



DIAS

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

Title	DIAS Annual Report 2021
Creators	DIAS, Council and Tobin, M
Date	2021
Citation	DIAS, Council and Tobin, M (2021) DIAS Annual Report 2021. Communications of the Dublin Institute for Advanced Studies.
URL	https://dair.dias.ie/id/eprint/1288/

DIAS

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

OVER
80
YEARS
OF DISCOVERY

Dublin Institute for
Advanced Studies

ANNUAL REPORT 2021

Contents

Minister Simon Harris TD visits DIAS	2
Chairman's Statement	5
Statement of Registrar and CEO	7
DIAS at a Glance	8
A flavour of our research...	10
DIAS in 2021	14
Goal 1 – Discovery of new knowledge and understanding through excellence and researcher led endeavour	16
Goal 2 – International research collaboration benefitting Ireland and the world	20
Goal 3 – Attraction, and retention of, research leaders for today and the future	25
Goal 4 – Strengthening disciplines and research communities nationally	31
DIAS Reach for the Stars Astrophotography Competition	36
Institute Staff	40
Health and Safety Report	44
Financial Statements	45

Explore online

Visit our website
to find out more
www.dias.ie



Minister Simon Harris TD visits DIAS

Theoretical Physics



Celtic Studies



Geophysics



Astronomy & Astrophysics





An Tánaiste Leo Varadkar TD visits DIAS Dunsink Observatory and launches DIAS "Reach for the Stars" Astrophotography public vote.

Chairman's Statement

I am pleased to welcome you to another Annual Report by the Dublin Institute for Advanced Studies (DIAS). 2021 was a year of adjustment and consolidation, and a year in which COVID-19 still impacted on our work. Big thanks to the Health and Safety Officers and Representatives and the administrative staff in the schools, and to the staff in central administration and IT for their massive work in enabling hybrid working, in updating H&S policy, developing new protocols, and organising the sites for full re-opening over the year.

Despite lockdowns and the presence of COVID-19, 2021 was a big year for DIAS. We hosted a number of senior government ministers in the course of the year. An Tánaiste Leo Varadkar T.D. visited Dunsink Observatory in April, and Min. Simon Harris T.D. visited DIAS and met the team across all schools in early November.

In addition to the ongoing research and scholarship at the Institute about which you can read in this short report, DIAS announced the results of the inaugural Astrophotography competition "Reach for the Stars" in June. This year also saw our fourth Samhain agus Science festival over the Halloween period. Although the talks took place entirely online we had our biggest programme yet and attracted a global audience.

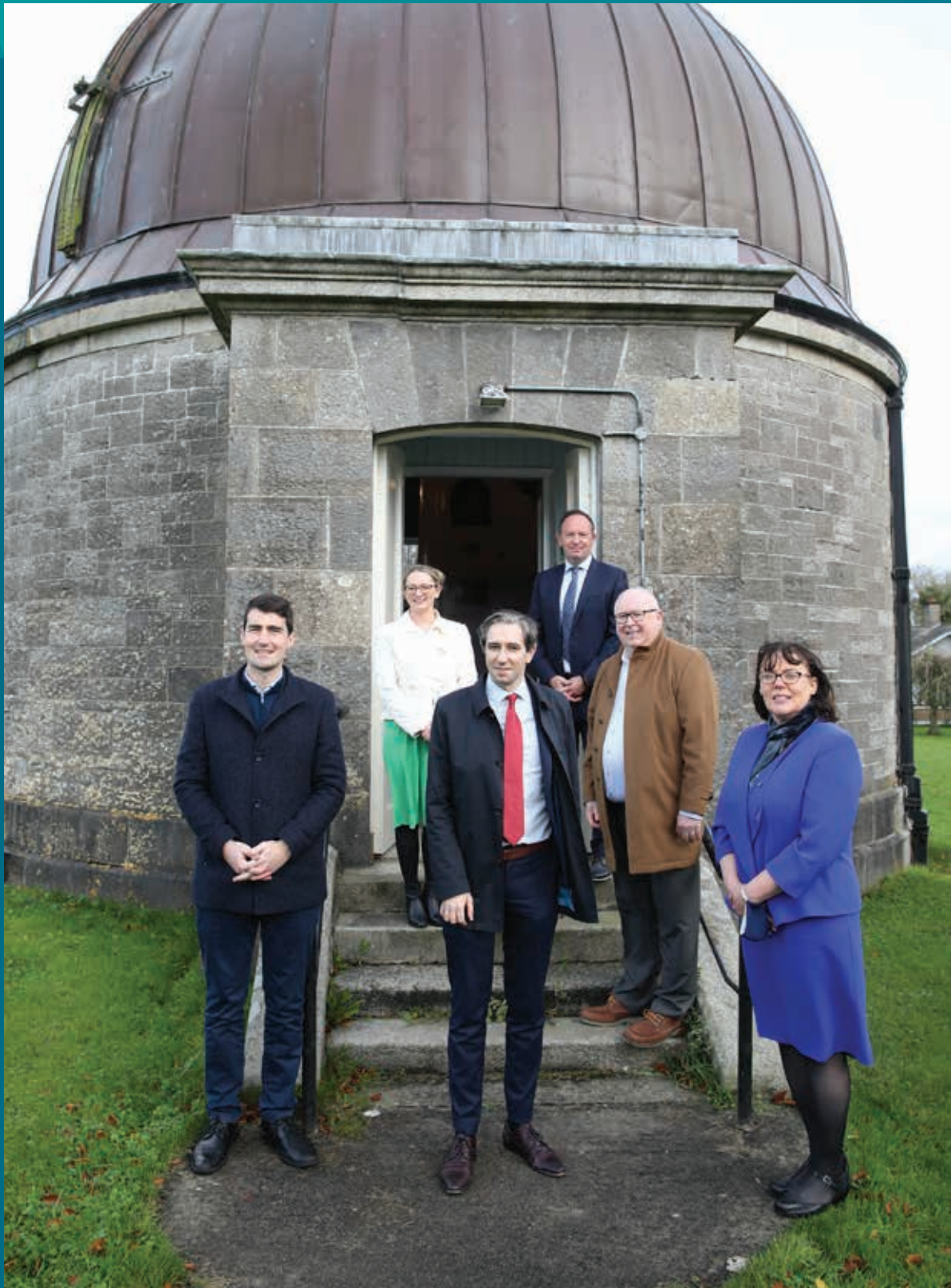
DIAS also this year developed new partnerships nationally with the National University of Ireland, the Department of the Environment, Climate and Communications and Waterford Treasures Museum. We continued to provide key research infrastructure to the community through the Irish National Seismic Network (INSN), I-LOFAR and the Irish Script on Screen portal to name a few.



John Hegarty

In spite of all of the above, the year was very much tinged with sadness for us, with the loss, in service of one of our most valued colleagues, Mr. Mick Smyth, Senior Technical Officer in Geophysics. *Ní bheidh a leithéad ann arís.* Our sympathies go to his family and friends.

Our next report will hopefully bring news of a return to something close to normal in terms of in person activities as the country fully reopens. Here in DIAS we will continue to work towards reaching the targets set in our 2018-2022 strategy, "Embedded Globally, Strength Locally" https://dias.ie/strategy2018_2022, and lead new discoveries in frontier research.



L-R Minister Jack Chambers TD, Senator Emer Currie, Minister Simon Harris TD, Professor Peter Gallagher, Cllr. Howard Mahony and DIAS CEO & Registrar Dr. Eucharia Meehan during a visit by the Ministers to DIAS Dunsink Observatory.

Statement of Registrar and CEO

It was an honour to be appointed as Chair of the Council of DIAS in December 2021. I look forward to playing my part as Chair in the coming years and supporting this work with the Council, School Boards, and of course most importantly, the staff and scholars of the Institute.

In taking up the Chair, I want to pay tribute to my predecessor Mr. Peter Heffernan, who in a short time navigated a review of the DIAS legislation. Thanks to Peter for his dedication to DIAS over his term as Chair of the Council, and I wish him every success and happiness for the future.

2021 was year whereby COVID-19 was still with us, and thus a year of adjustment and consolidation. Much of the activity at DIAS moved to a hybrid model whereby some work was done off site, and some on site. An example of this is the STP seminars which took place in person, but were also streamed with, in 2021, 29 institutions worldwide engaging regularly with the series.

The year of course was also another year of discovery. History was made with the launch of the Webb Space telescope on December 25th 2021. DIAS is the only Irish research group involved with the global multi-billion dollar project, having being a Co-PI on the development of one of the four instruments on board, i.e. the MIRI camera. Seeing the telescope being sent safely in to space was a very special moment for the researchers involved at DIAS and for the wider DIAS community.

History was also made with the appointment of the first female Senior Professor in the Institute, namely Dr. Caitriona Jackman of the University of Southampton who had joined DIAS on being awarded a SFI President of Ireland Future Research Leaders Award.

Another very special moment was the unveiling of the digitised version of An Cathach, marking the 1500th anniversary of the birth of St. Colmcille.



Eucharía Meehan

Critically for the future of geosciences in Ireland, DIAS was a key partner in the successful attainment of funding from SFI to continue iCRAG, the SFI Centre for the Geosciences.

My sincere thanks to the members of our Council, Governing Boards, our collaborators, suppliers and all those who helped keep the organisation functioning in a very challenging time. Thanks also to the members of the Audit and Risk Committee for the vital role they play in terms of risk, control, governance and associated assurances of the Institute. And finally, thanks to the Department of Further and Higher Education, Research, Innovation and Science its support.

It is a privilege to work with an Institute of such a high calibre and I look forward immensely to the coming years.

DIAS at a Glance

PERSONNEL

113

In 2021, DIAS had 113 team members

96

engaged directly in advanced studies/ research and **17** in general administration/ support and non-research roles

Of the **96**;

12

Professors
(Senior Professors and Professors)

19

Other specialist academic and technical staff

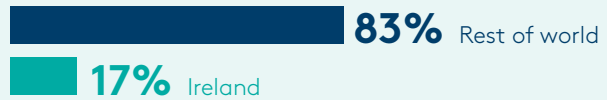
65

Early career researchers
(Fellows, postdocs and scholars)

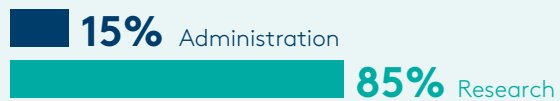
80%

Of the early stage career researchers, **80%** are funded by external competitively sourced funding

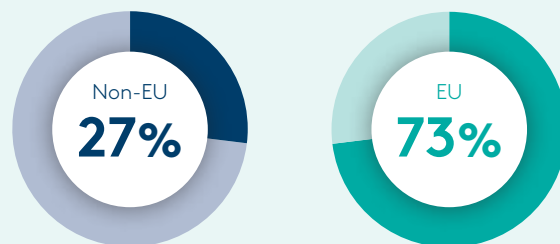
SCHOLARS



OVERVIEW PROFILE



ORIGIN OF RESEARCHERS

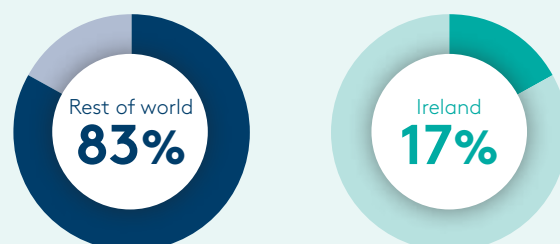


Total number of countries: 24

GENDER



FELLOWS/PROJECT STAFF



Our Financial Resources

FUNDING SOURCES



Funding Expenditure



Our Partners

ISLAND OF IRELAND COLLABORATIONS

NUIG	TCD
WIT	UCD
UCC	Irish Astronomical Society
DCU	Maynooth University
RIA	Armagh Planetarium
QUB	National Museum of Ireland
NCI	National Monuments Service
TUD	Met Éireann
IADT	Department of Foreign Affairs

ADJUNCT APPOINTMENTS

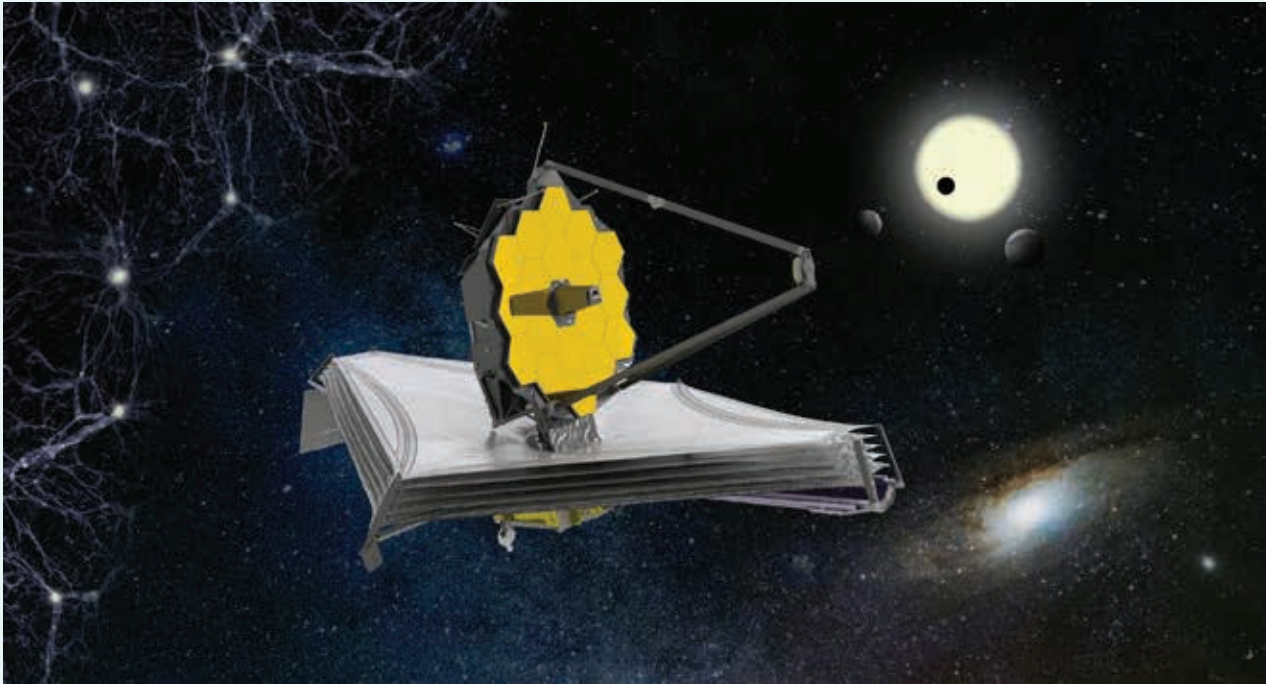
<p>Professors</p> <p>22</p>	<p>Fellows</p> <p>17</p>
------------------------------------	---------------------------------

A flavour of our research...

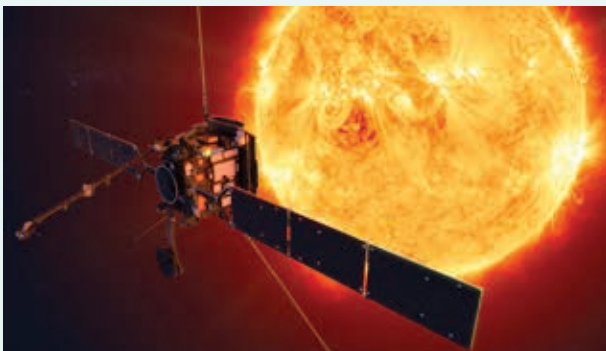
Satellite Missions

DIAS are currently involved in five Satellite Missions:

JWST



Solar Orbiter



JUICE



Ariel



Juno



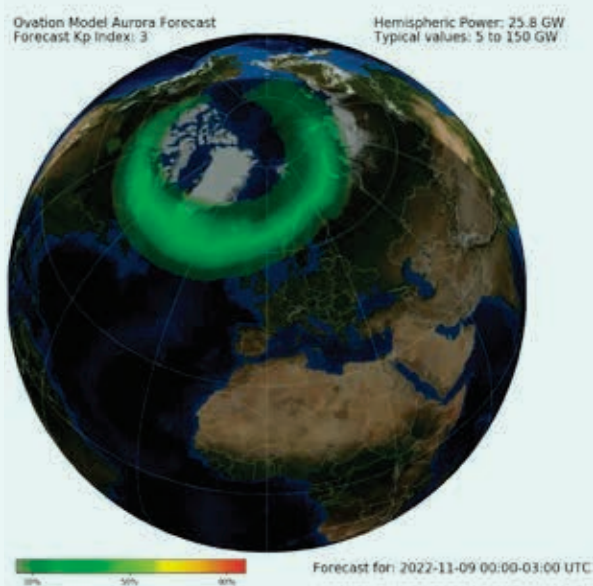
Seismic Activity Detections

In 2021 the Irish National Seismic Network (operated and maintained by DIAS and supported by Geological Survey Ireland) detected 22 earthquakes and 507 quarry explosions.



Geomagnetic/Solar Storms

A total of 35 solar storms were detected by MagIE (the Magnetometer Network of Ireland, founded by DIAS and TCD School of Physics) in 2021.



Meteor Detections at DIAS Dunsink Observatory

Approximately 1,270 meteors were detected by meteor cameras at DIAS Dunsink Observatory in 2021.



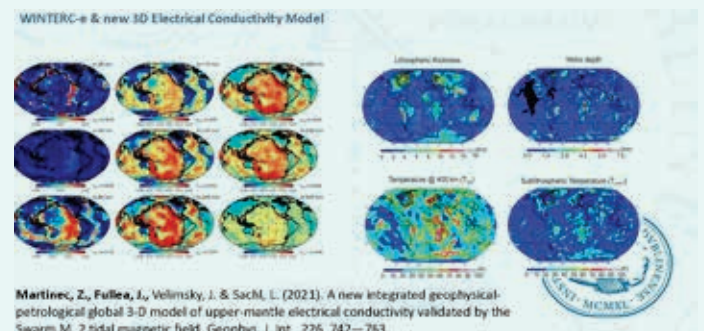
Number of software programmes/databases issued;

5 (incl data releases). Three examples are:

Simulation code PION – public release of simulation code for formation of the iconic Bubble Nebula (work by Sam Green DIAS).

SunPy – Feb. 2021, the now leading open-source Python library for solar physics data analysis and visualisation.

RETREAT SOFTWARE TOOL – positive reaction to development and paper in *Frontiers in Earth Science* and now publicly available volcano observations.



Number of peer reviewed publications

The Schools of Cosmic Physics and Theoretical Physics had over 100 physics peer reviewed publications in 2021.

A flavour of our research... (continued)

Books published by the DIAS publishing division

COVID-19 continued to impact on the publication program for our publishing house. Three new publications in 2021 now available through our bookshop were;

Clóliosta



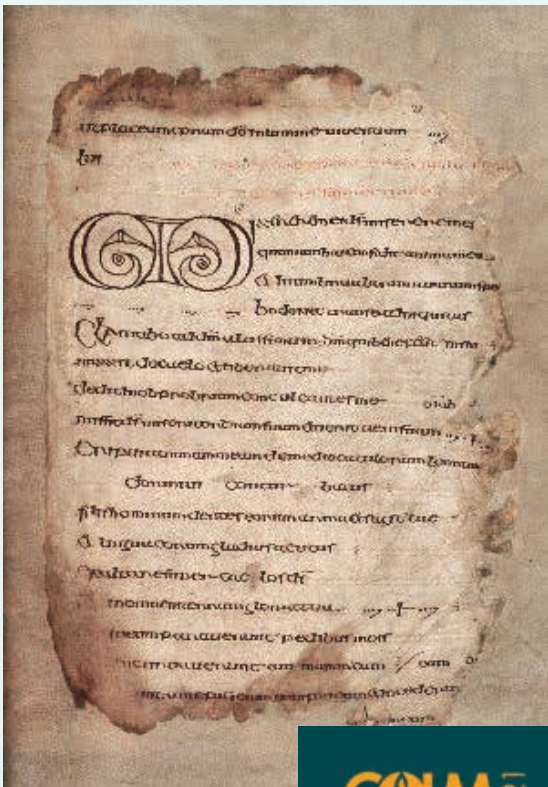
"Celtica 33"



"West Perthshire Gaelic: phonology, morphology, texts, and lexicon"



Manuscripts digitised and newly available through the on-line portal Irish Script on Screen (ISOS)



DIAS launched the digitised version of the Cathach of St. Colum Cille marking the 1500th anniversary of the birth of St. Colum Cille.



Image from the 10th century MS C.9, Psalter Southampton, an Insular illuminated Psalter from Ireland (@St. John's College Cambridge).



Image from "The Great Parchment Book of Waterford" 14th -17th century.

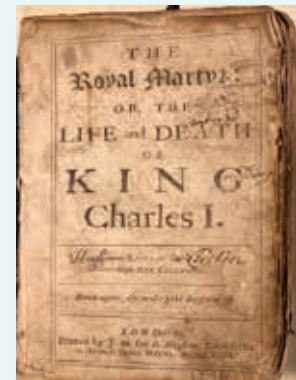


Image from "The Cruitín Fragment" a recent discovery from Los Angeles, 17th century.

New partnerships 2021 for Irish Script on Screen (ISOS) portal, Waterford Treasures Museums and St. John's College University of Cambridge.



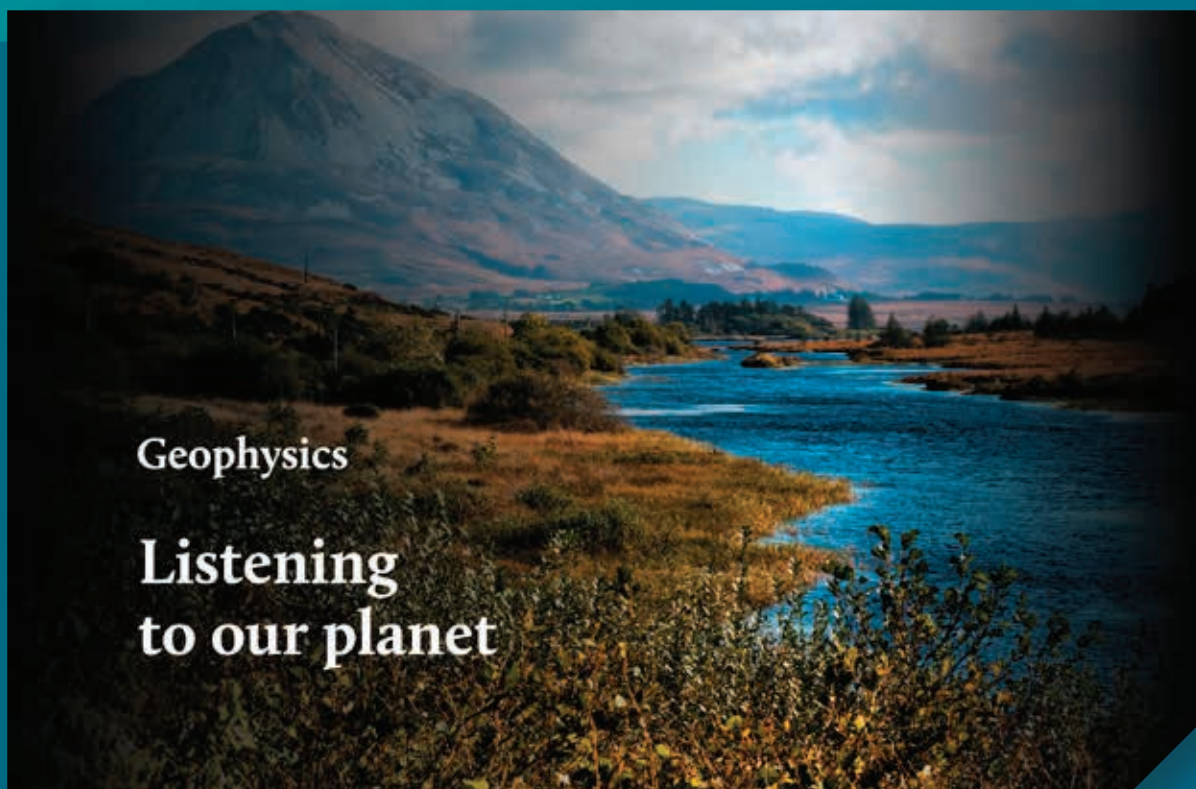
Early Career Researchers

5 of 36 awards in the sciences strand of the new SFI/IRC Pathways programme for early career researchers were made to DIAS.



L-R Dr. Florian le Pape (DIAS Geophysics), Dr. Donna Rodgers-Lee (DIAS Astronomy and Astrophysics), Dr. Venus Keus, Dr. Silvia Nagy (both DIAS School of Theoretical Physics) and Dr. Patrick Kavanagh (DIAS Astronomy and Astrophysics)

DIAS in 2021 – Working Towards our Strategic Goals



Spotlight on activities in 2021 reported in line with the four overarching strategic goals in the DIAS Strategy *Embedded Globally, Strength Locally*

Celtic Studies

Exploring worlds through words

DIAS

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

www.dias.ie



Theoretical Physics

Quantum, infinity and beyond

$$H = \frac{da/dt}{a}$$

$$i\hbar \frac{\partial}{\partial t} \psi = \hat{H} \psi$$



$$R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

Goal 1 – Discovery of new knowledge and understanding through excellence and researcher led endeavour

GAINING INSIGHTS TO OUR CELTIC HERITAGE

Publication of Books: Clóliosta

The School of Celtic Studies launched 'Clóliosta: Printing in the Irish language, 1571-1871, An attempt at narrative bibliography' by Professor Richard Sharpe and Dr. Mícheál Hoyne in May 2021.

Clóliosta is a catalogue of more than three centuries of printing in Irish, from the earliest instances of the language in print down to the eve of the modern revival. It is the most ambitious attempt yet undertaken to capture the complex and multifaceted print heritage of the Irish language. Entire books printed in Irish as well as pamphlets and other ephemera are described in detail. Information is provided on the types used, on the background, content and reception of the works catalogued, and how they relate to the manuscript tradition. The works catalogued in Clóliosta, in all their variety, allow us to tell a story of the Irish language very different from that built on the manuscript tradition alone. It is hoped that this richly detailed, chronological catalogue will inspire new research in this largely unexplored area.

Sadly Professor Sharpe passed away in March 2021, *ar dheis Dé go raibh a anam*.

Other Publications

In 2021 our publications program was very negatively affected by the COVID-19 crisis for the second consecutive year and only two other new publications were released:

- 1) "West Perthshire Gaelic: phonology, morphology, texts, and lexicon" (Cat. n° E.3.8), by Prof. Máirtín Ó Murchú, which is part of a set of two on Perthshire Gaelic together with his "East Perthshire Gaelic: social history, phonology, texts, and lexicon" (Cat. n° E.3.5) published by DIAS in 1989.
- 2) "Celtica 33" (Cat. n° C.1.33), edited by Profs. Barry Lewis and Ruairí Ó hUiginn, and boasting 14 original contributions as well as reviews on recent works.

Both the latter publications were formally launched at the 2021 Tionól. Emeritus Senior Professor Ó Murchú was not present on that occasion but it is hoped we can celebrate the publication of this work in his presence with an on-site ceremony in 2022.

Digitisation of Manuscripts

The digitisation of The Cathach was the most significant development in 2021, with 2021 also marking the 1500th commemoration of the birth of Colmcille.

The oldest surviving manuscript written in Ireland is the Cathach and it is a sixth-century psalter or psalm book that has traditionally been associated with the saint. This remarkable but fragile artefact is currently housed in the Library of the Royal Irish Academy on Dublin's Dawson Street.

In December 2021 Irish Script on Screen and the School of Celtic Studies launched the digitised version of the Cathach of St. Colum Cille to mark the 1500 anniversary of his birth.

LISTENING TO OUR PLANET

Seismic Love Waves

The deep ocean remains one of the final frontiers of the unknown on our planet. New research by scientists at DIAS Geophysics in 2021 revealed how interactions between the coupling of the deep ocean and land affects certain seismic vibrations. Nature Communications, April 2021

Wind-driven ocean waves generate continuous Earth vibrations that are observed all around the world. This new study investigates the origin of particular seismic waves called Love waves which are induced by ocean waves. This brings new insights on the complex interactions that couple ocean processes to the solid Earth. Over the past 15 years, ocean waves induced seismology has significantly impacted our understanding of the Earth.

Knowing more about Love waves present in the seismic noise is not only beneficial for a better imaging and monitoring of the Earth, from large faults to volcanoes, but it also brings further insights on the relationship between seismology and ocean climate observations.

How deep ocean-land coupling controls the generation of secondary microseism love waves, Nat. Comms, Florian le Pape et al. April 2021.

Sierra Negra (IGUANA project)

A volcanic eruption in the Galápagos Islands gave scientists a fresh insight into how volcanoes behave and provided vital information that will help to predict future hazards on the islands. Professor Chris Bean, Head of DIAS Geophysics, was part of the international research team that made the discovery. Nature Communications, March 2021

The research revealed the first ever detailed description of a volcanic eruption from Sierra Negra – one of the world’s most active volcanoes – found on Isabela Island, the largest of the Galápagos archipelago and home to nearly 2,000 people. The international research team combined the latest data recorded by instruments on the ground, by satellites, and by analysis of the chemical composition of the erupted lava. They showed how ascending magma permanently uplifted a ‘trapdoor’ in the floor of the caldera, raising the surface, and triggering large earthquakes. The new understandings developed from the research will allow Ecuadorian volcanologists to track the evolution of unrest for future eruptions in the Galápagos Islands, and communicate it to local authorities and the public.

DIAS/iCrag – scheme for geographical data integration



iCrag is the Science Foundation Ireland Research Centre in Applied Geosciences hosted by University College Dublin, which comprises 150 researchers across eight universities and institutions including DIAS. iCrag is supported by Science Foundation Ireland, Geological Survey Ireland and industry partners.

There are several ongoing strands to DIAS’ iCrag work;

Using Ireland as a lab for developing new methods for the direct detection of sub surface ground water flow. The main seismic field experiment within iCrag Geohazards Spoke was carried out on 15-20 December 2020 in Co. Roscommon (delayed due to COVID). Initial results in 2021 show detection and location of underground flow-induced seismic signal, using modified methodology developed on volcanoes for magma tracking. There are no other examples in the literature, opening up a new research area. Nature Geoscience, Deformation-controlled long period seismicity in low cohesion volcanic sediments

Another iCrag-DIAS team has performed gravity, magnetic & seismic modelling in the Rockall Trough demonstrating that the south Rockall Trough could have been at the verge of creating an ocean before breakup.

The iCrag- DIAS research project, namely MTGS-i - MagnetoTelluric Gravity and Seismic data Integration to image Ireland’s crust and upper mantle, is providing new images of the crust and mantle. A 3D simultaneous joint inversion framework of MT has been developed with seismic and gravity datasets to build a consistent multi-parameter image of the crust and uppermost mantle of the island of Ireland.

Method Development

New methodological developments in **Passive Seismic imagery** continue (mainly in collaboration with the University of Grenoble) that have led to several publications. New application area in volcano and geothermal field imaging are commencing (both geothermal in Ireland and in the US, in collaboration with ETH Zurich and Lawrence Berkeley National Labs). A new method of Optimal Resolution Tomography, has been developed and applied to imaging Ireland and surroundings.

Seismic **surface-wave tomography** of Ireland using the newly available dense data sampling offers exciting new insights into Ireland’s deep structure and evolution. The new data and models also yield important information on the thermal structure of the crust and lithosphere across the island. At the moment, they are used as essential inputs into the region-scale mapping of the geothermal gradient under the project DIG.

Goal 1 – Discovery of new knowledge and understanding through excellence and researcher led endeavour (continued)

REACHING FOR THE STARS

Cosmic Ray Factories

Professor Felix Aharonian from DIAS Astrophysics & Astronomy has played a key role in the discovery of a dozen sources of the highest energy cosmic rays in our Galaxy. These cosmic-ray factories, one of which is located in the famous Crab Nebula, were detected by observations with the partially complete Large High-Altitude Air Shower Observatory (LHAASO) in China. The findings provided an important new insight into the origin of Galactic cosmic rays. This discovery shows that clusters of young, massive stars should be considered as a serious alternative or addition to supernova remnants as the main contributors to the Galactic Cosmic Rays. Nature, May 2021.



View from satellite of the "LHAASO experiment". Professor Aharonian DIAS is Senior Scientific Advisor to the LHAASO collaboration. Image Credit: LHAASO

Gamma Ray Bursts - Near by gamma-ray burst observed in unprecedented detail



Two of the five telescopes that comprise the H.E.S.S. array

DIAS is a co-founder of the High Energy Stereoscopic System (H.E.S.S.) – a specialised observatory located in Namibia – which was able to gain the best view ever recorded observations of gamma-ray bursts – the brightest explosions in the universe due to its enhanced Cherenkov telescopes. The team of researchers involved in the discovery, includes Prof. Felix Aharonian, and Dr. Jonathan Mackey, and Dr. Davit Zargaryan. Science June 2021.

GRB 190829A's spectrum could be determined up to an energy of 3.3 tera-electronvolts, which is about a trillion times as energetic as the photons of visible light. This marks the highest energy spectrum of a gamma-ray burst recorded to date. The findings have also challenged the established idea of how gamma-rays are produced in these colossal stellar explosions.

The far-reaching implication of this discovery highlights the need for further studies in this area. GRB 190829A is only the fourth gamma-ray burst detected from the ground at very high energies. Looking to the future, the prospects for the detection of gamma-ray bursts by next-generation instruments look promising, which will help us to fully understand these gargantuan cosmic explosions.

Bubbles, Black Holes & Rings

An international team of researchers, including Dr. Simon Purser from the DIAS Astronomy and Astrophysics Section, observed the evolution of warm gas coming from an active black hole for the first time. The team were able to look at these structures that closely remind of the smoke streams produced by volcanic eruptions with unprecedented detail and on a scale of a hundred million years. *Nature Astronomy*, October 2021.

Their study focused on the Nest200047 system – a group of roughly 20 galaxies approximately 200 million light-years away. The central galaxy of this system houses an active black hole around which researchers observed many couples of gas bubbles diverse in age, some unknown filaments of magnetic fields and relativistic particles as big as hundreds of thousands of light-years. The observations were possible thanks to LOFAR (LOW Frequency ARray), the largest low-frequency radio telescope in the world. DIAS manage the Irish station for LOFAR, I-LOFAR, in Birr, Co. Offaly.



⋮ The Irish LOFAR radio telescope at Birr Castle, Co. Offaly.
⋮ Photo credit: Alison Delaney

Why did the Ulysses mission see no X-Rays when it flew past Jupiter in 1992?

In *Nature Astronomy*, a new study reports the finding and solves a decades old mystery. NuSTAR space observatory reports the highest energy light ever detected from Jupiter, also highest ever from a solar system planet other than Earth. Using data from the NuSTAR X-ray observatory combined with insitu plasma and energetic particle data from the NASA Juno spacecraft at Jupiter, the team have shown that Jupiter is a source of non-thermal X-ray bremsstrahlung emission generated by stochastically accelerated electrons - representing a novel model of X-ray production in solar system objects. Authors Dr. Kaya Mori, Columbia University, paper lead; Professor Caitriona Jackman, DIAS, co-author and PI of one of the NuSTAR observation campaigns used in the paper.

Solar microflares: ESA's Solar Orbiter/STIX instrument detected multiple microflares from the Sun during instrument commissioning. This is a significant result demonstrating that the instrument is working as designed and that the solar corona is constantly varying at X-ray energies. Professor Gallagher and Dr. Shane Maloney are Co-Investigators. This work was published in *Astronomy & Astrophysics*, December 2021.

Method development: Increasing the Pixel Yield of Microwave Kinetic Inductance Detectors (MKIDs)

One of the main challenges of MKIDs is that imperfections, arising from fabrication, can cause significant clashing of different resonators, i.e. pixels, which were originally designed not to clash. This makes a number of pixels indistinguishable and therefore unusable for imaging. A new method of re-tuning pixels using a DC bias coupled with an innovative resonator design has been proposed. The design is based on the fact that the kinetic inductance of a superconducting thin film is current-dependent and varies in a non-linear fashion. The design has been published in *Proceedings of the SPIE*.

Goal 2 – International research collaboration benefitting Ireland and the world



EUROPEAN AND GLOBAL INFRASTRUCTURE PARTICIPATION





Goal 2 – International research collaboration benefitting Ireland and the world (continued)

SOME EXAMPLES OF RESEARCH AND INFRASTRUCTURE COLLABORATION

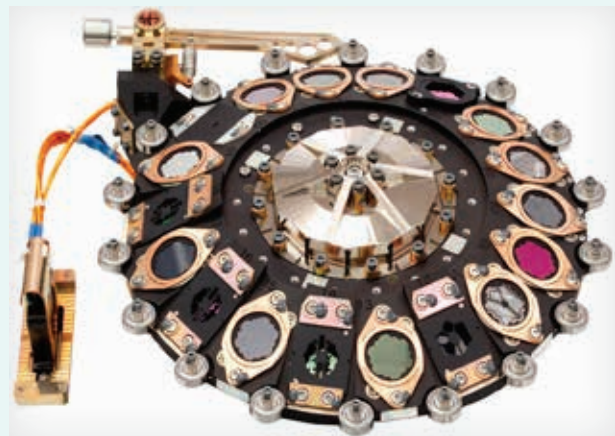
The James Webb Space Telescope (JWST)



A lifesize model of the JWST at a NASA/ESA/Conference hosted by DIAS at the Royal Hospital Kilmainham in 2007

After several delays, the ground-breaking James Webb Space Telescope (JWST) launched from Guiana Space Centre on Christmas Day 2021. The Webb Space Telescope is the most eagerly awaited space observatory of the last two decades and will be the premier observatory for the next. The natural successor to the Hubble Space Telescope, but many times larger, it will observe the first starlight in the Universe; answer key questions on galaxy, star, and planet formation; probe the atmospheres of planets around distant stars in the search for the building blocks of life; and is set to revolutionise all areas of astronomy!

Prof. Tom Ray of the Dublin Institute for Advanced Studies (DIAS) is co-Principal Investigator for the Mid-Infrared Instrument (MIRI), is one of the four science instruments on Webb. DIAS has contributed to the design and fabrication of this instrument by producing special filters that are used to break up infrared light into its various components. In recent years DIAS has played a major role in understanding the instrument's performance, and in providing specialised software (led by Dr. Patrick Kavanagh), so as to produce science-ready data. DIAS is the only Irish research organisation with technology on board the JWST.



The MIRI filter wheel

PORO-CLIM



The PORO-CLIM Project is a large, over-arching and multidisciplinary project aimed at understanding the complexity and feedbacks involved in the coupling of atmospheric and ocean processes to those in the Earth's deep convecting mantle. PORO-CLIM is looking at how Earth's deep interior has affected global climate in the geological past. Large Igneous Provinces (LIPs) are huge outpourings of lava accompanied by the voluminous release of greenhouse gases to the atmosphere. The aim is to investigate why LIPs coincide with some of the most remarkable global climate changes and mass extinctions in Earth's history. Specifically, asking whether our local LIP, the North Atlantic LIP, which comprises ancient volcanic eruptions from Giant's Causeway to western Greenland, could have driven a natural global climate change event that is the closest deep-time analog of anthropogenic environmental change (though the modern change is happening even faster).

It is built upon the substantial body of work gathered by DIAS researchers and both national and international collaborators along the conjugate continental margins of the North Atlantic. This work involves a large globally distributed team of experts in the diverse scientific fields required for this ambitious project and will introduce the next generation of young researchers to this research viewpoint. The Geological Survey of Denmark and Greenland (GEUS) and the Dublin Institute of Advanced Studies (DIAS) are the main collaborators, with contributions from the University of Aarhus, University of Brighton, University of Cambridge, Galway-Mayo Institute of Technology, University of Ghent, Tonnta Energy Ltd, Trinity College Dublin, and University College Dublin.

First successful marine experiments took place in the Porcupine Basin and the Hatton-Rockall Basin region to measure critical properties that gauge thermal flux from the Earth in 2021. DIAS Professor Brian O'Reilly is Co-Principal Investigator of the project and Dr. Haleh Karbala Ali is part of the team and acts as Outreach Officer for the project.

ISOS

Two new partnerships to ISOS, Waterford Treasures Museums and St. John's College University of Cambridge were also established. Digitisation of "The Great Parchment Book of Waterford" was substantial and received coverage on RTE. The 'Liber Antiquissimus Civitatis Waterfordiae' is a unique record of medieval history, preserved in vellum compiled between 14th-17th cent. It gives insights to medieval life in Waterford, details of long forgotten places, laws, plagues and war.

St. John's College Cambridge collaborated with their beautifully illuminated 10th cent. MS C.9, Psalter Southampton, an Insular illuminated Psalter from Ireland.

Other additions to the ISOS site "The Cruitin Fragment" a recent discovery from Los Angeles. A 17th cent. Binding that appeared to have a pastedown from a 17th cent. Irish manuscript, text in the hand of Aodh Buidhe Mac Crutin (private collector).

Manuscripts held by the Irish Jesuit Archives where digitised and more manuscripts from The National Library of Scotland were added.

PACIFIC: Collaboration has continued with the PACIFIC team at STerre, Univ. Grenoble Alpes on train signal simulation and how to use trains as a source for seismic interferometry imaging and compare the geological models obtained in Grenoble (France) with the estimated velocity models in DIAS, to improve the quantitative interpretation.

Goal 2 – International research collaboration benefitting Ireland and the world (continued)

SOME EXAMPLES OF EARLY RESEARCHER CAREER DEVELOPMENT AND TRAINING COLLABORATIONS

DIAS is a partner in three International Training Networks funded by the EU Horizon 2020 and Horizon Europe research and innovation funding programmes.

These are:



IMPROVE: a multi-disciplinary network of European Research Institutes and Small-Medium Enterprises. Early Stage Researchers are trained to innovative research in volcano science extending across the academia-industry bridge, and including cooperative work, leadership skills, and independent thinking. Volcano science includes from innovative monitoring and prospecting to advanced lab experiments, High Performance Computing, and Artificial Intelligence. Two volcanic areas provide ideal cases for relevant scientific advance and training-through-research: **Mount Etna** in Sicily, one of the most monitored volcanoes in the world and the place where to extend our understanding of active volcano dynamics; and the **Krafla caldera** in Iceland, site of a large geothermal circulation system largely exploited for energy production, and of a shallow magmatic intrusion which is catalysing break-through research from all over the world. DIAS is partnered with Italian, French, German, Icelandic and UK institutions.



SPIN: The overarching goal of the SPIN network is to **advance seismic observation, theory and hazard assessment alike by fully integrating the latest ground-motion sensing technology for optimising the forecasting and monitoring of geohazards** and create a fertile environment to train a new generation of unique European researchers who can incorporate new sensor types into widespread, societally-relevant applications. DIAS is partnered with French, German, Dutch, Swiss, US and UK institutions.



STELLAR: focused on the training of the next generation of radio astronomers. DIAS is partnered with institutions in Bulgaria and the Netherlands. The initiative, **“Scientific and Technological Excellence by Leveraging LOFAR Advancements in Radio astronomy” (STELLAR)**, will significantly increase the LOFAR technical and scientific expertise at TUS and IANAO. It will allow IANAO and TUS to develop and strengthen collaborations with ASTRON and DIAS. The focus brought by LOFAR technology and science will open a new exciting direction for scientific research and technological development in the area.

Goal 3 – Attraction, and retention of, research leaders for today and the future

First Female Senior Professor of Physics



Professor Caitriona Jackman was appointed to the role of senior professor in the School of Cosmic Physics. She is the first female senior professor of physics in the 81-year history of the Institute.

She leads a research group on planetary magnetospheres – the magnetic bubbles that surround magnetised planets. Professor Jackman is also involved in outreach projects under Goal 4, including the space-themed escape room at DIAS Dunsink Observatory which opened on a limited basis in 2021.

Prof. Jackman studied and worked in the UK for 17 years, having completed her PhD in Space Physics at the University of Leicester and held research positions at Imperial College London, University College London and the University of Southampton. She returned to Ireland in 2019 to take up a prestigious President of Ireland Future Research Leaders Award from Science Foundation Ireland.

Early Career Researcher Representation



Janneke de Laat



Maria Tsekhmistrenko

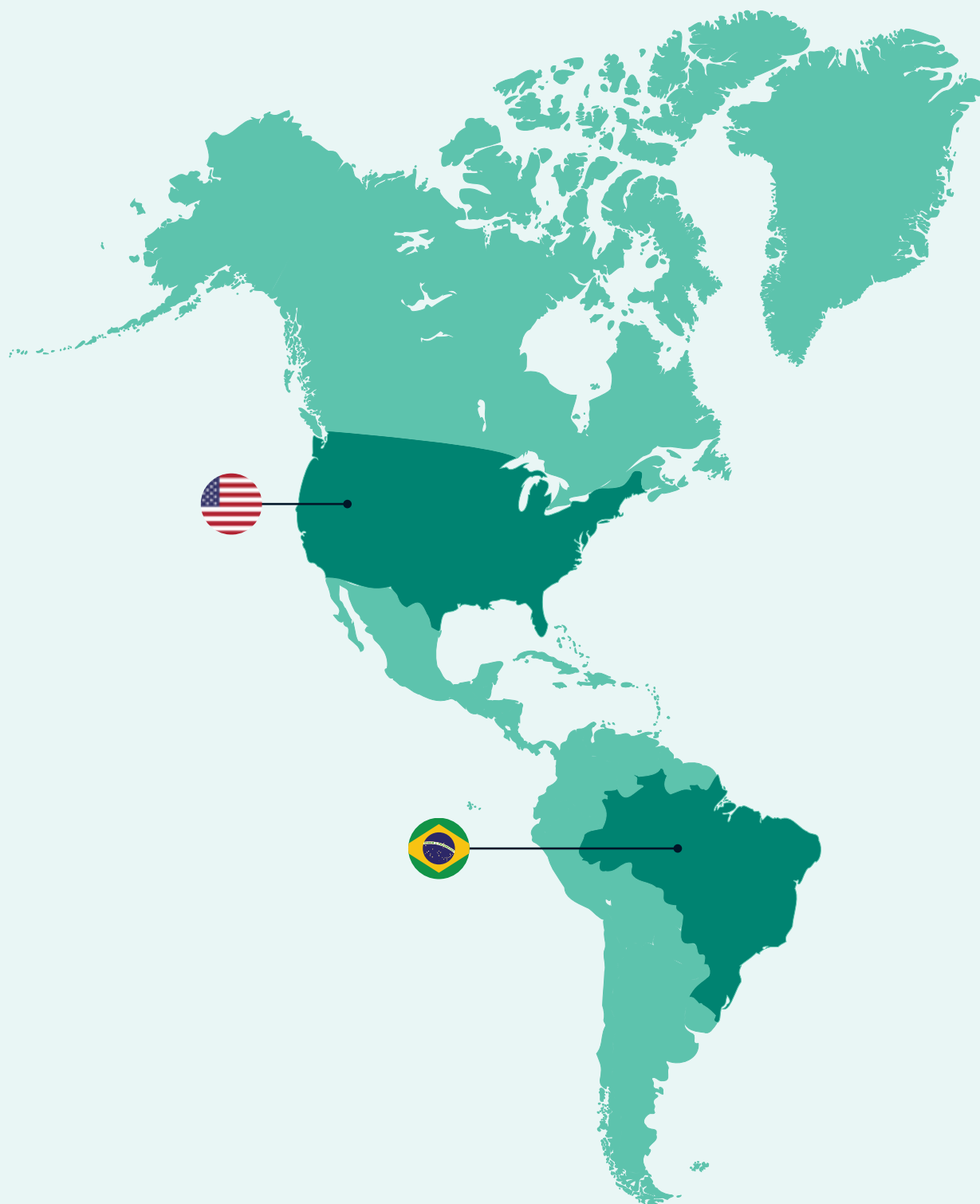
Janneke de Laat (seismology PhD student) and **Maria Tsekhmistrenko** (postdoctoral researcher) have joined the leadership of the Seismology Division, European Geosciences Union, as Early Career Scientist Representatives. Both have also enhanced their growing reputations in the field by giving invited seminars in Australia and the UK.

Developing Leaders



Dr. Eoin Carley formed and is Co-Principal Investigator of the Solar Key Project of the extension to the French LOFAR station, known as NenuFAR, located in central France and operated by the Paris Observatory. Dr. Carley led an international team of collaborators in a solar observing campaign during the NenuFAR Early Science Phase from June 2019 to December 2021.

Goal 3 – Attraction, and retention of, research leaders for today and the future (continued)



DIAS is a truly international Institute. In 2021 our staff and scholars came from 24 countries around the globe



Goal 3 – Attraction, and retention of, research leaders for today and the future (continued)

Focus on New Starters at DIAS in 2021

New Students and Scholars

Astronomy & Astrophysics



Chris Burger-Scheidlin
(Austria)

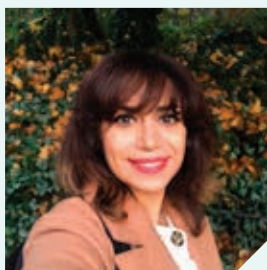


Elizabeth O'Dwyer
(Ireland)



Kevin Smith (Ireland)

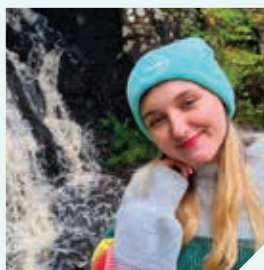
Geophysics



Samane Baranbooei
(Iran)



Somaye Bayat (Iran)



Eleanor Dunn (UK)

New Fellows and Postdocs



Dr. Oisín Creaner (US)



Dr. Caitlin Ellis (UK)



Dr. Neetu (India)



Dr. Deirdre nic Chártaigh
(Ireland)



Dr. Jack Piercy (UK)



Dr. Meysam Rezaeifar
(Iran)



Dr. Gaurav Tomar
(India)



Dr. Tao Ye (China)

PhD Defences 2021

- Luuk Coopmans
- Samuel Green
- Colin Hogg
- Ciara Maguire
- Giuseppe Maggio
- Senad Subasic
- Clara Gomez

Remembering Mick Smyth



In October 2021, Mick Smyth, a long serving and much loved technical officer at DIAS Geophysics lost his battle with cancer. Mick was a key member of the SEA-SEIS team and is missed by his colleagues, friends, and team. *Ni bheidh a leithéad ann arís*

Professor Sergei Lebedev



2021 saw Professor Sergei Lebedev depart DIAS to take up a position as Chair of Geophysics at Cambridge University. Sergei was the PI for the SEA-SEIS project and the Project Leader of the Ireland Array team. Sergei remains with DIAS in the capacity of Adjunct Professor.

Goal 3 – Attraction, and retention of, research leaders for today and the future (continued)

School of Cosmic Physics Adjunct Faculty 2021

Adjunct Professor

Prof. Turlough Downes, Mathematical Sciences, Dublin City University

Prof. Aline Vidotto, Trinity College Dublin, Ireland

Prof. Antonella Natta, Dublin Institute for Advanced Studies, Ireland

Prof. Sergei Lebedev, University of Cambridge

Prof. Ana Ferreira. Dpt. Of Earth Sciences, University College London

Prof. Richard Schwartz, NASA Goddard Space Flight Centre

Dr. Gareth O'Brien, Microsoft

Adjunct Fellow

Dr. Nicola Piana Agostinetti

Dr. Laura Hayes, European Space Agency ESTEC, Netherlands

Dr. Pietro Zucca, Dutch Centre for Radio Astronomy (ASTRON), the Netherlands

Dr. Ivan Colantoni, Italian National Research Council, Italy

Dr. Masha Chernyakova, Dublin City University, Ireland

Dr. Emma Whelan, Maynooth University, Ireland

Dr. Deirdre Coffey, University College Dublin, Ireland

Dr. Léa Griton, Research Institute in Astrophysics and Planetology, France

Prof. Javier Fullea, Complutense University Madrid

Prof. Jose Groh, Trinity College Dublin, Ireland

Dr. Andrew Schaeffer, Geological Survey of Canada

School of Theoretical Physics Adjunct Faculty 2021

Adjunct Professor

Prof. Cliff Burgess; McMaster University, Ontario

Prof. Riccardo Capovilla; Cinvestav, Mexico City

Prof. Brian Dolan, Maynooth University

Prof. Paul Feehan; Rutgers University, New Jersey

Prof. Veselin Filev, Bulgarian Academy of Sciences

Prof. Ruth Gregory; King's College, London

Prof. Fatima Laytimi, University of Lille

Prof. Ronan McNulty, University College Dublin

Prof. Charles Nash, Maynooth University (Formerly)

Prof. Alexei Rebenko, National Academy of Sciences Ukraine

Prof. Joost Slingerland, Maynooth University

Prof. Sumati Surya; Raman Research Institute, Bengaluru

Prof. D. H. Tchrakian, Maynooth University (Formerly)

Prof. Michael P. Tuite; National University of Ireland, Galway

Prof. Badis Ydri; Badji Mokhtar-Annaba University, Annaba, Algeria

Adjunct Fellow

Dr. Larisa Jonke; Ruđer Bošković Institute, Zagreb

Dr. Graham Kells, Dublin City University

Dr. Marianne Leitner, Trinity College Dublin

Dr. Cormac O'Raiheartaigh, Waterford Institute of Technology

Dr. Alina Vdovina, Newcastle University

Goal 4 – Strengthening disciplines and research communities nationally

Section A: Strengthening Disciplines – Research Community

Case Study: School of Theoretical Physics (STP)

STP Seminar Programme

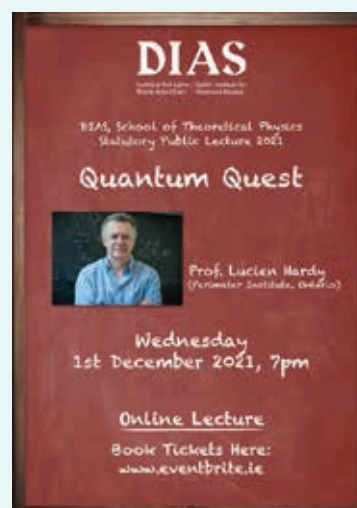


Seminars are an important tool to share and build knowledge across all of DIAS. In pandemic times, everyone moved largely to the online seminar model. This brought with it challenges, but also opportunities. Speakers from across the world were beamed into homes and offices of DIAS researchers.

DIAS School of Theoretical Physics held 36 regular seminars in 2021, 36 speakers from 29 institutions in 12 different countries, including 6 from DIAS, shared their knowledge and research on themes including dark matter and quantum theory. The seminars have also been shared on DIAS YouTube channel making them accessible to researchers and students across Ireland and beyond.

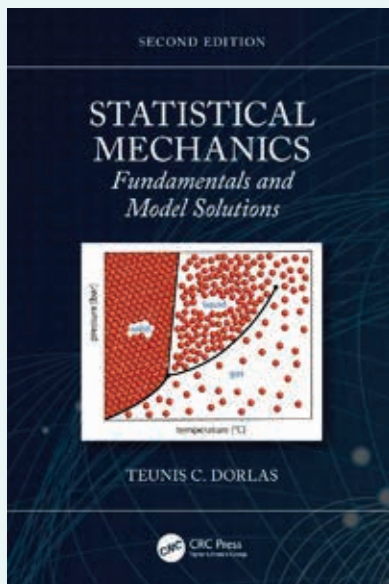
STP Statutory Lecture

The DIAS School of Theoretical Physics Statutory Lecture 2021 saw Professor Lucien Hardy of the Perimeter Institute deliver a talk entitled “Quantum Quest”. The lecture attracted attendees from institutions in Ireland and further afield as well as members of the public.



Goal 4 – Strengthening disciplines and research communities nationally (continued)

Textbook Publication: Professor Dorlas – Statistical Mechanics, Fundamentals and Model Solutions



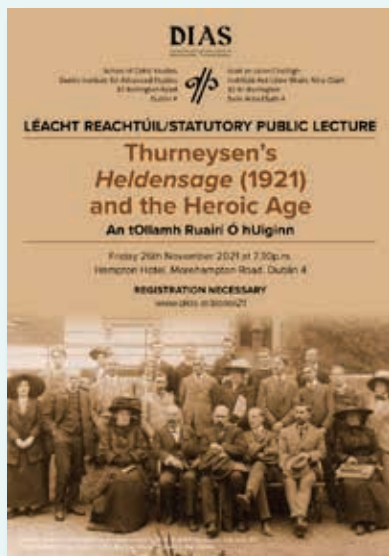
DIAS Summer Internships for Undergraduate Students

In an Institute wide initiative, and following an application and assessment process, students from DCU, QUB, TCD, TU Dublin, and UCD were awarded internships in the Summer of 2021.

Case Study: School of Celtic Studies

Tionól 2021

In person (hybrid) events finally returned as DIAS School of Celtic Studies held Tionól 2021 in the Hampton Hotel. There were attendees from national and international institutions. The programme for the weekend also included the School's Statutory Public Lecture "Thurneysen's Heldenage (1921) and the Heroic Age."



Medieval Multi-lingualism Conference May 2021

Attendees from national and international institutions attended this important conference.



Section B: Ongoing provision, and management, of Research Infrastructures based in Ireland benefitting the community

See page 22 for research infrastructures in the international domain in which DIAS collaborates.

Research infrastructure	Function	Nature of involvement
Irish National Seismic Network	Detects earthquakes and other seismic activity – part of global network	Leader and operator
Irish Script on Screen (ISOS)	Digitisation of Irish manuscripts; available online	Leader
Ogham in 3D	3D digitisation and conservation project for Ogham stones; made available online	Leader
Publishing in Irish and Celtic Studies	International publishing house for Irish and Celtic Studies; publisher of premier academic journal in Celtic Studies, Celtica	Publisher, editor and vendor
Bibliography of Irish Linguistics & Literature	Catalogue of publications in Celtic Studies	Leader
iMARL	National ocean-bottom listening infrastructure	Leader
I-LOFAR	National and international radio-telescope infrastructure	Key partner, Academic Director
Irish Centre for High-end Computing (ICHEC)	National high-performance computing infrastructure	Key partner and member of Academic Flagship Programme
National CTBTO Office	Comprehensive Nuclear-Test Ban Treaty Organisation	Host (for Department of Foreign Affairs)

Goal 4 – Strengthening disciplines and research communities nationally (continued)

Section C: Strengthening Disciplines – Public Outreach

Samhain agus Science Festival

Our 2021 Samhain agus Science festival was a huge success, with seven events held over the space of five days at the end of October into early November. All events took place online which attracted a global audience. This year’s festival achieved a 50/50 gender balance across speakers and panellists.



SAMHAIN
AGUS
SCIENCE
28 OCTOBER - 3 NOVEMBER

Bringing together researchers from DIAS and around the world for a series of free online events that explore the dark side of science and Celtic heritage.

Talks include:

- International Dark Matter Day Event: The Dark Side of the Universe**
Prof. Katherine Freese (University of Texas)
- The Ins and Outs of Irish Words Through Time**
Prof. Máire Ní Mhaonaigh (University of Cambridge), Prof. Greg Toner & Dr. Sharon Arbuthnot (Queens University Belfast)
- Hekla Volcano (Iceland) - a Gateway to Hell?**
Dr. Martin Mölhoff (DIAS)
- The Most Massive Black Holes in the Stellar Graveyard**
Dr. Erin R. Higgins (Armagh Observatory & Planetarium)

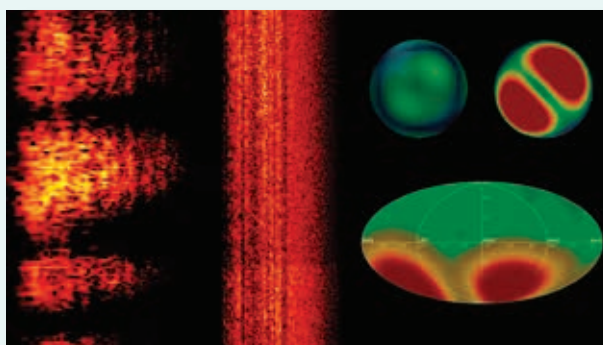
For the full list of events, and booking information, visit:
www.dias.ie/samhainagusscience

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

Advertisement in Irish Times promoting Samhain agus Science, listing some of the events that took place over the week.

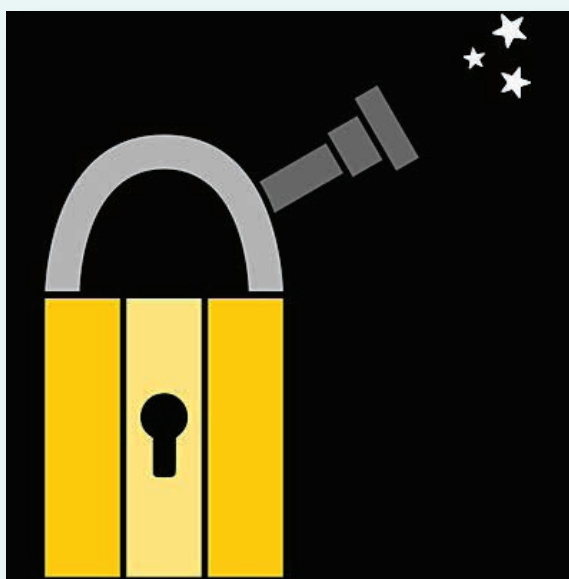
Sounds of the Earth

Sounds of the Earth is an art-science collaboration between the sound-artist and composer, David Stalling, and scientists at DIAS. The aim was to make various noises of the Earth audible to the human ear. The sounds were obtained thanks to one of the boldest deep-ocean research projects ever undertaken in Europe. The SEA-SEIS project, led by Professor Sergei Lebedev and scientists at DIAS Geophysics, utilised the DIAS iMARL infrastructure, a network of state-of-the-art ocean bottom seismometers (18 units) across the Irish offshore area, to record the sounds. The recordings were released in June 2021. To listen to the Sounds of the Earth, visit: www.soundsoftheearth.ie.



Escape Room Launch

The “Race to Space” is a fully immersive escape room experience, a collaboration between DIAS Dunsink Observatory and Adventure Rooms Dublin. It was launched on a pilot basis in October 2021.



Dev Talks – DIAS in Collaboration with the NUI

DIAS collaborated with the NUI on a series of lunchtime lectures on the legacy of Éamon de Valera. Four lectures and a final panel discussion were attended by people all over the world, including members of the De Valera family, politicians, historians, scholars and classes of schoolchildren around the country.

11 Thursday
De Valera: From revolution to politics
SPEAKER
 Dr Leeann Lane
 DCU
RESPONDENT
 Prof Diarmaid Ferriter
 UCD

16 Tuesday
De Valera's Ireland
SPEAKER
 Dr David McCullagh
 RTÉ
RESPONDENT
 Dr Caitriona Clear
 NUI Galway

18 Thursday
De Valera: The international dimension
SPEAKER
 Dr Michael Kennedy
 RIA
RESPONDENT
 Dr Jennifer Redmond
 Maynooth University

23 Tuesday
De Valera's vision for higher education and scholarship
SPEAKER
 Prof Mary Daly
 historian
RESPONDENT
 Prof Ruairi Ó hUiginn
 DIAS

25 Thursday
Discussion Panel: De Valera's political, social and cultural legacy
 12.30 - 2pm

Eamon de Valera on the steps of Earlsfort Terrace, 22 Nov 1921
 Reproduced by kind permission of UCD-CPM Partnership

DIAS Day Lecture 2021

The annual DIAS Day Lecture was conceived in 2020, as part of the calendar of events to mark the 80th anniversary of the establishment of the Institute. Internationally acclaimed Marine scientist Professor Terry Hughes delivered the Lecture on Friday, 18 June. Professor Hughes delivered a fascinating and enlightening lecture on coral reef sustainability and the damaging effects of coral bleaching on climate change. Professor Hughes' recent work has focused on marine ecology, macroecology, climate change, identifying safe planetary boundaries for human development, and on transformative governance of the sea in Australia, Chile, China, the Galapagos Islands, Gulf of Maine and the Coral Triangle.



DIAS Reach for the Stars Astrophotography Competition

Winner

To the waters and the wild.
Photographer: Josh Mathews



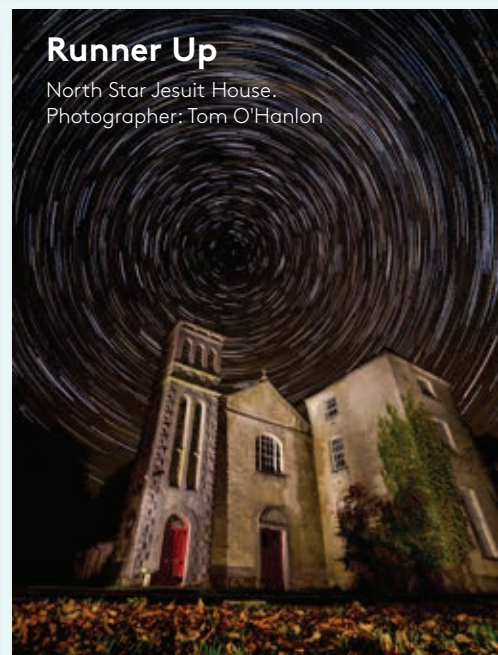
Runner Up

Cygnus Mosaic in Hubble Palette
Photographer: Ciaran P. O'Donnell



Runner Up

North Star Jesuit House.
Photographer: Tom O'Hanlon



Peoples Choice

Comet Neowise over Ardmore.
Photographer: Charles Coughlan



DIAS' inaugural astrophotography competition "Reach for the Stars" was launched in December 2020. Over 200 entries were received by the closing date in April 2021 and our judges had a difficult task to select a winner and two runners up. A people's choice award saw the public choose their favourite image via the DIAS website.

An outdoor exhibition of the winning and shortlisted entries was held on the railings at Burlington Road for several months and received a very positive reception. The images moved to the South Dome at DIAS Dunsink observatory in December.



DIAS CEO and Registrar Dr. Eucharia Meehan with some of the photos from the exhibition.

DIAS Reach for the Stars Astrophotography Competition (continued)

Case study: DIAS Geophysics at “Down to Earth” Exhibition in the National Museum

A new permanent exhibition opened in the National Museum of Ireland, Collins Barracks in September 2021. “Down to Earth” is a collaboration between Geological Survey Ireland, The Department of the Environment, Climate and Communications, and the National Museum, to mark 175 years of the Geological Survey.

The exhibition includes, from the Irish National Seismic Network (INSN) at DIAS Geophysics, an INSN display showing up to date local and global seismic events, and an interactive Lego seismometer.

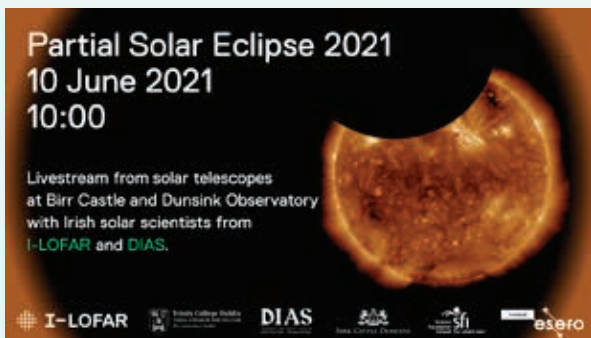
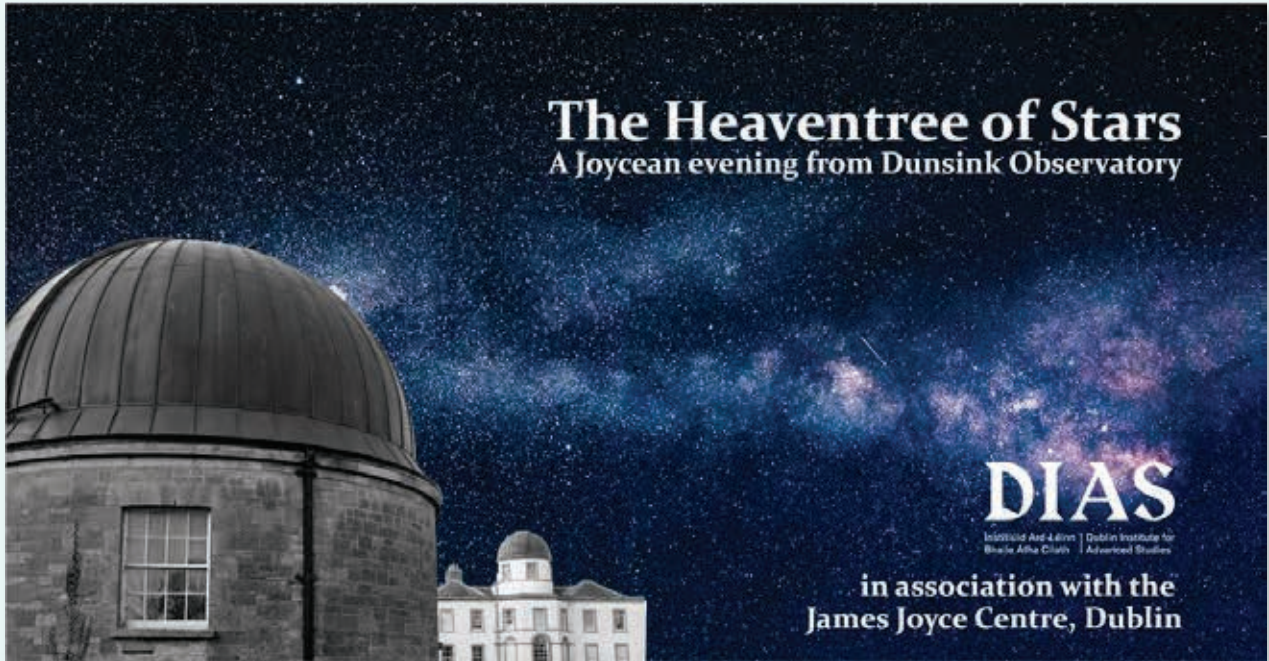


Lego seismometer as seen at “Down to Earth” Exhibition



Members of the DIAS Geophysics team at the exhibition. L-R Huda Mohamed, Clodagh Moriarty, Dr. Martin Molhoff, Director of the Irish National Seismic Network

Other external events with DIAS participation included The Heaventree of Stars, the Partial Solar Eclipse livestream, Culture Night, the Dublin Festival of History and the Hamilton Walk.



Institute Staff

Council of the Institute 2021

Chairman

J. Hegarty (from December)

P. Heffernan (to June)

Ex-Officio Members

A. Deeks, President, UCD

P. Prendergast, Provost, TCD (to August)

L. Doyle (from August)

M. Canning, President, RIA

Members Appointed by the Governing Boards of Constituent Schools

R. Ó hUiginn

M. Ní Mhaonaigh

M. Fowler

P. Goddard

D. O'Connor

C. Bean (to December)

T. Ray (from December)

Governing Board of the School of Celtic Studies

Chairman

M. Ní Mhaonaigh

Senior Professor

L. Breatnach

R. Ó hUiginn

Appointed Members

R. Chapman Stacey

M. Haycock

J. F. Nagy

D. Stifter

G. Toner

E. Fitzpatrick

Governing Board of the School of Theoretical Physics

Chairman

P. Goddard

Senior Professors

W. Nahm

D. O'Connor

T. Dorlas

Appointed Members

A. P. Balachandran

B. Dolan

F. Dowker

D. Evans

F. Lizzi

P. Vitale

S. Ryan

Governing Board of the School of Cosmic Physics

Chairman

M. Fowler

Senior Professors

C. Bean

P. Gallagher

T. Ray

C. Jackman (from September)

Appointed Members

M. Burton

K. Verbruggen

J. Drew

C. O'Sullivan (from November)

N. Vilmer (from November)

J.-P. Montagner (from November)

Administrative Staff of the Institute 2021

Registrar

Eucharía Meehan

Finance Officer

Grace Forkin

Senior Executive Officer

Richard Gow (to May)

Michelle Tobin (from June)

Senior Administrative Officer

Mary Burke

Assistant Finance Officer

Ronan Byrne

Policy Development & Impact Officer

Caoimhe Mulhall (to September) (Contract position)

Clerical Staff

Helena Moynihan
Elena Stoenescu (to July)
Pauline Hutton
Abiola Osunkunle (from May)

Head of IT

Dmitri Grigoriev

Senior Systems Administrator

Jean-François Bucas

Senior Support IT Administrator

David Miller (from April)

Systems Administrator

Philippe Grange

Part-time IT Support Staff

A. McCarthy (Celtic Studies)
S. McCullagh (Cosmic Physics)

Support Staff

Colette Doyle
Patrick Wynne

Staff and Scholars of the School of Celtic Studies 2021

Senior Professor

R. Ó hUiginn (Director)
L. Breatnach

Professor

B. Lewis

Assistant Professors

A. Nic Dhonnchadha
M. O Riordan (Publications Officer)

Dialectologist

B. Ó Curnáin

Librarian

M. Irons

Library Assistant

Ó. Ní Chanáin

School Administrator

E. Nic Dhonncha

Technical Staff

ISOS

A.M. O'Brien

Bibliographer

A. Guilarte

Bergin Fellow

M. Hoyne (Ireland)
C. Kobel (Switzerland)

Scholars

N. Stam (Netherlands) (to May)
A. Palandri (Italy) (to August)
C. Cleary (Ireland)
C. Ellis (United Kingdom) (from September)
D. Nic Chárthaigh (Ireland) (from September)

Research Students/Interns

A. Taylor Griffiths (United Kingdom) (Jan to Apr)
A. O Reilly (Ireland) (from 1 June to 31 July)
E. De Barra (Ireland) (from 1 June to 31 July)

Staff and Scholars of the School of Theoretical Physics 2021

Senior Professors

D. O'Connor (Director)
W. Nahm
T. Dorlas

Librarian/School Administrator

G. Rogers

Research Fellows (Schrödinger)

G. Kells (Ireland) (to Aug)
G. Palumbo (Italy)

Project Staff

S. Dooley (Ireland) SFI Project (to September)

Research Assistants (temporary)

K. Kavanagh (from September)
A. Conlon (from September)

Institute Staff (continued)

Scholars

L. Coopmans (Holland) Project-funded (to Aug)
K. Kavanagh (Ireland) Project- funded (to Aug)
M. Pandey (India)
T. Matsumoto (Japan)
I. Jubb (UK)
Neetu (India) (from September)

Research Students/Interns

B. Graham (Ireland) (from 1 June to 31 July)
J. Gleeson (Ireland) (from 1 June to 31 July)
P. Moody (Ireland) (from 1 June to 31 July)
P. Kishore (Ireland) (from 1 June to 31 July)
S. Ní Mhaoláin (Ireland) (from 1 June to 31 July)
T. Yu Lin (Ireland) (from 1 June to 31 July)
W. Ronayne (Ireland) (from 1 June to 31 July)

Staff and Scholars of the School of Cosmic Physics 2021

Senior Professors

C. Bean (Director)
P. Gallagher (Director to May)
T. Ray
C. Bean (Director to May)
C. Jackman (from November)
T. Ray (Director from June)

Professors

F. Aharonian
Z. Martinec

Assistant Professors

S. Lebedev (to Aug)
B. O'Reilly

Schroedinger Fellows

D. Kiyani (Turkey)
E. Carley (Ireland)

Director of Seismic Networks

M. Möllhoff

Senior Technical Officers

C. Horan
M. Smyth (RIP October)

Technical Officers

E. Flood
L. Collins
C. Hogg
S. Murray (from May)

Administrative Staff

H. Mohamad (Research Project Officer)
C. Moriarty (Secretary)

Scholars

N. Celli (Italy)
G. Maggio (Italy) (to September)
C. Gomez Garcia (Spain)
S. Subasic (Croatia) (to July)
L. Berdi (Hungary) (to September)
S. Green (U.K.) (to May)
M. de Lucia (Italy)
E. Baldwin (Ireland)
A. Feeney-Johansson (Ireland)
M. Moutzouri (Greece)
C. Stock (U.S.A)
M. Nelissen (Belgium)
M. Longobardi (Italy) (to December)
J. de Laat (Netherlands)
B. C. de Melo (Brazil)
E. Liang Chua (Singapore)
H. Dou (China) (to September)
L. Alberto Canizares (Ireland/Spain)
D. McKenna (Ireland)
J. Malone-Leigh (Ireland)
J. Rigney (Ireland)
S. McEntee (Ireland)
S. Bhunia (India)
S. Baranbooei (Iran) (from January)
E. O'Dwyer (Ireland) (from September)
C. Burger-Scheidlin (Austria) (from October)
S. Bayat (Iran) (from August)

Project Staff (for starters and leavers)

F. le Pape (France) SFI iCRAG
A. Caratti O Garatti (Italy) ERC EASY (to September)
D. Craig (Ireland) Technical Officer, GSI INSN
J. Grannell (Ireland) Technical Officer, GSI INSN
J. Mackey (Ireland) Royal Society/SFI
P. Kavanagh (Ireland) MIRI project
G. Tomar (India) SFI iCRAG
G. Ulbricht (Germany) SFI MKIDS
S. Purser (U.K.) ERC EASY
M. Rezaeifar (Iran) EU Pacific Project
D. Molodtsov (Russia) ITHERC Project
C. Civiero (Italy) SFI SEA-SEIS
D. Hariri Naghadeh (Iran) EU Pacific Project (to November)
P. Smith (UK) EU Eurovolc
P. McGinnis (Brazil/America) ERC EASY
Y. Xu (China) EU Pacific Project (to September)
H. Karbala Ali (Iran) SFI iCRAG
N. Nooshiri (Iran) GSI COSEISMIQ
M. Tsekhmistrenko (Germany) SFI SEA-SEIS
D. Rangaswamy (India) ERC EASY
D. Zargaryan (Armenia) IRC Laureate
R. Bonadio (Italy) SFI SEA-SEIS
C. Jackman (Ireland) SFI Future Leaders (to 31 August)
E. Chambers (UK) SEAI DIG
R. Brose (Germany) IRC Laureate
A. Fogg (UK) SFI Future Leaders
C. Louis (France) SFI Future Leaders
S. Maloney (Ireland) (from March)
T. Ye (China) (from September)
O. Creaner (Ireland) (from September)
J. Piercy (UK) (from September)
E. Dunn (UK) (from October)
N. Celli (from November)

Research Students/Interns

A. Empey (Ireland) (from 1 June to 31 July)
F. Feehily (Ireland) (from 14 June to 13 August)
S. Leahy (Ireland) (from 1 June to 31 July)
T. Corron (Ireland) (from 1 June to 31 July)
A. Brennan (Ireland) (from 14 June to 13 August)
S. O' Connor (Ireland) (from 1 June to 23 August)

Professor Emeritus

P. Readman
A. Thompson
A. Jones
L. Drury

Health and Safety Report

Staff and scholars were facilitated to work from home, or work on site for 2021. Guidelines in relation to homeworking were issued as part of the Homeworking Policy. For on-site working, the overarching Covid-19 Operational Plan and site-specific Covid-19 Response Plans were updated post the conduct of updated risk assessments, and a Response Levels policy adopted. All policies reflected the prevailing Government public health guidelines.

As the year progressed with ever increasing numbers of people on site, in addition to increasing durations on site for individuals, preparation of premises was ongoing throughout the year. The primary activities involved office modifications to enable social distancing, erection of Covid-19 signage, designation of Covid-19 Responders, induction of designated persons. A significant investment was made in procuring air filters and CO₂ monitors and good progress was made in getting these installed across all of the sites.

In addition, to Covid-19 measures, a follow-up H&S Review was undertaken by DIAS' internal auditors in May 2021 on the implementation status of recommendations arising from an earlier external Health & Safety Audit performed in November 2018. Given the limitations that applied due to Covid-19, the review was primarily paper-based but information was also obtained from online interviews with relevant staff at each of the sites. Whilst most of the recommendations were found to be either partially or fully completed, there were a few repeated outstanding issues. The absence of a dedicated post for Health and Safety/Facilities Management was identified as a deficiency that would, on an ongoing basis, mitigate against progress in H&S. The most immediate measures were prioritised for action.

The Health and Safety Statement was reviewed in Q1 2021, and approved by the Council in May of that year.

	Number	Comment
Accidents recorded	2	a. Cuts from glass b. Trip on a bag strap
Near misses	6	5x cars being burnt out on Lane outside DIAS Dunsink Observatory 1 x Delivery person slip on stairs
Days lost (FTE)	0	-

Dublin Institute for Advanced Studies

Financial Statements

for year ended 31 December 2021

Information	46
Governance Statement and Council Members' Report	47
Statement of Responsibilities of the Council	51
Statement on Internal Control	52
Report of the Comptroller & Auditor General	54
Statement of Income and Expenditure and Retained Revenue Reserves	56
Statement of Financial Position	57
Statement of Cash Flows	58
Notes to the Financial Statements	59

Information

Members of the Council of the Dublin Institute for Advanced Studies: 2021

Chairman

P. Heffernan to 17/6/21

J. Hegarty from 22/11/21

Ex-Officio Members

A. Deeks, President, UCD

P. Prendergast, Provost, TCD, to 31/7/21

L. Doyle, Provost, TCD, from 1/8/21

M. Canning, President, RIA

Members Appointed by the Governing Boards of Constituent Schools

M. Fowler

P. Goddard

M. Ní Mhaonaigh

D. O' Connor

R. Ó hUiginn

C. Bean

Registrar and Chief Executive Officer:

Dr. Eucharia Meehan

Head Office:

10 Burlington Road, Dublin 4

Internal Auditors:

Mazars, Block 3, Harcourt Centre, Harcourt Road, Dublin 2

Auditors:

The Office of the Comptroller and Auditor General, 3A Mayor Street Upper, Dublin 1

Bankers:

Bank of Ireland, College Green, Dublin 2

Bank of Ireland, Baggot Street, Dublin 2

Governance Statement and Council Members' Report

The Dublin Institute for Advanced Studies (DIAS) is a statutory corporation and was established in 1940 under the Institute for Advanced Studies Act of that year.

The Council is accountable to the Minister for Further and Higher Education, Research, Innovation and Science and is responsible for ensuring good governance and performs this task by setting strategic objectives and targets and taking strategic decisions on all key business issues. The regular day-to-day management, control and direction of the Institute are the responsibility of the Registrar/CEO and the senior management team. The Registrar/CEO and the senior management team must follow the broad strategic direction set by the Council, and must ensure that all Council Board members have a clear understanding of the key activities and decisions related to the entity, and of any significant risks likely to arise. The Registrar/CEO acts as a direct liaison between the Council and management of the Institute.

Council Responsibilities

The work and responsibilities of the Council are set out in the Institute for Advanced Studies Act 1940. Standing items considered by the members of Council include:

- reports from committees,
- financial reports/management accounts,
- performance reports, and
- reserved matters.

The Council is responsible for keeping adequate accounting records 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.

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 it will continue in operation, and disclose and explain any material departures disclosed from applicable standards.
- The maintenance and integrity of the corporate and financial information on the Institute's website is the responsibility of the Registrar/CEO.

The Council is also responsible for safeguarding the assets of the Institute and for taking reasonable steps for the prevention and detection of fraud and other irregularities.

The Council considers that the financial statements of the Institute give a true and fair view of the financial performance and the financial position of the Institute at 31 December 2021.

Council Structure

The Council consists of a Chairman appointed by the President, on the advice of the Government, three ex-officio members and six members appointed by the Governing Boards of the constituent schools. DIAS has a Registrar/CEO and a Central Administration. The members of Council were appointed for a period of five years. One meeting of Council was held during the period. The table below details the appointment period for current members:

Governance Statement and Council Members' Report (continued)

Council Member	Role	Period of Appointment
Dr. Peter Heffernan	Chairman	1 July 2020 to 17 June 2021
Dr. John Hegarty	Chairman	22 Nov 2021 to 30 June 2025
A. Deeks, Presid., UCD	Ex-Officio Member	1 Aug 2020 to 30 June 2025
P. Prendergast, Prov., TCD	Ex-Officio Member	1 Aug 2020 to 31 July 2021
L. Doyle, Prov., TCD	Ex-Officio Member	1 Aug 2021 to 30 June 2025
M. Canning, President, RIA	Ex-Officio Member	1 Aug 2020 to 30 June 2025
Prof. M. Fowler	Appointed by Gov. Board	1 Aug 2020 to 30 June 2025
Prof. P. Goddard	Appointed by Gov. Board	1 Aug 2020 to 30 June 2025
Prof. M. Ní Mhaonaigh	Appointed by Gov. Board	1 Aug 2020 to 30 June 2025
Prof. D. O' Connor	Appointed by Gov. Board	1 Aug 2020 to 30 June 2025
Prof. R.Ó hUiginn	Appointed by Gov. Board	1 Aug 2020 to 30 June 2025
Prof. C. Bean	Appointed by Gov. Board	1 Aug 2020 to 30 June 2025

The Council has established an Audit and Risk Committee.

The Audit and Risk Committee comprises four members. The role of the Audit and Risk Committee is to support the Council in relation to its responsibilities for issues of risk, control and governance and associated assurance. The Audit and Risk Committee is independent from the financial management of the organisation. In particular the Committee ensures that the internal control systems including audit activities are monitored actively and independently. The Audit and Risk Committee reports to the Council twice a year and formally in writing annually.

The members of the Audit and Risk Committee are: Mr. John Boland, Chairman, Prof. Dervilla Donnelly, Mr. Stewart Roche and Ms. Lesley Goulding. In 2021 the Audit and Risk Committee met on five occasions.

Schedule of Attendance, Fees and Expenses

A schedule of attendance at the Council and Audit and Risk Committee meetings for 2021 is set out below including the fees and expenses received by each member.

	Council	Audit & Risk Committee	Fees 2021 €	Expenses 2021 €
No. of Meetings	1	5		
Dr. Peter Heffernan (Ch)	1		-	
Dr. John Hegarty	1			
A. Deeks, Presid., UCD	0		-	-
Dr. P. Prendergast, Prov., TCD to 31/7/21	1		-	-
Dr. L. Doyle, Prov., TCD, from 1/8/21	0		-	-
M. Canning, President, RIA	1		-	-
Prof. M. Fowler	1		-	-
Prof. P. Goddard	1		-	-
Prof. M. Ní Mhaonaigh	1		-	-
Prof. D. O' Connor	1		-	-
Prof. R.Ó hUiginn	1		-	-
Prof. C. Bean	1		-	-
Mr. J. Boland (Ch)		5	-	-
Prof. D Donnelly		5	-	-
Mr. S. Roche		5	-	-
Ms. L. Goulding		5	-	-

Key Personnel Changes

The membership of the Council changed during 2021.

Dr. P. Heffernan resigned as Chairman of Council on 17th June 2021.

Dr. P. Prendergast resigned as Provost of TCD on 31st July 2021.

Dr. L. Doyle was appointed as Provost of TCD on 1st August 2021.

Dr. J. Hegarty was appointed as Chairman of Council from 22nd November 2021.

Professor A. Deeks resigned as President of UCD in April 2022.

Disclosures Required by Code of Practice for the Governance of State Bodies (2016)

The Council is responsible for ensuring that the Institute has complied as appropriate with the requirements of the Code of Practice for the Governance of State Bodies ("the Code"), as published by the Department of Public Expenditure and Reform in August 2016. The following disclosures are required by the Code:

Consultancy Costs

Consultancy costs include the cost of external advice to management and exclude outsourced "business-as-usual" functions.

	2021 €	2020 €
Legal Fees	25,688	43,409
Financial/actuarial	51,075	36,340
Communication	86,407	87,058
External Review	152	1,400
Performance Framework Review	-	4,683
Other	77,617	124,585
Total Consultancy Costs charged to the Income and Expenditure	240,939	297,475

Travel and Subsistence Expenditure

Travel and Subsistence Expenditure is categorised as follows:

	2021 €	2020 €
Domestic		
Council	-	720
Employees & Board	3,590	15,838
Academic Visitors	158	3,215
Project	16,036	53,457
Field	2,343	10,981
Total	22,127	84,211
International		
Council	-	-
Employees & Board	11,840	20,269
Academic Visitors	-	6,285
Project	21,108	46,851
Field	-	1,956
Total	32,948	75,361
Conferences Seminars and Online	48,025	-
Transport and Other Field	43,454	-
Overall Total	146,554	159,572

Governance Statement and Council Members' Report (continued)

Hospitality Expenditure

The Income and Expenditure includes the following hospitality expenditure:

	2021 €	2020 €
Staff Hospitality	111	337
Client Hospitality	298	173
Total	409	510

Statement of Compliance

The Institute has complied with the requirements of the Code of Practice for the Governance of State Bodies in 2021.



Dr. John Hegarty
Chairman of Council

Date 23rd June 2022



Dr. Eucharía Meehan
Registrar/CEO

Date 23rd June 2022

Statement of Responsibilities of the Council

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

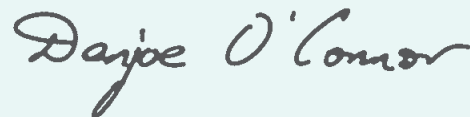
- select suitable accounting policies and apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Institute will continue in operation; and
- disclose and explain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

The Council is responsible for keeping adequate accounting records 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.



Ruairí Ó hUiginn
Council Member

Date 23rd June 2022



Denjoe O'Connor
Council Member

Date 23rd June 2022

Statement on Internal Control

Scope of Responsibility

On behalf of the Council of the Institute we acknowledge our responsibility for ensuring that an effective system of internal control is maintained and operated. This responsibility takes account of the requirements of the Code of Practice for the Governance of State Bodies (2016).

Purpose of the System of Internal Control

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.

Capacity to Handle Risk

The Council has an Audit and Risk Committee comprising of four external members.

The Audit and Risk Committee continues to review internal control matters and issues raised by the Comptroller and Auditor General. In 2021, the Audit and Risk Committee met on five occasions.

In addition, the 2021 report on internal control systems as provided by the Internal Auditor has been made available to Members of Council.

Risk and Control Framework

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

- clearly defining management responsibilities;
- adopting the principles of corporate governance contained in the 2016 Code of Practice for Governance of State bodies;
- establishing formal procedures for reporting significant control failures and ensuring appropriate corrective action; and
- establishing formal procedures to monitor the activities and safeguard the assets of the organisation.

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.

Ongoing Monitoring and Review

The system of internal control is based on a framework of regular management information, administrative procedures including segregation of duties, and a system of delegation and accountability. In particular it includes:

- comprehensive budgeting system with an annual budget which is reviewed and agreed by the Council of the Institute;
- regular reviews by the Council of periodic and annual financial reports which indicate financial performance against forecasts;
- setting targets to measure financial and other performance;
- adherence to public procurement guidelines;
- regular reviews by the Council of external research projects.

Procurement

We confirm that the DIAS has procedures in place to ensure compliance with current procurement rules and guidelines. Matters arising regarding controls over procurement are highlighted under internal control issues below.

Internal Control Issues

During 2021, expenditure of €54,300 was incurred in relation to goods and services where the procedures employed did not comply with procurement guidelines. The expenditure costs identified by DIAS were in respect of premises and maintenance costs and gardening services.

Premises and Maintenance costs €35,800

Due to Covid-19, it was necessary to increase expenditure on premises and maintenance support in order to prepare the buildings and facilities for the safe return of staff and scholars to working on site. As a consequence, the cost of premises and maintenance support exceeded the €25,000 threshold.

Gardening Services €18,500

DIAS spent €18,500 in respect of gardening services in Dunsink. Procurement guidelines were not followed and DIAS is currently working with the Office of Government Procurement to get the matter resolved.

Impact of Covid-19 on the Control Environment

DIAS management have sought to ensure that the strong control environment has been maintained despite staff working remotely during the period. DIAS operations have been aligned with government policy and the senior management team have been meeting on a weekly basis in order to manage the DIAS response to Covid-19.

Emphasis has been placed on research and advanced study work to continue as normal and to ensure a minimum disruption to output. A number of critical national fieldwork activities were maintained and DIAS provided on-line events and seminars where possible.

Financial Controls

Roles and responsibilities have remained the same throughout and there continues to be segregation of duties across all of the finance operations. Authorisation limits and payment thresholds were not changed. Sign-off and evidence of approval are now via electronic signature and/or email as opposed to manual sign-off pre-pandemic. The process around the posting and approval of journals has not changed as a result of the new working arrangements. Monthly balance sheet reconciliations continue to be performed in a timely manner. Strong controls remain in place regarding the changing of employee and supplier bank details.

Budgeting and Forecasting

DIAS has a robust budgeting and forecasting process. There is a comprehensive annual budgeting system in place and Council continue to review the periodic and annual financial reports and forecasts. Expenditure in the schools and sections is constantly monitored against budget to ensure there is not significant overspends. The financial impact of Covid-19 on the Institute is closely monitored.

Risk Management

During 2020 and most of 2021, a Covid-19 Risk Register was in place to deal specifically with the risks associated with the pandemic. In December 2021 the Covid -19 Risk Register and the General Risk Register were merged into one document. The Risk Register was presented to Council in December 2021. Risk is a standing item on the ARC agenda and the Risk Registers were reviewed by the ARC in February, March, October and December 2021.

Information Technology

DIAS procured a number of laptops for central administration staff. There was an upgrade to the primary and failover DIAS routers. In relation to IT security, there is secure VPN based on individual

password-protected SSL certificates specifically authorised for access to the DIAS server. Access to VPN was rolled out for all DIAS research staff and scholars. Procedures were established for carrying out IT support for home working.

Training and guidance was provided on Zoom and Microsoft Teams in order to facilitate meetings and to access seminars.

Review of Effectiveness

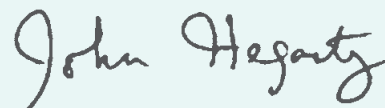
We confirm that the DIAS has procedures to monitor the effectiveness of its risk management and control procedures.

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

We confirm that for the 12 month period ended 31st December 2021, Council conducted a review of the effectiveness of the internal controls of the Institute.

A review of the internal control in 2021 was carried out by an external firm and was reviewed by the members of the Audit and Risk Committee on 31st March 2022. The review of the internal control in 2021 was signed off by Council in May 2022.

We confirm that the Institute has an appropriate system of internal and financial control in place. Signed on behalf of the Council of the Institute.



Dr. John Hegarty
Chairman
Council of the Institute

Date 23rd June 2022



Dr. Eucharía Meehan
Registrar/CEO

Date 23rd June 2022



Ard Reachtaire Cuntas agus Ciste Comptroller and Auditor General

Report for presentation to the Houses of the Oireachtas

Opinion on the financial statements

I have audited the financial statements of the Dublin Institute for Advanced Studies for the year ended 31 December 2021 as required under the provisions of the Institute for Advanced Studies Act 1940. The financial statements comprise

- the statement of income and expenditure and retained revenue reserves
- the statement of comprehensive income
- the statement of financial position
- the statement of cash flows, and
- the related notes, including a summary of significant accounting policies.

In my opinion, the financial statements give a true and fair view of the assets, liabilities and financial position of the Institute at 31 December 2021 and its income and expenditure for 2021 in accordance with Financial Reporting Standard (FRS) 102 — *The Financial Reporting Standard applicable in the UK and the Republic of Ireland*.

Basis of opinion

I conducted my audit of the financial statements in accordance with the International Standards on Auditing (ISAs) as promulgated by the International Organisation of Supreme Audit Institutions. My responsibilities under those standards are described in the appendix to this report. I am independent of the Institute and have fulfilled my other ethical responsibilities in accordance with the standards.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Report on information other than the financial statements, and on other matters

The Institute has presented certain other information together with the financial statements. This comprises a governance statement and Council members' report, a statement of responsibilities of the Council, and a statement on internal control.

My responsibilities to report in relation to such information, and on certain other matters upon which I report by exception, are described in the appendix to this report.

I have nothing to report in regard to those matters.

Peter Kinsley

For and on behalf of the
Comptroller and Auditor General

29 June 2022

Appendix to the report

Responsibilities of Council members

The members are responsible for

- the preparation of annual financial statements in the form prescribed under the Institute for Advanced Studies Act 1940
- ensuring that the financial statements give a true and fair view in accordance with FRS102
- ensuring the regularity of transactions
- assessing whether the use of the going concern basis of accounting is appropriate, and
- such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Responsibilities of the Comptroller and Auditor General

I am required under the Institute for Advanced Studies Act 1940 to audit the financial statements of the Institute and to report thereon to the Houses of the Oireachtas.

My objective in carrying out the audit is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement due to fraud or error. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with the ISAs, I exercise professional judgment and maintain professional scepticism throughout the audit. In doing so,

- I identify and assess the risks of material misstatement of the financial statements whether due to fraud or error; design and perform audit procedures responsive to those risks; and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- I obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal controls.
- I evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures.
- I conclude on the appropriateness of the use of the going concern basis of accounting and, based on the audit evidence obtained, on whether a material

uncertainty exists related to events or conditions that may cast significant doubt on the Institute's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my report. However, future events or conditions may cause the Institute to cease to continue as a going concern.

- I evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

I report by exception if, in my opinion,

- I have not received all the information and explanations I required for my audit, or
- the accounting records were not sufficient to permit the financial statements to be readily and properly audited, or
- the financial statements are not in agreement with the accounting records.

Information other than the financial statements

My opinion on the financial statements does not cover the other information presented with those statements, and I do not express any form of assurance conclusion thereon.

In connection with my audit of the financial statements, I am required under the ISAs to read the other information presented and, in doing so, consider whether the other information is materially inconsistent with the financial statements or with knowledge obtained during the audit, or if it otherwise appears to be materially misstated. If, based on the work I have performed, I conclude that there is a material misstatement of this other information, I am required to report that fact.

Reporting on other matters

My audit is conducted by reference to the special considerations which attach to bodies in receipt of substantial funding from the State in relation to their management and operation. I report if I identify material matters relating to the manner in which public business has been conducted.

I seek to obtain evidence about the regularity of financial transactions in the course of audit. I report if I identify any material instance where public money has not been applied for the purposes intended or where transactions did not conform to the authorities governing them.

Statement of Income and Expenditure and Retained Revenue Reserves

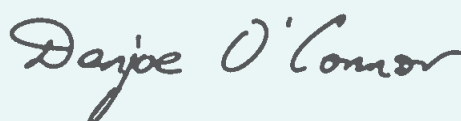
	Notes	2021 €	2020 €
Income	2		
Oireachtas Grant	3	7,637,146	7,210,250
Net deferred funding for retirement benefits	10.d	1,141,770	1,043,730
Sales of Publications		52,077	43,934
Projects	4	2,595,658	3,316,581
Other	5	33,093	172,048
		11,459,744	11,786,543
Transfer (to)/from Capital Reserve	14	159,346	223,395
Amount released on Disposal		7,904	324,363
		11,626,994	12,334,301
Expenditure	2		
School of Celtic Studies		1,773,191	1,778,585
School of Theoretical Physics		1,643,071	1,690,290
School of Cosmic Physics		5,235,308	5,752,966
Administration		2,846,133	3,462,939
		11,497,702	12,684,780
Surplus/(Deficit) for the year		129,291	(350,479)
Balance at 1 January		540,936	891,415
Balance at 31 December		670,227	540,936
		2021	2020
		€	€
Statement of Comprehensive Income			
Surplus/(Deficit) for the year		129,291	(350,479)
Experience gains/(losses) on retirement benefit obligations		905,000	(906,000)
Changes in assumptions underlying the present value of retirement benefit obligations		68,000	(4,969,000)
Actuarial Gain/(Loss) on Retirement Benefit Obligations	10.c	973,000	(5,875,000)
Adjustment to Deferred Retirement Benefit Funding		(973,000)	5,875,000
Total Recognised Gain/(Loss) for the Year		129,291	(350,479)

The Statement of Cash Flows and notes 1 to 18 form part of these financial statements.



Ruairí Ó hUiginn
Council Member

Date 23rd June 2022



Denjoe O'Connor
Council Member

Date 23rd June 2022

Statement of Financial Position

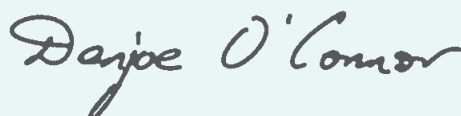
	Notes	2021 €	2020 €
Assets			
Fixed Assets: Property, Plant and Equipment	13	2,466,662	2,633,912
Current Assets:			
Cash on hand and at bank	15	5,462,850	3,496,626
Receivables		152,678	304,880
Project Receivables	4(a)	1,151,304	1,738,164
Total Assets		9,233,494	8,173,582
Less Liabilities			
Payables - Amounts falling due within one year			
Payables	16	3,085,665	2,594,518
Project Payables	4(a)	2,982,973	2,376,422
Payables - Amounts falling due after one year	16	27,967	27,794
		6,096,605	4,998,734
Assets Less Liabilities Before Retirement Benefits			
		3,136,889	3,174,848
Deferred Retirement Benefit funding	10.d	77,665,117	77,496,117
Retirement Benefit Obligations	10.c	(77,665,117)	(77,496,117)
		0	0
Net Assets			
		3,136,889	3,174,848
Financed by:			
Income and Expenditure Account		670,227	540,936
Capital Reserve	14	2,466,662	2,633,912
		3,136,889	3,174,848

The Statement of Cash Flows and notes 1 to 18 form part of these financial statements.



Ruairí Ó hUiginn
Council Member

Date 23rd June 2022



Denjoe O'Connor
Council Member

Date 23rd June 2022

Statement of Cash Flows

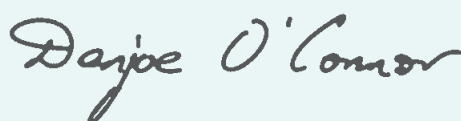
	Notes	2021 €	2020 €
Reconciliation of Operating Surplus to Net Cash (Outflow)/Inflow from Operating Activities			
Surplus/(Deficit) for the Year		129,291	(350,479)
Increase/(Decrease) in Payables		491,320	840,348
(Increase)/Decrease in Receivables		152,202	(161,157)
Net Decrease in Research Programmes and Fees		1,193,411	(576,633)
Depreciation	13	432,609	456,851
Capital Reserve Transfer	14	(167,250)	(547,758)
Amount Released on Disposal		7,904	324,363
Net Cash (Outflow)/Inflow from Operating Activities		2,239,487	(14,465)
Cash Flow Statement			
Net Cash (Outflow)/Inflow from Operating Activities		2,239,487	(14,465)
Cash Flow from Financing Activities			
Bank Interest Received	5	-	-
Cash Flow from Investing Activities			
Purchase of Tangible Assets	13	(273,263)	(233,456)
(Decrease)/Increase in Cash		1,966,224	(247,921)
Reconciliation of Net Cash Flow to Movement in Net Funds			
(Decrease)/Increase in Cash		1,966,224	(247,921)
Net Funds at 1 January		3,496,626	3,744,547
Net Funds at 31 December		5,462,850	3,496,626
Analysis of Change in Net Funds			
At Beginning of Year		3,496,626	3,744,547
Cash Flows		1,966,224	(247,921)
At End of Year		5,462,850	3,496,626

The Statement of Cash Flows and notes 1 to 18 form part of these financial statements.



Ruairi Ó hUiginn
Council Member

Date 23rd June 2022



Denjoe O'Connor
Council Member

Date 23rd June 2022

Notes to the Financial Statements

1. Accounting Policies

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.

a) Basis of Preparation and Statement of Compliance

Going concern

The Financial statements have been prepared on a going concern basis. The Council has considered the impact of Covid-19 on the operations of the Institute at meetings held in June and December 2020 and December 2021. Throughout the financial period 2021, the senior management of the Institute continued to monitor the impact of Covid-19 on the operations of DIAS.

An assessment on the projected financial impact of Covid-19 on the Institute has been completed to the end of December 2021 and the Council are satisfied that the Institute has sufficient resources to continue in operation for at least 12 months from the signing of the financial statements.

b) Basis of Accounting

This set of financial statements is prepared by the Dublin Institute for Advanced Studies in accordance with accounting standards issued by the Financial Reporting Council, including FRS 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland" ("FRS 102").

The preparation of financial statements in compliance with FRS 102 requires the use of certain critical accounting estimates. It also requires management to exercise judgement in applying the Institute's accounting policies. (See Note 18).

The financial statements have been prepared on an accruals basis under the historical cost convention and comply with the financial reporting standards of the Financial Reporting Council.

The following accounting policies have been applied:

c) Oireachtas Grants

Income from Oireachtas grants represents accrued income in the year.

d) Fixed Assets: Property, Plant and Equipment

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 & Equipm.	10%
Computers	25%
Motor Vehicles	25%

Fixed assets below the capitalisation threshold are charged to the Statement of Income and Expenditure in the year of purchase.

The capitalisation threshold amount is €3,000 exclusive of VAT.

The Fixed Assets are made up of exchequer and project funded assets. The depreciation of project funded assets are calculated on a straight line basis as outlined above.

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

At each reporting date the Institute assesses whether there is any indication of impairment. If such indication exists, the recoverable amount of the asset is determined which is the higher of its fair value less costs to sell and its value in use. An impairment loss is recognised where the carrying amount exceeds the recoverable amount.

Notes to the Financial Statements (continued)

1. Accounting Policies (continued)

Gains and losses on disposals are determined by comparing the proceeds with the carrying amount and are recognised within the Income and Expenditure Account.

Heritage Assets

The Institute holds and maintains certain heritage assets, such as libraries holding manuscripts, book and pamphlet collections, as well as antique scientific instruments. Included in the list of assets is a book collection and antique astronomical equipment and clocks which are itemised on the contents of insurance.

The Institute conserves these assets for research and for interaction between the Institute and the public.

In accordance with accounting standard FRS102, heritage assets acquired pre 1 January 2007 are not capitalised in the financial statements since reliable estimates of cost or value are not available at a reasonable cost.

There have been no heritage assets acquired subsequent to 1 January 2007, within the thresholds as specified in this policy. The Institute will capitalise any assets acquired after this date at either their cost (in the case of acquisitions made by the Institute) or their fair value (in the case of donations). Donated heritage assets will be capitalised with reference to recent sales of similar objects.

Heritage assets valued at less than €10,000 are not capitalised in the financial statements.

As funds permit and if judged necessary, conservation is carried out on heritage items and the expenditure incurred is recognised in the income and expenditure accounts.

The Institute does not dispose of heritage items, whether acquired, donated or bequeathed.

e) Capital Reserve

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

Capital income received from non-state sources is recognised in full when the asset is purchased.

f) Library

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

g) Publications

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

h) Superannuation

The Dublin Institute for Advanced Studies operates a defined benefit retirement benefit scheme which is funded annually on a pay as you go basis from monies available to it, including monies provided by the Department of Further and Higher Education, Research, Innovation and Science and from contributions deducted from staff salaries. Staff appointed before 1 January 2013 have pension terms under the relevant DIAS Superannuation Scheme as set out in:

- (a) Dublin Institute for Advanced Studies (Superannuation) Scheme 1947 as amended
- (b) Dublin Institute for Advanced Studies Spouses and Children's Contributory Scheme 1991
- (c) Dublin Institute for Advanced Studies Non-Established Employees (Superannuation) Scheme 1983
- (d) Dublin Institute for Advanced Studies Staff Superannuation (Consolidation) Scheme, 2008 and Dublin Institute for Advanced Studies Staff Superannuation Spouses' and Children's Contributory Pension (Consolidation) Scheme, 2008.

The Dublin Institute for Advanced Studies also operates the Single Public Service Pension Scheme (Single Scheme) which is the defined benefit retirement benefit scheme for pensionable public servants appointed on or after 1 January 2013. Single Scheme member's contributions are paid over to the Department of Public Expenditure and Reform.

1. Accounting Policies (continued)

h) Superannuation (continued)

As required under circular 28/2016, the Dublin Institute for Advanced Studies also pays Single Scheme employer contributions, at the rate of three times the employee contribution, over to the Department of Public Expenditure and Reform in respect of members of the single scheme engaged on self-financing projects (note 16).

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

Actuarial gains or losses arising on scheme liabilities are reflected in the Statement of Comprehensive Income and a corresponding adjustment is recognised in the amount recoverable from the Department of Further and Higher Education, Research, Innovation and Science.

Retirement benefit liabilities represent the present value of future retirement benefit payments earned by staff to date. Deferred retirement benefits funding represents the corresponding asset to be recovered in future periods from the Department of Further and Higher Education, Research, Innovation and Science.

i) Projects

The Dublin Institute for Advanced Studies receives external funding from industry, government bodies and the European Commission.

A chart of accounts is maintained for each project.

Project receipts are applied as project income, at a level that equals the annual expenditure incurred on direct costs and overheads earned by the associated project.

At the end of the life of the project any surplus or deficit balance left on the project is reflected in the financial statements.

The Dublin Institute for Advanced Studies receives overhead income on a number of externally funded projects. Overhead income from projects is credited to the income and expenditure account in the period in which it is earned.

Depending on the level of overhead expenditure on the project within the period, this may result in a surplus or deficit on overhead income being reflected in the financial statements.

Overhead income is recognised in line with funding arrangements.

j) Payables

Short term payables are measured at the transaction price.

k) Cash and Cash Equivalents

Cash is represented by cash in hand and deposits with financial institutions repayable without penalty on notice of not more than 24 hours. Cash equivalents are highly liquid investments that mature in no more than three months from the date of acquisition and that are readily convertible to known amounts of cash with insignificant risk of change in value.

l) Financial Instruments

The Institute only enters into basic financial instrument transactions that result in the recognition of financial assets and liabilities like trade and other accounts receivable and payable. Basic financial instruments are recorded at transaction price.

Notes to the Financial Statements (continued)

1. Accounting Policies (continued)

m) Holiday Pay

A liability is recognised to the extent of any unused holiday pay entitlement which is accrued at the balance sheet date and carried forward to future periods. This is measured at the undiscounted salary cost of the future holiday entitlement and accrued at the balance sheet date.

n) Operating leases

Rentals payable under operating leases are charged to the Income and Expenditure Account as incurred over the term of the lease.

o) Functional Currency

The Institute's functional and presentational currency is euro.

p) Non Project Grants.

Grants from third parties are recorded in the financial statements using the Accruals Method and are allocated to income so as to match with the related expenditure to which they relate.

q) Judgements in Applying Accounting Policies and Key Sources of Estimation

The preparation of these financial statements requires management to make judgements, estimates and assumptions that affect the application of policies and reported amounts of assets and liabilities, income and expenses. Judgements and estimates are continually evaluated and are based on historical experiences and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

The Institute makes estimates and assumptions concerning the future. The resulting accounting estimates will, by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

Useful Lives of Tangible Fixed Assets

Long-lived assets comprising primarily of Furniture and Equipment, Computers and Motor Vehicles represent a significant portion of total assets. The annual depreciation charge depends primarily on the estimated lives of each type of asset and, in certain circumstances, estimates of residual values. The Council regularly review these useful lives and change them if necessary to reflect current conditions. In determining these useful lives management consider technological change, patterns of consumption, physical condition and expected economic utilisation of the assets. Changes in the useful lives can have a significant impact on the depreciation charge for the financial year.

Actuarial Assumptions in Respect of Defined Benefit Retirement Benefit Schemes

The application of actuarial assumptions relating to defined benefit retirement benefit schemes is incorporated in the financial statements in accordance with FRS 102. In applying FRS 102, advice is taken from independent qualified actuaries. In this context, significant judgement is exercised in a number of areas, including future changes in salaries and inflation, mortality rates and the selection of appropriate discount rates. A defined benefit asset is recorded matching the liability on the basis that the liability is funded by the state.

Provisions

The Institute makes provisions for legal and constructive obligations, which it knows to be outstanding at the period end date. These provisions are generally made based on historical or other pertinent information, adjusted for recent trends where relevant. However, they are estimates of the financial costs of events that may not occur for some years. As a result of this and the level of uncertainty attaching to the final outcomes, the actual out-turn may differ significantly from that estimated.

2. Detailed Analysis of Income & Expenditure for the year ended 31/12/2021

	Notes	School of Celtic Studies €	School of Theoretical Physics €	School of Cosmic Physics €	Administration €	2021 Total €	2020 Total €
INCOME							
Dept. of Further and Higher Education, Research, Innovation and Science Grant (Annual)	3	1,760,813	976,787	2,740,276	2,159,270	7,637,146	7,210,250
*Net Deferred Funding for Retirement Benefits	10.d	368,438	80,470	551,175	141,687	1,141,770	1,043,730
Sales of Publications		52,077	-	-	-	52,077	43,934
Project Income	4.a	-	118,430	2,367,217	110,011	2,595,658	3,316,581
Other	5	200	-	32,335	558	33,093	172,048
		2,181,528	1,175,687	5,691,003	2,411,526	11,459,744	11,786,543
Transfer (to)/from Capital Reserve							
Amount released on disposal	14	-	-	-	159,346	159,346	223,395
	14	-	-	-	7,904	7,904	324,363
		2,181,528	1,175,687	5,691,003	2,578,776	11,626,994	12,334,301
EXPENDITURE							
Payroll Costs	6	1,212,076	797,075	1,725,280	992,492	4,726,923	4,731,321
*Retirement Benefit Costs	10.b	477,700	675,118	1,006,192	438,197	2,597,207	2,582,111
**Project Costs	4.a	-	104,008	2,315,919	-	2,419,927	3,047,097
Library and Book Storage		33,889	49,672	19,877	-	103,438	103,344
Depreciation	13	-	-	-	432,609	432,609	456,851
Rent Rates and Insurance		-	-	-	211,239	211,239	202,681
General Expenses	8	6,561	1,206	49,777	278,391	335,935	392,629
Travel and Seminar Expenses		6,806	486	41,815	3,837	52,944	54,364
"Survey- Ship Time Costs		-	-	-	-	-	115,000
Premises Maintenance and Security		-	-	-	214,863	214,863	263,312
Computer and Internet Expenses		1,796	7,594	41,979	89,968	141,337	143,442
Fuel Light and Power		-	-	-	125,777	125,777	130,106
Postage and Telephone		-	-	-	19,262	19,262	17,011
Stationery		3,789	1,117	3,556	3,268	11,730	24,444
Publications		23,125	-	9,600	61	32,786	36,254
Advertising		1,663	-	215	2,360	4,238	20,689
Minor Office Equipment		5,786	6,795	21,098	25,905	59,584	39,761
Disposal of Asset		-	-	-	7,904	7,904	324,363
		1,773,191	1,643,071	5,235,308	2,846,133	11,497,703	12,684,780
SURPLUS/(DEFICIT) FOR YEAR		408,337	(467,384)	455,695	(267,357)	129,291	(350,479)
Balance at 1 January		1,488,304	(2,256,688)	7,607,009	(6,297,689)	540,936	891,415
Balance at 31 December		1,896,641	(2,724,072)	8,062,704	(6,565,046)	670,227	540,936

Note (a) *The Net Deferred Funding for Retirement Benefits are allocated on a pro rata basis to the amount paid to pensioners in the year.

*The Retirement Benefits Costs are allocated on a pro rata basis to the pension contributions from staff in the year.

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

Notes to the Financial Statements (continued)

2. Detailed Analysis of Income & Expenditure for the year ended 31/12/2021 (continued)

Note (c) Grant An amount of 7,637,146, (2020 7,210,250) was received from the Department of Further and Higher Education, Research, Innovation and Science. The grant is provided by the Department of Further and Higher Education, Research, Innovation and Science towards liabilities under pay and general non-pay expenses and is drawn down by the Institute on an annual basis.

Note (d) Survey Ship Time Costs ** In 2020, shipping costs of €476,000 was incurred following the retrieval of seismic equipment from the sea-bed. A cost of €361,000 was posted to projects costs and €115,000 which was covered by Insurance was posted to a separate line item.

3. Oireachtas Grant

	2021 €	2020 €
Dept. of Further and Higher Education, Research, Innovation and Science		
Grant for Recurrent Purposes	7,258,416	7,091,000
Supplementary Grant Covid-19	559,650	461,250
Grant for Capital Purposes	169,080	-
	7,987,146	7,552,250
Less Supplementary Grant Covid-19 deferred to 2022.	(350,000)	(342,000)
	7,637,146	7,210,250

4. (a) Projects

	2021 €	2020 €
Opening Balances	638,258	1,214,891
Receipts	3,789,077	2,739,948
	4,427,335	3,954,839
Closing Balances (Project Receivables €1,151,304, Project Payables €2,982,973)	(1,831,677)	(638,258)
Applied as Income	2,595,658	3,316,581
Income Allocation		
Administration	110,011	147,547
School of Celtic Studies	-	-
School of Theoretical Physics	118,430	162,539
School of Cosmic Physics	2,367,217	3,006,495
	2,595,658	3,316,581
Total Project Income *	2,595,658	3,316,581

Note * This figure is made up of project Income to Central Admin €110,011, project income to Schools €2,444,642 and capital expenditure on projects of €41,005.

4. (a) Projects (continued)

Project Costs	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	2021 Total €	2020 Total €
* Salaries/Scholarships	-	98,970	1,916,736	2,015,706	2,008,678
Travel					
- Domestic	-	-	30,268	30,268	46,851
- International	-	-	21,108	21,108	53,457
- Seminars	-	-	42,218	42,218	-
Survey – Ship Time Costs	-	-	-	-	361,000
Other	-	5,038	305,589	310,627	577,111
Total Project Cost	-	104,008	2,315,919	2,419,927	3,047,097

*Note (a) Externally Funded Research Staff and Scholars Numbers (WTE) 47 (2020: 47).

4. (b) Project Detail

	Funding Authority	Opening Balance €	Receipts €	Recurrent Expenditure €	Applied as Income Central Admin Charge €	Applied as Income Schools (including Capital) €	Closing Balance €	Capital €
School of Celtic Studies								
Celtic Studies Summer School	Various	500	-	-	-	-	500	-
Total Celtic Studies		500	-	-	-	-	500	-
School of Theoretical Physics								
G Kells	SFI	66,708	-	104,008	7,251	118,430	(58,973)	-
Silvia Nagy Pathway	SFI	-	131,845	-	-	-	131,845	-
Venus Keus Pathway	SFI	-	135,302	-	-	-	135,302	-
Total Theoretical Physics		66,708	267,147	104,008	7,251	118,430	208,174	-
School of Cosmic Physics								
NGST Project	ESA	(102,242)	278,447	73,729	-	73,729	102,476	-
Lindsay Scholar	Armagh Observatory	5,000	5,000	-	-	10,000	-	-
J Mackey Royal Society Fellowship	Royal Society	21,768	3,560	15,446	1,158	24,170	-	-
MKID Camera IPT Ray	SFI	376,526	-	203,903	14,333	260,962	101,231	14,822
Radionet EC Project	EC	(16,723)	16,724	-	-	1	-	-
T Ray ERC Easy	EC	502,172	13,934	373,383	19,365	381,873	114,868	10,943
Royal Society Enhancement Award	Royal Society	15,460	26,612	25,850	1,800	29,400	10,872	-
HIRES IRC -Laureate Award	IRC	222,410	78,380	92,661	5,298	103,214	192,278	-
David Mckenna IRC Scholarship	IRC	3,219	28,375	24,273	-	24,273	7,321	-
Luis Alberto Canizares IRC Scholarship	IRC	3,419	28,375	24,250	-	24,250	7,544	-

Notes to the Financial Statements (continued)

4. (b) Project Detail (continued)

	Funding Authority	Opening Balance €	Receipts €	Recurrent Expenditure €	Applied as Income Central Admin Charge €	Applied as Income Schools (including Capital) €	Closing Balance €	Capital €
C Jackman – SSDA	SFI	66,532	246,114	221,163	13,029	212,385	87,232	-
ARIEL- Prodex	ESA	(34,137)	33,626	20,509	-	20,509	(21,020)	-
Royal Society Engagement	Royal society	4,439	-	4,466	-	4,439	-	-
J. Mackey RS Fellowship	Royal society	-	149,546	118,286	5,807	120,568	23,171	-
John Malone IRC Scholarship	IRC	6,250	28,375	25,390	-	29,701	4,924	4,311
Stellar EC CSA	EC	153,673	-	44,757	2,314	43,960	107,399	-
Sophie Murray RAS	RAS	-	-	2,230	-	2,230	(2,230)	-
ESA PRODEX STIX	ESA	-	-	37,019	463	38,407	(38,870)	-
IRC ULYSSES C JACKMAN	IRC	-	2,500	-	-	-	2,500	-
Donna R Lee Pathway SFI	SFI	-	134,312	-	-	-	134,312	-
Total Astrophysics		1,227,766	1,073,880	1,307,315	63,567	1,404,072	834,007	30,076
ICRAG	SFI	(1,519,283)	702,189	(16,327)	-	(16,325)	(800,769)	-
ICRAG GeoHazard	SFI	(41,358)	-	60,769	466	58,866	(100,690)	-
ESA 3D Earth	ESA	(24,421)	55,000	7,725	-	7,725	22,854	-
SEA-SEIS	SFI	66,194	237,133	238,199	15,578	178,231	109,518	-
GSI Seismic Network Support	GSI	256,319	125,000	136,781	-	142,181	239,138	5,400
Eurovolc -Research and Innovation	EC	19,300	-	47,450	2,532	48,106	(31,338)	-
Geothermica EC Call-URBAN	GSI	32,313	21,084	49,156	1,213	52,183	1	-
Geothermica EC Call-COSEISMIQ	GSI	16,430	66,652	74,717	1,829	78,634	2,619	-
Geo External MT	Various	13,873	20,259	2,972	-	2,972	31,160	-
EC-PACIFIC	EC	67,676	-	165,724	8,296	156,795	(97,415)	5,529
SEAI-DIG	SEAI	357,329	-	140,397	7,211	144,481	205,637	-
PIPCO	PIPCO RSG	3,186	-	-	-	3,186	-	-
Geothermica 005 Deep	GSI	66,653	-	17,033	420	18,079	48,154	-
GSI Kiyon 2020 sc 049 Short Call	GSI	15,000	-	11,125	111	12,126	2,763	-
GSI Bean 2020 sc 040 Short Call	GSI	14,073	13,992	25,493	637	27,428	(1)	-
SPIN-Marie Curie Training Network	EC	-	175,233	13,508	900	15,840	158,493	-
IMPROVE-Marie Curie Training Network	EC	-	-	215	-	-	-	-
DIAS-UCD Geothermal	UCD	-	20,000	21,029	-	20,000	-	-
ICRAG 2 Equipment	UCD	-	98,000	12,638	-	12,638	85,362	-

4. (b) Project Detail (continued)

	Funding Authority	Opening Balance €	Receipts €	Recurrent Expenditure €	Applied as Income Central Admin Charge €	Applied as Income Schools (including Capital) €	Closing Balance €	Capital €
Florian Le pape IRC pathway	SFI	-	141,033	-	-	-	141,033	-
Master Infrastructure	SFI	-	772,475	-	-	-	772,475	-
Total Geophysics		(656,717)	2,448,050	1,008,604	39,193	963,146	788,995	10,929
Total Cosmic Physics		571,050	3,521,930	2,315,919	102,760	2,367,218	1,623,002	41,005
Total Net Balances – DIAS		638,258	3,789,077	2,419,927	110,011	2,485,648	1,831,676	41,005

Note Project receipts are applied as project income, at a level that equals the annual expenditure (recurrent plus capital) and overheads earned by the associated project. The closing balances above represent overhead earned and advance funding to meet financial commitments in 2022.

The capital column outlines the expenditure on fixed assets during 2021.

5. Other Income

	2021 €	2020 €
Insurance	-	115,000
Historical Funds Grant	-	50,000
Other	33,093	7,048
Total	33,093	172,048

6. Remuneration

	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	Admin. €	2021 Total €	2020 Total €
Core Funded Posts						
* Salaries/Wages	1,135,076	693,092	1,585,155	858,170	4,271,493	4,366,921
Covid Extensions	-	-	-	109,132	109,132	-
Retirement Benefit Costs	-	-	-	-	-	-
** Scholarships	77,000	103,983	140,125	25,190	346,298	364,400
	1,212,076	797,075	1,725,280	992,492	4,726,923	4,731,321

Note on Core Funded Posts

* Core Staff Numbers (WTE) 53 (2020:51.7), ECF Numbers (WTE) 61 (2020: 61).

** Core Scholars (WTE) 12 (2020: 14).

Note on Externally Funded Posts

Externally Funded Research Staff and Scholars Numbers (WTE) 47 (2020: 47).

Additional Superannuation Contributions of €224,305 (2020: €207,268) were paid to the Dept. of Further and Higher Education, Research, Innovation and Science 2021.

Notes to the Financial Statements (continued)

6. Remuneration (continued)

a) Aggregate Employee Benefits

	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	Admin. €	2021 Total €	2020 Total €
Salaries/Wages	1,071,665	645,294	1,494,612	786,024	3,997,595	4,110,014
Covid Extensions *	-	-	-	97,175	97,175	-
Overtime	-	-	-	-	-	-
Allowances	-	-	-	-	-	-
Employer's PRSI	63,411	47,798	90,543	72,146	273,898	256,907
Covid Extens. Empl' PRSI*	-	-	-	11,957	11,957	-
Retirement Benefit Costs	-	-	-	-	-	-
	1,135,076	693,092	1,585,155	967,302	4,380,625	4,366,921

***Note** A number of projects were due to finish in 2021. Due to the impact of Covid-19, it was necessary to extend the projects and the researcher's contracts in order to complete the project deliverables.

b) Key Management Personnel

Key management personnel in the Dublin Institute for Advanced Studies include the Registrar/CEO, the three School Directors, the Finance Officer and Higher Executive Officer for whom the total remuneration cost was €739,735 (2020: €722,213) in the year. Key management personnel are in receipt of a salary only. They are not paid any bonus. Their retirement benefit entitlements do not exceed the standard entitlements in the model public sector defined benefit superannuation scheme.

c) Registrar and Chief Executive Officer Salary

	2021 Total €	2020 Total €
The Registrar/CEO remuneration package for the financial period as follows:		
Basic Pay	109,821	107,936
	109,821	107,936

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

7. Number of Employees with Benefits in 2021 that fall within bands of €10,000 from €60,000 onwards.

	2021	2020
€60,000 to €69,999	5	4
€70,000 to €79,999	3	2
€80,000 to €89,999	5	5
€90,000 to €99,999	-	1
€100,000 to €109,999	2	1
€110,000 to €119,999	2	4
€120,000 to €129,999	-	-
€130,000 to €139,999	-	-
€140,000 to €149,999	-	-
€150,000 to €159,999	4	3
€160,000 to €169,999	4	4

The average number of employees (whole-time equivalents) during the year excluding externally funded posts was 53 (2020:51.7). The table above shows the number of employees whose total employee benefits fell into the respective bands.

8. General Expenses

	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	Admin. €	2021 Total €	2020 Total €
Miscellaneous	5,796	1,206	45,905	10,650	63,557	51,797
Catering/Lunches	765	-	2,130	711	3,606	6,099
Professional Fees/ Consultancy	-	-	845	153,535	154,380	209,017
Training	-	-	885	5,388	6,273	4,635
Bank Charges	-	-	-	9,329	9,329	3,461
Board Meeting Expenses	-	-	-	-	-	4,900
External Review	-	-	-	152	152	1,400
Health & Safety	-	-	12	12,219	12,231	24,262
Communications	-	-	-	86,407	86,407	87,058
	6,561	1,206	49,777	278,391	335,935	392,629

9. Leasing

Operating Leases

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

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

There is a term of 77 years left on the lease for Observatory House and the other leases are renewed on an annual basis.

The commitment on foot of such leases in respect of 2022 is €113,609.

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

At 31 December 2021 the Institute had the following future minimum lease payments under non-cancellable operating leases for each of the following periods:

	2021 €	2020 €
Payable within one year	113,609	113,609
Between two and five years	1,320	1,320
After five years	23,760	24,090

Note

The Institute has a licence agreement with the OPW for a stores area located in Fenian Street at a cost of €1,000 per annum.

Notes to the Financial Statements (continued)

10. Retirement Benefit Costs

a) General Description of the Schemes

Staff members appointed before 1 January 2013 have pension terms under the relevant DIAS Superannuation Scheme as set out in:

- (a) Dublin Institute for Advanced Studies (Superannuation) Scheme 1947 as amended
- (b) Dublin Institute for Advanced Studies Spouses and Children's Contributory Scheme 1991
- (c) Dublin Institute for Advanced Studies Non-Established Employees (Superannuation) Scheme 1983
- (d) Dublin Institute for Advanced Studies Staff Superannuation (Consolidation) Scheme, 2008 and Dublin Institute for Advanced Studies Staff Superannuation Spouses' and Children's Contributory Pension (Consolidation) Scheme, 2008

The retirement benefits scheme is a defined benefit final salary retirement benefit arrangement with benefits and contributions defined by reference to current "model" public sector scheme regulations. The scheme provides a retirement benefit (eightieths per year of service), a gratuity or lump sum (three eightieths per year of service) and spouse's and children's retirement benefits. Normal Retirement Age is a member's 65th birthday, and pre 2004 members have an entitlement to retire without actuarial reduction from age 60. Retirement Benefits in payment (and deferment) normally increase in line with general public sector salary inflation.

The valuation used for FRS 102 disclosures has been based on a full actuarial valuation by a qualified independent actuary taking account of the requirements of the FRS in order to assess the scheme liabilities at 31 December 2021.

The Single Public Service Pension Scheme (Single Scheme) is the defined benefit retirement benefit scheme for pensionable public servants appointed on or after 1 January 2013 in accordance with the Public Service Pension Scheme (Single Scheme and Other Provisions) Act 2012. The scheme provides for a retirement benefit and retirement lump sum based on career-average pensionable remuneration and spouse's and children's pensions. The minimum pension age is 66 years (rising in line with State pension age changes). It includes an actuarially-reduced early retirement facility from age 55. Retirement Benefits in payment increase in line with the consumer price index.

The principal actuarial assumptions were as follows:

	2021	2020	2019
Rate of Increase in Salaries	3.00%	2.50%	2.50%
Rate of Increase in Retirement Benefits in Payment	2.50%	2.00%	2.00%
Discount Rate	1.20%	0.70%	1.10%
Inflation Rate	2.00%	1.50%	1.50%

The mortality basis adopted allows for improvements in life expectancy over time, so that the life expectancy at retirement will depend on the year in which a member attains retirement age (age 65). The table below shows the life expectancy for members attaining age 65 in 2021 and 2041.

Year of Attaining Age 65	31/12/2021		31/12/2020	
	2021	2041	2020	2040
Life Expectancy – Male	88.3	89.7	88.2	89.6
Life Expectancy – Female	89.8	91.4	89.8	91.3

10. Retirement Benefit Costs (continued)

b) Analysis of total retirement benefit costs charged to Expenditure

	2021 (€'000)	2020 (€'000)
Current Service Cost	2,213	1,966
Interest on Retirement Benefit Obligations	537	768
Employee Contributions	(475)	(434)
	2,275	2,300

c) Movement in Net Retirement Benefit Obligations during the financial year

	2021 (€'000)	2020 (€'000)
Retirement Benefit Obligations at 1 January	(77,496)	(70,580)
Current Service Cost	(2,213)	(1,966)
Interest Costs	(537)	(768)
Actuarial Gain/(Loss)	973	(5,875)
Retirement Benefits Paid in the Year	1,608	1,693
Retirement Benefit Obligations at 31 December	(77,665)	(77,496)

*Liabilities relating to the Single Scheme amount to €2,800,000 and for the DIAS Scheme amounts to €74,865,000.

d) Deferred Funding for Retirement Benefits

DIAS recognises these amounts as an asset corresponding to the unfunded retirement benefit obligations on the basis of the set of principal actuarial and mortality assumptions set out in a) General Description of the Schemes and a number of past events. These events include the statutory basis for the establishment of the retirement benefit scheme, and the policy and practice in relation to funding public service retirement benefits including contributions by employees and the annual estimates process. While there is no formal agreement regarding these specific amounts with the Department of Further and Higher Education, Research, Innovation and Science, DIAS has no evidence that this funding policy will not continue to meet such sums in accordance with current practice.

The Net Deferred Funding for Retirement Benefit Obligations recognised in Income and Expenditure Account was as follows:

	2021 (€'000)	2020 (€'000)
Funding Recoverable in Respect of Current Year Retirement Benefit Costs	2,750	2,734
State Grant Applied to Pay Pensioners	(1,608)	(1,693)
	1,142	1,041

The deferred funding asset for retirement benefits as at 31 December 2021 amounted to €77.665 million (2020: €77.496 million).

e) History of defined benefit obligations

	2021 (€'000)	2020 (€'000)	2019 (€'000)
Defined Benefit Obligations	77,665	77,496	70,580
Experience (Gains)/Losses on Scheme Liabilities Amount	(905)	906	2,048
Percentage of Scheme Liabilities.	-1.2%	1.17%	2.90%

The cumulative actuarial gain recognised in the Statement of Comprehensive Income amounts to €9,451,000 (2020: €10,356,000).

Notes to the Financial Statements (continued)

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. Council Member and Registrar/CEO Payments 2021

Appointed	Start Date	Finish Date	Total Remuneration 2021 €	Total Expenses 2021 €	Total Remuneration 2020 €	Total Expenses 2020 €
Council Member						
Dr. Vincent Cunnane	1/7/15	to 30/6/20	-	-	-	720
Dr. Peter Heffernan	1/7/20	to 17/6/21	-	-	-	-
Dr. John Hegarty	22/11/21	to 30/6/25	-	-	-	-
Members Appointed by the Governing Boards of Constituent Schools						
Professor A. Deeks	1/8/20	to 30/6/25	-	-	-	-
Professor P. Prendergast	1/8/20	to 31/7/21	-	-	-	-
Dr. Linda Doyle	1/8/21	to 30/6/25	-	-	-	-
Professor M. Canning	1/8/20	to 30/6/25	-	-	-	-
Professor Mary Fowler	1/8/20	to 30/6/25	-	-	-	-
Professor Peter Goddard	1/8/20	to 30/6/25	-	-	-	-
Professor Máire Ní Mhaonaigh	1/8/20	to 30/6/25	-	-	-	-
Professor Denjoe O' Connor	1/8/20	to 30/6/25	-	-	-	-
Professor Ruairí Ó hUiginn	1/8/20	to 30/6/25	-	-	-	-
Professor Chris Bean	1/8/20	to 30/6/25	-	-	-	-
Registrar & CEO						
Dr. Eucharía Meehan *			109,821	1,152	107,936	2,506
			109,821	1,152	107,936	3,226

Council Members travel and subsistence payments are paid in accordance with rates set by the Department of Public Expenditure and Reform.

* Registrar & CEO remuneration and expenses

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

13. Fixed Assets: Property, Plant and Equipment

Cost	Furniture & Equipment €	Motor Vehicles €	Computers €	2021 Total €	2020 Total €
Opening Balance 1/1/2021	6,787,838	15,131	2,561,563	9,364,532	9,534,795
Additions*	65,453	-	207,810	273,263	233,456
Disposals	(57,877)	-	(760,414)	(818,291)	(403,719)
	6,795,414	15,131	2,008,959	8,819,504	9,364,532
Depreciation					
Opening Balance 1/1/2021	4,324,866	15,131	2 390 623	6,730,620	6,353,125
Charge	343,087	-	89,522	432,609	456,850
Disposals	(50,339)	-	(760,048)	(810,387)	(79,355)
	4,617,614	15,131	1,720,097	6,352,842	6,730,620
Net book value 31/12/2021	2,177,800	-	288,862	2,466,662	2,633,912

Note

All fixed assets in excess of €3,000 are capitalised in the books of DIAS.

14. Capital Reserve

	2021 €	2020 €
Balance at 1 January	2,633,912	3,181,670
Transfer to Income and Expenditure Account		
Income allocated to acquire fixed assets (Project Funded)	41,004	145,727
Income allocated to acquire fixed assets (Exchq. Funded)	232,259	87,729
Amortisation in line with asset depreciation	(432,609)	(456,851)
Amount released on disposals	(7,904)	(324,363)
	(167,250)	(547,758)
Balance at 31 December	2,466,662	2,633,912

15. Receivables

	2021 €	2020 €
Prepayments	105,512	165,294
Book Sales Receivables	529	818
Sundry	8,001	19,912
Accrued Income	38,636	118,856
	152,678	304,880

Notes to the Financial Statements (continued)

16. Payables due within twelve months

	2021 €	2020 €
Trade Payables	157,898	186,871
Accruals	639,484	698,408
VAT	18,081	32,162
Revenue Payables	182,932	179,344
Deferred Income 2022 Expenditure	438,732	145,800
Retirement Benefit Control Account*	1,169,637	1,009,933
Deferred Supplementary Covid-19 Grant	478,901	342,000
	3,085,665	2,594,518

* Note

This figure relates to employer contributions for externally funded Research staff. The DIAS is liaising with DES/DFHERIS in relation to the payment of the contributions.

Payables due after twelve months	2021 €	2020 €
The following funds are held on deposit.		
These comprise: Vernam Hull Bequest	25,522	25,333
Carmody Fund	2,445	2,461
	27,967	27,794

17. Contingent Liability

There is a potential liability arising from a Personal Injuries claim.

18. Approval of Accounts

The Financial Statements were approved by Council on 26th May 2022.

Dublin Institute for Advanced Studies
10 Burlington Road, Dublin 4
www.dias.ie



Printed on recycled paper