

Unlocking the future potential of physics in Ireland

Physics is fundamental to the health, wealth, security and advancement of society. Physics creates problem solvers and the innovators of the future, and has a vital role to play in helping make Ireland fit for a new industrial era of science, technology and engineering.

Decisions taken today will shape our society for decades to come. Ireland's Government must pursue policies to support and grow Ireland's physics community. This will place Ireland in the strongest position to realise the associated benefits in terms of economic growth, skilled jobs, and improved quality of life.

The IOP highlights the following six priorities to help secure a prosperous and productive future for Ireland.

1. Increased investment in research and development

Despite attracting world-class business and talent from abroad, Ireland ranks among the lowest investors in its own Research and Development, investing just 1.16% of its annual GDP on R&D (2016). This compares to 2.9% in Germany, 2.2% in France, and 1.7% in the UK. The Government must implement a clear strategy by renewing Ireland's Innovation Strategy, including both a commitment to increase R&D spending to 2% of annual GDP (2.5% of GNP) by 2025, and providing clear incentives to support business to achieve this target.

Source: OECD, Gross domestic spending on R&D, at: <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>

2. Develop new partnerships with European researchers and innovators

Since the publication of Innovation 2020, Ireland has joined a number of European research bodies, providing increased access to new scientific research programmes. However, we are currently one of only three European countries that are not members or associates of CERN. Our ability to easily collaborate with European colleagues is fundamental to the success of Ireland's physics community. With the joining cost at less than €1 million, experts have estimated the economic return to be in the region of €90 million in terms of industrial contracts for hightech equipment. In addition, membership would allow scientists and students in Ireland to take up research positions, as well as provide further training, workshops, placements and apprenticeships at one of the most cutting-edge facilities in the world. Ireland must join CERN at the earliest opportunity.

Source: Joint Committee on Business, Enterprise and Innovation; *The Case for Irish Membership of CERN* (November 2019): https://data.oireachtas.ie/ie/oireachtas/committee/dail/32/joint_committee_on_business_enterprise_and_innovation/reports/2019/2019-11-13_report-on-the-case-for-irish-membership-of-cern_en.pdf

3. Ensure physics education reflects diversity of society

In 2017, just 14% of students in Ireland completed the Leaving Certificate Examination for Physics, and of this fewer than 20% were girls. Ireland's Government must focus efforts on improving diversity in physics education to ensure the workforce better reflects Irish society, and overcomes the growing shortage of STEM-skilled workers. This can be achieved by increasing awareness of STEM careers and employing a whole school approach to addressing unconscious bias and gender stereotyping and build confidence and resilience for students.

Source: *STEM Education Policy statement (2017)*, <https://www.education.ie/en/The-Education-System/STEM-Education-Policy/stem-education-policy-statement-2017-2026-.pdf>

4. Enhance Ireland's world-class further and technical education

Ireland currently ranks second out of twenty OECD countries for the proportion of employees with technical qualifications – however just 15% of these are in STEM subjects. These skills are essential to high-tech industries and innovation in Ireland. Ireland's Government should increase investment in and reform further and technical education to put them on an equal footing with academic education.

Source: *OECD (2014) Skills Beyond School Synthesis Report*, <http://www.oecd.org/education/skills-beyond-school/SkillsBeyond-School-Synthesis-Report.pdf>

5. Safeguard Ireland's researchers and partnerships

Future negotiations between Ireland, the EU and the UK must continue to allow science professionals to move easily between countries, and especially within the island of Ireland in light of Brexit. Ireland's physics sector must continue to be able to bring together scientists and organisations from around the world, building the cross-border links that fuel scientific discovery and technological innovation. This can also open up opportunities for research, business development and investment. This requires sustained funding to support fundamental research and investment in research infrastructure and collaborative opportunities for Higher Education Institutions.

6. Guarantee specialist science teachers for every student

The STEM Education Policy consultation report has highlighted the issue of a severe shortage of teachers in physics. Increased investment in teacher recruitment, training, and retention is needed to ensure every secondary school student has access to a specialist physics teacher and receives a high-quality learning experience in the classroom.

Source: *STEM Education Policy consultation report (2017)*: <https://www.education.ie/en/The-Education-System/STEMRegistered>

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