Quarterly Newsletter Issue 1 2023

EURAXESS India Newsletter is a quarterly electronic publication. It provides information about conducting research in Europe or with European partners and gives insights for Indian and European researchers who are interested in the European research landscape.

Please email to india@euraxess.net for any comments on this newsletter, contributions you would like to make.

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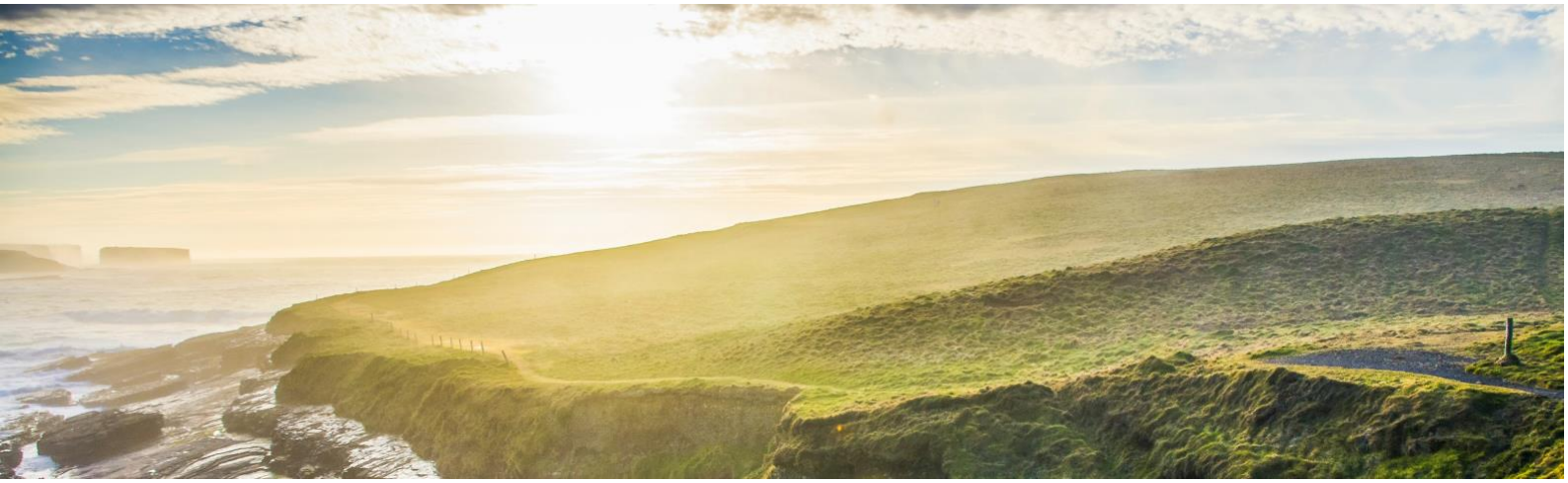
Contents



1 EURAXESS country in focus: Ireland

Higher education in Ireland is provided mainly by universities and technological universities, institutes of technology, and colleges of education. Other tertiary institutions provide specialist education in fields such as art and design, medicine, business studies, rural development, theology, music, law, etc.

Internationalisation provides significant new opportunities for Irish higher education. The government has invested heavily in research and innovation (R&I) to support this. Today, Ireland ranks 8th out of 29 countries (EU, Japan and the US) in terms of research publications per 1,000 inhabitants. It is regarded as a leader in the advancement and implementation of the Bologna Declaration and its higher education structures and national guiding principles resonate well with the values of institutional autonomy, academic freedom, and social equity. By international standards, Ireland has a relatively large number of tertiary institutions, offering a rich learning, teaching and research environment. Some 25 of Irish higher education institutions, including eight universities currently receive public funding.

Ireland was ranked highest of all countries in the international recruiter reviews of graduate employability and second highest of 28 countries in the international peer review of graduate quality.

In respect to female researchers in the higher education sector, Ireland has been steadily moving up the ranks over the past ten years, ranking 8th out of 31 OECD countries in 2018. In the field of medical and health sciences, female researchers account for 62%.

The main sources of R&D funding come from three distinct areas: direct government, indirect government and other sources such as Irish industry, foreign industry, and EU funding programmes. Direct government funding comes via various government departments and agencies that fund research projects performed in the higher education sector. According to

2018 figures, direct government funding amounted to €364m. The largest proportion (€213m) of R&D expenditure was in the field of engineering and technology, up 39% from 2016. Expenditure on R&D in the humanities amounted to €47m. The total spend on R&D in the higher education sector amounted to €876.1 million, an increase of 17% over 2016, and also of 17% over the past decade.

According to Ireland's Strategy for Science, Technology and Innovation (SSTI), four sectors – electrical and optical equipment (which includes ICT and medical devices), chemicals and pharmaceuticals, food and drink, and print and recorded media – account for the largest share of Irish manufacturing output.

Main government departments/agencies with spending on R&D

- Higher Education Authority
- Science Foundation Ireland
- Enterprise Ireland
- Teagasc
- IDA Ireland
- Health Research Board
- Irish Research Council
- Dept. of Agriculture, Food and the Marine
- Environmental Protection Agency
- Marine Institute
- Sustainable Energy Authority of Ireland
- Department of Further and Higher Education, Research, Innovation and Science

Funding from Science Foundation Ireland (SFI) to the higher education sector amounted to €169.2m in 2018, accounting for 46% of total direct government funding**.**

Department of Education funding is available to all universities and institutes of technology to support the development of their research capabilities and talented individual researchers, and to encourage cooperation within institutions and between institutions. This funding is primarily aimed at boosting research the higher education system and developing and improving postgraduate-level education. Funding is provided for PhD students and early-stage postdoctoral researchers under the Irish Research Council. Funding for these programmes is made available through the Higher Education Authority (HEA). The education related elements of the regional operational programmes – funded through the Department of Enterprise, Trade and Employment – also supports R&D activities in the higher education sector.

The establishment of the Department of Further and Higher Education, Research, Innovation and Science was completed in January 2021 following a transfer of functions. A number of agencies involved in research were consequently transferred over to this Department in 2021. The Department funds and creates policy for the higher and further education and research

sectors. It also oversees the work of the state agencies and public institutions operating in these areas. With respect to research activity, its approach will be grounded in the next national strategy for research and innovation, which will run until end 2027 and will be broken down into two work programmes: to end 2024 and then end 2027.

University level studies in Ireland

Students enrolled in tertiary studies in Ireland typically obtain a Bachelor's Degree or a professional equivalent (Professional Degree). The length of study for this stage varies between three and four years. The Bachelor's Degree may be awarded as a General Degree, an Honours Degree or a BA (Special) Degree. Courses in veterinary medicine/science, architecture and dentistry last for five years, while medicine takes six years. More advanced studies at university level typically lead to a Postgraduate Diploma and/or Master's Degree. These studies last for a minimum of one year after the award of the Bachelor's Degree, and candidates are usually expected to present a thesis based on research. After the Master's, a further two years of study are normally required to obtain a PhD Degree – a Higher Doctorate is awarded on the defence of a thesis introducing more detailed original research several years longer.

Around 12% (~20,000) of the total student body (~156,000) attending Irish universities are international students representing more than 120 countries, which reflects the attractiveness of the Irish university experience to students from across the globe.

The importance of higher education is evident in the high value-added sectors of the Irish economy, such as information and communication, professional, scientific and technical activities. Universities also play a significant role in Irish social and cultural life. They are deeply embedded in the communities in which they are located with socio-cultural activities spanning tourism, sport, music and entertainment, arts and culture. There are eight universities in Ireland:

- Dublin City University
- University of Galway
- Technological University Dublin
- University College Dublin
- Maynooth University
- Trinity College Dublin
- University College Cork
- University of Limerick

Research priorities

The Department of Further and Higher Education, Research, Innovation and Science focuses on a selection of priority areas for future R&D investment to achieve the government's economic objectives, including:

1. Future networks and communications
2. Food for health
3. Data analytics, management, security and privacy
4. Sustainable food production and processing
5. Digital platforms, content and applications
6. Marine renewable energy
7. Connected health and independent living
8. Smart grids and smart cities
9. Medical devices
10. Manufacturing competitiveness
11. Diagnostics
12. Processing technologies and novel materials
13. Therapeutics, synthesis formulation, processing and drug delivery
14. Innovation in services and business processes

There are several centres of excellence spread throughout Ireland focusing on, for example, ICT, nanotechnology, medical devices, and more. One centre of excellence, **Adapt**, is a Science Foundation Ireland (SFI) research centre for AI-driven digital content technology based in Trinity College Dublin. Another is **Lero**, Europe's first e-sport science research lab, co-funded by industry and SFI, which investigates how software and technology can "impact, a person's physical and mental condition, and performance".

Special features of R&D strategy

Innovation aspects (funding, companies, startups, Global Innovation Index, GII)

Ireland ranks 19th among the 132 economies featured in the GII 2022. Ireland performs above the high-income group average in five pillars, namely: institutions; human capital and research; infrastructure; business sophistication; and knowledge and technology outputs.

The Irish Government budget allocation for R&D in 2020 was €866.8m and €949.1m in 2021 which marks an increase of over 8% in expenditure compared to 2019.

Innovation 2020, the national science and innovation strategy, includes an Action (No. 3.10), to "develop a coherent national policy on structured progression for researchers". The Irish Researcher Career Development and Employment Framework put together by the Irish Universities Association aims to deliver on this national policy action.

Business enterprise sector

With its budget of nearly €1.13b (2021), Enterprise Ireland provides a range of programmes that help enterprises to innovate. These range from programmes for short-term and relatively small innovation projects, right through to building deeper engagement through large-scale, multiannual

collaborative projects. Included are programmes to drive in-company R&D in Irish-owned companies and programmes to support the translation of academic research into new products, processes and services by industry. Enterprise Ireland's innovation programmes are centred on:

- Transforming R&D activity in enterprise
- Direct support to help Irish companies build R&D capability and acquire new technology through licensing, and equity support for new High Potential Start-ups (HPSUs)
- Promoting industry collaboration with the higher education sector
- Programmes to increase the level of collaborative R&D activity between industry and academia
- Realising the commercial potential of the Irish research community

The Disruptive Technologies Innovation Fund is a €500m challenge-based fund established under Project Ireland 2040. It is one of four funds set up under the National Development Plan (NDP) 2018-2027. It is managed by the Department of Enterprise, Trade and Employment and administered by Enterprise Ireland. The Fund is seeing investment in the development and commercial deployment of disruptive, innovative technologies tackling national and global challenges. The fund is driving collaboration between Ireland's research base and industry, as well as helping enterprises to compete directly for funding to further develop and deploy these technologies, and seeding a new wave of start-ups.

IBEC is Ireland's largest lobby and business representative group seeking to build a better, sustainable future by influencing, supporting and delivering for business success.

Industrial Development Agency (IDA) has national responsibility for securing new investment from overseas in manufacturing and international services, and for encouraging existing foreign enterprises to expand their businesses. Through its 23 overseas offices, the IDA Research, Development & Innovation programme is designed to support companies at all research and development stages, enabling them to move from start-up R&D, through developing capacity and adding competence, to a fully integrated RD&I function.

InterTrade Ireland is the only organisation which supports SMEs across Ireland to develop North/South trade and business development opportunities for the mutual benefit of both economies.

Academy – industry relations and networks

Science Foundation Ireland funds a diverse and balanced portfolio of programmes, supporting both individually led researchers (from early stage to mid-stage career researchers, to emerging research stars and established research leaders), and research teams working collaboratively in large-scale SFI Research Centres. Many of SFI's funding programmes involve national and international collaborations with both small and large companies, charities, international funders as well as national funders such as Teagasc,

Marine Institute, Environmental Protection Agency, Health Research Board, etc.

Innovation Partnership Programme (Enterprise Ireland) supports collaborative research projects between Irish higher education institutes and companies. The financial support is provided to the college with co-funding from the partner company. The proposal process and administration of the project is managed by the participating institute. Researchers participating in an Innovation Partnership will benefit from the opportunity to work with companies working to solve real technical challenges and develop new products or services. The initiative also allows researchers to apply for a small grant to undertake a feasibility study that could lead to a full Innovation Partnership project.

Wild Geese Network of Irish Scientists (WGNIS) enables connection, communication and collaboration among Irish scientific, technological and engineering diaspora.

EURAXESS Ireland

EURAXESS Ireland has one main office under the Irish Universities Association umbrella. Staff in Ireland provide practical assistance to researchers relocating to and from Ireland to pursue research careers in academia and industry among other sectors. Services include advice on immigration, fast-track researcher work permits, research jobs and funding opportunities, networking events for researchers, and outreach activities to research institutions and human resources. EURAXESS Ireland is a government-funded, central processing hub for hosting agreements (visas for scientific research, employed in Ireland). Over 7,000 researchers have benefited from the scheme to date. Researchers working under hosting agreements in Ireland don't need any additional work permits and, under certain conditions, may stay in the country to work freely in any sector after their research contract has expired. The scheme covers immediate family members (spouses and children) accompanying the researcher in Ireland.

Contact details

EURAXESS – Researchers in Motion is an initiative of the European Research Area (ERA) to stimulate researcher mobility and career development. This pan-European effort is currently supported by 43 countries, one of which we profile in each of our quarterly e-newsletters.

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2 HOT TOPIC: Is AI hogging immersive technology's limelight?

ChatGPT's likely answer: 'yes'. Realistic answer: 'yes … for now'.

ChatGPT and its artificial intelligence-inspired kin are filling headlines and firing imaginations. For the world of **augmented and virtual reality (AVR)** it means having to share the limelight… for a while.

But when excitement over chatty robots settles, experts are predicting that it will be immersive technologies that people are likely to 'experience' in the near term, and 'remember' in the long term.

Gartner actually sees them as a "mutually beneficial" collection or subset of technologies that enterprises will increasingly adopt in the coming years. Vendors will need to figure out how to get more artificial intelligence functionality out of the cloud and into the edge, the tech research company continues, where AVR can be better leveraged.

Already today, thanks to greater computing power and expertise in the AVR sector, immersive technologies have established themselves as much more than a novelty.

"Technology like virtual reality/augmented reality is stepping inside an alternate reality, deeper than the real world, where users have complete control over their environment in a highly engaging and immersive way," as *FutureSide* neatly explains in a feature on the "benefits of augmenting the world".

Indeed, research has sped forward in recent years and applications now range from frivolous fun to highly practical to truly life-saving. The technical maturity and growing reach of AVR have not escaped the notice of markets and the investors that drive them.

Immersive solutions can be seen in business applications to improve communication, collaboration and accessibility. They are in tools for workplace training and developing new skills. And they drive various 'serious games' applied to everything from medicine and cognitive health to risk-prevention, emergency responses, and pilot simulations.

Immersive technologies used to create realistic 3D environments are increasingly applied to product design, development and testing. They also act as a conduit for innovation in a wide range of other industries, from architecture and the automotive sector to creative and cultural pursuits.

In marketing and advertising, it is a powerful means of personalising experiences and raising online engagement using 'gamification' techniques, thus boosting sales. While more broadly, businesses can use visualisation

tools in routine tasks, such as optimising production and finding cost-savings.

As the cost of VR headsets comes down with scale, and new ways of integrating AVR into other devices, haptics and applications emerge, experts imagine a further expansion of the immersive universe – or what the EURAXESS WORLDWIDE community is welcome to call the *Immersiverse*!

A creative endeavour

The growing use of AVR in different sectors offers some insight into its impact on society and the economy today. Take the creative and cultural industry (CCI) as a prime example.

Immersive technology has fundamentally changed the way people consume content. Using digital storytelling combined with audio-, visual- and extended reality, companies offer memorable, emotional 'experiences' not just 'products' and 'services'. This strengthens customer engagement and loyalty, so the theory goes.

Tour operators, museums, and exhibitors can augment physical objects and places with additional animations, graphics, and other contextual features to transform and even individualise the visit or journey.

In Europe, the games industry was an early adopter, but with improvements in the technology, proliferation of broadband, and advances in mobile (5G), AVR is opening up to other leisure sectors, and the transport industry, according to developments communicated by the 5G Automotive Association (5GAA).

The Covid-19 pandemic further accelerated the use of digital technologies, and AVR, in particular, as the culture and museum sector got creative with enhanced "virtual" tours and performances. Architects and designers dived into computer aided design (CAD) in combination with VR to show clients how, for example, a rebuild or new product might look.

More and more startups are entering (or adopting) the immersive technology domain, which is a further indicator of the growing interest in Europe. One example of a young Estonian company using AVR for cultural and creative purposes is *Ready Player Me*, a metaverse 3Davatar creator platform.

Another is Denmark's *Books & Magic*, which develops augmented reality storybooks combining physical books and an app for children to immerse themselves in the story. In the film and broadcasting world, *zLense* has developed technologies for real-time 3D scene scanning, and a "virtual production platform".

A 'virtual' European mindset

The European Union has been at the forefront of many of these innovations, as part of its Digital Europe's Programme – and seen through the lens of its twin digital and green transition ambitions under the European Green Deal. With an overall budget of €7.5 billion, Digital Europe provides strategic funding in five key areas: supercomputing, artificial intelligence, cybersecurity, advanced digital skills, and ensuring wider use of digital technologies across the economy and society.

AVR developments fall under several of these headings as well as activities under EU Research Framework Programmes – previously Horizon 2020 and currently **Horizon Europe**.

A Virtual and Augmented Reality Industrial Coalition (VARIC) was created, as part of the European Commission's 2020 Media and Audiovisual Action Plan (see the current MAAP) to make sure commercial developments align with key challenges and opportunities in the European AVR sector.

In 2021, the Commission also announced a call under Horizon Europe to create a VR Media Lab to "stimulate interdisciplinary cooperation and build prototypes of advanced solutions for the creation, distribution and consumption of new immersive and innovative products for media".

On the investment side, with a war chest worth €400 million (2022-2027), the EU-backed MediaInvest is looking to stimulate commercial innovations throughout the audiovisual sector. Funding is drawn from the Creative Europe MEDIA programme and the European Investment Fund's InvestEU equity package, among others.

More recently, the Commission hosted a European citizens' panel to formulate recommendations on a vision, principles, and actions to ensure that virtual worlds in the EU are "fair and fit for people".

3 In case you missed it...

Find latest EU Research and Innovation News and open Calls on our EURAXES India website.

About us

EURAXESS India is a networking tool for European researchers active in India and for Indian and international researchers wishing to collaborate with and/or pursue a career in Europe. EURAXESS India provides information about research in Europe, European research policy, opportunities for research funding, for EU-India and international collaboration and for trans-national mobility. **Membership is free.**

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