Dear Friends and Colleagues,

As fall progresses, we are about to embark on missions to Canada to further connect on the country’s research collaboration with Europe and opportunities for researchers of all nationalities based in Canada, whether it is to go to Europe or partner with researchers there.

A central priority of ours is to have a direct line to researchers of all backgrounds interested in Europe and therefore to help connect you further. In that regard, we welcome you as a free member by signing up for our flashnote emails.

And if you work at a research or international office at a university or other institution, we also encourage you to sign up above and send us a message so we can update our institution-specific contact list; we aim to reach out when planning talks in your city or when there are other important European research-related events and news to share.

Whether you are a researcher or you support those working in research and innovation, contact us with your questions or thoughts, you can simply email us at NorthAmerica@euraxess.net – talk to you soon!

—Your EURAXESS North America Team
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1 Country in focus: Switzerland

EURAXESS – Researchers in Motion is an initiative of the European Research Area (ERA) that addresses barriers to the mobility of researchers and seeks to enhance their career development. This pan-European effort is currently supported by 44 countries, of which we will profile Switzerland here and Latvia further below in this quarterly e-newsletter.

Small in size, but big in reach

Switzerland is a small country of 8.8 million inhabitants in the middle of Europe, well known for its excellent chocolate and high-precision watches. But there is much more to Switzerland than this. With a quarter of the population holding a foreign passport, 66% of whom are EU citizens, Switzerland is one of the most international and multicultural countries in the world.

The Swiss also see themselves as pioneering innovators. In 2022, Switzerland topped the Global Innovation Index ranking for the twelfth time in succession. Perhaps related, the Swiss are also very proud of their higher education standing with a number of recognized institutions. Swiss universities score well in the Times Higher Education World University Ranking. The Swiss Federal Institute of Technology Zurich placed 11 on the 2023 list, making it the best-ranked continental European university. Meanwhile, six out of ten students in Switzerland are enrolled at one of the world’s top 200 universities.

And a fun fact: Albert Einstein, a Swiss citizen since 1901, was awarded the Nobel Prize in Physics in 1921. He joins a venerable list of 25 scientists with Swiss citizenship who have received Nobel Prizes in the natural sciences to date. Measured against the size of the population, this is a world record.

1. Introduction to the national research landscape

Facts and figures

Switzerland has several types of higher education institutions (HEIs) tailored to meet the needs of their respective target groups. These include two federal institutes of technology (FIT) – ETH Zurich and EPFL in Lausanne – and ten universities of applied sciences and arts (UASAs). There are also 19 universities of teacher education (UTE), and four research institutes that belong to the ETH Domain: the Paul Scherrer Institute (PSI), the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL),
the Swiss Federal Laboratories for Materials Science and Technology (EMPA) and the Swiss Federal Institute of Aquatic Science and Technology (EAWAG).

Moreover, there are several other institutions active in higher education, such as the Swiss Federal Institute of Sport Magglingen (SFISM) and the Geneva Graduate Institute, which together offer a comprehensive and complementary range of studies. Most HEIs are state-funded and publicly accredited. The universities offer bachelor’s, master’s and PhD degrees, and focus on fundamental research. UASAs offer bachelor’s and master’s degrees more oriented towards scientific and professional education and carry out mostly applied research. UTEs offer practice-oriented training in various subject areas at primary and secondary levels; their research mostly touches on educational and learning processes and related subjects. All university types offer a wide range of courses in continuing education.

Swiss HEIs attract researchers from all over the world. Nearly 70% of PhDs and scientific collaborators registered at Swiss HEIs are international. At universities, 50% of professors come from abroad. Regarding the scientific outputs, 70% of publications are the result of international collaborations.

The framework conditions for research and innovation in Switzerland are considered to be very good. Political stability, security and quality of life are excellent by international standards. Other outstanding features are the well-developed, continuously modernized infrastructure, high quality of state institutions, high level of digital competitiveness, and flexible education system.

Around 3.2% of GDP is spent on research and development, with the private sector accounting for around two-thirds of this expenditure. In 2022, Switzerland filed a total of 9 008 patents with the European Patent Office, making the country the global leader for the number of patent applications per capita. In absolute terms, Switzerland ranks seventh worldwide.

Between 2016 and 2020, Switzerland ranked first with 8 015 scientific publications per year and per million inhabitants in relation to population size. In the same timeframe, the research areas most strongly represented in the publications in Switzerland were: clinical medicine (27% of the total), life sciences (23%), and physics, chemistry and earth sciences (22%, combined).

2. Centers of excellence

Swiss HEIs are renowned for conducting excellent research according to their profiles and the disciplines offered. Here, the
National Centers of Competence in Research (NCCR) stand out as an example of excellence. NCCRs are a well-established federal funding instrument for long-term, strategically important research in Switzerland. They are internationally recognized for knowledge and technology transfer, promoting equal opportunities, and supporting the careers of young researchers. Funding is provided for research projects of the highest quality, with a particular emphasis on interdisciplinary and innovative approaches.

NCCRs receive federal government support to the tune of SFR 4-5 million per year, which is supplemented by contributions from the HEIs involved, competitive third-party funds raised by the research groups, and contributions from industry. Each NCCR runs for a maximum of 12 years.

The NCCR series that started 2020 are focused on the following topics:
- **NCCR AntiResist**: New approaches to combat antibiotic-resistant bacteria
- **NCCR Dependable Ubiquitous Automation**: New approaches to the control of complex automated systems
- **NCCR Evolving Language**: The origins and future of language
- **NCCR Microbiomes**: Microbial communities in health and environment
- **NCCR SPIN**: Spin qubits in silicon
- **NCCR Suchcat**: Sustainable chemical processes through catalysis

**Swissnex**

Swissnex is the global network connecting Switzerland and the world in education, research and innovation. Its mission is to support the outreach and active engagement of partners through the international exchange of knowledge, ideas, and talent. Partners can be researchers, entrepreneurs, artists, etc. from Switzerland and the respective country where Swissnex is located.

The network regularly holds events of interest to researchers.

**Euresearch**

Euresearch is the Swiss guide to European research and innovation, providing information and guidance on cooperation and funding opportunities offered by Horizon Europe – the current EU framework program (FP) – and other initiatives.

Euresearch conducts events and activities, for example training in proposal or application writing, or introductory information on Horizon Europe.
3. Where can you get a research job or funding from?

In Switzerland, research funding is awarded on a competitive basis according to qualitative assessment criteria. The private sector is a crucial actor for both R&I jobs and as a source of funding.

Around two-thirds of research and development activities in Switzerland are financed and carried out by large corporations, such as Novartis or ABB, but also by SMEs and start-ups. Many of these companies are internationally active. Their work is primarily dedicated to applied research and development and to translating knowledge into marketable innovations. In doing so, they often work together with HEIs, especially universities of applied sciences.

Check out the jobs database on www.euraxess.com where a lot of Swiss companies put their open research positions.

Moreover, since 1987, participation in EU research framework programs has been central for researchers in Switzerland. As a non-associated third country, this means applicants based in Switzerland can participate in most collaborative FP projects.
Learn more on Switzerland’s opportunities, including the funding of transitional measures in Horizon Europe and Euratom. Also read the policy background on Switzerland’s association with EU R&I. Information about Switzerland is a member and partner of research infrastructures, research infrastructure networks and initiatives of international R&I cooperation. For example, it is member of the European Space Agency (ESA) as well as host state and member of the European Laboratory for Particle Physics CERN in Geneva. As a result, Swiss R&I actors have access to, among other things, cost-intensive research infrastructures for conducting experiments as well as scientific data and diverse knowledge.

Each year the Swiss Confederation awards excellence scholarships to promote international exchange and research cooperation between Switzerland and over 180 other countries. The scholarships are aimed at young researchers from abroad who have completed a master’s degree or PhD and at foreign artists holding a bachelor’s degree.

The federal government’s bilateral cooperation programs aim to intensify research and innovation cooperation with Europe and North America, and other countries that have a significant potential for scientific and technological development. These programs consist of two complementary instruments: joint research projects with the BRICS countries as well as with Argentina, Japan, South Korea, and Vietnam, and Leading House pilot activities with promising regions.

The Confederation is responsible for providing research funding through two federal agencies: the Swiss National Science Foundation (SNSF) which primarily funds research aimed at gaining general knowledge (basic research); and Innosuisse, the Swiss Agency for Innovation Promotion, which supports science-based innovations, companies and organizations, as well as the transfer of knowledge and technology transfer (KTT) between research and industry.

An important role in KTT is also played by the Swiss Innovation Park’s six centers located across the country. It facilitates collaboration among companies, start-ups, and HEIs looking to find solutions to some of the world’s most pressing challenges.

4. Where can you get more information?
Find funding opportunities and calls for innovation projects with international partners.
The Confederation also provides funding to the institutions and research institutes within the ETH Domain, a close-knit network comprising ETH Zurich, ETH Lausanne (EPFL), and the four research institutes EAWAG, WSL, EMPA, and PSI.

Information about the most important funding instruments, calls for joint research projects, and mobility programs showcasing scientific and technological cooperation opportunities between Switzerland and the rest of the world can be found on the Research Swiss website.

The My Science portal for research and innovation provides news, information and includes relevant job offers.

A compact overview of funding opportunities can also be found on the Swiss EURAXESS portal. And more news and information about living, working, studying and the international research landscape in Switzerland can be found in the information and assistance section of EURAXESS.

Please watch this video and check out a typical career story as part of your preparations for carrying out research in Switzerland. They will help to explain the most important aspects when arriving.

You can find the contact details of all the EURAXESS Centers in Switzerland here: https://www.euraxess.ch/switzerland/switzerland-network
Interview with the Irish Ambassador

EURAXESS North America held an interview with H.E. Dr. Eamonn McKee, Ambassador of Ireland to Canada, to ask about the Irish research and innovation landscape and Irish ties with North America.

Biography: Born and educated in Dublin, Dr. Eamonn McKee has been a career diplomat since 1986. The main focus of his work was the Northern Ireland peace process, including postings to Washington and New York, followed by postings as Ambassador to Korea, Israel, and currently Canada, Jamaica, and The Bahamas.

EURAXESS North America: What makes Ireland an attractive destination for researchers?

Amb. McKee: Ireland has a great science heritage. From the Neoplatonist John Eriugena in the 9th century to Robert Boyle in the 17th century, the first true modern chemist. The founder of modern quantum mathematics was Rowan Hamilton in the 19th century. Look at the work of ground-breaking work of Stephen Bell on entanglement and Jocelyn Bell Burnell on pulsars in the 20th century.

At the Dublin Institute of Advanced Studies we facilitate research that is not intended for application, at least initially. It is speculative, and encouraged to be so. Yet this produces some research breakthroughs. I think it is a really important approach: give time and space to some of our best mathematicians and scientists and see where it leads them. Eventually it matters. A researcher on continental shelves at DIAS transformed our maritime jurisdiction for example.

However, most of our research is applied. The Government puts research and innovation at the heart of Ireland’s response to critical social, economic and environmental challenges. It is a whole-of-government approach. Science Foundation Ireland brings together government, industry, and universities in sixteen research centers focused on our priorities such as AI, new materials, climate change, medical devices, biopharmaceuticals, and geo-sciences. We have 470 partnerships with global companies. We support PhD candidates. We are part of the EU’s Horizon program with access to €95bn in funding, that is €13bn a year. Ireland spends some €5bn on research a year, with much of this leveraged from business. All of this is applied research that generates hundreds of licensing agreements and spin-off companies.

The government is integrating our research and education with a new Department of Further and Higher Education, Research, Innovation, and Science. Overall, we have a very exciting eco-system built on our international reach and home-grown talent.
Finally, Ireland is a great place for inspiration. Without inspiration, research is stillborn. We take inspiration from everywhere: our history, landscape, writers, and artists. We love to collaborate as much as socialize. Ireland is going through an incredibly creative phase at the moment, a real liberation.

What does the Irish researcher diaspora in Canada look like? Are they primarily concentrated in a certain geographic area or research field, for example?

Irish researchers in Canada, like in the rest of the world, are engaged in almost every research field and are spread across the country. A large amount of Irish and Irish diaspora are engaged in Irish Studies. The Canadian Association for Irish Studies (CAIS) is a group that comes to mind as they hosted their Annual Conference at the Official Residence in Ottawa this year. CAIS members can be found in every province and territory of Canada. CAIS has been fostering and encouraging the study of Irish Culture in Canada for over thirty years and is working hard to encourage younger scholars to ensure people continue to research and celebrate Irish culture.

Does the Government of Ireland engage the diaspora through any particular agency or strategy?

Yes, first and foremost ‘Global Ireland - Ireland’s Strategy for the US and Canada 2019–2025’ sets out to deepen and expand the extraordinary partnership with our diaspora in Canada, doubling the impact of this collaboration in the period to 2025 and commits to celebrating the achievements of Irish communities in all their diversity across Canada. The Government also engages the diaspora through a number of agencies including Enterprise Ireland (EI), Science Foundation Ireland (SFI) and IDA Ireland.

EI, funded by the Department of Enterprise, Trade and Employment, provides research, development and innovation supports for Irish companies to develop new technologies and processes that will lead to job creation and increased exports. EI does this in the research space through driving increased collaboration between industry and academia. Enterprise Ireland are based in Toronto and Montreal, their Market advisors are always happy to connect with Irish diaspora and will help source products or services from Irish companies, offering a free tailored service to help people engage with suitable Irish-based suppliers.

SFI facilitates global research cooperation between Irish researchers and the best from academia and industry worldwide including Irish diaspora in addition to reinforcing Ireland’s standing as a top-class research-performing nation. SFI is always keen to develop links with countries like Canada.

IDA Ireland is the agency responsible for the attraction and retention of inward foreign direct investment into Ireland. IDA’s ambition is to capitalize on opportunities to provide MNCs with solutions to the challenges they face in this difficult global environment. IDA Ireland are based in Toronto and are always able to help members of the diaspora who are looking to invest or do business in Ireland.
You are an historian and must have a detailed understanding of Irish immigration to North America. How do you see Irish influence in Canada and the United States in the present based on this past?

We are all familiar with the story of the Irish in the United States. It is an epic one, that really takes off with the Great Irish Famine and massive emigration to the U.S. over the following generations. The influence of the Irish and the very distinct identity of the Irish American in the U.S. is profound and wide ranging, from Hollywood to the White House.

The influence of the Irish in Canada is just as profound and widespread. Yet that story is barely known. There are many reasons for this, mainly I think because it happened in the first half of the 19th century, not the second half. And because unlike Canada, Ireland broke from the Crown and the British Commonwealth and modelled Independent Ireland as a republic, inspired by the United States. However, we need to recover the story of the Irish in Canada. It is a part of Ireland’s own history. And it has lessons for us and how different identities are less divergent than we think, that space can be shared in harmony and prosperity. The Irish in Canada is a very new and exciting discovery or perhaps more accurately recovery.

Today Ireland and Canada share values and outlooks. In recent years, we have seen the connection deepen; people-to-people contacts have increased enormously between Ireland and Canada, boosted by renewed emigration, the opportunities afforded to Ireland by EU membership and CETA, and the increased number of political visits in each direction.

It seems that not just individual researchers choose to go to Ireland, but also multinational companies and start-ups looking for a European location. Out of a large number of countries, why do they choose Ireland?

Ireland is a business gateway to Europe and beyond, allowing companies barrier-free access to Europe’s 500 million consumers – one of the largest markets in the world. We value and support enterprise as vital for creating quality jobs, meeting challenges, and for driving sustainable growth.

Ireland is an enormously attractive place for multinational companies and start-ups. Over 1,600 foreign-owned companies have put down roots in Ireland, employing over 275,000 people. These include many of the world’s most successful global businesses, which have chosen Ireland as their strategic base in Europe.

Companies choose Ireland for a variety of reasons, but primarily because Ireland is regarded, and regularly ranked, as one of the best places in the world to do business. Companies are drawn by Ireland’s young, highly educated, highly skilled, multi-lingual work force, our membership of the European Union, the strong base of existing FDI companies, the access to the European market, a consistent and stable business environment, a much improved cost competitiveness, and a safe and secure Common Law jurisdiction.
What are the mutual priorities of Ireland and Canada when it comes to fields such as science, technology, and innovation?

Like Canada, Ireland is committed to building long-lasting and meaningful relationships with international partners of excellence to drive research and innovation performance. Both Ireland and Canada attach huge importance to skills, knowledge, research, and innovation as drivers of national and regional economic development, which will contribute to the creation of a fairer and more inclusive society.

The National Institute for Bioprocessing Research and Training (NIBRT) in Ireland is partnered with The Canadian Alliance for Skills and Training in Life Sciences (CASTL). CASTL has signed a commercial agreement with NIBRT to be the exclusive provider of NIBRT licensed training programs in Canada. This formal partnership supports Canada’s need for skilled and trained individuals to continue the growth of the biopharmaceutical manufacturing industry. Last October CASTL officially opened a new bio-manufacturing training facility in Charlottetown, Prince Edward Island.

A particular area of mutual interest is putting research and innovation at the center of our response to environmental challenges. When it comes to climate action Ireland continues to provide space and visibility for the importance of science-informed policy as set out in Ireland’s Climate Action Plan. Ireland is striving to advance greater European and international scientific assessment and stocktaking processes, focused on future challenges related to managing the transition and transformation to a climate neutral and resilient economy.

Another area of collaboration between Ireland and Canada is at the European Space Agency (ESA). In 2023, Canada contributed €19 million to ESA programs highlighting its commitment to partnering with the EU in this area. Common areas of interest for Ireland and Canada at the ESA include wetlands (carbon capture), coastal erosion, Atlantic (surveillance and ocean health) and forest management.

Any final thoughts?

Get on a plane to Ireland. You can do all the research you want online, and there’s a lot there, but you can only understand Ireland by being there, meeting the people, and exploring. Whatever your interests are, you will find connections. They usually last a lifetime, so it is worth the price of the ticket.
3 Hot Topic: A glimpse at the “smart social factory” of the future

EURAXESS Worldwide takes a closer look at the nexus between innovation, industrial (r)evolution, the digital economy and, ultimately, the journey to Industry 5.0. We explore what it means for the EU’s Global Approach to research and innovation policy and developments in terms of new industrial patterns but also wider societal and environmental challenges (sustainability, ethics, impact, etc.).

The immutable relationship between innovation and entrepreneurship is long and powerful, driving fundamental developments for millennia. It works quite simply and elegantly: see a problem or gap, think of a way to fix or fill it, assemble the resources and then deliver the solution – whether a physical good, service, tool or trade.

The principles of digital entrepreneurship – making and selling ‘soft’ and intangible wares including data, information and communication technologies – have not vastly changed from those practiced by early traders supplying mostly ‘hard’ or physical wares. It is still all about the market.

According to a new book called ‘Digital Entrepreneurship and the Digital Economy’, published by Routledge and edited by J.M Munoz, the digital economy is expected to bring about some US$60 trillion in revenue by 2025. The authors note that with the rise and proliferation of emerging technologies globally, entrepreneurs have followed their native instincts and “pursued opportunities to leverage skills, abilities, and resources to find innovative revenue streams”.

Here, digital and tech giants such as Uber, Apple, Meta, ‘X’ (formerly Twitter) as well the makers of chips and digital kit like Taiwan Semiconductor Manufacturing Fujitsu, Intel, Siemens, Ericsson, etc. offer tidy examples of the importance of early mover status and how data – and the way it is handled – has emerged as the king-maker in an unchartered and enticing realm.

A growing breed of digital entrepreneurs is now found in everything from artificial intelligence, cloud computing, big data, and block chain to the ubiquitous internet of things and networked applications. These pioneers are taking innovations to market in virtual/augmented reality, gaming, media and publishing, while developing and fostering content- and digital asset-creation, as well as all manner of middleware needed to produce and deliver value across disciplines and sectors (science, education, health, aviation, energy, manufacturing, etc.).

The only real limit to these vast digital opportunities, say experts, is computing power, the regulatory environment, the imaginations of the inventors, and the foresight of entrepreneurs and their investors prepared to take a punt on new ideas.

From industrial to digital… to social

Industry has and will always be vital to both the economy and society. We need fridges, toothbrushes, shoes, seats, and everything else that helps to feed, clothe and sustain the billions of people on this planet. The rise of the digital world has done nothing to change that reality. But new digital technologies have enhanced and in many ways disrupted the way industrial processes take place.
This is the essence of Industrial Revolution (see box) which emerges as the benefits of earlier innovations pave the way for new advances in, for example, machine automation and robotics, cloud computing, and AI. Industries are also quickly learning the value of better exploiting data and digital insights to improve production efficiency and worker safety while reducing waste, labor costs, etc.

Today, we are on the cusp of what has been variously called Industry 3.0 and Industry 4.0, and experts are looking at what comes next in the journey to Industry 5.0, which is expected to leverage human, environmental and social aspects into new digital dividends. A world where innovators and entrepreneurs gain competitive advantage while still meeting stricter regulatory requirements, where flexible factories can turn out even personalized products cost-effectively and safely.


The article goes on to explore the main challenges and research lines leading to the “smart social factory” of the future. It also provides an overview (table) of research priorities and developments, supported by cases and examples. One such example is a project by Repsol, a Spanish energy company, which is using blockchain and smart robotics to build a guided-automated “cobot” capable of tasks like delivering raw materials and removing waste, while constantly feeding data on safety, efficiency, etc. back into the smart system.

Current challenges to Industry 5.0’s progress include lack of skilled workers, time-consuming processes, (data) security and privacy issues, and R&D investment. Any new solutions also need to be mindful of current and future industrial regulations concerning intelligent machines and collaborative robots.

The sheer complexity of the machinery and science supporting human-centric Industry 5.0 developments is only half of the challenge, the paper suggests. Greater investment will be needed to train managers and technicians expected to interact with these new technologies.

(Mis)understanding blockchain

As shown above, blockchain technology plays a key role in many Industry 5.0 advances. But it is often misunderstood or misrepresented. Businesses using blockchain are “able to operate in a constantly changing environment, where not only the regulatory environment, but also the attitude of industry and society towards these innovative businesses is still forming and changing”, according to a statement from Kaunus University of Technology (KUT), Lithuania in connection with the Routledge publication.

Blockchain technology is a distributed database mechanism that stores data in ‘blocks’ linked together in a ‘chain’, as its name suggests. It allows transparent information- and digital asset-sharing and back-ups within a network – private, public or in hybrid forms. Blockchain technology is perhaps best known today for its role in cryptocurrency developments, acting as a shared digital ledger collecting and storing the trading – buy, sell, exchange – information. The linked and transparent nature of blockchain makes it a catalyst for future digital developments that need to operate globally or in complex environments relying on decentralization.

The publicized failings of crypto should not be seen as a direct indictment on blockchain, experts say. Jurgita Butkevičienė from KUT’s School of Economics and Business and
co-author of a chapter on *Digital entrepreneurs’ strategic responses to the incomplete global policy framework for blockchain-based business*, says the problem lies more in “willful” and “opportunistic” actions of certain players who took advantage of policy and regulatory gaps.

She and fellow researchers surveyed companies that create applications on blockchains, develop blockchain platforms, provide legal advice, and help application developers with sales and other marketing issues. They found that different regulatory approaches and “imperfections in different countries” affect these companies and their responses.

The fact that “transparent business-oriented entrepreneurs were able to successfully develop innovative and global solutions” even in unchartered territory must be seen a positive, the researchers conclude.

**A case for a Global Approach to R&I**

The silver lining of crypto’s fall from grace is that innovation and entrepreneurship are alive and well. Yet this narrative has focused minds on the value of building a solid understanding of the fundamentals of new or emerging technologies as the basis for good policymaking in complex and challenging fields. It also speaks to the importance of benevolent and transparent cooperation and partnerships among relevant stakeholders.

“The magnitude of current global challenges, such as the climate crisis and the COVID-19 pandemic, stresses the relevance of joining forces worldwide and pooling human and financial resources to facilitate the creation and dissemination of knowledge and innovative solutions for EU research,” explains the European Parliament’s (EP) ‘Think Tank’ in a briefing on the Global Approach to research and innovation.

Excellent, mission-oriented research and innovation feeds turnkey technologies and solutions and underpins EU policies and global sustainable development goals. Horizon Europe’s (HE) three pillars, especially those focused on tackling pressing global challenges and European industrial competitiveness (Pillar 2) and promoting greater innovation (Pillar 3), are thus a vital funding instrument for the EU’s Global Approach.

The EP’s briefing further confirms that “Europe’s openness to the world will safeguard EU strategic autonomy, interests and values” even in the face of geopolitical tensions, including the Russian invasion of Ukraine. Intensified international cooperation with like-minded partners signals Europe’s bid for better global stewardship in key fields and spanning the whole research lifecycle through to technological development and standardization.

“European research and innovation players are unambiguously supporting international cooperation for global goods, such as knowledge, the environment and global health,” concludes the EP.

Combined with improved communication about the opportunities under HE – as competently supported and empowered by the work of EURAXESS Worldwide regional hubs – this is having a clear knock-on effect in terms of non-EU-based participation in
the program. The latest figures indicate that non-European entities are present in 42.17% of the 5,200 grant agreements signed since HE was launched in 2021.

All of this points to signs that the EU’s Global Approach and internationalization efforts are paying dividends, and will play an instrumental role on the path to Industry 5.0 and other major digital advances.

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**Industrial Revolutions, past and present**

The original or First Industrial Revolution is remembered as the period roughly between 1760-1840 when production went from a hand-crafted to machine-made processes, spurred on by developments in textiles, mining, engineering, iron-making – later powered by innovations in steam-powered engines. Further advances in manufacturing and production were then made thanks to the introduction of electricity, sparking industrial innovation and greater labour mobility – what would become known as the Second Industrial Revolution.

With the invention of computers and rapid emergence of information and communication technology from the late 20th century onwards, a Third Industrial/Digital Revolution (or Industry 3.0 in today’s speak) quickly captured imaginations, allowing ever-greater automation in production processes and of course giving rise to integrated circuits and the internet.

From around 2010 onwards, a Fourth Industrial Revolution started taking shape. According to experts at UpKeep, the main difference between Industry 3.0 and Industry 4.0 is the rise of interconnected technologies in plant operations thanks to progress in cloud computing and the industrial internet of things (IIoT), with additive manufacturing (3D printing) allowing rapid prototyping. The benefits of Industry 4.0 include real-time data collection, greater interoperability, and more decentralised, secure and flexible information and applications.

But where to from here? Industry watchers are already talking about the next big Industrial Revolution – building on advances in ‘cyber-physical cognitive systems’ – which they believe will orient around greater human-machine interaction in manufacturing and have clear implications on green manufacturing and the pursuit of positive socio-economic impact.

Industry 5.0 sees collaborative robots and smart machines (cobots) working alongside people, but their relationship will go beyond operational/safety objectives. TWI Global explains this: “Where Industry 4.0 focused on technologies such as the internet of things and big data, Industry 5.0 seeks to add human, environmental and social aspects back into the equation.”

This brings a whole set of new ideas and processes into business, factoring in corporate social responsibility, new investment models, global resilience, sustainability, and net-zero goals (Sustainable Development Goals and EU’s Green Deal Industrial Plan, Global Approach, and Recovery and Resilience Facility).

It also touches on global societal challenges and ethical issues covering worker rights and fair working conditions and wider declarations on universal human rights enshrined within the United Nations.
Country in focus: Latvia

Opportunities for research and cooperation with a sea view.

Latvia is a country located in the Baltic region of northern Europe. It has a diverse research and development landscape and is generally considered a very attractive space for researchers.

Latvian scientists have recorded a number of scientific accomplishments that are highly valued in the country and well-recognized abroad. There is exceptional progress in certain sciences, including medicine, pharmacy, and material science. New discoveries are announced on a regular basis, contributing to Latvia’s high growth potential. For example, in 2012 a new and significantly faster method for quantum algorithms was discovered and a novel quantum interference application in nano-electronics was developed by Latvian researchers Andris Ambainis, Dr Vyacheslav Kascheyev, Aleksandr Belovs, Jana Timoshenko et al. In the same year, Liga Berzina-Cimdina and Janis Locs from RTU Riga Bio-material Innovations and Development Centre successfully proved that their co-developed synthetic bio-material effectively attaches to bone – it is now used for implants in dentistry and cosmetic surgery. An active anti-cancer substance, called Belinostat, which was synthesised in Latvia, has been approved for use in the USA in the treatment of T-Cell Lymphoma. This substance was developed by Dr Klara Dikovska, Ivars Kalvins and Dr Einars Loza alongside the Latvian Institute of Organic Synthesis.

Facts and figures

The research system in Latvia is being developed as part of the European Research Area (ERA) in line with the systems and best practices pursued by the European Union, its Member States, and international standards. The main issues addressed by Latvian science policy are the need to increase investment in research and development (R&D), to promote the renewal of research human capital and knowledge-creation in all branches of science, and to develop research infrastructure aimed at increasing research and innovation capacity. Latvia invests around 0.74% of its GDP, or EUR 249 million, in R&D. A quarter of companies are very active in the innovation field. The research landscape in Latvia is well governed and represented; there are 64 research institutions, 22 of which are funded by the state.

Since 2015, science policy in Latvia has been developed in line with the country’s Smart Specialization Strategy (RIS3). The Strategy targets research according to sectoral growth priorities, facilitates knowledge and technology transfer, and stimulates social and economic transformation towards more efficient use of resources.
and the creation of new, higher value-added products and services. These specializations described under Latvia’s RIS3 are:

- Knowledge intensive bio-economy
- Biomedicine, medical technologies and biotechnology
- Advanced ICT
- Smart materials, technology and engineering
- Smart energy

The main research policy priorities in Latvia for the period 2021-2027 are:

- Increase R&D as a percentage of GDP (GERD) to 1.5% and improve public support for emerging private R&D investments
- Achieve sustainable growth in R&D human capital needed to foster economic transformations (at least 8,000 FTE research personnel)
- Achieve success on the international stage through a diverse and competitive research system (i.e. underwritten by Horizon Europe)

Latvia is striving to be a welcoming place for incoming researchers and their families. Its compact size and location make Latvia a very comfortable place to conduct and advance research projects. Research infrastructure and institutions are in close proximity to each other and easily accessible, so commuting times are lower, which is a premium for attaining a good work-life balance. Everything is reachable and most of the research institutions are based or at least have offices in Riga, the biggest city in Latvia which is known be a cozy place to live.

Some countries focus on stimulating innovation in the private sector, others encourage scientific entrepreneurship more broadly, while some concentrate more on securing grants and funding opportunities for institutions, but Latvia takes a more classic approach to science. Researchers are highly valued professionals and given every incentive to pursue a long career in academia if they so choose.

The main research universities in Latvia include:

**University of Latvia** (UL) is the largest in the country. In addition to research in the natural sciences, humanities, social sciences, technical sciences and medicine, UL provides various types and levels of higher education opportunities for both Latvians and people from other countries. The university’s scientists have developed important research that has contributed to the competitiveness of the national economy and improved quality of life in society. The opinion of the University of Latvia is essential for decision-making in public administration. [Read more]
EURAXESS Researchers in Motion is an initiative of the European Research Area (ERA) that addresses barriers to the mobility of researchers and seeks to enhance their career development. This pan-European effort is currently supported by 43 countries, of which we profile one in each of our quarterly e-newsletters.

EURAXESS Latvia provides information and support to mobile researchers through this portal, and with the support of national EURAXESS Centers. EURAXESS Latvia has more than 20 service centers that are ready to provide you a range of services and any information concerning your arrival and stay in Latvia.

Riga Technical University (RTU) conducts fundamental and applied research in engineering with the aim of analyzing and solving technical and social problems. RTU conducts interdisciplinary research in six scientific fields: Energy and Environment (research on sustainable energy supply, electricity, heat and transport fuels); Cities and Development (environmental and heritage conservation, housing, mobility and infrastructure provision, employment and social issues); Information and Communication Technologies (electronics, control software and data transmission); Transport (improving transport safety and energy efficiency, solving various transport infrastructure problems); Materials, processes and technologies (research ranging from the synthesis of nanoparticles to the calculation of large structures with practical applications, structural strength testing and durability prediction; extraction and research of nano-fibers, composites and biomaterials for applications in medicine, electronics, photonics and alternative energy; optimization and improvement of technological processes for materials research); Security and Defense (interdisciplinary research in areas related to individual and national security). Read more

RTU Ēnu kasts Rīgas Biomaterials Innovation and Development Centre conducts biomaterials research and develops implant materials for medical applications. Since 2020, funding from Horizon 2020 has been granted to the Baltic Biomaterials Centre of Excellence (BBCE). The RTU Centre for High Energy Particle Physics and Accelerator Technology is responsible for Latvia’s international cooperation with CERN, and its main tasks are to promote the development of high-energy particle physics in Latvia, to participate in research on high-energy particle physics and particle accelerator technology, and to establish an international Master’s and PhD program within the CERN Baltic Group. Read more

Riga Stradiņš University (RSU) conducts research in three scientific fields: Medicine, Public Health, and Social Sciences. Medical research covers major disease groups and virtually all the basic sciences of medicine – molecular aspects of disease, genetics, epidemiology, prognosis and treatment, impact on quality of life, treatment goals and outcomes. Read more

Latvian University of Biosciences and Technologies (LBTU) offers interdisciplinary higher education aimed at building the knowledge needed for sustained environmental and social development. To ensure excellence in research and studies, LBTU has established a science university ecosystem – a unified framework of commercial companies, scientific institutions, educational institutions and other organizations working under the direction and supervision of the university, including the LBTU APP.
Institute of Horticulture and APP Institute of Agroresources and Economics. Read more

Different research fields are covered by various scientific institutes, such as the Latvian Institute of Organic Synthesis; Baltic Studies Centre; Institute of Electronics and Computer Science; Institute of Solid State Physics; Latvian State Institute of Wood Chemistry, etc.

Science-business relations

It is still a struggle for almost all EU countries to translate innovation inputs into outputs efficiently. Latvia is no exception. It ranks 41 on the Global Innovation Index 2022. While it is working to overcome remaining barriers, there are strong signs that Latvia is learning valuable lessons and making the most of its opportunities as a small Member State. The country is focused on creating a balanced and efficient innovation ecosystems.

This is thanks in large part to Latvia’s science policy framework and the work of its Investment and Development Agency, which is recognized for its efforts in bringing a wide range of science and investment opportunities together.

EURAXESS Latvia is a one-stop shop for all incoming researchers. We strongly believe that people come to people and we try to do our best to make your journey and stay in Latvia comfortable and pleasant.
5 Latvian researcher diaspora

To complement the Latvian country profile, EURAXESS North America spoke with Stella Ankrava of the Latvian Embassy to Canada. Read her bio below followed by information compiled on cooperation between Latvia and Canada in the areas of science and education.

“I joined the Latvian diplomatic service in 2003. Since then I have held different positions at the Ministry of Foreign Affairs of Latvia, mostly related to International and European Security Policy, as well as bilateral relations with European and Global partners. I have served at the Embassy of Latvia in New Delhi, India, and earlier at the Permanent Representation of Latvia at the European Union in Brussels, Belgium.

In July 2023 I started my posting as the Deputy Head of Mission at the Embassy of Latvia in Canada. I am honored and delighted to be part of Latvia’s diplomatic mission in a country which is one of our most important international partners. Latvia and Canada enjoy excellent bilateral relations, we are strong allies in NATO and share common values and interests, such as democracy, rule of law and rules-based international order. I am looking forward to a very exciting and fruitful posting over the next 4 years during which I hope to be able to contribute to further strengthening and developing ties between Latvia and Canada in various aspects of bilateral and international cooperation.”

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Cooperation between Latvia and Canada in the areas of education and science have been rather limited so far leaving us ample opportunities to expand and deepen it in future.

Youth Exchange Program

The Agreement Between the Government of Canada and the Government of the Republic of Latvia Concerning Exchanges of Young Citizens was signed in 2009. The Agreement foresees up to 50 participants of each country.

Cooperation in education

According to the information provided by the Ministry of Education and Science of the Republic of Latvia there were 22 Canadian nationals at the higher education institutions in Latvia during the academic year
**EURAXESS North America**

**2022/2023** (13 students during the 2021-2022 academic year and 21 students during the 2020-2021 academic year.

For the moment Latvia does not offer state scholarships to Canadian nationals.

Cooperation between Latvia and Canada in the framework of **EU Erasmus+ program (2014 – 2020)** and **(2021 – 2027)** has been rather limited so far:
- 12 staff mobilities have been included in the reserve list in Call 2023 by the Riga Technical University as part of EU **Erasmus+ program (2021 – 2027)** “Mobility of higher education students and staff by external policy funds KA171-HED);
- In Call 2020, no mobility was confirmed with Canada, 4 mobilities were included in the reserve list by the Riga Technical University;
- In Call 2018, 9 virtual mobility programs were approved and implemented with Canada (5 for Latvia and 4 for Canada) by the Novikonta Maritime College in Latvia.

**Cooperation in Science**

According to the information provided by the Ministry of Education and Science of the Republic of Latvia there were **369 joint publications by Latvian and Canadian researchers between 2017 and 2022**.

As part of the EU program **Horizon Europe** Latvian and Canadian partners have been involved in 3 joint projects.

As part of the EU program **Horizon 2020** Latvian and Canadian partners have been involved in 16 joint projects.

*For more information visit the [website of the Embassy of Latvia to Canada](http://ec.europa.eu/euraxess).*
EURAXESS North America also held an interview with Olivia Gachoud, Head of the Science Office of the Embassy of Switzerland to the United States.

**EURAXESS North America**: Could you introduce yourself and explain how your career path led you to your current position? The world of science diplomacy makes clear that there is no cookie-cutter path to end up doing the work you do.

**Swiss Embassy**: My name is Olivia Gachoud, a very common name in the French-speaking canton of Fribourg, the part of Switzerland where I grew up. My academic background is in socio-political studies followed by a Master’s in Business Communication from the University of Fribourg. In 2018 I also studied in Chile at the Pontificia Universidad Católica in Santiago. This experience abroad—and I would assume this goes for academic mobility in general—allowed me to see things through a new prism, giving me a broader international perspective, including for my own career prospects. After that I joined an organization that aims to reinforce the economic ties between Switzerland and African countries. I worked as an event manager on an annual event called AFRICA CEO Forum, which in some ways is similar to the World Economic Forum but dedicated to the African continent. I enjoyed working in this dynamic, high-energy private sector environment and witnessing what can be mobilized when 60+ countries come together in one place. After that I joined the Swiss Federal Department of Foreign Affairs (FDFA), in an organization called Presence Switzerland. This organization is responsible for promoting Switzerland’s “brand” abroad. I was responsible for the Americas continent and already...
getting acquainted with the innovation landscape in both the United States and in Switzerland. These experiences, combined with a great interest in strategic partnerships and entrepreneurial policies, led me to my current position as head of the Science & Technology Office at the Embassy of Switzerland in Washington, DC.

**Switzerland has a great global reputation. When it comes to higher education and research, what should people know about the country?**

Switzerland’s education, research, and innovation landscape plays a big role in building its excellent reputation. Our country consistently holds leading positions in global innovation rankings and two of our higher education institutions—EPFL Lausanne and ETH Zurich—feature among the world’s top 20 universities. Other universities in this ranking are predominantly American and British. These results are impressive for a country with a population of 8.8 million and they are mainly based on 3 ingredients that create this recipe for success. The first is focusing on the basics of research, with a bottom-up approach and high levels of investment. To give you a figure, over 3% of Switzerland’s GDP is devoted to research and development. The second pillar is formed by the strong links between industry and academia, who work closely together. Almost every university and higher education institution can count on the presence of innovation parks, which also attract a good number of international companies. Other examples of this close collaboration are the technology transfer offices on campuses and the partnerships between student associations and local companies, which sometimes act as sponsors, get involved in innovative projects, and have a first chance to recruit future talents. This gives a major boost to the creation of start-ups and to entrepreneurial initiatives. A third and final pillar is workforce preparedness with Switzerland’s investment in its youth and education. Our dual training system is a unique model of education which is often recognized as the gold standard and one of the reasons behind the “Swiss-made” quality standard. The schools of applied sciences also play an essential role by offering education programs that have a practical approach and are based on the needs of the industry. The jobs of the 21st century are increasingly complex, and Switzerland has been consistently working to successfully anticipate any skills gaps.

**Switzerland is at the heart of Europe - as the Swiss science counselor to the U.S., can you give an overview of Swiss collaboration with North America in all things research and innovation?**

The United States is Switzerland’s number one partner in research, as demonstrated for instance by the number of co-authored scientific publications between the two countries. At the peer-to-peer scientific level, the links are extremely dense, and this goes far beyond the humble
work of a scientific advisor. But our mandate is not (yet!) obsolete, because Switzerland has formal collaboration agreements with the United States when it comes to key technologies: for example, we signed a Joint Statement on Quantum Information Science and Technology (QIST) in 2022 and there is also an established partnership with the U.S. Department of Energy’s Fermi National Accelerator Laboratory on the international Deep Underground Neutrino Experiment. Swiss economic actors—Switzerland is the United States’ seventh largest foreign direct investor—also play a decisive role, not only by creating jobs but also by funding R&D, particularly in pharmaceuticals, medtech, and life sciences. Additionally, Swissnex offices in San Francisco, Boston, and New York are building strong and innovative bridges between Switzerland and the United States. They organize summits, such as the Swiss-U.S. Quantum Days, to strengthen links between researchers, as well as internationalization programs to facilitate the transfer of knowledge and experience between Swiss and American start-ups. Interesting collaborations are taking off, for example, in the field of climate and urban innovation with the Climate Collider and Metropolis initiatives.

On the same subject, and because you mentioned North America, I should refer to the recent agreement signed between Switzerland and Quebec on polar research. Thanks to pioneering expertise in analyzing extreme environments and changing ecosystems, institutions such as the Swiss Polar Institute and the Swiss Federal Institute for Forest, Snow and Landscape (WSL) are sharing knowledge about polar research with both the United States and Canada.

**You’ve mentioned Swissnex - how is this different from a typical national network of researchers?**

Swissnex was conceived by the Swiss State Secretariat for Education, Research, and Innovation (SERI) as an autonomous institution serving not primarily its ministry but all Swiss stakeholders involved in innovation and education. The first site was set up in the United States, in Boston, MA, in 2000. It was the world’s first scientific consulate. A pioneering initiative at the time! Today, the Swissnex network has six offices and is represented by 22 scientific advisors within Swiss embassies abroad. The Swissnex offices operate on a highly entrepreneurial basis, relying on public-private partnerships and funding. This collaborative modus operandi gives the Swissnex offices greater flexibility and a very creative approach to reinforcing the exchange of knowledge, ideas, and talent between Switzerland and the rest of the world.

**What network for Swiss researchers should those in North America be aware of?**
The Swissnex offices are strategically located close to major university centers and innovation hubs such as the Bay Area. They regularly organize activities to which Swiss scientists are invited, as well as lunches and receptions for alumni of Swiss universities. I invite you to follow them on social media to stay in touch! In addition, the Science Office at the Embassy, with the help of Swissnex and the regional consulates, has drawn up a map of Swiss professors and scientists working in the United States. This was an important initiative launched in 2023 in order to have a nationwide overview of this network and to allow us to better activate it. The map now includes more than 250 contacts, from New York to Hawaii, and will continue to grow as we discover more scientists and professors based here. Please get in touch if you are one of them or know of them! Connecting Swiss experts with one another here in the United States and also back to Switzerland matters greatly to us. In addition, this network is a fantastic source of knowledge to tap into when we organize scientific round tables at the Embassy, Swissnex offices, and consulates.

**Switzerland is not part of the EU’s current framework program for research and innovation, Horizon Europe, but was part of the previous one, Horizon 2020. How is Switzerland working with its neighbors to promote and facilitate research collaboration within Europe?**

That is correct: Switzerland is treated as a non-associated third country in the EU Framework Program for Research and Innovation. Researchers in Switzerland can still participate in calls for proposals under this new status and receive funding directly from the Swiss government. However, participation in individual projects, particularly European Research Council calls for proposals, will be affected. But Switzerland remains strongly connected to its neighbors, for example through research collaboration funded by the Swiss National Science Foundation (SNSF) and Innosuisse, the Swiss Agency for Innovation. Similarly, in Europe’s global research landscape, Switzerland is a member of numerous international research institutions and organizations, including the European Organization for Nuclear Research (CERN) and the European Space Agency (ESA). For the first time, a Swiss citizen, Renato Krpoun, head of the Swiss Space Office, is chairing the ESA at the delegate level in 2023-24.

Switzerland also maintains an active dialogue with European countries on important issues such as open science and open data, and consistently seeks to maintain close links with European universities, for the benefit of students and largely through the European University Alliances. European students are welcome in Switzerland, as are North American students.

**How can researchers in the United States and Canada get involved?**

Most Swiss universities and schools of applied sciences have student exchange programs with U.S. universities, and there are also a number of...
scholarships offering financial support to U.S. and Canadian students wishing to come to Switzerland for their studies or research.

The Fulbright-Swiss Government Excellence Scholarship funds research stays of 6 to 12 months. In addition, the ThinkSwiss program offers research grants (2-3 months) and summer school travel grants to students from U.S. and Canadian universities. These grants are open to all fields of study, provided that students have completed their second year of study. In addition, U.S. and Canadian researchers can also consult the calls for multilateral and bilateral projects funded by the SNSF and apply for open research positions offered by international companies based in Switzerland and active in the field of R&D.

I invite you to consult the very comprehensive document provided by EURAXESS in their newsletter and to visit the Research.Swiss website to discover opportunities in our country!

**In a few words, what is the part of the job that you enjoy most?**

I like the idea that we are the eyes and ears of Switzerland here in the USA. Keeping an eye out for new collaborations and initiating strategic partnerships in education, research, and innovation is the part that gives me the most satisfaction. It is humbling to work for the scientific community of my country, for the students and innovators. The message that we get from them every day is that international collaboration is essential to their work. In the United States, the current dynamic is one of openness with partner countries and I am sure that linkages between the two countries will only continue to grow.
7  In case you missed it...

Recent activities

While not a complete list, here are a few past and upcoming virtual events of ours and close partners—watch the recordings on the event webpages below!

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<tr>
<th>Event</th>
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<td>EU Research Opportunity Info Session with Simon Fraser University</td>
<td>October 11th, 2023</td>
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<td>Simon Fraser University</td>
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<tr>
<td>MSCA Staff Exchanges 2023: Insights and Information</td>
<td>October 16th, 2023</td>
<td>Virtual</td>
<td>EURAXESS North America and UK Research and Innovation (UKRO Brussels)</td>
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<tr>
<td>Ninth Annual Meeting of the European Scientific Diasporas in North America</td>
<td>October 27th, 2023</td>
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About EURAXESS North America

EURAXESS North America is a network of thousands of European and non-European researchers, scientists, and scholars throughout North America (USA and Canada). This multidisciplinary network includes members at all stages of their careers. It allows them to connect with each other and with Europe, ensuring that they are recognized as an important resource for European research, whether they remain in North America or return to Europe.

For further information about EURAXESS North America, please visit our homepage: [http://northamerica.euraxess.org](http://northamerica.euraxess.org).

To sign up for free membership in our network, [subscribe here](#).

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