, so they are of very high spatial resolution. The data will primarily be used to provide proper motion information, i.e. to see how the system evolve with time for comparison with models.

Modelling Infall and Outflow in Young Stars

Work is continuing on developing semi-analytical models that treat both infall and outflows in a coherent fashion. According to these models, we consider molecular outflows to be infalling gas that has been deflected outward by the combination of pressure gradients and magnetic fields when approaching the central protostar. We have modified the original self-similar

Samhail a dhéanamh d'Intitim agus d'Eis-Sreabhadh i Réaltaí Óga

Táthar ag leanúint den obair ar shamhlacha leath-anailíseacha a fhorbairt a dhéileálann le hintitim agus le heis-sreabhadh ar shlí chomhleanúnach. De réir na samhlacha sin, measaimid gurb éard atá sna heis-sreabhanna móilíneacha ná gás intitime atá sraonta amach ag teaglaim de bhrúghrádáin agus réimsí maignéadacha nuair a thagann siad i dtreo an phrótairéalta lárnaigh. Tá modhnú déanta ar na bun-samhlacha féin-chosúla chun staidéar a dhéanamh ar thionchar an réimse mhaighnéadaigh agus na teimhneachta ar na réitigh. Fuaireamar amach gur féidir le heis-sreabhanna a bheith ann gan réimse maighnéadach a bheith i láthair, agus go méadaíonn na rátaí intitime agus eis-sreafa nuair nach mbíonn deannach ceannasach san fhuarú. Tá réimse taighde comhlánach ar siúl faoi láthair chun staidéar uimhriúil a dhéanamh ar chobhsaíocht na réiteach sin. Tá an obair sin ar siúl go fóill agus déantar í trí réiteach den tsamhail a fheidhmiú ar chód uimhriúil FLASH. Ní amháin go bhfuil cód uimhriúil FLASH in ann insamhladh maighnéadaihidridinimiciúil i dtír thoise a láimhseáil ach tá sé go hiomlán comhthreoraithe agus úsáideann Mínghlanadh Mogall Oiriúnaitheach (AMR).

Scairdeanna ó Dhé-Réaltaí agus Scaird-Fhorleathadh a Idirghníomhú

Foirmíonn formhór na réaltaí grian-chosúla i gcórais dhéralta. Dá bhrí sin, d'fhéadfadh tréimhse a bheith ann, i ré an chórais óig, nuair a eisteilgtear dhá scaird nó níos mó ag an am céanna (m.sh. mar atá le feiceáil i gcóras L1551-RRS 5). Tá insamhltaí déanta de gach a dtarlaíonn nuair a idirghníomhaíonn scairdeanna den sórt sin. Fuarthas amach do pharaiméadair inchreidte, gur féidir leis an idirghníomhú seo éifeachtaí láidre a bheith acu ar an sreabhadh. Tá na héifeachtaí a bhíonn ag rothlú déréaltaí, agus na coinníollacha faoina bhféadfadh na scairdeanna cumascadh, scrúdaithe.

Rinneadh staidéar ar scairdeanna a bhí ag forleathadh faoi saor-leathnú nó i meán comhthimpeallach ina raibh an dlús ag meath go géar. Ba é an cuspóir a bhí leis sin ná cruth ard-chomhlínithe na scairdeanna réaltfhisiceacha a mhíniú, a bhféadfadh sé gur ann dóibh i bpáirt nó go hiomlán mar gheall ar phróifíl dlúis an mheáin chomhthimpeallaigh. I staidéir roimhe seo, déileáladh leis an scamall

models in order to study the influence of magnetic field and opacity on the solutions. We found that outflows can exist without the presence of a magnetic field, and that infall and outflow rates increase when dust does not dominate the cooling. A complementary line of research is currently ongoing to numerically study the stability of these solutions. This work is still in progress and is performed by implementing a solution of the model into the FLASH numerical code. The latter cannot only handle magneto-hydrodynamic simulations in 3 dimensions but is fully parallelised and uses Adaptive Mesh Refinement (AMR).

Interacting Jets from Binary Stars and Jet Propagation

Most solar-like stars form in binary systems. There may thus be a period, in the life of a young system, when two or more jets are ejected simultaneously (e.g. as seen in the system L1551-IRS 5). Simulations of what happens when such jets interact have been performed. It is found that for plausible parameters, the interaction can have strong effects on the flow. The effects of binary rotation, and conditions under which the jets could merge, have been examined.

A study of jets propagating under free expansion or in an ambient medium of steeply declining density was carried out The purpose of this was to explain the highly collimated shape of astrophysical jets, which may be caused in part or wholly by the density profile of the ambient medium. In previous studies the ambient cloud into which a jet propagates has been treated as a constant density and pressure structure, whereas in reality it may have a density gradient or cavity. The cavity may be caused by the joint effects of gravitational infall and centrifugal force or by previous episodes of strong ejection from the source.

Interstellar Dust

Dust is an important component of the interstellar medium as well as a major complication for observers. Work was carried out on the properties of dust in star forming regions of our own Galaxy (concentrating on the Taurus region) as well as on the kinematics of the dust shells observed in some elliptical galaxies (the latter in the context of an international collaboration with Liverpool University, the Kapteyn Institute and the Instituto de Astrofisica de Canarias).

comhthimpeallach ina bhforleathann scaird mar struchtúr seasta dlúis agus brú, ach i ndáiríre d'fhéadfadh dlúsghrádán nó cuas a bheith ann. D'fhéadfadh an cuas a bheith ann mar gheall ar chomhéifeachtaí intitim imtharraingte agus fórsa lártheifeach nó trí eipeasóidí roimhe sin d'eisteilgean láidir ón bhfoinse.

Deannach Idir-Réaltach

Is comhchuid thábhachtach den mheán idir-réaltach é an deannach chomh maith le bheith ina chastacht mhór do bhreathnadóirí. Rinneadh obair ar airíonna deannaigh i réigiúin ina ndéantar réaltaí ónár Réaltra féin (ag díriú isteach ar réigiún Taurus) chomh maith le hobair ar chinéamaitic na sceall deannaigh a facthas i roinnt réaltraí éilipseacha (iad sin is deireanaí a luadh i gcomhthéacs comhoibrithe idirnáisiúnta le hOllscoil Learphoill, Institiúid Kapteyn agus Instituto de Astrofisica de Canarias).

Ard-Réaltfhisic Ríomha

Tá sé seanbhunaithe ar fhorais theoirice go gcaithfidh éifeachtaí MHD neamh-idéalacha a bheith ina ngnéithe tábhachtacha de chruthú réaltaí agus gur dócha go bhfuil ról tábhachtach freisin acu i struchtúrú meán idir-réaltach. Tá ríomhstaidéir ar na héifeachtaí sin ar siúl agus tá sé beartaithe an obair seo a leathnú chun líonraí d'imoibriú ceimiceach am-spleách a chur san áireamh. Tá cruthú hidrigine móilíní agus a ról mar fhuarthán ina ngnéithe thar a bheith tábhachtach den obair seo agus rinneadh staidéar mion ar hidrigin mhóilíneach ag fuarú.

HESS

Lean comhoibriú HESS (Córas Steireascópach Ard-Fhuinnimh), ar comhalta de é DIAS, de bhliain an-rathúil breathnuithe agus d'fhoilsigh sé 16 mórfhoilseachán measúnaithe (lena n-áirítear dhá Iris Eolaíochta). Bhí tábhacht ar leith ag baint le SNR eile de chineál scealla taifithe go spásúil, RXJ0852.0-4622 (ar a dtugtar Vela Óg) chomh maith le RXJ1713-3942.

Completing the MIRI Structural Model at the Rutherford Appleton Laboratory

Samhail Struchtúrtha MIRI á críochnú ag Saotharlann Rutherford Appleton

Advanced Computational Astrophysics

It is well established on theoretical grounds that non-ideal MHD effects must be important in aspects of star formation and probably also play an important role in structuring the interstellar medium. Computational studies of such effects are in progress and it planned to extend this work to include time-dependent chemical reaction networks. The formation of molecular hydrogen and its role as a coolant are particularly important aspects of this work and a detailed study of molecular hydrogen cooling was carried out.

HESS

The HESS (High Energy Stereoscopic System) collaboration of which DIAS is a member continued a very successful year of observations and published some 16 major refereed publications (including two in the journal Science). Of particular significance was the detection of another spatially resolved shell-type SNR, RXJ0852.0-4622 (the so-called Vela Junior) in addition to RXJ1713-3942.

The Mid-Infrared Instrument for the James Webb Space Telescope

MIRI, the Mid-Infrared Instrument for the James Webb Space Telescope (JWST), will provide imaging and spectroscopy at wavelengths from 5 to 27 microns. It is an international collaboration between the European Space Agency and NASA. DIAS is part of an international consortium of European partners building the optics modules. NASA/JPL will supply the cryostat to cool the optics as well as the detectors.

Production of the imager filters and the dichroics for the spectrograph are progressing well under a DIAS contract with the Infrared Multilayer Laboratory at the University of Reading. The various filters are produced in batch mode that includes not only specimens for the Demonstration and Virtual Models (DM and VM respectively) but also the Flight Model (FM). Radiation testing has been performed by ESA on all filter materials to check for out-gassing and radiation damage.

Some oxidising of two filters for the imager and coronagraph was noted. In both cases germanium had been used to strengthen the multilayer. As the oxidising resulted in a loss of transmission, experiments are ongoing to seal the filters

An Ionstraim Mheán-Infridhearg do Spásteileascóp James Webb

Soláthróidh MIRI, an Ionstraim Mheán-Infridhearg do Spásteileascóp James Webb (JWST) íomhánna agus speictreascópacht ag tonnfhaid ó 5 go dtí 27 miocrón. Is comhoibriú idirnáisiúnta é idir Gníomhaireacht Spáis na hEorpa agus NASA. Is cuid de chuibhreannas idirnáisiúnta de chomhpháirtithe Eorpacha é DIAS atá ag tógáil ar na modúil optaice. Soláthróidh NASA/JPL an crióstat chun an optaic chomh maith leis na braiteoirí a fhuarú.

Táthar ag dul chun cinn go maith ar tháirgeadh na scagairí íomháire agus na déchrómaigh don speictreagraf faoin chonradh DIAS le Saotharlann Ilchiseal Infridhearg ag Ollscoil Reading. Déantar na scagairí éagsúla i modh baisce a mbíonn eiseamail do Shamhail Léirithe agus do Shamhail Fhíorúil (DM agus VM faoi seach) san áireamh iontu ach ní amháin sin, bíonn eiseamail don tSamhail Eitilte (FM) san áireamh freisin ann. Tá tástáil radaíochta déanta ag an ESA ar na hábhair scagaire go léir chun féachaint ar ann d'eis-ghású nó damáiste radaíochta.

Tugadh roinnt ocsaídithe ar dhá scagaire don íomháire agus don chorónagraf faoi deara. Sa dá chás, baineadh úsáid as gearmáiniam chun an t-ilchiseal a neartú. De bhrí go raibh cailleadh tarchuir ann mar gheall ar an oscaídiú, tá turgnaimh ar siúl chun na scagairí a shéalú i bpairiléin. Má éiríonn leis sin, déanfar na scagairí arís. Níor éirigh le malairt iarrachta é a imchochlú faoi bhratú de chineál diamainte.

D'éirigh go maith leis an tástáil struchtúrtha ar MIRI ag Saotharlann Rutherford Appleton.

Tuiscint ar Scairdeanna trí Insamhladh, Turgnamh agus Teoiric (JETSET)

Is Líonra Oiliúna Taighde (RTN) Marie Curie ceithre bliana é JETSET atá leagtha amach chun pobal idirdhisciplíneach taighde agus oiliúna Eorpach a thógáil a bheidh lárnaithe ar staidéar ar scairdeanna, agus a dhíreoidh ar eis-sreabhadh a chuirtear ar fáil nuair a chruthaítear réaltaí. Tugann an líonra oibrithe sna réimsí seo a leanas le chéile: breathnuithe réaltfhisiceacha, samhlú teoiriciúil agus ríomha, turgnaimh saotharlainne agus teicneolaíocht Ghreille. Tá JETSET comhordaithe ag DIAS agus

in parylene. If successful these filters will be remanufactured. An alternative encapsulation in a diamond-like coating was found to be unsuccessful.

Structural testing of MIRI at the Rutherford Appleton Laboratory went well.

Understanding Jets through Simulation, Experiment and Theory (JETSET)

JETSET is a four-year Marie Curie Research Training Network (RTN) designed to build an interdisciplinary European research and training community centered on the study of jets, with a focus on outflows produced during stellar birth. The network brings together workers in the fields of astrophysical observations, theoretical and computational modelling, laboratory experiments, and Grid technology. JETSET is coordinated by DIAS and its creation has led to twenty new post-doctoral (Experienced Researcher) and postgraduate (Early Stage Researcher) positions in the ten partner institutions.

Commencement of the project began in February 2005 with a two-day kick-off meeting held in Rome Observatory. By the end of the year virtually all of the Experienced and Early Stage Researcher posts were filled.

CosmoGrid and ICHEC

DIAS and CosmoGrid are founding members of the consortium which established the Irish Centre for High End Computing with two seats on the interim board of the centre. During the year CosmoGrid, with the agreement of the HEA, agreed to contribute €700,000 towards the initial equipment purchase of ICHEC in return for access to 40% of ICHEC's facilities and part ownership of the "Walton" cluster.

Hamilton Bicentenary

Special significance attached to the annual Hamilton walk from Dunsink Observatory to Broome Bridge because 2005, the bicentenary of his birth, was declared by the Irish Government to be "Hamilton Year celebrating Irish Science". To mark the occasion an Irish oak tree was planted in the grounds of Dunsink by Hamilton's closest known living descendent, Michael Rowan Hamilton John O'Regan and the Nobel prize winning physicist, Stephen Weinberg.

The JETSET Team assembled in Villard de Lans, France

Foireann JETSET bailithe le chéile ag Villard de Lans, An Fhrainc

tá fiche post nua iardhochtúireachta (Taighdeoir le Taithí) agus iarchéime (Taighdeoir Luath-Chéime) i ndeich bhforas compháirtíochta tagtha as a chruthú.

Thosaigh an tionscadal i mí Feabhra 2005 le cruinniú tosaigh dhá lá a tionóladh i Réadlann na Róimhe. Faoi dheireadh na bliana bhí mórán gach post Taighdeora le Taithí agus Luath-Chéime líonta.

CosmoGrid agus ICHEC

Is comhaltaí bunaithe iad DIAS agus CosmoGrid de chuibhreannas a bhunaigh Ionad na hÉireann don Ard-Ríomhaireacht agus tá dhá shuíochán acu ar bhord eatramhach an ionaid. I rith na bliana, d'aontaigh CosmoGrid, le comhaontú an HEA, €700,000 a íoc i dtreo trealamh tosaigh an ICHEC a cheannach agus air sin gheobhadh siad rochtain ar 40% de shaoráidí an ICHEC agus páirtúinéireacht ar bhraisle "Walton".

Cothrom Dhá Chéad Bliain Hamilton

Bhí tábhacht speisialta ag gabháil le siúlóid bhliantúil Hamilton ó Réadlann Dhún Since go dtí Droichead Broome mar gur fhógair Rialtas na hÉireann gurb í an bhliain 2005, chothrom dhá chéad bliain a bhreithe, "Bliain Hamilton mar chomóradh ar Eolaíocht na hÉireann". Mar chomóradh ar an ócáid chuir an duine is gaire gaoil de shliocht Hamilton, Michael Rowan Hamilton, mar aon le John O'Regan agus an fisicí a bhfuil duais Nobel buaite aige, Stephen Weinberg, crann darach Éireannach i dtailte Dhún Since.

School of Cosmic Physics Geophysics

Scoil na Fisice Cosmaí Geofisice

General

After unprecedented growth of the Geophysics Section during 2004, 2005 saw yet more growth in numbers and further consolidation of activities. Through Science Foundation Ireland grant funding to Alan Jones, positions for two new people became available, a fellowship and a studentship. In addition, prestigious IRCSET awards were made to two members of the Section. The position of Professorship in Seismology was advertised, and candidates were interviewed in November. Finally, an IT manager was hired in January.

The members of the Section during 2005 were:

Permanent academic staff:

Senior Professor (Head of Section):	Alan G. Jones
Professor of Seismology:	In process of being filled
Assistant Professors:	Brian O'Reilly Peter Readman
Experimental Officer:	Tom Blake

Contract academic staff:

Schrödinger Fellow:	Xavier Garcia
CosmoGrid Fellows:	Dmitry Avdeev (Senior Fellow) Tadashi Yamasaki
Emmy Noether Fellow:	Ute Weckmann
HADES Fellows:	Laurent Gernigon (until Sept) Celine Ravaut
ISLE-MT Fellow:	C.K. Rao
SAMTEX Fellow:	Mark Muller (*took up appointment in Feb, 2006*)

Scholars:

CosmoGrid:	Anna Avdeeva
Geodynamic modelling:	John Sheehan
ISLE:	Van Chuong Do
ISLE-MT:	Max Moorkamp
SAMTEX:	Mark Hamilton, Marion Miensopust (*started in Sept*)

Ginearálta

Tháinig borradh faoi Roinn na Geoifisice sa bhliain 2004, borradh nach bhfacthas riamh cheana agus tharla sin arís sa bhliain 2005 ó thaobh uimhreacha de agus freisin maidir le gníomhaíochtaí a chomhdhluthú tuilleadh. Cuireadh poist nua ar fáil do bheirt, comhaltacht agus scoláireacht, trí mhaoiniú deontais a chuir Fondúireacht Eolaíochta Éireann ar fáil do Alan Jones. Ina theannta sin, bronnadh gradaim cháiliúla IRCSET ar bheirt chomhaltaí Roinne. Fógraíodh Ollúnacht i Seismeolaíocht agus cuireadh iarrthóirí faoi agallamh i mí na Samhna. Ar deireadh, fostaíodh bainisteoir TF i mí Eanáir.

Ba iad comhaltaí na Roinne i rith na bliana 2005:

An bhuanfhoireann acadúil:

Ollamh Sinsearach (Ceann Roinne):	Alan G. Jones
Ollamh le Seismeolaíocht:	An folúntas á líonadh
Ollúna Cúnta:	Brian O'Reilly Peter Readman
Oifigeach Turgnamhach:	Tom Blake

An fhoireann ar chonradh:

Comhalta Schrödinger:	Xavier Garcia
Comhaltaí CosmoGrid:	Dmitry Avdeev (*Comhalta Sinsearach*) Tadashi Yamasaki
Comhalta Emmy Noether:	Ute Weckmann
Comhaltaí HADES:	Laurent Gernigon (*go dtí Meán Fómhair*) Celine Ravaut
Comhalta ISLE-MT:	C.K. Rao
Comhalta SAMTEX:	Mark Muller (*a ghlac lena cheapachán i mí Feabhra, 2006*)

Scoláirí:

CosmoGrid:	Anna Avdeeva
Samhaltú geoidinimiciúil:	John Sheehan
ISLE:	Van Chuong Do

Figure 1: Map of SAMTEX MT station locations (squares) and planned routes for 2006 work (green dashed lines)

Fíor 1: *Léarscáil de shuímh na stáisiún SAMTEX MT (cearnóga) agus bealaí beartaithe d'obair 2006 (línte briste glasa)*

Permanent technical staff:

Senior technicians:	Clare Horan Gerry Wallace
Technician:	Louise Collins

Contract technical staff:

Field technician:	Jessica Spratt
IT manager:	John Allman

Clerical and administrative staff:

Secretary:	Anne Byrne
Receptionist:	Phyllis Daly

In addition, the Section hosted two international scientists for significant visits; Professor David Eaton, of the University of Western Ontario (Canada), and Professor Michel Weber, of the GeoForschungsZentrum Potsdam and University of Potsdam (Germany). Professor Eaton initiated a number of collaborative activities with Section members, and these will continue into the future; Professor Eaton was made an Honorary Professor of the School during 2005.

Highlights of electromagnetic activities

SAMTEX

The main focus of the electromagnetic activity of the Section was again the Southern African Magnetotelluric Experiment (SAMTEX), with new partners joining the consortium in 2005 bringing additional financial and logistical resources to the project. Rio Tinto Mineral Exploration Ltd joined the consortium as a second industry member, and the Geological Surveys of Botswana and Namibia joined as new government members. These additional resources facilitated an expanded Phase II acquisition programme in Spring, 2005, and the addition of a third phase, Phase III, of acquisition in the Autumn, 2005. Data were collected as part of Phase II at the pink and purple locations shown in Figure 1 in January-March, and as the first part of

ISLE-MT:	Max Moorkamp
SAMTEX:	Mark Hamilton, Marion Miensopust (*a thosaigh i Meán Fómhair*)

An fhoireann theicniúil bhuan:

Teicneoirí sinsearacha:	Clare Horan Gerry Wallace
Teicneoir:	Louise Collins

An fhoireann theicniúil ar conradh:

Teicneoir allamuigh:	Jessica Spratt
Bainisteoir TE:	John Allman

An fhoireann chléireachais agus riaracháin:

Rúnaí:	Anne Byrne
Fáilteoir:	Phyllis Daly

Ina theannta sin tháinig beirt eolaithe idirnáisúnta chuig an Roinn ar chuairteanna tábhachtacha; an tOllamh David Eaton ó Ollscoil Iarthar Ontario (Ceanada) agus an tOllamh Michel Weber ón GeoForschungsZentrum Potsdam agus ó Ollscoil Potsdam (an Ghearmáin). Chuir an tOllamh Eaton tús le roinnt gníomhaíochtaí comhoibríocha le baill de chuid na Roinne agus leanfar leo amach sna blianta atá romhainn; Rinneadh Ollamh Oinigh sa Scoil den Ollamh Eaton i rith na bliana 2005.

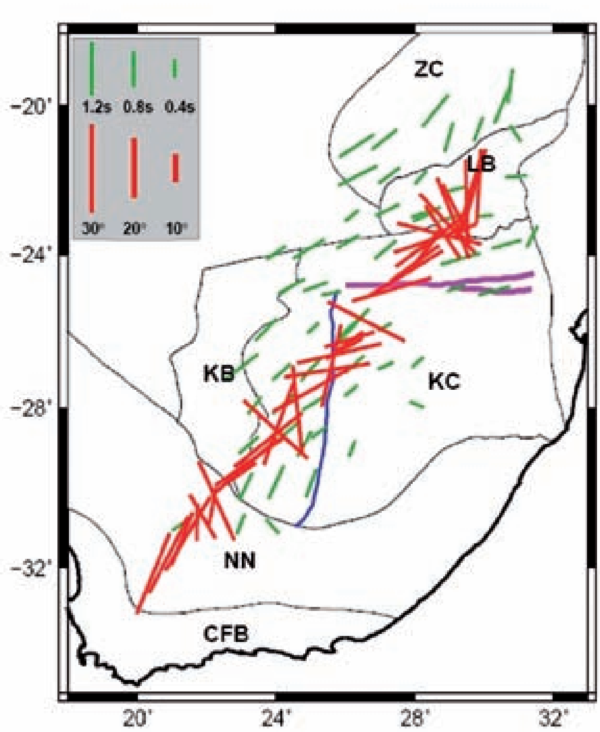
Buaicphointí na ngníomhaíochtaí leictreamaighnéadacha

SAMTEX

Ba é an Turgnamh Maignéadaiteallúireach na hAfraice Theas (SAMTEX) príomhfhócas ghníomhaíocht leictreamaighnéadach na Roinne arís agus tháinig comhpháirtithe eile isteach sa chuibhreannas sa bhliain 2005 a chur leis an turgnamh ó thaobh acmhainní breise airgeadais agus loighisticiúla de. Tháinig Rio Tinto Mineral Exploration Ltd. isteach sa chuibhreannas mar an dara comhalta tionscail, agus tháinig Suirbhéireachtaí Geolaíocha na Botsuáine agus na Namaibe isteach sa chuibhreannas mar chomhaltaí nua rialtais. D'éascaigh na hacmhainní breise sin clár fála leathanaithe do Chéim II in Earrach na bliana 2005, agus bhíothas in ann an tríú céim fála, Céim III, a chur leis sin i bhFómhar na bliana céanna. Bailíodh sonraí ag na láithreacha bándearga agus corcra a léirítear i bhFíor 1, mar chuid de Chéim II, in Eanáir-Márta agus ag na láithreacha dúghorma i Meán

Figure 2: Electrically more conductive directions (in red), scaled by maximum phase difference, for the lithospheric upper mantle, and the shear-wave splitting results (both high and low quality results plotted in green, but sites with no detectable splitting omitted). ZC: Zimbabwe craton. KC: Kaapvaal craton. LB: Limpopo Belt. NN: Namaqua-Natal mobile belt. CFB: Cape Fold Belt. KB: Kheis and Proterozoic fold and thrust Belt. Blue line: the N-S trending Colesburg Magnetic Lineament (CML). Purple lines: the E-W trending Thabazimbi-Murchison Lineament (TML).

Fíor 2: Treonna leictreacha níos seoltaí (i ndearg), scálaithe ag pasdifríocht uasta, don mhaintlín uachtair liteasféarach, agus torthaí scoilte na bhfiarthonn (tá na torthaí ar ard-chaighdeán mar aon leis na torthaí ar chaighdeán íseal breactha i ndath glas, ach tá láithreáin nach n-aimsítear scoilteadh iontu fágtha ar lár). ZC: cratón na Siombáibe. KC: cratón Kaapvaal. LB: Crios Limpopo. NN: Crios gluaisteach Namaqua-Natal. CFB: Crios Fillidh na Rinne. KB: Sá-Chrios Kheis agus filleadh Prótarasóch. An líne ghorm: Línimint Mhaighnéadach Colesburg atá ag síneadh Thuaidh-Theas (CML). Na línte corcra: Línimint Thabazimbi-Murchison atá ag síneadh Soir-Siar (TML).



Phase III at the dark blue locations in September-November. The second part of Phase III acquisition is scheduled for February-May, 2007, is planned to occur along the profiles marked by green dashed lines.

The first international publication from the project was submitted in 2005, and is a comparison of electrical and seismic anisotropy of the lithosphere beneath the Kaapvaal Craton and the mobile belts to the northeast and southwest. This paper, led by SAMTEX scholar Mark Hamilton, will appear in a special issue of the journal *Physics of the Earth and Planetary Interiors* devoted to continental lithospheric anisotropy. The main results of the comparison are shown in Figure 2, with the more electrically conductive strike directions in red and the seismic faster strike directions in green. The electrical results are for depths of 40-100 km, i.e., the uppermost mantle.

The SAMTEX experiment is funded by Science Foundation Ireland, the U.S. National Science Foundation, the South African Department of Science and Technology, De Beers Group Exploration, and Rio Tinto Mineral Exploration Ltd. Logistical support is provided by the South African Council for Geosciences, and the Geological Surveys of Botswana and Namibia.

Fómhair-Samhain mar an chéad chuid de Chéim III. Tá Feabhra-Márta, 2007 leagtha síos don dara cuid de chlár fála Chéim III, agus beartaítear go dtarlóidh sé ar na próifílí atá marcáilte ag línte briste glasa.

Cuireadh an chéad fhoilseachán poiblí idirnáisiúnta de chuid an tionscadail amach sa bhliain 2005, agus is comparáid é d'ainíostrópacht leictreach agus seismeach an litisféir faoin gCratón Kaapvaal agus na criosanna soghluaiste thoir-thuaidh agus thiar-theas. Beidh an páipéar sin, faoi chinnireacht Mark Hamilton, scoláire SAMTEX, le feiceáil in eagrán speisialta den iris *Physics of the Earth and Planetary Interiors* a bheidh dírithe ar ainíostrópacht litisféarach ilchríochach. Léirítear príomhthorthaí na comparáide i bhFíor 2, leis na treonna leictreacha treoíochta atá níos seoltaí i ndearg agus na treonna seismeacha treoíochta atá níos tapúla i nglas. Is do dhoimhneachtaí de 40-100km i.e., an mhaintlín is uachtaraí, iad na torthaí leictreacha.

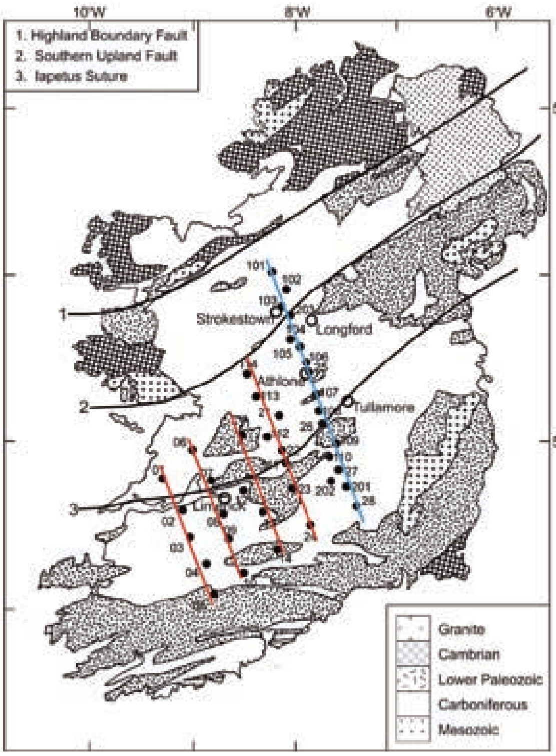
Maoiníonn Fondúireacht Eolaíochta Éireann, Fondúireacht Náisiúnta Eolaíochta na Stáit Aontaithe, Roinn Eolaíochta agus Teicneolaíochta na hAfraice Theas, De Beers Group Exploration, agus Rio Tinto Mineral Exploration Ltd., an tionscadal SAMTEX. Cuireann Comhairle um Gheoéolaíochta na hAfraice Theas agus Suirbhéireachtaí Geolaíocha na Botsuáine agus na Namaibe tacaíocht loighisticiúil ar fáil.

ISLE-MT

Fuarthas sonraí maighnéadaiteallúireacha le dhá bhliain anuas ag 36 stáisiún (Fíor 3) thar uaim Iaipéitis i lár agus i ndeisceart na hÉireann mar chuid de Thurgnamh Maighnéadaiteallúireach Litisféir na hÉireann, ISLE-MT. Is taifead cloiche geolaíoch de dhúnadh an Aigéin Iaipéitis san aois Odrdaivíseach-Shiolúrach í an uaim Iaipéitis, dúnadh a tharla mar thoradh ar imbhualadh idir an pláta Labhrásach agus an pláta Abhalónach. Bhí an tAigéan Iaipéitis chomh mór céanna ar a laghad agus atá an tAigéan Atlantach sa lá atá inniú ann agus bhí tuaisceart Éireann deighilte aige ó dheisceart Éireann, bhí Albain deighilte ó Shasana agus bhí tuaisceart Thalamh an Éisc deighilte ó dheisceart Thalamh an Éisc. Tá seasamh príomha ag an oraigineas Iaipéitis laistigh de phobal na geolaíochta, mar gurbh sna Sléibhte Apaláiseacha i dTalamh an Éisc a d'aithin J.Tuzo Wilson an timthriall a tharlaíonn arís agus arís eile den

Figure 3: Map of ISLE-MT station locations, with the profiles shown.
A resistivity model of the data from the easternmost profile is shown in Figure 6.

Fíor 3: Léarscáil de shuímh na stáisiún ISLE-MT, agus na próifílí á léiriú.
Léirítear samhail friotachais de shonraí na próifíle is faide soir i bhFíor 6.



ISLE-MT

Over the last two years magnetotelluric data at 36 stations (Fig. 3) across the Iapetus suture in central and southern Ireland have been acquired as part of the Irish Lithosphere Magnetotelluric Experiment, ISLE-MT. The Iapetus suture is the geological rock record of the closure of the Iapetus Ocean during the Ordovician-Silurian times as a consequence of the collision between the Laurentian and Avalonian plates. The Iapetus Ocean was at least as large as the present day Atlantic Ocean, and separated northern from southern Ireland, Scotland from England, and northern Newfoundland from southern Newfoundland. The Iapetus orogeny holds a prime place within the geological community, as it was in the Appalachians of Newfoundland that J. Tuzo Wilson first recognized what has become termed the Wilson cycle of repeated ocean opening, ocean closing, and ocean re-opening.

The MT data acquired at many of the sites in 2004 were heavily contaminated by electromagnetic noise from electric fences that were operating on farm land. Different processing techniques were applied to attempt to remove the noise, with unfortunately little success. Consequently, the uncontaminated

chéad uair riamh, ina n-osclaíonn an t-aigéan, ina ndúnann an t-aigéan agus ina n-osclaíonn sé arís, agus tugtar timthriall Wilson air sin anois.

Bhí na sonraí MT a fuarthas ag go leor de na láithreáin sa bhliain 2004 éillithe go mór ag torann leictreamaighnéadach ó na fálta leictreacha a bhí in úsáid ar thalamh feirme. Feidhmíodh teicnící próiseála éagsúla agus iarrachtaí á ndéanamh an torann a bhaint amach, ach ar an drochuair, níor éirigh ró-mhaith leo. Mar thoradh air sin, úsáideadh codanna de na sonraí nach raibh éillithe le haghaidh léirmhíniú agus thángthas ar roinnt réamhtrasghearrthacha geoleictreacha bunúsacha. Fuarthas sonraí MT, bunaithe ar na réamhthorthaí, ag 17 stáisiún breise sa bhliain 2005 le huirlisí leathanbhanda agus tréimhsí fada, le smacht níos fearr a bheith ar na struchtúir sa tsamhail friotachais. Mar gheall ar an taithí roimhe seo le torann ó fhálta leictreacha, roghnaíodh láithreáin fhoraoise sa bhliain 2005 a bhí beagnach saor ó fhálta leictreacha. Tá caighdeán na sonraí a fuarthas sa bhliain 2005 i bhfad níos fearr ná caighdeán na sonraí a fuarthas sa bhliain 2004 mar a léirítear i bhFíoracha 4 agus 5.

Próiseáladh na sonraí a fuarthas ó na 36 stáisiún agus gnáthmhodhanna in úsáid agus chuathas i mbun samhlú déthoiseach (2D) a dhéanamh ar phróifílí aonair. Léirítear an tsamhail friotachais deiridh ar an bpróifíl is faide soir i bhFíor 6. Taispeánann an tsamhail sraith seolta an-ard ag doimhneachtaí de 10-20km, agus léirmhínítear é sin mar dhríodair ghraifíteacha chlaochlaithe a cruthaíodh idir an dá ilchríoch coinbhéirseach, an ilchríoch Labhrásach agus an ilchríoch Abhalónach. Thángthas ar an tátal go bhfuil comhghaol ag an ábhar ar chruth U atá faoi lár na próifíle leis an gcrios uama Iaipéitis. Tá obair bhreise léirmhínithe ar siúl faoi láthair ar na próifílí eile chomh maith le samhail thríthoiseach á tógáil.

Figure 4: Typical MT data acquired in 2004. Poor response estimates caused by proximity to electric fences.

Fíor 4: Sonraí tipiciúla MT a fuarthas sa bhliain 2004. Ba é an gaireacht do na fálta leictreachais ba chúis leis na drochmheastacháin freagartha.

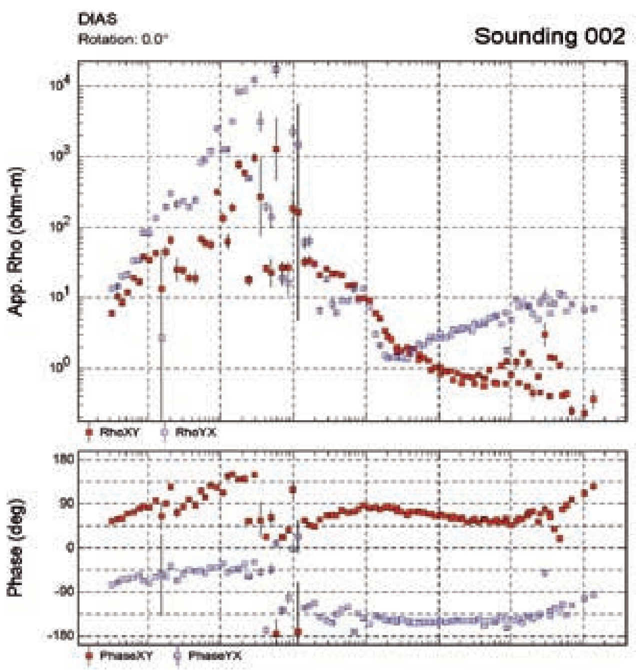
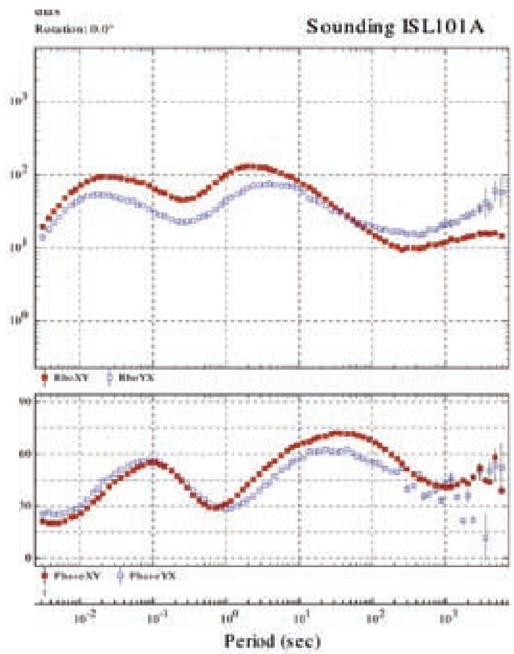


Figure 5: Typical MT data acquired in 2005.

Fíor 5: Sonraí tipiciúla MT a fuarthas sa bhliain 2005.



parts of the data were used in interpretation and some basic preliminary geo-electric sections were obtained. Based on the preliminary results, MT data were acquired at a further 17 additional stations in 2005 with broadband and long period instruments, for better control of the structures in the resistivity model. With the previous experience of electric fence noise, in 2005 forest sites were selected which were relatively free from electric fences. The quality of the data obtained in 2005 is greatly superior to the data obtained in 2004 as shown in Figures 4 and 5.

The data from all 36 stations were processed with conventional methods and two-dimensional modelling of individual profiles was undertaken. The final resistivity model along the easternmost profile is shown in Figure 6. The model shows a very high conducting layer at depths of 10-20 km, which is interpreted as metamorphosed graphitic sediments that were formed between the two converging continents of Laurentia and Avalonia. The U-shaped body beneath the centre of the profile is concluded to correlate with the Iapetus suture zone. Currently further interpretational work on the other profiles, and the construction of a three-dimensional model, is in progress.

Is é an dara cuid den obair ná na féidearthachtaí a scrúdú maidir le modhanna scagtha oiriúnaitheacha le haghaidh an torann sna sonraí a thagann ó fhálta leictreachais a laghdú. Bhí gealladh faoi chéad torthaí na modhanna sin maidir le tionchar na bhfálta eallaigh a laghdú. Laghdaigh síneadh ar na scagairí oiriúnaitheacha-LMS chuig cur chuige bunaithe ar Líonra Néarach roinnt den díchumadh trí chomhpháirteanna aonair de na sonraí a scagadh. Is comhpháirt den obair freisin é comhchlár inbhéartaithe a fhorbairt le haghaidh sonraí MT agus na feidhme glacadóra. Tá forbairt an chláir ar siúl i láthair na huaire.

Tá Turgnamh Maighnéadaiteallúireach Litisféir na hÉireann, ISLE-MT, á mhaoiniú ag Comhairle na hÉireann um Eolaíocht, Innealtóireacht agus Teicneolaíocht.

Samhlú agus inbhéartú iltoiseach:

Tionscnaíodh gnéithe teoiriciúla agus ríomhaireachta/uimhríochta de shamhlú agus inbhéartú sonraí leictreamaighnéadacha, go háirithe, inbhéartú tríthoiseach (3D) sonraí MT, sa bhliain 2004, in éineacht le Comhalta Sinsearach CosmoGrid Dmitry Avdeev agus Scoláire Anna Avdeeva.

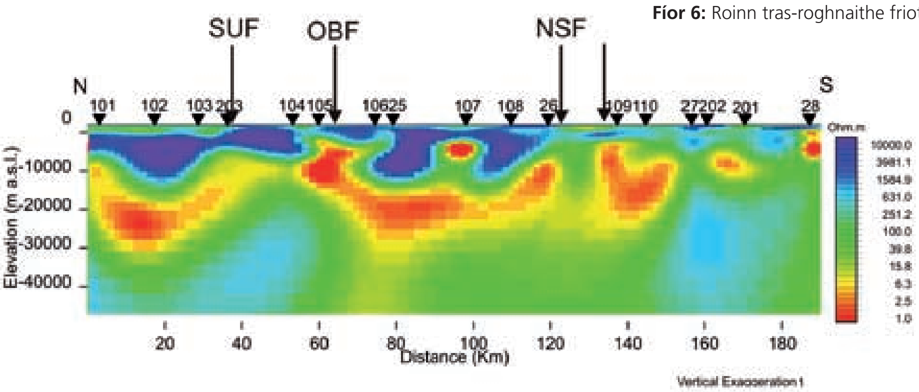


Figure 6: Resistivity cross-election section along the eastern-most profile in Figure 3.

Fíor 6: Roinn tras-roghnaithe friotachais ar fud na próifíle is faide soir i bhFíor 3.

The second part of the work is to examine the possibilities of adaptive filtering methods for reducing electric fence noise in the data. These methods showed promising first results in reducing the influence of the cow-fences. An extension of the LMS-adaptive filters to a Neural Network based approach reduced some of the distortion introduced by filtering individual components of the data. Also another component of the work is to develop joint inversion program for receiver function and MT data. The development of the program is currently in progress.

The Irish Lithosphere Magnetotelluric Experiment, ISLE-MT, is funded by the Irish Research Council for Science Engineering and Technology (IRCSET).

Multi-dimensional modelling and inversion

Theoretical and computational aspects of electromagnetic data modelling and inversion, particularly three-dimensional (3-D) inversion of MT data, were initiated in 2004 with Senior CosmoGrid Fellow Dmitry Avdeev and Scholar Anna Avdeeva.

In 2005, an efficient solution of the 3-D MT large scale inverse problem was the subject of the research. A limited-memory quasi-Newton (QN) method with simple bounds was chosen to develop a novel fully 3-D MT inversion technique. The central problem of this approach is to calculate effectively the derivatives of the so called penalty function. This calculation, if applied straightforwardly, can require many years on serial PCs, and consequently a significant effort was made to circumvent this computational bottleneck.

Ba é an réiteach éifeachtúil ar an bhfadhb inbhéartach MT 3-D ar scála mór ábhar na taighde sa bhliain 2005. Roghnaíodh modh leath-Newton (QN) le cuimhne shrianta agus teorainneacha simplí chun teicníc inbhéartaithe MT nua agus go hiomlán 3-D, a fhorbairt. Is í an fhadhb lárnach atá leis an gcur chuige sin ná díorthaigh na feidhme pionóis mar a thugtar uirthi, a ríomh go héifeachtúil. D'fhéadfadh sé go dtógfadh an ríomh sin, dá bhfeidhmeofaí go díreach é, go leor blianta ar PCanna srathacha, agus mar thoradh air sin rinneadh iarracht shuntasach dul timpeall ar an mbac ríomhaireachtúla/ uimhríochta sin.

Mar chéad chéim i dtreo na faidhbe a réiteach, rinneadh roinnt staidéir samhalacha ar dtús báire chun infheidhmitheacht an réitigh maidir le sonraí MT 1-D a léirmhíniú. Taispeánann na comparáidí a ndeacthas ina mbun gur rogha réasúnach é módh optamúcháin leath-Newton le cuimhne shrianta agus teorainneacha simplí. Léirítear torthaí ón samhlú 1-D i bhFíor 7. Bhí achoimre ar thorthaí an staidéir sin i bpáipéar ar ghlac an *Society of Exploration Geophysicists* leis lena fhoilsiú ina bpríomhiris *Geophysics*.

Spreag na dea-thorthaí a baineadh amach don chás 1-D atá níos simplí, sinn chun tús a chur le taighde lánscála ar an gcás 3-D. Rinneadh mionathrú ar an algartam don chás 3-D agus tástáladh é ansin ar shamhail 3-D simplí, rud a dhéanann aithris ar an díog sheoltach chlaonta i gcúlra aonfhoirmeach. Léirítear na réamhthorthaí a baineadh amach i bhFíor 8. Suimiúil go leor, is forbairt ghinearálta go maith í an fhorbairt a rinneadh i rith na taighde seo agus níltear teoranta do mhaighnéadaiteallúracha amháin. Féadfar an fhorbairt a fheidhmiú ar fhadhbanna EM éagsúla, ar nós foinse-rialaithe mara etc. Tá achoimre de thorthaí an dara staidéir sin i bpáipéar a ullmhaíodh le cur isteach chuig *Geophysics*.

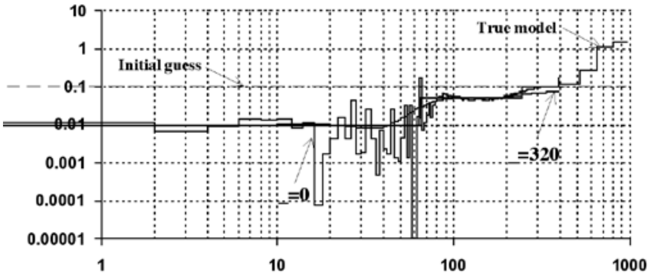


Figure 7: Conductivity models obtained from inversion based on the LMQNB optimization. The true model is shown by the solid line and the initial guess by the dashed line.

Fíor 7: Samhlacha seoltachta a fuarthas ó inbhéartú bunaithe ar an optamú LMQNB. Léiríonn an líne nach bhfuil briste an fíorshamhail agus léiríonn an líne bhriste an chéad bhuille faoi thuairim.

As a first step to solving the full 3-D problem, a number of model studies were initially performed to investigate the applicability of the solution to interpret 1-D MT data. The comparisons performed show that a limited memory quasi-Newton optimization method with simple bounds is a reasonable choice. Results from the 1-D modelling are shown in Figure 7. The results of this study were summarized in a paper that was accepted by the Society of Exploration Geophysicists for publication in their premier journal *Geophysics*.

These successful results obtained for the simpler 1-D case have encouraged us to initiate full-scale research on the 3-D case. The algorithm has been modified for the 3-D case and tested on a simple 3-D model that imitates a tilted conductive dyke in a uniform background. The preliminary results obtained are shown in Figure 8. Interestingly, the development done in the course of this research is quite general and is not limited to magnetotellurics alone. It can be applied to a variety of EM problems, such as marine controlled-source etc. The results of this second study are summarized in a paper prepared for submission to *Geophysics*.

Targeted surveys

Two small-scale targeted electromagnetic surveys took place in 2005. One of these was on the grounds of Birr Castle, the site of a possible radar telescope. On the grounds there is a question about the thickness of the overburden above the bedrock. Using direct current tomographic equipment borrowed from UCC, a survey was conducted, and depth to basement derived.

The second survey was for determining saline incursions into groundwater aquifers close to the city of Cork. A pilot high-frequency audio-magnetotelluric survey was conducted, but the data were heavily contaminated by noise. For 2006 a survey using a controlled electromagnetic source is planned.

Suirbhéanna spriocdhírithe:

Rinneadh dhá shuirbhé leictreamaighnéadach spriochdhírithe ar scála beag sa bhliain 2005. Rinneadh ceann díobh ar thailte Chaisleán Bhiorra, an láithreán a bhféadfaí teileascóip radair a chur ann. Maidir leis na tailte, tá ceist ann faoi thiús an fhorchlúdaigh atá os cionn na buncharraige. Rinneadh suirbhé ag baint úsáide as trealamh tomagrafach srutha dhírigh a fuarthas ar iasacht ó Choláiste na hOllscoile, Corcaigh, agus díorthaíodh an doimhneacht go dtí an bonnlach.

Chuathas i mbun an dara suirbhé chun ionraí sailíne isteach in uiscígh screamhuisce i ngar do chathair Chorcaí, a chinneadh. Rinneadh suirbhé píolótach clos-mhaighnéadaiteallúireach ardmhinicíochta, ach bhí drochéilliú torainn ar na sonraí. Tá sé beartaithe foinse leictreamaighnéadach rialaithe a úsáid i suirbhé don bhliain 2006.

Buaicphointí na ngníomhaíochtaí seismeolaíochta

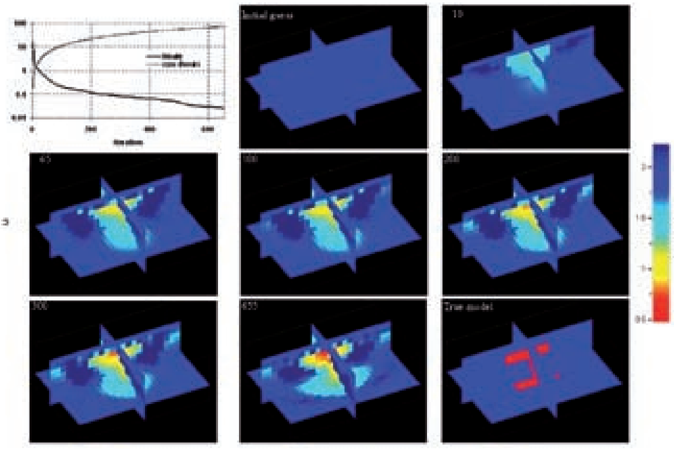
Is iad ár dtionscadail amach ón gcósta (HADES agus RAPIDS 4) agus an tionscadal teiliseismeach ar an gcósta (ISLE), na príomhfhócais a bhí ar obair an ghrúpa seismeolaíochta.

HADES agus RAPIDS

Rinneadh mínghlanadh ar shamhlacha tomagrafacha de na sonraí ón dá thraslíne a théann trasna Imeall Ilchríochach Hatton, chomh maith leis an líne a théann, go neasach, le hais Imchuach Hatton (féach an léarscáil suímh i bhFíor 9), do thionscadal Domhainseismeach Hatton (HADES) amach ón gcósta. Leis an tionscadal sin bhí 300 seismiméadar lonnaithe ar ghrinneall na farraige ag eatraimh tuairim is 3km, le hurchair gach uile 120m, agus táirgeadh lear mór sonraí, agus dá bhrí sin bhí gá le modheolaíochtaí samhlaithe agus modheolaíochtaí próiseála nua a fhorbairt. Shainmhínigh meascán de na torthaí tomografacha chomh maith le chur chuige tulshamhlaithe atá níos traidisiúnta, an Móhó agus bonn an ábhair threoluais aimhrialta atá thíos faoi Imeall Ilchríochach Hatton.

Figure 8: Convergence of the MT inversion for a 3-D model of a 3 ohm-m dyke in a uniform 100 ohm-m half-space. The top-left panel presents the misfit and cpu time vs the iteration number. Other panels present images of the initial guess, the true model, as well as the models obtained at various stages of inversion. Number of iterations is given in upper-left corner of each panel.

Fíor 8: Coinbhéirseacht an inbhéartaithe MT maidir le samhail thríthoiseach de dhingeán 3 óm-m i leathspás aonfhoirmeach 100 óm-m. Léiríonn an painéal thuas ar chlé an t-am mí-acmhainneach agus an t-am cpu vs an uimhir atrialla. Léiríonn painéil eile íomhánna den chéad bhuille faoi thuairim, den fhíorshamhail chomh maith leis na samhlacha a fuarthas i gcéimeanna éagsúla inbhéartaithe. Tugtar líon na n-atriallta sa choirnéal thuas ar chlé i ngach painéal.



Highlights of seismological activities

The main foci of the work of the seismological group have been on our offshore projects (HADES and RAPIDS 4) and the ISLE onshore teleseismic project.

HADES and RAPIDS

For the offshore Hatton Deep Seismic (HADES) project, tomography models of the data from the two transverse lines running across the Hatton Continental Margin, as well as the line running approximately along the axis of the Hatton Basin, have been refined (see location map in Figure 9). With 300 ocean bottom seismometers positioned at ca 3km intervals, and with shots every 120 m, this project produced an enormous quantity of data that necessitated the development of new processing and modelling methodologies. The Moho and base of the anomalous velocity body beneath the Hatton Continental Margin, were defined by a combination of the tomography results together with a more traditional forward modelling approach.

On the geological/geophysical side of the project, seismic reflection lines across the continental-ocean boundary were interpreted and integrated with our wide-angle results and other geophysical datasets, in particular gravity and magnetic data. Modelling of the RAPIDS 4 (Rockall and Porcupine Irish Deep Seismic) wide-angle seismic line across the Porcupine Arch indicated the presence of an anomalous velocity body beneath the basin centre, in agreement with the results from our previous gravity modelling. The crust is either very thin, or absent, and the presence of this body we interpret as serpentinised mantle (see model in Figure 10). A paper describing this result was submitted and accepted for publication in the *Journal of the Geological Society, London*.

The HADES and RAPIDS 4 experiments are funded by the Irish Petroleum Infrastructure Programme and the Geological Survey of Ireland.

Maidir le taobh geolaíoch/geofhisiceach an tionscadail, léirmhíníodh línte frithchaithimh seismeacha trasna teorann an aigéin ilchríche agus rinneadh iad a chomhtháthú lenár dtorthaí leathanuilleacha agus le tacair shonraí gheofhisiceacha eile, sonraí domhantarraingte agus sonraí maighnéadacha eile go háirithe. Agus an líne sheismeach leathanuilleach RAPIDS 4 (Rockall and Porcupine Irish Deep Seismic), trasna Stua an Torcáin á samhlú, léiríodh go raibh ábhar treoluais aimhrialta thíos faoi lár an imchuach, rud a thagann le torthaí an tsamhlaithe domhantarraingte a rinneamar roimhe sin. Is screamh fíorthanaí atá ann nó níl screamh ar bith ann, agus léirimid an t-ábhar sin atá ann mar mhaintlín nathairínithe, (féach ar an tsamhail atá i bhFíor10). Cuireadh páipéar a dhéanann cur síos ar an toradh sin isteach agus glacadh leis lena fhoilsiú san *Journal of the Geological Society, London*.

Maoiníonn Clár um Infrastruchtúr Peitriliam na hÉireann agus Suirbhéireacht Geolaíochta na hÉireann turgnamh HADES agus turgnamh RAPIDS 4.

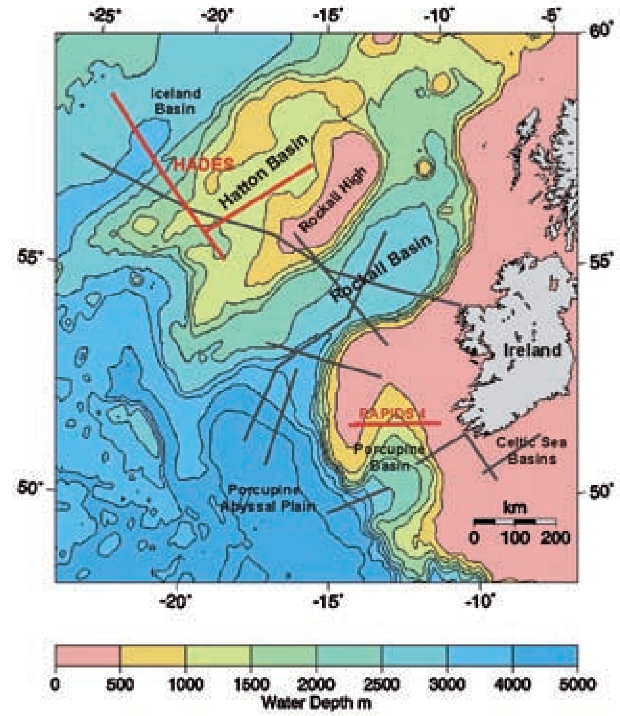


Figure 9: Location map for the offshore wide-angle seismic profiles across the Hatton Bank (HADES) and the Porcupine Basin (RAPIDS).

Fíor 9: Léarscáil suímh de na próifílí leathanuilleach seismeacha amach ón gcósta trasna Banc Hatton (HADES) agus Imchuach an Torcáin (RAPIDS).

ISLE

The Irish Seismological Lithospheric Experiment (ISLE) continued collecting data from about 10 broadband stations during the second phase of deployment (see location map in Figure 11). Intriguing results from the shear-wave splitting analyses have been obtained which have been supported by analysis of data over periods of 5 and 10 years from the Irish permanent stations VAL and DSB, respectively. The results suggest a component in the observed anisotropy related to the closure of the Iapetus Ocean at about 400 Ma, with another stronger component resulting from a deeper source in the mantle to the west of Ireland. Because of the limited range of back-azimuths available in the data recorded so far we cannot discount deep mantle boundaries as the origin of this deeper source anisotropy. Our data collection is continuing to try to resolve this. Collaboration with our Karlsruhe colleagues on the receiver function study continued throughout the year. Papers have been accepted for publication in *Geophysical Research Letters and Geophysical Journal International*.

The Irish Seismological Lithospheric Experiment is funded by a Basic Research Grant from Enterprise Ireland.

Turgnamh Litisféarach Seismeolaíoch na hÉireann (ISLE)

Le Turgnamh Litisféarach Seismeolaíoch na hÉireann (ISLE), leanadh ar aghaidh ag bailiú sonraí ó thuairim is 10 stáisiún leathanbhanda le linn dara céim imlonnaithe, (féach an léarscáil suímh atá i bhFíor 11). Fuarthas torthaí suimiúla ón anailís scoilte fiarthoinne lena dtacaíonn anailís a rinneadh ar shonraí thar tréimhsí 5 bliana agus 10 mbliana, sonraí a fuarthas ó na buanstáisiúin de chuid na hÉireann, VAL agus DSB, faoi seach. Léirigh na torthaí comhpháirt san ainíostrópacht bhreathnaithe a bhaineann le dúnadh an Aigéin Iaipéitis ag tuairim is 400 Ma, agus comhpháirt eile níos láidre atá mar thoradh ar fhoinse níos doimhne sa mhaintlín siar ó Éirinn. De bhrí go bhfuil raon teoranta cúl-asamat ar fáil sna sonraí a taifeadadh go dtí seo, ní fhéadfaimid a rá nach iad teorainneacha an mhaintlín dhomhain bunphointe na hainíostrópachta ó fhoinse níos doimhne. Táimid ag iarraidh réiteach a fháil air sin i gcónaí agus sinn ag bailiú sonraí. Leanadh den obair, i rith na bliana, ar an staidéar ar an bhfeidhm ghlacadóra, i gcomhar lenár gcomhghleacaithe in Karlsruhe. Glacadh le páipéir lena bhfoilsiú in *Geophysical Research Letters* agus in Geophysical *Journal International*.

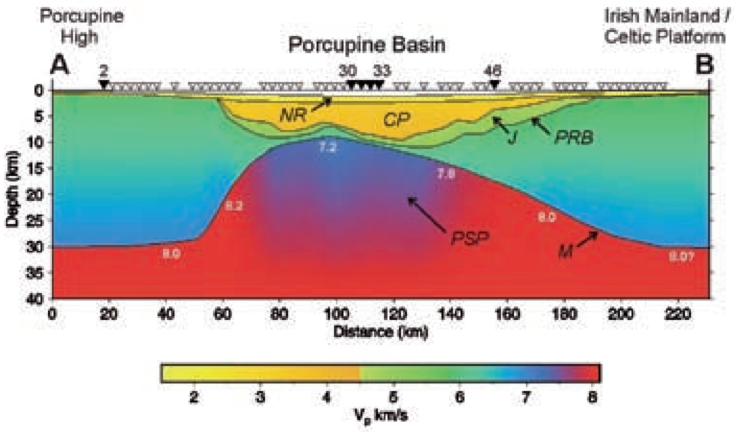
Maoiníonn Deontas Taighde Bhunúsach ó Fiontraíocht Éireann Turgnamh Litisféarach Seismeolaíoch na hÉireann.

Turgnamh Litisféarach Geo-eolaíoch Afach na hAetóipe (EAGLE)

Bhíomar rannpháirteach sa Turgnamh Litisféarach Geo-eolaíoch Afach na hAetóipe (EAGLE), sa bhliain 2003 agus bhíothas ag déanamh anailíse ar na torthaí fós i rith na bliana 2005. Soláthraíonn an turgnamh pictiúr de bhriseadh suas litisféarach os cionn "púir mhaintlín", ag an idirthréimhse idir scoilteadh ilchríochach. Bhí an tionscadal dírithe ar Phríomh-Scoilt Thuaisceart na hAetóipe (NMER), atá ina luí trasna an ardchláir ardaithe Aetópach. Ba comhpháirt mhór de EAGLE ab ea suirbhé athraonta/suirbhé frithchaithimh leathanuilleach foinse-rialaithe, suirbhé a bhí comhdhéanta de dhá phróifíl

Figure 10: Velocity model for the RAPIDS4 profile across the Porcupine Basin *(see location map in Figure 9)*.

Fíor 10: Samhail treoluais do na sonraí ón bpróifíl RAPIDS4 trasna Imchuach Porcupine *(féach an léarscáil suímh i bhFíor 9)*.



EAGLE

We participated in the Ethiopia Afar Geoscientific Lithospheric Experiment (EAGLE) in 2003 and analysis of the results continued during 2005. The experiment provides a snapshot of lithospheric break-up above a "mantle plume", at the transition between continental rifting. The focus of the project was the Northern Main Ethiopian Rift (NMER) that lies across the uplifted Ethiopian plateau. A major component of EAGLE was a controlled-source refraction/wide-angle reflection survey comprising two 400 km profiles and a 100 km diameter 2-D array. The latter was deployed to provide a 3-D image of the sub-surface beneath the intersection of the profiles. The resulting seismic velocity model provides insight into the magmatic and structural processes occurring beneath this section of the NMER. A paper in a Special Publication of the Geological Society, London is in press and will appear in 2006.

TRIM

Slightly away from the main focus of our seismic work, interpretation of data from a previous deep-tow sidescan sonar project (TOBI Rockall Irish Margins – TRIM) and integration with other data progressed in collaboration with colleagues from the UCD School of Geological Sciences. This incorporated data from the Irish National Seabed Survey and included high resolution seismic information. Numerous canyons and slope failure features have incised the eastern margin of the Rockall Trough, west of Ireland. Swath multibeam bathymetry has been integrated with an extensive grid of 2-D exploration industry seismic data and our high resolution TOBI data to constrain the evolution and development of the slope from mid-Cenozoic times through to the present. The morphology varies along the margin with canyon heads either located at mid-slope depths, or extending onto the shelf. A 'bottom driven' upslope retrogressive slope failure mechanism for the formation of the canyons is inferred, largely consistent with the interpretations from the TRIM survey. The canyons found in the NE Rockall Trough were utilised as sediment conduits associated with Plio-Pleistocene progradation of glaciomarine sediments. A paper describing these results has been submitted to *Marine Geology*.

400km agus eagar 2-D le trastomhas de 100km. Imlonnaíodh an t-eagar chun íomhá 3-D den fhodhromchla atá faoin áit a dtrasnaíonn na próifílí a chéile a chur ar fáil. Tugann an tsamhail treoluais sheismeach a bhí mar thoradh air sin, léargas dúinn ar na próisis mhagmatacha agus ar na próisis struchtúrtha atá ag tarlú faoin gcuid sin den NMER. Tá páipéar in Eagrán Speisialta den *Geological Society, London* ag na clódóirí faoi láthair agus beidh sé le feiceáil sa bhliain 2006.

Imill Éireannacha Rocal TOBI (TRIM)

Is ábhar é seo atá imithe beagáinín ó phríomfhócas ár n-oibre seismí, ábhar ina ndéantar sonraí ó thionscadal sonóra taobhscanta domhain-tarraingte a rinneadh roimhe seo (Imill Éireannacha Rocal TOBI – TRIM) a léirmhíniú agus a chomhtháthú le sonraí eile a cuireadh chun cinn i gcomhar le comhghleacaithe ó Scoil na nEolaíochtaí Geolaíochta UCD. Bhí sonraí ó Shuirbhéireacht Náisiúnta Ghrinneall Farraige na hÉireann ionchorpraithe leis agus bhí faisnéis sheismeach ardtaifeach san áireamh ann. Tá imill thoir Umar Rocal atá siar ó Éirinn trinsithe ag an iliomad cainneon agus gnéithe chliseadh fána. Tá bataiméadracht ilbhíoma sraithe comhtháite le heangach fhorleathan de shonraí seismeacha an tionscail taiscéalaíochta 2-D agus dár sonraí TOBI ardtaifeach chun srian a chur ar éabhlú agus ar fhorbairt na fána ó lár na ré Chaenasóch go dtí an lá atá inniu ann. Tá éagsúlachtaí sa mhoirfeolaíocht ar fud an imill agus tá cinn na gcainneon lonnaithe ag doimhneachtaí i lár na fána nó síneann siad ar an scairbh. Tá meicníocht chliseadh fána cúlchéimnithe in aghaidh na fána 'a thiomáintear ar an ngrinneall', infeirithe, a thagann le léirmhínithe ón suirbhé TRIM, den chuid is mó. Úsáideadh na cainneoin ar thángthas orthu in Oirthuaisceart Umar Rocal mar sheolbhealach dríodair a raibh baint acu le forghrádú dríodar oighearmhuirí Pléi-Pléisticéinea. Tá páipéar a dhéanann cur síos ar na torthaí sin curtha isteach chuig *Marine Geology*.

Figure 11: Location map of seismic stations for the ISLE experiment.

Fíor 11: Léarscáil suímh de stáisiúin sheismeacha don turgnamh ISLE.

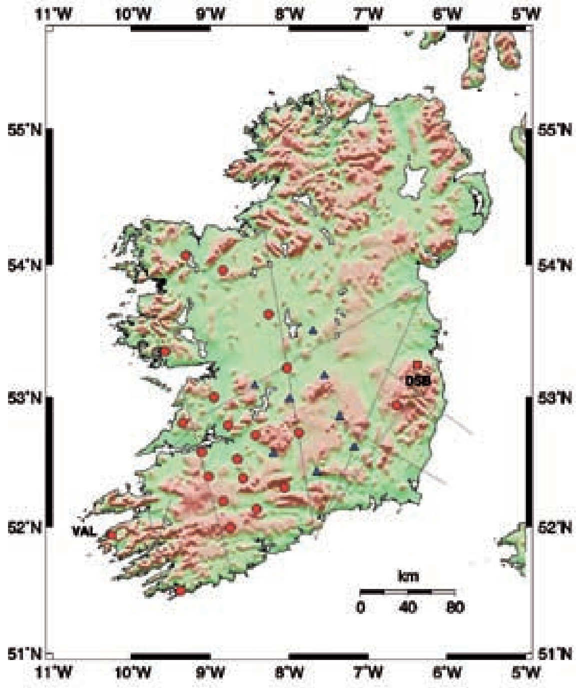
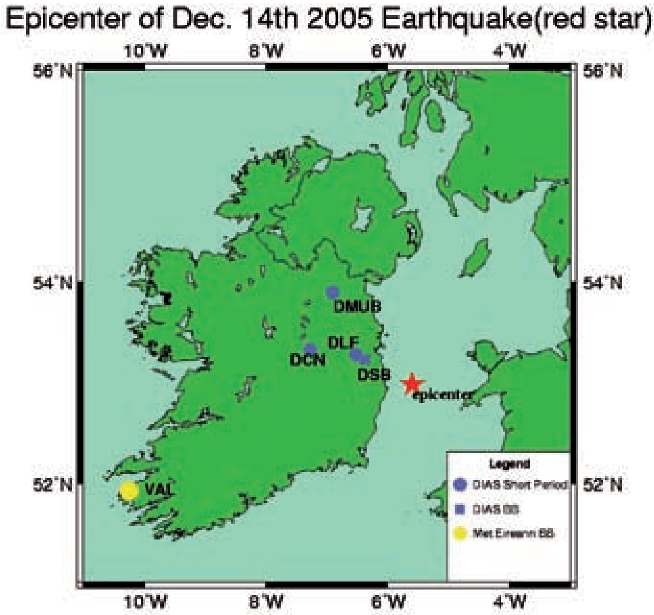


Figure 12: Station map of national seismic network stations, plus location of the December 14, 2005 earthquake event.

Fíor 12: Léarscáil stáisiún de stáisiúin an líonra sheismigh náisiúnta agus suíomh an chreatha talún a tharla an 14 Nollaig, 2005.



Seismic network activities

Following the heightened media and public awareness of earthquake hazards and related events following the Sumatra SE Asia event, the Geophysics Section was very busy through January and February responding to requests for information from the media, academics and students, and the general public. This gave the Section an opportunity to report on the state of Ireland's seismic network (location map in Figure 12) and the fact that a modern, real-time, nationally-funded seismic network does not exist in Ireland. Efforts are ongoing to bring this issue to the attention of the government.

On December 14th at 03:30 a.m. the east coast of Ireland experienced an earthquake whose epicentre was in the Irish Sea at latitude 53.00 N, longitude 5.60 W (see Figure 12). This event had a local magnitude of 2.8ML on the Richter Scale and occurred adjacent to the location in the Irish Sea of a strong earthquake (local magnitude 3.8 ML) that took place in 1951.

The earthquake was recorded at all the seismic stations in the network. The DSB seismic recording station in the Dublin Mountains was the nearest station to the epicentre and Figure 13 shows the seismic signal recorded at that station. The red and blue lines represent 30 minutes of recording time at the station, which records local, regional and teleseismic events from around the world. This station is part of the international seismic network GEOFON which is based in Potsdam, Germany.

Gníomhaíochtaí an líonra seismigh

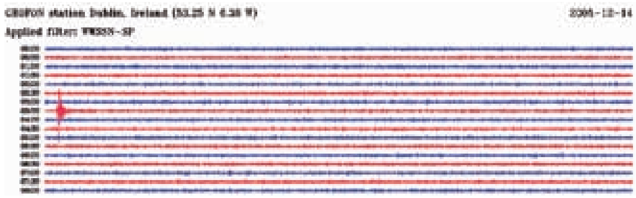
Bhí Roinn na Geoifisice fíorghnóthach i rith mhí Eanáir agus i rith mhí Feabhra agus iarratais ar fhaisnéis ó na meáin, ó lucht acadúil, ó mhic léinn agus ón bpobal i gcoitinne, á bhfreagairt acu mar go raibh feasacht na meán agus an phobail méadaithe maidir le guaiseacha creathanna talún agus imeachtaí gaolmhara tar éis ar tharla i Sumatra in Oirdheisceart na hÁise. Leis sin, tugadh an deis don Roinn tuairisc a thabhairt ar staid líonra seismigh na hÉireann (léarscáil suímh i bhFíor 12), agus ar an bhfíric nach bhfuil líonra seismeach nua-aimseartha, réad-ama, líonra a mhaoinítear go náisiúnta, in Éirinn. Tá iarrachtaí leanúnacha á ndéanamh i gcónaí an tsaincheist sin a thabhairt ar aird an rialtais.

Tharla crith talún ar chósta thoir na hÉireann an 14ú Nollaig ag 03:30 a.m. agus bhí eipealár an chreatha talún i Muir Éireann ag domhanleithead 53.00 T, domhanfhad 5.60 I (féach Fíor 12). Bhí méid áitiúil de 2.8M ar an Scála Richter ag an eachtra agus tharla sé i ngar do shuíomh creatha talún láidir a tharla i Muir Éireann sa bhliain 1951.

Taifeadadh an crith talún ag na stáisiúin sheismeacha ar fad sa líonra. Ba é an stáisiún taifeadta seismeach DSB i Sléibhte Bhaile Átha Cliath an stáisiún ba ghaire don eipealár agus léiríonn Fíor 13 gurb é an stáisiún sin a rinne taifeadadh ar an gcomhartha seismeach. Léiríonn na línte dearga agus na línte gorma 30 nóiméad d'am taifeadta sa stáisiún a dhéanann taifeadadh ar eachtraí áitiúla, eachtraí réigiúnacha agus

Figure 13: Recording of the December 14th, 2005 earthquake on the seismic station DUB located in the Dublin Mountains.

Fíor 13: Taifeadadh den chrith talún a tharla an 14ú Nollaig, 2005, a taifeadadh sa stáisiún seismeach DUB atá lonnaithe i Sléibhte Bhaile Átha Cliath.



The December 14th 2005 event was felt by many people on the east coast of Ireland stretching from Wicklow as far north as Portmarnock in north County Dublin. The DIAS Geophysics website introduced an online questionnaire so that those who felt the earthquake could report on what they felt, and there were over 60 respondents.

Rheological modelling

Within the COSMOGRID project our studies have encompassed various geodynamical problems. The main study has been on the possible influence of reaction-related grain-size refinement creating rheological weak zones during the post-rift stage of an extensional event. The development of such rheologically weak zones may contribute to simple shear deformation in many rift-related sedimentary basins developed by multi-rifting events. Some results from rheological modelling illustrating the possible creation of these weak zones in the uppermost mantle are shown in Figure 14. The role of strain hardening on rift dynamics, factors controlling the uplift of the Transantarctic Mountains in Antarctica and localized deformation brought about by magmatic underplating at volcanic passive margins have also been investigated.

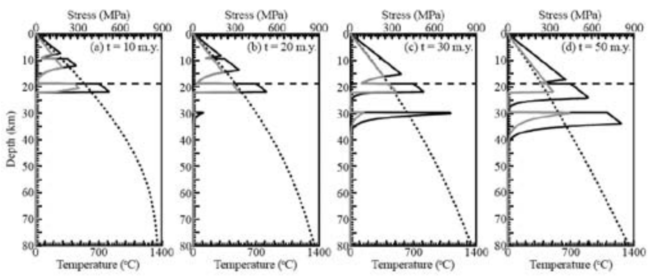


Figure 14: Modelled yield stress envelope associated with reactivation of rifting in the post-rift period showing the start of a rheological weak zone in the sub-crustal mantle at 20 m.y.

Fíor 14: Imchlúdach struis táirgeachta samhaltaithe a bhaineann le hathghníomhachtú scoilte sa tréimhse iar-scoilte a léiríonn crios lag sreabheolaíoch ag tosú sa mhaintlín fo-screimhe ag 20 m.y.

eachtraí teilisheismeacha as áiteanna ar fud an domhain. Is cuid den líonra seismeach idirnáisiúnta GEOFON atá lonnaithe in Potsdam sa Ghearmáin, é an stáisiún sin.

Bhraith go leor daoine in áiteanna ar chósta thoir na hÉireann, ó Chontae Chill Mhantáin suas chomh fada ó thuaidh le Port Mearnóg i dtuaisceart Chontae Bhaile Átha Cliath an eachtra a tharla an 14ú Nollaig 2005. Tugadh ceistiúchán ar líne isteach ar láithreán gréasáin na roinne Geofisice de chuid Institiúid Ardléinn Bhaile Átha Cliath le go bhféadfadh na daoine sin a bhraith an crith talún tuairisc a thabhairt ar gach a bhraith siad. D’fhreagair breis agus 60 duine an ceistiúchán.

Samhlú Sreabheolaíoch

Cuimsíonn an staidéar a rinneadh laistigh dár dtionscadal COSMOGRID fadhbanna geo-dhinimiciúla éagsúla. Is ar an tionchar a d’fhéadfadh a bheith ag mionchóiriú ar mhéid gráinne a bhaineann le himoibriú agus a chruthódh lagchriosanna sreabheolaíocha le linn na céime iar-scoilte d’eachtra shínteach a bhí an príomhstaidéar. D’fhéadfadh forbairt lagchriosanna sreabheolaíoch den sórt sin cur le fiardhífhoirmiú simplí in go leor imchuacha dríodair a bhaineann le scoiltí arna bhforbairt ag eachtraí ilscoilte. Tugtar roinnt torthaí ó shamhlú sreabheolaíoch a léiríonn go bhféadfaí go gcruthófaí na lagchriosanna sin sa mhaintlín is uachtaraí, i bhFíor 14. Imscrúdaíodh ról na straidhnchruachana ar dhinimic scoiltí, fachtóirí a rialaíonn an t-ardú ar na Sléibhte Trasantartacha san Antartach agus dífhoirmiú logánta a tharlaíonn mar thoradh ar fhophlátú magmatach ag imill éighníomhacha bholcánacha, freisin.

School of Theoretical Physics
Scoil na Fisice Teoiriciúla

This year a new Governing Board was installed. We are grateful to the outgoing Chairman, Professor Sir Michael Atiyah, for all his efforts on behalf of the School, and we welcome Professor Arthur Jaffe as the new Chairman. We also thank Professors Joe Pule and Jim Dooge for their support as outgoing Board members, and welcome Professor Hermann Nicolai, Dr. Sinead Ryan and Dr. Michael Tuite as new members of the Board. Unfortunately, two other proposed members for the Board declined. During the first meeting of the new Board it was decided to enlarge the Board, and propose the names of four other eminent researchers to the Government for appointment to the Board.

Another important development was the approval of the appointment of two new Schrödinger Fellows in the School. Interviews were held on 28 April and 12 July. Dr. Alexander Povolotsky and Dr. Oleg Lisovyy were offered and accepted 3 resp. 5-year Fellowships. The latter started at the end of October, the former will start in January 2006.

In November the first John Lewis Lectures were held in collaboration with the Hamilton Mathematics Institute of Trinity College. The first Distinguished John Lewis Lecturer was Professor Jürg Fröhlich from Zürich. He gave 4 lectures on a variety of topics.

Other main development during the year were:

Personnel

- One pre-doctoral Scholar, Pavel Castro, finished in February, and two others, Fernando Garcia and Rodrigo Delgadillo, finished at the end of November. They are all expected to complete their Ph.D. in Mexico in the beginning of 2006.
- A pre-doctoral Scholar, Anne Ghesquiere started work under Prof. Dorlas on the subject of quantum information theory and entanglement.

Insealbhaíodh Bord Rialaithe nua i mbliana. Táimid buíoch don Chathaoirleach atá ag fágáil, An tOllamh Sir Michael Atiyah, as a dhícheall go léir thar ceann na Scoile, agus fáiltímid roimh an Ollamh Arthur Jaffe mar Chathaoirleach nua. Glacaimid buíochas freisin leis na hOllúna Joe Pule agus Jim Dooge as a dtacaíocht mar chomhaltaí Boird atá ag imeacht agus fáiltímid roimh an Ollamh Hermann Nicolai agus an Dr Michael Tuite mar chomhaltaí nua den Bhord. Faraor, dhiúltaigh beirt eile a bhí molta mar chomhaltaí don Bhord comhaltas a ghlacadh. Ag an gcéad chruinniú den Bhord nua cinneadh an Bord a mhéadú, agus ainmneacha ceathrar taighdeoirí móra le rá eile a mholadh don Rialtas le ceapadh ar an mBord.

Forbairt thábhachtach eile a bhí sa chead a tugadh beirt Ánraí Schrödinger a cheapadh sa Scoil. Tionóladh agallaimh an 28 Aibreán agus an 12 Iúil. Tairgeadh Ánracht 3 bliana agus 5 bliana faoi seach don Dr Alexander Povolotsky agus don Dr Oleg Lisovyy. Thosaigh an Dr Lisovyy ag deireadh mhí Deireadh Fómhair agus tosóidh an Dr Povolotsky in Eanáir 2006.

I mí na Samhna tionóladh na chéad Léachtanna John Lewis i gcomhar le hInstitiúid Matamaitice Hamilton de chuid Choláiste na Tríonóide. Ba é an chéad Léachtóir Oirirc John Lewis ná an tOllamh Jürg Fröhlich as Zürich. Thug sé 4 léacht ar thopaicí éagsúla.

Ar na príomhfhorbairtí eile i rith na bliana bhí:

Pearsanra

- Chríochnaigh Scoláire réamhdochtúireachta amháin, Pavel Castro, i mí Feabhra agus chríochnaigh beirt eile, Fernando Garcia agus Rodrigo Delgadillo, ag deireadh mhí na Samhna. Bhí siad ar fad ag súil lena Ph.D. a chríochnú i Meicsiceo i dtús 2006.
- Chuir Scoláire réamhdochtúireachta, Anne Ghesquiere, tús le hobair faoin Ollamh Dorlas agus is teoiric faisnéise an chandaim agus aimhréidhe an t-ábhar atá aici.

- A pre-doctoral Scholar, Ciara Morgan started work under Prof. Dorlas on the subject of quantum information theory.
- Another pre-doctoral Scholar, Idrish Huet, resumed his studies at DIAS in August under supervision of Prof. O'Connor.
- A new Schrödinger Fellow, Dr. Oleg Lisovyy, took up his 5-year position at the end of October.
- A new full-time IT assistant, Andres Jimenez, was appointed in May.
- Two Embark Initiative Post-doctoral Fellowships were awarded, to Subrata Bal and David Garcia Alvarez, for studies to be carried out at the school in collaboration with Prof. O'Connor.

Organisational Activities and Achievements

- An international conference in honour of the late Professor John Lewis was organised in collaboration with Prof. Brendan Goldsmith (DIT) and Dr. Ken Duffy (CSRI). It was held in the Dublin Institute of Technology from 14-17 June, and concentrated on 3 main topics: Quantum Mechanics; Statistical Mechanics; and Communication Theory. Proceedings are being prepared and will be published in Markov Processes and Related Fields.
- The first John Lewis Lectures were organised in collaboration with the Hamilton Mathematics Institute (TCD). They were given by Professor Jürg Fröhlich from Zürich from 21-25 November. Four lectures were given on the following topics: Thermodynamics and Statistical Mechanics; Bose Gases and Boson Stars; CFT, TFT and Others; and The Fractional Quantum Hall Effect.
- The DIAS Winter Symposium was organised in collaboration with the Irish Mathematical Society. It took place on 14-15 December.
- It was agreed to honour the late Professor O'Raifeartaigh by hosting an O'Raifeartaigh lecture by an distinguished researcher as part of the annual Irish Quantum Field Theory meeting.

- Chuir Scoláire réamhdhochtúireachta, Ciara Morgan, tús le hobair faoin Ollamh Dorlas agus is teoiric faisnéise an chandaim an t-ábhar atá aici.
- D'fhill Scoláire réamhdhochtúireachta eile, Idrish Huet, ar a chuid staidéir ag DIAS i Lúnasa faoi mhaoirseacht an Ollaimh O'Connor.
- Ghlac Ánra nua Schrödinger, An Dr Oleg Lisovyy, lena phost 5 bliana ag deireadh mhí Deireadh Fómhair.
- Ceapadh cúntóir IT lánaimseartha nua, Andres Jimenez, sa Bhealtaine.
- Bronnadh dhá Ánracht Iardochtúireachta Thionscnamh Embark, ar Subrata Bal agus David Garcia Alvarez, ar staidéar atá le déanamh ag an scoil i gcomhar leis an Ollamh O'Connor.

Gníomhaíochtaí Eagraíochtúla agus Gnóthachtálacha

- D'eagraigh an tOllamh Brendan Goldsmith (DIT) agus an Dr Ken Duffey (CSRI), i gcomhar, comhdháil idirnáisiúnta i gcuimhne ar an Ollamh John Lewis, nach maireann. Tionóladh í in Institiúid Teicneolaíochta Bhaile Átha Cliath ón 14-17 Meitheamh, agus dhírigh sí isteach ar 3 phríomhthopaic: Meicnic Chandamach; Meicnic Staitistiúil; agus Teoiric na Cumarsáide. Tá na himeachtaí á n-ullmhú agus foilseofar iad i *Markov Processes and Related Fields*.
- Eagraíodh na chéad Léachtanna John Lewis i gcomhar le hInstitiúid Matamaitice Hamilton (TCD). Ba é an tOllamh Jürg Fröhlich as Zürich a thug na léachtanna ón 21-25 Samhain. Tugadh ceithre léacht ar na topaicí seo a leanas: Teimidinimic agus Meicnic Staitistiúil; Gáis Bose agus Réalta Bósóin; CFT, TFT agus Eile; agus Éifeacht Chodánach Hall an Chandaim.
- Eagraíodh Siompóisiam Geimhridh an DIAS i gcomhar le Cumann Matamaitice na hÉireann. Bhí sé ar siúl an 14-15 Nollaig.
- Socraíodh ómós a léiriú don Ollamh Ó Raifeartaigh, nach maireann, trí iarraidh ar thaighdeoir mór le rá Léacht Uí Raifeartaigh a thionól mar chuid de chruinniú bliantúil Theoiric Réimse Candamach na hÉireann

Research Activities

Statistical Mechanics and Disordered Systems

The collaboration with Prof. Joe Pule (UCD) on Anderson localisation in one-dimensional systems was continued in collaboration with a post-doc, Dr. Christophe Dobrovolny. We started by computing the Lyapunov exponent of the 1-dimensional Anderson model, to second order in the disorder strength. The power series for the invariant measure, from which the Lyapunov exponent can be derived, was shown to diverge at certain values of the energy by Kappus and Wegner, and in more detail, Derrida and Gardner. In particular, they found that at zero energy, i.e. in the middle of the band, the invariant measure is discontinuous in the limit of zero disorder. In previous work we showed that this situation persists for two chains, and in a sense becomes worse. We now extended a method due to Pastur to the case of several chains. We also applied this analysis to the case of a carbon nanotube, where it becomes quite complicated. However, the main conclusion is that the Lyapunov exponent behaves in the same way as the width of the tube varies as in the case of the Anderson model.

Another topic studied was the Feynman-Kac representation of a Bose gas with interaction, which involves a sum over permutations due to the Bose symmetry. These permutations can be decomposed into cycles, and it was predicted by Feynman, and more precisely by Onsager and Penrose, that Bose-Einstein condensation can be characterised in the Feynman-Kac representation of the partition function, by the occurrence of very long cycles with high probability. This suggestions was proved in the case of a free gas and also for a gas with mean-field interaction, by Sütö. In collaboration with Profs. Philippe Martin (Lausanne) and Joe Pule (UCD), it was shown, using large deviation techniques, that this conjecture is also valid in the case of the perturbed mean-field model, introduced by Profs. John Lewis and Joe Pule and Dorlas in 1990.

Gníomhaíochtaí Taighde

Meicnic Staitistiúil agus Córais Neamhordúla

Leanadh den chomhoibriú leis an Ollamh Joe Pule (UCD) ar logálú Anderson i gcórais aon-toiseacha i gcomhoibriú leis an scoláire iardhochtúireachta, An Dr Christophe Dobrovolny. Thosaíomar trí easpónant Lyapunov de shamhail 1-toiseach Anderson a ríomh, go dtí an dara ord sa neart neamhoird. Léiríodh go ndibhéirsíonn an chumhachtsraith don tomhas do-athraitheach, ónar féidir easpónant Lyapunov a dhíoradh, ag luachanna áirithe den fhuinneamh ag Kappus agus Wegner, agus níos mionsonraithe, ag Derrida agus Gardner. Go háirithe, fuarthas ag náid fuinnimh, i.e. i lár an bhanda, go bhfuil an tomhas do-athraitheach díleanúnach sa teorainn de neamhord náid. I saothar roimhe seo, thaispeánamar gur ann don chás seo do dhá shlabhra, agus ar shlí go bhfaigheann sé níos measa. Anois leathnaíomar modh mar gheall ar Pastur go dtí cás roinnt slabhraí. Chuireamar an anailís seo i bhfeidhm freisin i gcás nanaifheadáin charbóin, áit a bhfaigheann sé sách casta. Mar sin féin, is í an phríomhchonclúid gur mar a chéile a bhíonn iompar easpónant Lyapunov de réir mar a athraíonn leithead an fheadáin, faoi mar atá an cás i samhail Anderson.

Topaic eile a ndearnadh staidéar air ná léiriú Feynman-Kac ar ghás Bose le hidirghníomhú, lena mbaineann suim os cionn iomalartuithe mar gheall ar shiméadracht Bose. Is féidir na hiomalartuithe sin a bhriseadh síos ina dtimthrialacha, agus ba é an tuar a bhí ag Feyman, agus níos cruinne ag Onsager agus Penrose, gur féidir comhdhlúthú Bose-Einstein a aicmiú sa léiriú Fehnman-Kac ar fheidhm rannach, trí timthrialacha an-fhada le dóchúlacht an ard a bheith ann. Chruthaigh Sütö an moladh seo i gcás saorgháis agus freisin do ghás le meánréimse idirghníomhaíochta. I gcomhoibriú leis an Ollamh Phillipe Martin (Lausanne) agus le Joe Pule (UCD), léiríodh, ag baint úsáide as teicnící mór-diallta go bhfuil an bharúil seo bailí freisin i gcás na samhla meán-réimse corraithe, a thug na hOllúna John Lewis agus Joe Pule agus Dorlas i láthair i 1990.

Another project concerned the Asymmetric Exclusion Process. This is a collaboration with Prof. V. B. Priezzhev (Dubna, Russia). A modification of the Bethe Ansatz method introduced by Priezzhev allows an exact solution of this model on a ring. However, the resulting equations are rather complicated and it is not a straightforward exercise to derive explicit expressions for physical quantities from these. In fact, even the simple fact that the total probability of all configurations at time $t > 0$ equals 1, is not trivial to prove. This normalisation of the total probability was proved last year. We proceeded by evaluating the Bethe Ansatz expression for the probability that a particle reaches the end of the interval in time t, and we analysed its asymptotics.

Field Theory and Particle Physics

The group associated with Professor O'Connor continued its investigations of fuzzy spaces and their use for the non-perturbative study of field theories. The motivation for the study of fuzzy field theory is diverse, but one principal goal is to develop an alternative method for dealing with the non-perturbative aspects of quantum field theory and hence provide an alternative to lattice approximations. Moreover, fuzzy spaces (and more general non-commutative spaces) also appear to be of fundamental importance in string theory. They also provide methods of studying the renormalizability properties of the non-commutative field theories that have received much attention in recent years.

The focus in this reporting period is on the continued development of both theoretical and numerical techniques for the study of supersymmetric models. It is remarkable that these spaces permit the truncation of supersymmetric theories to ones with a finite number of degrees of freedom while preserving the supersymmetry. An initial numerical study was commenced on a model with dynamical fermions on the fuzzy sphere. The chosen model has supersymmetry in the planar limit. It is hoped to have the phase diagram of this model by the next reporting period.

Bhain tionscadal eile leis an bPróiseas Eisiaimh neamhshiméadrach. Is comhoibriú é seo leis an Ollamh V. B. Priezzhev (Dubna, An Rúis). Is féidir le modhnú ar mhodh Bethe Ansatz atá tugtha i láthair ag Priezzhev réiteach beacht a fháil ar an tsamhail seo ar fháinne. Mar sin féin, tá na cothromóidí a bhíonn mar thoradh air sách casta agus ní cleachtadh díreach é chun léirshloinn a dhíoradh do chainníochta fisiceacha astu seo. Go deimhin, fiú amháin ní saothar beag gan dua a chruthú gur fíor an fhíric shimplí go bhfuil an dóchúlacht iomlán de na cumraíochtaí go léir ag am $t > 0$ comhionann le 1. Cruthaíodh normálú na dóchúlachta iomláine seo anuraidh. Leanamar linn trí shlonn Bethe Ansatz a mheasúnú don dóchúlacht go sroicheann cáithnín deireadh eatraimh in am t, agus rinneamar anailís ar a asamtóitigh.

Réimsetheoiric agus Fisic Cháithníní

Lean an grúpa i gcomhar leis an Ollamh O'Connor dá imscrúduithe ar spásanna doiléire agus ar a n-úsáid do staidéar neamhchorraithe na réimsetheoiricí. Tá éagsúlacht ag baint leis an spreagadh don staidéar ar an réimsetheoiric doiléire, ach príomhsprioc amháin ná modh eile a fhorbairt chun déileáil le gnéithe neamhchorraithe den réimsetheoiric chandamach agus as sin rogha eile a sholáthar do neastachán laitíse. Chomh maith leis sin, is dealraitheach go bhfuil tábhacht bhunúsach sa sreangtheoiric freisin le spásanna doiléire (agus níos ginearálta spásanna neamh-chómhalartacha). Cuireann siad modhanna ar fáil freisin chun staidéar a dhéanamh ar airíonna ath-in-normálachta na réimsetheoiricí neamh-chómhalartacha a bhfuil aird mhór tugtha orthu le blianta beaga anuas.

Tá an fócas sa tréimhse tuairiscithe seo ar fhorbairt leanúnach ar na teicnící teoiriciúla agus uimhriúla don staidéar ar shamhlacha forshiméadracha. Is cuid suntais go gceadaíonn na spásanna sin teascadh a dhéanamh ar theoiricí forshiméadracha go dtí cinn a bhfuil líon críochta céimeanna saoirse acu agus fós a bheith ag caomhnú na forshiméadrachta. Cuireadh tús le staidéar uimhriúil tosaigh ar shamhail le fearmóin dhinimiciúla ar an sféar doiléire. Tá forshiméadracht sa teorainn phlánach ag an tsamhail a roghnaíodh. Táthar ag súil go mbeidh pas-léaráid den tsamhail seo ann faoin gcéad tréimhse tuairiscithe eile.

Progress was also made on a range of studies of lattice gauge theories, including a numerical study of a confined Q Q system in compact U(1) lattice gauge theory in 4D, a studying glueball masses in SU(2) lattice gauge theory in 3D and a numerical study of confinement in compact QED.

The group hosted a long term visit by T.R. Govindarajan, who worked on non-commutative two dimensional gravities and a non-local regularization of non-commutative field theories.

Professor Nahm has started a collaboration with Dr. Marianne Leitner about the theoretical understanding of the quantum Hall effect in graphene, a two-dimensional form (sheet) of graphite. This effect had in fact been predicted for relativistic fermions before it was observed experimentally. A geometric interpretation had been put forward by Dr. Leitner in her Ph.D. thesis. The present work concerns the existence of spontaneous edge currents due to magnetic impurities in the material, which break reflection symmetry.

Professor Nahm also started work on conformal field theories with integrable perturbations. A theory for such theories was put forward by Kirillov and Reshetikhin, but this is very obscure. Lectures were given on the subject of integrable models with the aim of clarifying some of the questions involved. In particular, it is found that the use of elliptic functions can be avoided and replaced by some algebraic geometry. The lectures will be written up for the DIAS Communications.

Rinneadh dul chun cinn freisin ar raon staidéir ar thomhasteoiricí laitíse, lena n-áirítear staidéar uimhriúil ar chóras gaibhnithe Q Q i ndlúth-thomhasteoiric laitíse U(1) i 4D, staidéar ar mhaiseanna ghliúmheallanna i dtomhasteoiric laitíse SU(2) i 3D agus staidéar uimhriúil ar ghaibhniú i QED dlúth.

D'óstaigh an grúpa cuairt fadtéarmach ó T.R. Govindarajan, a d'oibrigh ar dhomhtarraingtí déthoiseacha neamh-chómhalartacha agus ar rialtú neamhlogánta ar réimsetheoiricí neamh-chómhalartacha.

Tá an tOllamh Nahm tosaithe ag obair i gcomhar leis an Dr. Marianne Leitner maidir le tuiscint theoiriciúil a fháil ar éifeacht Hall an chandaim i ngraifín,foirm dhéthoiseach (leathán)de ghraifít. Bhí an éifeacht sin tuartha d'fhearmóin choibhneasaíocha go deimhin, sular facthas an éifeacht i dturgnaimh. Chuir an Dr. Leitner léirmhíniú geoiméadrach chun cinn ina tráchtas Ph.D. Baineann an obair atá ar siúl faoi láthair le heiseadh uathshruthanna faobhair mar gheall ar eisíontais mhaighnéadacha san ábhar a bhriseann siméadracht frithchaithimh.

Thosaigh an tOllamh Nahm freisin ar obair ar theoiricí réimsí comhfhoirmiúla le corraíl insuimeálaithe. Chuir Kirillov agus Reshetikhin teoiric chun cinn do theoiricí den sórt sin, ach níl an teoiric sin an-soiléir. Bhí léachtaí ann ar shamhlacha insuimeálaithe agus ba é an aidhm a bhí leo ná roinnt de na ceisteanna a bhí ann a shoiléiriú. Is léir go háirithe, gur féidir úsáid feidhmeanna éilipseacha a sheachaint agus gur féidir roinnt geoiméadracht ailgéabrach a úsáid ina n-ionad. Beidh na léachtaí sin á scríobh suas do Chumarsáid Institiúid Ard-Léinn Bhaile Átha Cliath.

Administration and Finance

Riarachán agus Airgeadas

The services provided by central administration staff include secretarial support to Council, individual School Boards and associated Committees, Human Resources, General governance/compliance, Public Relations, Accommodation and Maintenance, Health and Safety.

Appointment of new Boards and Council
The term of office for the Governing Boards of individual Schools and the Council expired in March and June respectively. New Boards and Council were appointed and the Secretariat facilitated arrangements for this and provided support to newly appointed members.

PMDS
A system of Performance Management and Development for non-academic staff was devised with significant input from the Partnership Forum. Training was provided for all reviewees and reviewers and the system was formally introduced in September 2005.

Staffing
The staffing structure was re-organised resulting in a strengthened IT support structure within two of the Schools and within central administration. A number of new Fellowship appointments were made during the year. The Institute also welcomed two former members of staff from ITÉ who joined the Institute under a redeployment arrangement.

The attached financial statements report a surplus of €242,730 for the year.

This compares with a deficit of €56,061 in the year to 31st December 2004.

Total income for the Institute increased from €9,828,672 in 2004 after adjusting for pensions to €10,310,410 for 2005.

This represents an improvement of €481,738 or 4.90% and the main increase arose in Oireachtas income.

The Institute’s total costs, after adjusting for the transfer to the capital reserves, also increased from €9,884,733 in 2004 to €10,067,680 in 2005 i.e. an increase of €182,947 or 1.85%.

The significant movements in costs took place in payroll, pensions, premises & maintenance and fuel, light & power where the respective increases of €204,846, €193,453, €46,067 and €17,126 arose.

In 2005 the Institute invested in a replacement landrover, a 5 channel 24bit data unit and replacement photocopiers.

In addition, investment in facilities included the upgrade of backup storage, replacement of fileservers and the purchase of additional clusters in the School of Theoretical Physics.

Áirítear tacaíocht rúnaíochta don Chomhairle, do Bhoird Scoile aonair agus do na Coistí a bhaineann leo sin, d'Acmhainní Daonna, do Rialachas Ginearálta/comhlíonadh, do Chaidreamh Poiblí, do Chóiríocht agus Cothabháil, do Shláinte agus Sábháilteacht, ar na seirbhísí a chuireann an fhoireann riaracháin lárnach ar fáil.

Boird agus Comhairle nua a cheapadh
Chuaigh téarma oifige na mBord Rialúcháin de chuid na Scoileanna aonair agus téarma oifige na Comhairle in éag i míonna an Mhárta agus an Mheithimh faoi seach. Ceapadh Boird agus Comhairle nua agus d'éascaigh an Rúnaíocht socruithe lena aghaidh sin agus chuir sí tacaíocht ar fáil do chomhaltaí nuacheaptha.

Córas um Bainistiú agus Forbairt Feidhmíochta (PMDS)
Leagadh amach córas do Bhainistiú agus d'Fhorbairt Feidhmíochta don fhoireann neamhacadúil agus fuarthas go leor ionchuir ón bhFóram Comhpháirtíochta. Cuireadh oiliúint ar fáil do na hathbhreithneoirí ar fad agus do na daoine sin ar fad a rabhthas á n-athbhreithniú agus tugadh an córas isteach go foirmiúil i Meán Fómhair na bliana 2005.

An Fhoireann
Rinneadh an struchtúr foirne a atheagrú agus bhí struchtúr tacaíochta TF neartaithe laistigh de phéire de na Scoileanna agus laistigh de riarachán lárnach mar thoradh ar an atheagrú sin. Rinneadh roinnt ceapachán Comhaltachta nua i rith na bliana. Fáiltíodh freisin roimh bheirt iarchomhalta d'fhoireann ITÉ a tháinig isteach san Institiúid faoi shocrú athimlonnaithe.

Tuairiscíonn na ráitis airgeadais atá faoi iamh barrachas de €242,730 don bhliain.

Sin i gcomparáid le easnamh de €56,061 sa bhliain go dtí 31ú Nollaig 2004.

Tháinig ardú ar ioncam iomlán na hInstitiúide ó €9,828,672 i 2004 tar éis coigeartaithe do phinsin go dtí €10,310,410 do 2005. Léiríonn sé seo feabhas de €481,738 nó 4.90% agus tharla na príomhharduithe in ioncam Oireachtais.

Tháinig ardú ar chostais iomlána na hInstitiúide freisin, tar éis coigeartaithe don aistriú chuig an gcúlchiste caipitil ó €9,884,733 i 2004 go dtí €10,067,680 i 2005 i.e. ardú de €182,947 nó 1.85%.

Tharla na gluaiseachtaí suntasacha i gcostais i bpárolla, i bpinsin, in áitribh, i gcothabháil agus breosla/solas/cumhacht áit ar tharla na harduithe faoi seach de €204,846, €193,453, €46,067 agus €17,126 chun cinn.

In 2005 d’infheistigh an Institiúid i landrover athsholáthair, aonad sonraí 24 giotán cúig chainéal agus gléasanna fótachóipeála athsholáthair.

Ina theannta sin bhí uasghrádú ar stóras cúltaca, athchur freastalaithe comhad san áireamh in infheistíocht i saoráidí agus ceannaíodh braislí breise i Scoil na Fisice Teoiriciúla.

Institute Staff

Council of the Institute

Chairman
D. Donnelly

Ex-Officio Members
Dr. H. Brady, President, UCD
Dr. J. Slevin, President, RIA
Dr J. Hegarty, Provost, TCD

Members Appointed by the Governing Boards of Constituent Schools
G. Wrixon
A. Jaffe
A. Ahlqvist
T.C. Dorlas
A. Jones
L. Breatnach

Governing Board of the School of Celtic Studies

Chairman
Anders Ahlqvist

Senior Professors
L. Breatnach
F. Kelly
M. Ó Murchú

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.C. Dorlas
D.J. O' Connor
W. Nahm

Appointed Members
A.C. Breslin
S. Ryan
H. Nicolai
M. Grünewald
M. Tuite

Governing Board of the School of Cosmic Physics

Chairman
G. Wrixon

Senior Professors
L. Drury
E.J.A. Meurs
A.G. Jones

Appointed Members
A. Khan
O. Glaser
C. Stehlé-Cojan
L. Enright
R. Perrott
L. Hanlon

Administrative Staff of the Institute 2005

Registrar
Cecil Keaveney

Finance Officer
Grace Forkin

Senior Administrative Officer
Mary Burke

Assistant Finance Officer
Ronan Byrne

Clerks
Tony Broderick
Noreen Granahan
Margaret Loughman
Helena Moynihan

Temporary Administrative Staff
Edmond Barrett
Ruth Graham

Support Staff
Nuala Carney
Geraldine Casey
Esther Healy (until 31 May)
Roger Jones
Barbara Judge
Patricia McDonald
James McFeeley†
Michael Quinn
Collette Doyle
Tomás O Griofa (from 7 March)

†Died 27 September 2005

Staff and Scholars of the School of Celtic Studies 2005

Senior Professors
L. Breatnach (Director)
F. Kelly
M. Ó Murchú

Professors
M. McKenna
P. Ó Macháin

Assistant Professors
A. Nic Dhonnchadha
S. Ní Laoire (until 15 December)
M. O Riordan
B. Ó Curnáin

Assistant Librarians
C. Dillon (temporary) (from 1 Jan to 31 August)
(from 10 October)
G. Toland (part-time) (until 28 October)

Library Assistant
Órla Ní Chanainn (from 7 March)

School Administrator
E. Nic Dhonncha

Technical Staff
ISOS
A.M. O'Brien

IT Support
A. McCarthy (part-time)
G. McCullagh (part-time) (until 29 July)
S. McCullagh (part-time) (from 28 July)

Bibliographer
Alexander Guilarte (contract) (from 5 Sept)

Bergin Fellow
Roisín McLaughlin (from 9 May)

Scholars
N. Evans (England)
J. Ní Ghrádaigh (Ireland)
E. O Raghallaigh (Ireland)
B. Miles (Canada) (from 1 October)

Temporary Support Staff
Sandra Carrick (from 5 July to 2 September)

Professor Emeritus

Staff School of Theoretical Physics 2005

Senior Professors
T.C. Dorlas (Director)
D.J. O'Connor
W. Nahm

Librarian
A. Goldsmith

Secretary
M. Matthews

Systems Administrator
R. Cunniffe (to 6 May)
A. Jimenez (temporary) (from 9 May)

Post-Doctoral Scholars
S. Adams (Germany)
M. Leitner (Germany)
T. Tsukioka (Japan) (until 30 Sept)

Pre-Doctoral Scholars
R. Delgadillo Blando (Mexico) (until 30 November)
F. Garcia Flores (Mexico) (until 30 November)
I. Huet Hernandez (Mexico)
P. Castro Villareal (Mexico) (until 9 February)

Schroedinger Fellow
O Lisovyy (Ukraine) (from 25 October)

Project Staff
M. Panero (Italy) *"Quantum Field Theory from Matrix Models: An Alternative to Lattice Field Theory"*

Embark Initiative Post-doctoral Research Fellow
S. Kurkcuoglu (Turkey) *"Aspects of Field Theories on Fuzzy and Non-commutative Spaces"*

Embark Initiative Postgraduate Research Scholar
S. Ní Chiagáin (Ireland)
S. Murray (Ireland)

Professor Emeritus

Staff School of Cosmic Physics 2005

Senior Professors
A. Jones (Director)
L. Drury
E. Meurs

Professors
T. Ray

Assistant Professors
B. O'Reilly
P. Readman

Fellows
C. del Burgo (Spain)
X. Garcia (Spain)
A. Lim (England)

Experimental Officers
T. Blake
S. Dudzinski (contract)

Senior Technical Assistants
C. Horan
M. Smyth
G. Wallace

Technical Assistants
E. Flood
A. Grace
H. O'Donnell
L. Collins
J. Spratt (contract)

IT Technician
J Allman (contract) (from 18 January)

Clerical Staff
A. Byrne
E. Clifton
P. Daly
C. Woods

Scholars
A. Avdeeva (Russia)
A. Chabert (France)
D. Coffey (Ireland) (to 31 July)
C. Combet (France)
V.C. Do (Vietnam)
Á. Gras Velázquez (Spain)
M. Hamilton (South Africa)
C. Melody (Ireland)
M. Moorkamp (Germany)
G. Murphy (Ireland)
J. Sheehan (Ireland)
P. Ward (Ireland)
E. Whelan (Ireland)
M. Miensopust (Germany) (from 7 September)
S. Vergani (Italy) (from 28 August)

Project Staff
C.K. Rao (India) *"Deep-probing electromagnetic studies of the lithosphere across the Iapetus suture"*
C. Ravaut (France) "HADES"
Rachel Curran (from 1 February) SFI project

CosmoGrid
Project Scientist
T. Lery

Cluster Manager
D. Golden

Project Administrator
A. Shaw

Post-Doctoral Researchers
D. Avdeev
D. Froebrich
S. Leygnac
C. Sweeney (until 23 December)
S. Wang
T. Yamasaki

Professor Emeritus

Vacation Students
Claire Raftery (from 7 June to 4 July)
(from 24 August to 23 September)
Ronan McSwiney (from 27 June to 26 August)
Shane Carr (from 27 June to 30 September)
Jonathan Collins (from 11 July to 19 August)
Diarmuid Byrne (from 11 July to 19 August)

Temporary Support Staff
Brendan McWilliams (from 15 April to 4 July)
Carol Beigneux (from 12 July)

Financial Statements

for year ended 31 December 2005

Contents

Statement of Responsibilities of the Council	40
Statement on the System of Internal Financial Control	41
Accounting Policies	43
Income and Expenditure Account	44
Balance Sheet	45
Cash Flow Statement	46
Notes to the Financial Statements	47
Report of the Comptroller & Auditor General	53

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

Tony Dorlas
Council Member

Statement on the System of Internal Financial Control

Responsibility for system of 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;
- clearly defined capital investment control guidelines;
- formal project management disciplines.

Statement on the System of Internal Financial Control *Continued*

The Audit Committee continues to review internal control matters and issues raised by the Comptroller and Auditor General and Internal Auditor.

In addition, the 2005 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 has in the past been based on the work of the Registrar and other officers within the Institute who have responsibility for the development and maintenance of an appropriate financial control framework. Council will not only continue to seek the input of the Registrar and other senior staff on this matter, but will also rely upon reports 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 2005 Council conducted a review of the effectiveness of the system of internal financial controls of the Institute.

Signed on behalf of the Council of the Institute

Dervilla Donnelly
Chairman - Council of the Institute

21 June 2006

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

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

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

4 Capital Reserve

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

5 Library

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

6 Publications

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

7 Superannuation

The provisions of FRS17 on accounting for retirement benefits have been adopted in full for the first time.

The effect of this Accounting Policy is disclosed in Note 10.

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

Income and expenditure from projects are derived from successful application of the Institute to fund research activities that complement the work of the Schools e.g. (Science Foundation Ireland, Higher Education Authority, European Commission, Enterprise Ireland and IRCSET).

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	2005 €	2004 €
Income			
Oireachtas Grant		6,578,000	6,158,999
Net deferred funding for pensions	10.b	1,143,157	889,457
Sales of Publications		61,332	47,630
Projects	2	2,473,148	2,688,666
Other	3	54,773	43,920
		10,310,410	9,828,672
Transfer (to)/from Capital Reserve	5	108,247	47,211
		10,418,657	9,875,883
Expenditure			
School of Celtic Studies		1,380,170	1,536,803
School of Theoretical Physics		974,230	1,056,694
School of Cosmic Physics		4,252,069	4,735,881
Administration		3,569,458	2,602,566
		10,175,927	9,931,944
Surplus/(Deficit) for year		**242,730**	**(56,061)**
Balance at 1 January		289,568	345,629
Balance at 31 December		**532,298**	**289,568**

Statement of Recognised Gains and Losses		**2005**	**2004**
Surplus/(Deficit) for the year		242,730	(56,061)
Experience losses /(gains) on pension scheme liabilities		830,000	975,000
Changes in assumptions underlying the present value of pension scheme liabilities		(5,483,000)	(2,174,000)
Actuarial Loss /(gain) on Pension Liabilities	**10.e**	**(4,653,000)**	**(1,199,000)**
Adjustment to Deferred Pension Funding		**4,653,000**	**1,199,000**
Total recognised gain/(loss) for the year		**242,730**	**(56,061)**

The Statement of Accounting Policies and notes 1 to 13 form part of these financial statements.

Dervilla Donnelly
Chairman - Council of the Institute

Tony Dorlas
Council Member

Balance Sheet

	Notes	2005 €	2004 €
Assets			
Fixed Assets	4	843,108	951,355
Current Assets:			
Cash on Hand and at Bank		3,027,863	2,271,993
Debtors and Prepayments		215,200	212,414
Total Assets		**4,086,171**	**3,435,762**
Less Liabilities			
Creditors - Amounts falling due within one year			
Creditors and Accruals		393,380	455,623
Projects	2	2,261,064	1,683,510
Creditors - Amounts falling due after one year	6	56,321	55,706
Total Liabilities Before Pensions		**2,710,765**	**2,194,839**
Assets Less Liabilities Before Pensions		**1,375,406**	**1,240,923**
Deferred Pension funding	10.d	30,868,000	25,072,000
Pension Liabilities	10.e	(30,868,000)	(25,072,000)
		0	0
Net Assets		**1,375,406**	**1,240,923**
Financed by:			
Income and Expenditure Account		532,298	289,568
Capital Reserve	5	843,108	951,355
		1,375,406	**1,240,923**

The Statement of Accounting Policies and notes 1 to 13 form part of these financial statements.

Dervilla Donnelly
Chairman - Council of the Institute

Tony Dorlas
Council Member

Cash Flow Statement

	Notes	2005 €	2004 €
Reconciliation of operating surplus to net cash inflow from operating activities			
Surplus/(Deficit) for year		**242,730**	**(56,061)**
Interest received	3	(24,251)	(20,183)
Increase/(Decrease) in Creditors		(61,628)	206,427
Decrease/(Increase) in Debtors		(2,786)	(21,388)
Net Increase in Research Programmes and Fees		577,554	187,565
Depreciation	4	274,789	276,646
Capital Reserve Transfer	5	(108,247)	(47,211)
(Gain)/Loss on disposal		21,645	-
Net Cash Inflow from operating activities		919,806	525,795
Cash Flow Statement			
Net Cash Inflow from operating activities		919,806	525,795
Returns on investments and servicing of finance			
Bank Interest Received	3	24,251	20,183
Capital expenditure			
Purchase of Tangible Assets	4	(188,187)	(229,435)
Increase/(Decrease) in Cash		**755,870**	**316,543**
Reconciliation of net cash flow to movement in net funds			
(Decrease)/Increase in Cash		755,870	316,543
Net (Debt)/Funds at 1 January		2,271,993	1,955,450
Net (Debt)/Funds at 31 December		**3,027,863**	**2,271,993**

Analysis of change in net (debt)/funds	**Cash at bank and in hand €**	**Bank Overdraft €**	**Total €**
At beginning of year 2005	2,271,993	-	2,271,993
Cash flows	755,870	-	755,870
At end of year 2005	**3,027,863**	**-**	**3,027,863**

The Statement of Accounting Policies and notes 1 to 13 form part of these financial statements.

Dervilla Donnelly
Chairman - Council of the Institute

Tony Dorlas
Council Member

Notes to the Financial Statements

1 Detailed Analysis of Income & Expenditure for the year ended 31/12/2005

	Notes	School of Celtic Studies €	School of Theoretical Physics €	School of Cosmic Physics €	Adminis-tration €	2005 Total €	2004 Total €
INCOME							
Oireachtas Grants		1,488,207	894,215	2,386,900	1,808,678	6,578,000	6,158,999
Net deferred funding for pensions	10.b				1,143,157	1,143,157	889,457
Sales of Publications		61,190		142		61,332	47,630
Project Income	2	3,982	118,164	2,310,380	40,622	2,473,148	2,688,666
Other Income	3		3,565	14,550	36,658	54,773	43,920
		1,553,379	1,015,944	4,711,972	3,029,115	10,310,410	9,828,672
Transfer (to)/from Capital Reserve					108,247	108,247	47,211
		1,553,379	1,015,944	4,711,972	3,137,362	10,418,657	9,875,883
EXPENDITURE							
Payroll Costs	7	1,211,670	715,772	1,708,109	653,971	4,289,522	4,084,676
Pension Costs	10.c				1,886,059	1,886,059	1,692,606
Project Costs	2	3,982	118,164	2,310,380		2,432,526	2,666,351
Library and Book Storage		37,898	103,554	64,142	15,838	221,432	212,261
Depreciation	4				274,789	274,789	276,646
Rent, Rates and Insurance					120,551	120,551	126,665
General Expenses	8	15,872	4,420	60,655	116,630	197,577	187,822
Travel and Seminar Expenses		30,756	10,934	49,613	20,215	111,518	132,189
Premises Maintenance and Security		270	6,991	6,655	193,074	206,990	160,923
Computer and Internet Expenses		4,508	4,700	39,390	56,478	105,076	109,061
Fuel, Light and Power					93,501	93,501	76,375
Postage and Telephone					57,640	57,640	58,418
Stationery		14,044	6,193	5,715	36,189	62,141	59,817
Publications		53,128				53,128	49,525
Advertising		363	182		18,980	19,525	9,373
Minor Office Equipment		7,679	3,320	7,410	3,898	22,307	29,236
Gain/Loss on Disposal					21,645	21,645	-
		1,380,170	974,230	4,252,069	3,569,458	10,175,927	9,931,944
SURPLUS/(DEFICIT) FOR YEAR		**173,209**	**41,714**	**459,903**	**(432,096)**	**242,730**	**(56,061)**
Balance at 1 January		290,672	100,160	(154,830)	53,566	289,568	345,629
Balance at 31 December		**463,881**	**141,874**	**305,073**	**(378,530)**	**532,298**	**289,568**

Notes to the Financial Statements *continued*

2 Projects

	2005	2004
	€	€
Opening Balances	1,683,510	1,495,945
Receipts	3,050,702	2,876,231
	4,734,212	4,372,176
Closing Balances	(2,261,064)	(1,683,510)
Applied as Income	2,473,148	2,688,666

Income Allocation

	2005	2004
School of Celtic Studies	3,982	1,953
School of Theoretical Physics	118,164	98,146
School of Cosmic Physics	2,310,380	2,567,382
	2,432,526	2,667,481
Administration	40,622	21,185
Total Project Income	2,473,148	2,688,666

Project Cost

	Celtic Studies	Theoretical Physics	Cosmic Physics	2005 Total	2004 Total
	€	€	€	€	€
Payments to Partners/Associates			1,510,809	1,510,809	1,914,393
Salaries/Scholarships		104,633	615,104	719,737	605,944
Travel		11,257	101,040	112,297	83,834
Other	3,982	2,274	83,427	89,683	62,180
Total	3,982	118,164	2,310,380	2,432,526	2,666,351

3 Other Income

	2005	2004
	€	€
Bank interest	24,251	20,183
Fees & grants	561	17,037
Other	29,961	6,700
Total	54,773	43,920

4 Fixed Assets

	Furniture & Equipment €	Motor Vehicles €	Computers €	Total €
Cost				
Opening Balance 1/1/2005	1,894,000	45,964	1,104,630	3,044,594
Additions	51,760	43,950	92,477	188,187
Disposals	(38,942)	(39,679)	(99,653)	(178,274)
	1,906,818	50,235	1,097,454	3,054,507
Depreciation				
Opening Balance 1/1/2005	1,308,788	45,766	738,685	2,093,239
Charge 2005	118,174	228	156,387	274,789
Disposals	(17,334)	(39,679)	(99,616)	(156,629)
	1,409,628	6,315	795,456	2,211,399
Net book value 31/12/2005	497,190	43,920	301,998	843,108
Net book value 31/12/2004	585,212	198	365,945	951,355

5 Capital Reserve

	2005 €	2004 €
Balance at 1 January	951,355	998,566
Transfer from/(to) Income and Expenditure Account		
Income allocated to acquire fixed assets	188,187	229,435
Amortisation in line with asset depreciation	(274,789)	(276,646)
Amount released on disposals	(21,645)	0
	(108,247)	(47,211)
Balance at 31 December	**843,108**	**951,355**

6 Creditors due after twelve months

		2005 €	2004 €
These comprise:	Vernam Hull Bequest	53,910	53,295
	Carmody Fund	2,411	2,411
		56,321	**55,706**

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

Notes to the Financial Statements *continued*

7 Payroll Costs

	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	Admin. €	2005 Total €	2004 Total €
Salaries/Wages	1,116,009	544,143	1,481,155	650,657	3,791,964	3,543,026
Scholarships	63,430	74,090	161,780		299,300	371,756
Visitors	32,231	97,020	62,674		191,925	166,030
Honoraria	-	519	2,500	3,314	6,333	3,864
	1,211,670	715,772	1,708,109	653,971	4,289,522	4,084,676

8 General Expenses

	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	Admin. €	2005 Total €	2004 Total €
Miscellaneous	4,606	1,909	39,709	23,565	69,789	50,122
Promotions/Lunches	10,376	2,511	3,950	12,018	28,855	14,410
Professional Fees				39,235	39,235	82,887
Training	804		16,859	16,951	34,614	18,262
Audit Fee				15,800	15,800	13,200
Bank Charges				3,788	3,788	3,954
Health & Safety	86	-	137	5,273	5,496	4,987
	15,872	4,420	60,655	116,630	197,577	187,822

9 Leasing

Operating Leases

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

The commitment on foot of such leases in respect of 2006 is €55,519.

10 Superannuation

a) Pension Scheme

The Board operates a defined benefit superannuation scheme for its employees. The valuation used for FRS17 has been based on a full actuarial valuation updated to 31st December 2005 by a qualified independent actuary to take account of the requirements of FRS17 in order to assess the scheme liabilities at 31 December 2005.

The financial assumptions used to calculate the components of the defined benefit cost for the year ended December 31, 2005 were as follows:

	At 31/12/05	At 31/12/04	At 31/12/03
Discount Rate	4.70%	5.25%	5.50%
Inflation Rate	2.25%	2.25%	2.25%
Rate of Salary Increases	4.00%	4.00%	4.00%
Rate of Pension Increases	4.00%	4.00%	4.00%

b) Net Deferred Funding for Pensions in year

	2005 (€'000)	2004 (€'000)
Funding recoverable in respect of current year pension costs	1,975	1,778
State Grant applied to pay pensioners	(832)	(889)
	1,143	889

c) Analysis of total pension costs charged to Expenditure

	2005 (€'000)	2004 (€'000)
Current service cost	780	571
Interest on Pension Scheme Liabilities	1,195	1,207
Employee Contributions	(89)	(85)
	1,886	1,693

d) Deferred Funding Asset for Pensions

DIAS recognises these amounts as an asset corresponding to the unfunded deferred liability for pensions on the basis of a number of past events. These events include the statutory basis for the establishment of the superannuation 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 this amount in accordance with current practice.

The deferred funding asset for pensions as at 31 December 2005 amounted to €31 million (2004: €25 million).

e) Movement in Net Pension Liability during the financial year

	2005 (€'000)	2004 (€'000)
Net Pension Liability at 1 January	(25,072)	(22,984)
Current Service Cost	(780)	(571)
Interest Costs	(1,195)	(1,207)
Actuarial loss/(gain)	(4,653)	(1,199)
Pensions paid in the year	832	889
Net Pension Liability at 31 December	(30,868)	(25,072)

f) History of experience gains and losses

	2005 (€'000)	2004 (€'000)	2003 (€'000)
Experience (gains)/losses on scheme liabilities.	830	975	(713)
Percentage of the present value of scheme liabilities.	2.69%	3.89%	-3.10%
Total Amount recognised in Statement of total recognised gains and losses.	4,653	1,199	1,580
Percentage of the present value of scheme liabilities.	15.07%	4.78%	6.87%

Effect of Change in Accounting Policy

The effect of the change in accounting policy arising from the introduction of FRS17 is to recognise as expenditure in the year the cost of pensions earned rather than the payments made to pensioners, and a corresponding funding amount.

In addition the Balance Sheet recognises the cumulative liability for pensions earned by employees as at 31st December 2005 together with a corresponding asset, whereas previously this liability was disclosed by note only.

11 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.

12 Contingent Liabilities

Legal proceedings against the Institute have been initiated by the former Registrar. It is not possible to anticipate the outcome of such proceedings nor their financial impact, if any.

13 Approval of Accounts

The Financial Statements were approved by Council on the 21st June 2006.

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 2005 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 Balance Sheet, the Cash Flow Statement, the Statement of Total Recognised Gains and Losses 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 the form and manner provided under 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.

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 2005 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

30 June 2006

Ráitis Airgeadais

don bhliain dár críoch 31 Nollaig 2005

Ábhar

Ráiteas Freagrachtaí na Comhairle	56
Ráiteas faoin gCóras Rialaithe Airgeadais Inmheánaigh	57
Polasaithe Chuntasaíochta	59
Cuntas Ioncaim agus Caiteachais	60
Clár Comhardaithe	61
Ráiteas Sreabhadh Airgid	62
Nótaí do na Ráitis Airgeadais	63
Tuairisc an Ard-Reachtaire Cuntas agus Ciste	69

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 cuntasaíochta 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

Tony Dorlas
Comhalta den Comhairle

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;
- treoirlínte rialaithe infheistíochta caipitil a bhíonn sainmhínithe go soiléir;
- disciplíní bainistíochta tionscadal foirmiúla.

Ráiteas faoin gCóras Rialaithe Airgeadais Inmheánaigh *ar lean*

Lean 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. In 2005, bhuail an Coiste Iniúchta le chéile trí huaire. Ina theannta sin, cuireadh tuarascáil an Reachtaire inmheánaigh ar chórais rialaithe inmheánaigh don bhliain 2004 ar fáil do bhaill na Comhairle.

Bhíodh monatóireacht agus athbhreithniú na Comhairle ar éifeachtúlacht an chórais rialaithe airgeadais inmheánaigh bunaithe roimhe seo ar obair an Chláraitheora agus oifigigh eile laistigh den Institiúid atá freagrach as creat oibre rialaithe airgeadais cuí a fhorbairt agus a chothabháil.

Ní hamháin go leanfaidh an Chomhairle ag lorg ionchuir ón gCláraitheoir agus ó fhoireann shinsearach eile maidir leis an ábhar seo, ach beidh sí ag brath ar thuairiscí agus ar thuairimí a dhéanfaidh an Coiste Iniúchta agus an tArd-Reachtaire Cuntas agus Ciste ina litir bhainistíochta nó i dtuairiscí eile.

Athbhreithniú Bliantúil ar Rialacháin

Dearbhaím go ndearna an Bord athbhreithniú ar éifeachtachas chórais rialaithe airgeadais inmhéanaigh na hInstitiúide sa bhliain dár críoch 31ú Nollaig 2005.

Sínithe thar ceann Chomhairle na hInstitiúide

Dervilla Donnelly
Cathaoirleach-Comhairle Na hInstitiúide

21 Meitheamh 2006.

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 Cuntasaíochta

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%

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

a) Pinsin

Tá na forálacha de chuid an FRS17 maidir le cuntasaíocht sochar scoir glactha den chéad uair. Tá toradh an bheartais cuntasaíochta seo nochta i Nóta 10.

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

Tagann ioncam agus caiteachas ó thionscadail ó fheidhmiú rathúil na hInstitiúide chun maoiniú a dhéanamh ar ghníomhaíochtaí taighde a chomhlánaíonn obair na Scoileanna m.sh. (Fondúireacht Eolaíochta na hÉireann, An tÚdarás um Ardoideachas, An Coimisiún Eorpach, Fiontraíocht Éireann agus IRCSET).

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	2005 €	2004 €
Ioncam			
Deontas Oireachtais		6,578,000	6,158,999
Glan-mhaoiniú iarchurtha do phinsin	10.b	1,143,157	889,457
Díolacháin Foilseachán		61,332	47,630
Tionscadail	2	2,473,148	2,688,666
Eile	3	54,773	43,920
		10,310,410	9,828,672
Aistriú (chuig)/ó Chúlchiste Caipitil	5	108,247	47,211
		10,418,657	9,875,883
Caiteachas	1		
Scoil an Léinn Cheiltigh		1,380,170	1,536,803
Scoil na Fisice Teoiriciúla		974,230	1,056,694
Scoil na Fisice Cosmaí		4,252,069	4,735,881
Riarachán		3,569,458	2,602,566
		10,175,927	9,931,944
Barraíocht/(Easnamh) don bhliain		**242,730**	**(56,061)**
Iarmhéid amhail an 1 Eanáir		289,568	345,629
Iarmhéid amhail an 31 Nollaig		**532,298**	**289,568**

Ráiteas ar Ghnóthachain agus Caillteanais Aitheanta		**2005**	**2004**
Barrachas/(Easnamh) don bhliain		242,730	(56,061)
Caillteanais/(gnóthachain) iarbhíre ar dhliteanais na scéime pinsin		830,000	975,000
Athruithe i dtoimhdí is bonn do luach reatha dhliteanais na scéime pinsin		(5,483,000)	(2,174,000)
Caillteanas/(gnóthachan) achtúireach ar Dhliteanais Phinsin	**10.e**	**(4,653,000)**	**(1,199,000)**
Coigeartú ar Mhaoiniú an Phinsin Iarchurtha		**4,653,000**	**1,199,000**
Gnóthachan/(caillteanas) iomlán aitheanta don bhliain		**242,730**	**(56,061)**

Is cuid de na ráitis airgeadais seo é an Ráiteas Beartais Cuntasaíochta agus nótaí 1 go dtí 13.

Dervilla Donnelly
Cathaoirleach - Comhairle na hInstitiúide

Tony Dorlas
Comhalta den Comhairle

Clár Comhardaithe

	Nótaí	2005	2004
		€	€
Sócmhainní			
Sócmhainní Seasta	4	843,108	951,355
Sócmhainní Reatha:			
Airgead sa Lámh agus ag an mBanc		3,027,863	2,271,993
Féichiúnaithe agus Réamhíocaíochtaí		215,200	212,414
Sócmhainní Iomlána		**4,086,171**	**3,435,762**
Lúide Dliteanais			
Creidiúnaithe - Méideanna atá dlite laistigh de bhliain amháin			
Creidiúnaithe agus Fabhruithe		393,380	455,623
Tionscadail	2	2,261,064	1,683,510
Creidiúnaithe - méideanna atá dlite tar éis bliana amháin	6	56,321	55,706
Dliteanais Iomlána Roimh Phinsin		**2,710,765**	**2,194,839**
Sócmhainní (Glana) Lúide dliteanais Roimh Phinsin		**1,375,406**	**1,240,923**
Maoiniú an Phinsin Iarchurtha	10.d	30,868,000	25,072,000
Dliteanais Phinsin	10.e	(30,868,000)	(25,072,000)
		0	**0**
Sócmhainní Glana		**1,375,406**	**1,240,923**
Maoinithe ag:			
Cuntas Ioncaim agus Caiteachais		532,298	289,568
Cúlchiste Caipitil	5	843,108	951,355
		1,375,406	**1,240,923**

Is cuid de na ráitis airgeadais seo é an Ráiteas Beartais Cuntasaíochta agus na nótaí ó 1 go dtí 13.

Dervilla Donnelly
Cathaoirleach - Comhairle na hInstitiúide

Tony Dorlas
Comhalta den Comhairle

Ráiteas Sreabhadh Airgid

	Nótaí	2005 €	2004 €
Réiteach barrachais oibríochta chuig glan-insreabhadh airgid ó ghníomhaíochtaí oibríochta			
Barrachas/(Easnamh) don bhliain		242,730	(56,061)
Ús infhaighte	3	(24,251)	(20,183)
Ardú/(Laghdú) i gCreidiúnaithe		(61,628)	206,427
Laghdú/(Ardú) i bhFéichiúnaithe		(2,786)	(21,388)
Glan-ardú i gCláir Thaighde agus Táillí		577,554	187,565
Dímheas	4	274,789	276,646
Aistriú Cúlchiste Caipitil	5	(108,247)	(47,211)
(Gnóthachan)/Caillteanas ar dhiúscairt		21,645	0
Glaninsreabhadh Airgead tirim ó ghníomhaíochtaí oibríochta		919,806	525,795
Ráiteas Sreabhadh Airgid			
Glaninsreabhadh airgid ó ghníomhaíochtaí oibríochta		919,806	525,795
Aischuir ar infheistíochtaí agus seirbhísiú airgeadais			
Ús Bainc Infhaighte	3	24,251	20,183
Caiteachas Caipitiúil			
Ceannach Sócmhainní Inláimhsithe	4	(188,187)	(229,435)
Ardú/(Laghdú) ar Airgead		**755,870**	**316,543**
Réiteach glaninsreabhadh airgead tirim chuig gluaiseacht i nglanchistí			
Ardú ar Airgead Tirim		755,870	316,543
Iarmhéid faoin 1 Eanáir		2,271,993	1,955,450
Iarmhéid faoin 31 Nollaig		**3,027,863**	**2,271,993**

Anailís ar athrú i nglanchistí (fiacha)	**Airgead infhaighte sa Bhanc** €	**Ró tharraingt** €	**Iomlán** €
I dtús na bliana 2005	2,271,993	0	2,271,993
Sreabhadh Airgid	755,870	0	755,870
Ag deireadh na bliana 2005	3,027,863	0	3,027,863

Is cuid de na ráitis airgeadais seo é an Ráiteas Beartais Cuntasíochta agus nótaí 1 go dtí 13.

Dervilla Donnelly
Cathaoirleach - Comhairle na hInstitiúide

Tony Dorlas
Comhalta den Comhairle

Nótaí do na Ráitis Airgeadais

	Nótaí	Léann Cheilteach €	Fisic Theoiriciúil €	Fisic Chosmach €	Riarachán €	2005 Iomlán €	2004 Iomlán €
IONCAM							
Deontais Oireachtais		1,488,207	894,215	2,386,900	1,808,678	6,578,000	6,158,999
Glan-mhaoiniú iarchurtha do phinsin	10.b				1,143,157	1,143,157	889,457
Díolacháin Foilseachán		61,190		142		61,332	47,630
Ioncam Tionscadail	2	3,982	118,164	2,310,380	40,622	2,473,148	2,688,666
Ioncam Eile	3		3,565	14,550	36,658	54,773	43,920
		1,553,379	1,015,944	4,711,972	3,029,115	10,310,410	9,828,672
Aistriú (chuig) ó Chúlchiste Caipitil					108,247	108,247	47,211
		1,553,379	1,015,944	4,711,972	3,137,362	10,418,657	9,875,883
CAITEACHAS							
Costais Phárolla	7	1,211,670	715,772	1,708,109	653,971	4,289,522	4,084,676
Costais Phinsin	10.c				1,886,059	1,886,059	1,692,606
Costais Tionscnamh	2	3,982	118,164	2,310,380		2,432,526	2,666,351
Stóráil Leabharlainne agus Leabhar		37,898	103,554	64,142	15,838	221,432	212,261
Dímheas	4				274,789	274,789	276,646
Cíos, Rátaí agus Árachas					120,551	120,551	126,665
Costais Ghinearálta	8	15,872	4,420	60,655	116,630	197,577	187,822
Costais Taistil agus Seimineáir		30,756	10,934	49,613	20,215	111,518	132,189
Cothabháil Áitribh agus Slándáil		270	6,991	6,655	193,074	206,990	160,923
Costais Ríomhairí agus Idirlín		4,508	4,700	39,390	56,478	105,076	109,061
Breosla Solas agus Cumhacht					93,501	93,501	76,375
Post agus Teileafón					57,640	57,640	58,418
Páipéarachas		14,044	6,193	5,715	36,189	62,141	59,817
Foilseacháin		53,128				53,128	49,525
Fógraíocht		363	182		18,980	19,525	9,373
Mion Trealamh Oifige		7,679	3,320	7,410	3,898	22,307	29,236
(Gnóthachan)/Caillteanas ar Dhiúscairt					21,645	21,645	-
		1,380,170	974,230	4,252,069	3,569,458	10,175,927	9,931,944
BARRAÍOCHT/(EASNAMH) DON BHLIAIN		**173,209**	**41,714**	**459,903**	**(432,096)**	**242,730**	**(56,061)**
Iarmhéid amhail an 1 Eanáir		290,672	100,160	(154,830)	53,566	289,568	345,629
Iarmhéid amhail an 31 Nollaig		**463,881**	**141,874**	**305,073**	**(378,530)**	**532,298**	**289,568**

Nótaí do na Ráitis Airgeadais *ar lean*

2 Tionscadail

	2005	2004
	€	€
Iarmhéideanna Tosaigh	1,683,510	1,495,945
Admhálacha	3,050,702	2,876,231
	4,734,212	4,372,176
Iarmhéideanna Deiridh	(2,261,064)	(1,683,510)
Curtha i bhfeidhm mar ioncam	2,473,148	2,688,666

Leithroinnt Ioncaim

	2005	2004
Scoil an Léinn Cheiltigh	3,982	1,953
Scoil na Fisice Teoiriciúla	118,164	98,146
Scoil na Fisice Cosmaí	2,310,380	2,567,382
	2,432,526	2,667,481
Riarachán	40,622	21,185
Ioncam Iomlán Tionscadal	2,473,148	2,688,666

Costais Tionscadal

	Léann Cheilteach	Fisic Theoiriciúil	Fisic Chosmach	2005 Iomlán	2004 Iomlán
	€	€	€	€	€
Íocaíochtaí chuig Páirtithe/ Comhlachais			1,510,809	1,510,809	1,914,393
Tuarastail/Scoláireachtaí		104,633	615,104	719,737	605,944
Taisteal		11,257	101,040	112,297	83,834
Eile	3,982	2,274	83,427	89,683	62,180
Iomlán	3,982	118,164	2,310,380	2,432,526	2,666,351

3 Ioncam Eile

	2005	2004
	€	€
Ús bainc	24,251	20,183
Táillí & Deontais	561	17,037
Eile	29,961	6,700
Iomlán	54,773	43,920

4 Sócmhainní Seasta

	Troscán & Trealamh	Mótarfheithicilí	Ríomhairí	Iomlán
	€	€	€	€
Costais				
Iarmhéid Tosaigh 1/1/2005	1,894,000	45,964	1,104,630	3,044,594
Breiseanna	51,760	43,950	92,477	188,187
Riartha	(38,942)	(39,679)	(99,653)	(178,274)
	1,906,818	50,235	1,097,454	3,054,507
Dímheas				
Iarmhéid Tosaigh 1/1/2005	1,308,788	45,766	738,685	2,093,239
Muirear 2004	118,174	228	156,387	274,789
Riartha	(17,334)	(39,679)	(99,616)	(156,629)
	1,409,628	6,315	795,456	2,211,399
Luach glan de réir na leabhar 31/12/2005	497,190	43,920	301,998	843,108
Luach glan de réir na leabhar 31/12/2004	585,212	198	365,945	951,355

5 Cúlchiste Caipitil

	2005	2004
	€	€
Iarmhéid amhail an 1 Eanáir	951,355	998,566
Aistriú ó/(chuig) Cuntas Ioncaim agus Caiteachais		
Ioncam leithroinnte le sócmhainní seasta a fháil	188,187	229,435
Amúchadh ag teacht le dímheas sócmhainní	(274,789)	(276,646)
Méid scaoilte ar diúscairtí	(21,645)	0
	(108,247)	(47,211)
Iarmhéid amhail an 31 Nollaig	**843,108**	**951,355**

6 Creidiúnaithe dlite tar éis dhá mhí dhéag

		2005	2004
		€	€
Comhdhéanta as:	Vernam Hull Bequest	53,910	53,295
	Carmody Fund	2,411	2,411
		56,321	**55,706**

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

Nótaí do na Ráitis Airgeadais *ar lean*

7 Costais Phárolla

	Léann Cheilteach €	Fisic Theoiriciúil €	Fisic Chosmach €	Riar. €	2005 Iomlán €	2004 Iomlán €
Tuarastal/Pá	1,116,009	544,143	1,481,155	650,657	3,791,964	3,543,026
Scoláireachtaí	63,430	74,090	161,780		299,300	371,756
Cuairteoirí	32,231	97,020	62,674		191,925	166,030
Honoraria		519	2,500	3,314	6,333	3,864
	1,211,670	715,772	1,708,109	653,971	4,289,522	4,084,676

8 Costais Ghinearálta

	Léann Cheilteach €	Fisic Theoiriciúil €	Fisic Chosmach €	Riar. €	2005 Iomlán €	2004 Iomlán €
Ilghnéitheach	4,606	1,909	39,709	23,565	69,789	50,122
Tionscnaimh cur chun cinn/Lóin	10,376	2,511	3,950	12,018	28,855	14,410
Táillí Gairmiúla				39,235	39,235	82,887
Oiliúint	804		16,859	16,951	34,614	18,262
Táille Iniúchta				15,800	15,800	13,200
Muirir Bhainc				3,788	3,788	3,954
Sláinte & Sábháilteacht	86	-	137	5,273	5,496	4,987
	15,872	4,420	60,655	116,630	197,577	187,822

9 Léasáil

Léasanna Oibríochta

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

Is é an tiomantas ar scór léasanna den sórt sin maidir le 2006 ná €55,519.

10 Aoisliúntas

a) Scéim Phinsin

Feidhmíonn an Bord scéim aoisliúntais shochair shonraithe dá fhostaithe. Bunaíodh an luacháil a úsáideadh do FRS17 ar luacháil iomlán achtúireach atá tugtha cothrom le dáta go dtí an 31ú Nollaig 2005 ag achtúire neamhspleách cáilithe chun ceanglais FRS17 a chur san áireamh chun dliteanais na scéime amhail an 31 Nollaig 2005 a mheasúnú.

Is mar seo a leanas a bhí na toimhdí airgeadais a úsáideadh chun chomhchodanna an chostais shochair shonraithe a ríomh don bhliain dar críoch an 31 Nollaig, 2005:

	Ag 31/12/05	**Ag 31/12/04**	**Ag 31/12/03**
Ráta Lascaine	4.70%	5.25%	5.50%
Ráta Boilscithe	2.25%	2.25%	2.25%
Ráta na nArduithe Tuarastail	4.00%	4.00%	4.00%
Ráta na nArduithe Pinsin	4.00%	4.00%	4.00%

b) Glan-Mhaoiniú Iarchurtha do Phinsin sa bhliain

	2005 (€'000)	**2004 (€'000)**
Maoiniú inaisghabhála i ndáil le costais phinsin na bliana reatha	1,975	1,778
Deontas Stáit feidhmithe chun pinsinéirí a íoc	(832)	(889)
	1,143	889

c) Anailís ar na costais iomlána pinsin curtha chun dochair do Chaiteachas

	2005 (€'000)	**2004 (€'000)**
Costas seirbhíse reatha	780	571
Ús ar Dhliteanais na Scéime Pinsin	1,195	1,207
Ranníocaíochtaí Fostaí	(89)	(85)
	1,886	1,693

d) Sócmhainn Mhaoinithe Iarchurtha do Phinsin

Aithníonn DIAS na méideanna seo mar shócmhainn a chomhfhreagraíonn don dliteanas iarchurtha neamh-mhaoinithe do phinsin bunaithe 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 meastachán 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 an méid seo de réir an chleachtais reatha.

Ba í €31 milliún (2004: €25 milliún) an tsócmhainn mhaoinithe iarchurtha do phinsin amhail an 31 Nollaig 2005.

Nótaí do na Ráitis Airgeadais *ar lean*

e) Gluaiseacht i nGlan-Dliteanas Pinsin i rith na bliana airgeadais

	2005 (€'000)	**2004 (€'000)**
Glan-Dliteanas Pinsin amhail an 1 Eanáir	(25,072)	(22,984)
An Costas Seirbhíse Reatha	(780)	(571)
Costais Úis	(1,195)	(1,207)
Caillteanas/(gnóthachan) achtúireach	(4,653)	(1,199)
Pinsin íoctha sa bhliain	832	889
Glan-Dliteanas Pinsin amhail an 31 Nollaig	(30,868)	(25,072)

f) Stair na ngnóthachan agus na gcaillteanas iarbhír

	2005 (€'000)	**2004 (€'000)**	**2003 (€'000)**
(Gnóthachain)/caillteanais iarbhíre ar dhliteanais na scéime.	830	975	(713)
Céatadán de luach reatha dhliteanais na scéime.	2.69%	3.89%	-3.10%
Méid Iomlán aitheanta i Ráiteas d'iomlán na ngnóthachan agus na gcaillteanas aitheanta.	4,653	1,199	1,580
Céatadán de luach reatha dhliteanais na scéime.	15.07%	4.78%	6.87%

Éifeacht an Athraithe sa Pholasaí Cuntasaíochta

Is é éifeacht an athraithe sa pholasaí cuntasaíochta ag eascairt as FRS17 a thabhairt isteach ná go n-aithnítear costas na bpinsean a tuilleadh seachas na híocaíochtaí a rinneadh le pinsinéirí mar chaiteachas sa bhliain, agus méid maoinithe comhfhreagrach. Chomh maith leis sin, aithníonn an Clár Comhardaithe an dliteanas carnach do phinsin a thuill fostaithe amhail an 31ú Nollaig i dteannta le sócmhainn chomhfhreagrach, an áit gur le nóta amháin a nochtadh an dliteanas seo roimhe seo.

11 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.

12 Dliteanais Teagmhasacha

Thionscain an tIar-Chláraitheoir imeachtaí dlí in aghaidh na hInstitiúide. Ní féidir toradh imeachtaí den sórt sin a thuar ná a dtionchar airgeadais, más ann.

13 Ceadú Cuntais

Cheadaigh an Chomhairle na Ráitis Airgeadais ar an 21 Meitheamh 2006.

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 2005 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 Clár Comhardaithe, an Ráiteas ar Shreabhadh Airgid, Ráiteas Gnóthachan agus Caillteanas Aitheanta Iomlán 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.

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 2005 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 2006