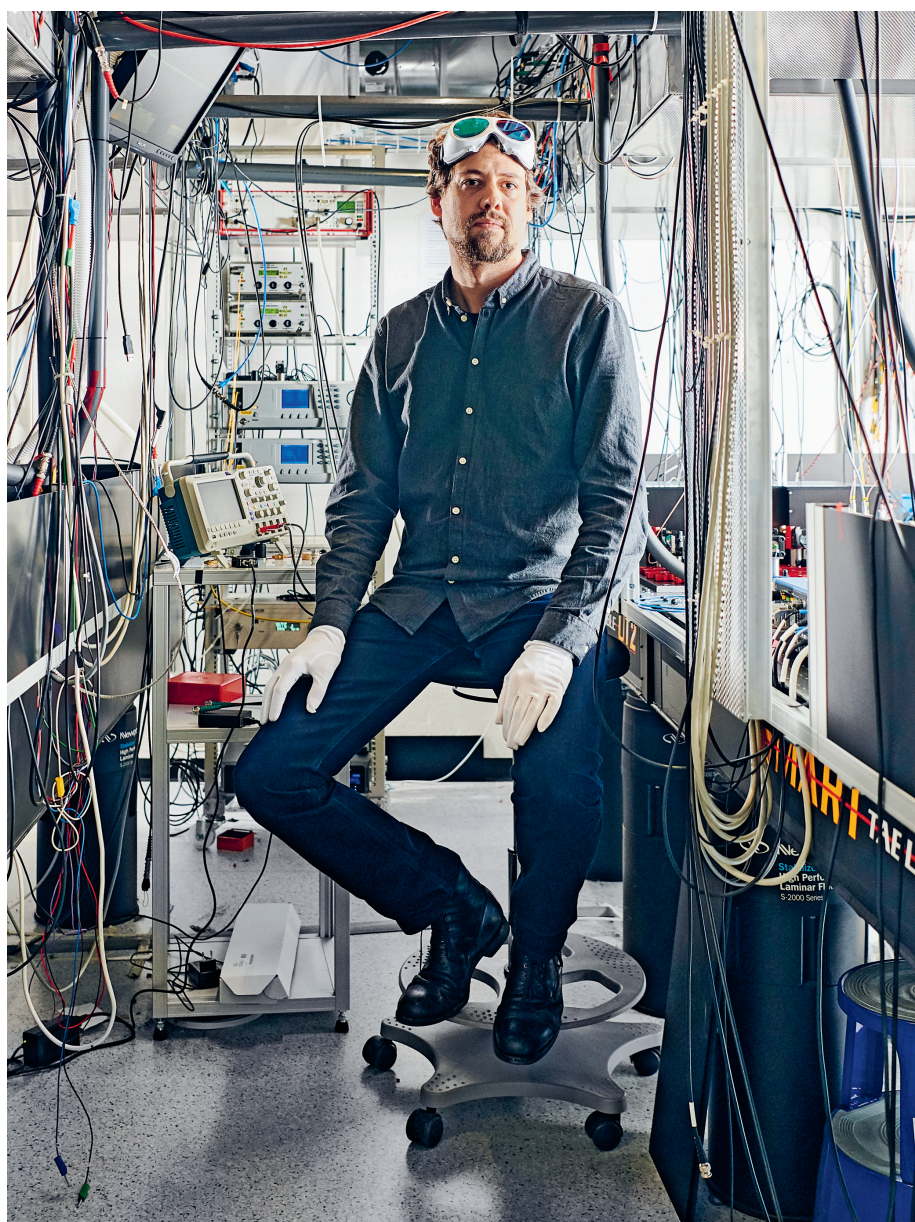


Successful cross-border collaboration

Swiss science is in a leading position thanks to its strong outreach in Europe and the world. At year-end 2018, the SNSF was funding 2,000 international projects and fellowships abroad.



The quantum physicist Daniel Kienzler sets up an experiment on hydrogen molecules at ETH Zurich. The idea behind it began to form in his mind during a research stay in the USA.

When Daniel Kienzler returned to Switzerland in August 2017 after his research stay in Boulder, Colorado, he brought a full rucksack with him. "While I was working as a postdoc in the USA, I broadened my scientific horizons by forging important links with researchers," the 35-year-old physicist is happy to report. "And I developed ideas for future projects."

Daniel Kienzler was researching quantum logic operations at the National Institute of Standards and Technology. Operations of this kind are essential in creating quantum computers. One of the aims of his project was to get two quantum bits, or qubits – the units of information with which quantum computers work – to perform operations together without them ever being linked. Doing so will make it possible to build larger quantum computers suitable for practical applications. His visit in Boulder was largely financed by an SNSF fellowship.

Essential for top-flight research

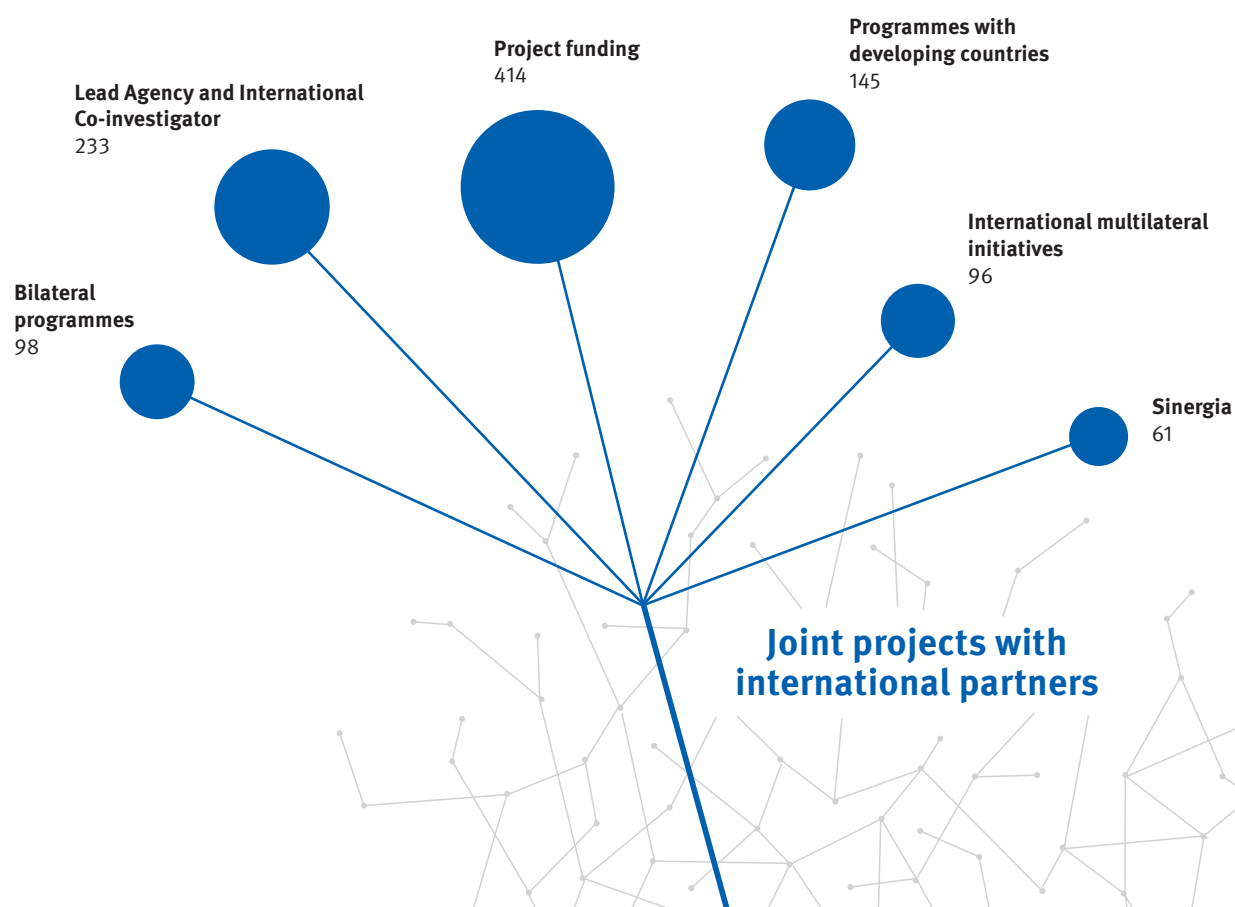
"Internationality is crucial to Swiss research," says Jean-Luc Barras, head of the SNSF's International Co-operation division. "In today's world, top-flight research is only possible if there is ongoing dialogue with partners in other countries."

The SNSF has therefore been promoting international cooperation for a long time. It supports joint projects by researchers in Switzerland and abroad. It takes part in multinational programmes and in European joint programmes. It enables researchers to spend time abroad by awarding fellowships to doctoral students and postdocs like Daniel Kienzler. At the end of 2018, the SNSF was funding 2,000 international projects and fellowships. In a large number of other projects, researchers maintain a dialogue with colleagues abroad. At year-end 2018, over 6,000 different network activities were taking place in SNSF projects (see page 7).

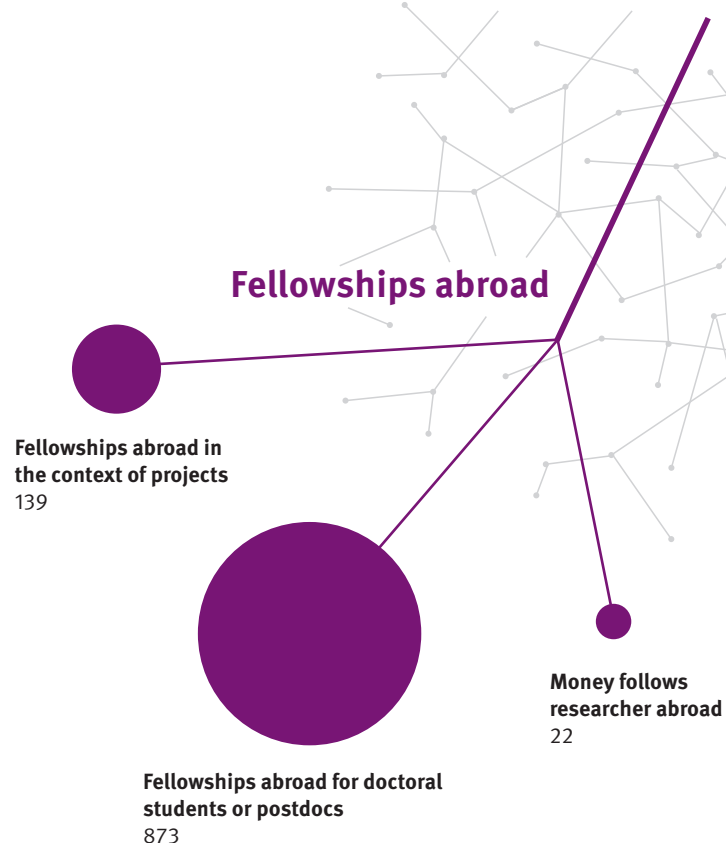


International expertise

The SNSF also promotes internationality through its selection procedure, under which the vast majority of applications for financing are reviewed by experts from other countries. Furthermore, the National Research Council and its evaluation commissions have an international membership. Having this outside perspective gives Swiss research extra momentum and speeds up its development.



How the SNSF promotes international cooperation



Network activities

Number of international network activities* in all SNSF projects
6,464

70% of all 9,260 network activities are international.

*Network activities are, for example, information exchanges, joint publications and the sharing of infrastructures. Such international network activities are carried out within the scope of joint projects with international partners and fellowships abroad, as well as in many other SNSF projects.

Joint projects and fellowships abroad: as at 31.12.2018
Network activities: in SNSF projects that ended in 2018

"Thanks to SNSF funding, thousands of Swiss scientists have networks in Europe and throughout the world," says Jean-Luc Barras. "That enables them to incorporate the latest findings and trends into their projects and deliver high-quality research." The SNSF thus makes a key contribution to maintaining Switzerland's leading position in scientific research – which is one of the goals of the new international education, research and innovation strategy adopted by the Federal Council in 2018.

"Thanks to SNSF funding, thousands of Swiss scientists have networks in Europe and throughout the world."

Jean-Luc Barras, head of the SNSF's International Co-operation division

Strengthening dialogue

The SNSF also revised its international strategy during 2018. Its aim is to facilitate greater idea and knowledge sharing at global level wherever it makes sense to do so, and to further intensify its efforts in support of academic freedom. "This will increase research capacity both at home and abroad," says Jean-Luc Barras.

The strategy also sets out principles. Scientific quality is the primary criterion that the SNSF applies when deciding whether to finance an international project. Partner organisations have to operate a peer review system and comply with high ethical standards. Project results and data will be freely accessible. The SNSF is particularly keen to support cooperation with research groups from several countries.

Key impetus

The fellowship that Daniel Kienzler received was key in bringing fresh impetus to his scientific career. His new project has passed the SNSF's strict selection procedure and been awarded one of the coveted Ambizione grants. Since November 2018, Kienzler – assisted by a doctoral student – has been setting up an experiment to inspect and survey hydrogen molecules using quantum logic methods at ETH Zurich. In the course of his work, he exchanges information with researchers in Switzerland, Germany, France, the United Kingdom and USA. "This project would never have happened if I hadn't gone to Boulder."

28%

of the newly approved projects in the SNSF's Project funding scheme involve research partners abroad (2018)

65%

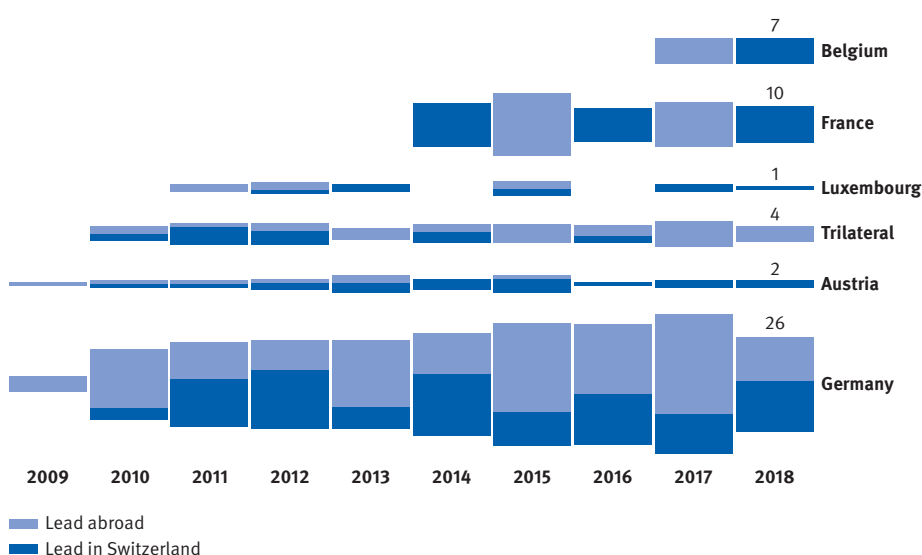
of all network activities in SNSF-funded projects are with the European Union (2011–2018)

From abroad to Switzerland

Researchers in other countries can also apply for SNSF funding if they plan to carry out their project in Switzerland or are employed by a Swiss research institution. In addition, foreign project partners are given the opportunity to spend some time working in Switzerland. Universities and research centres such as PSI or CERN benefit from these researchers. Finally, the SNSF can support fellowship recipients for a period of three to twelve months following their return to Switzerland.

The new programme SPIRIT

In early 2019, the SNSF launched SPIRIT, the Swiss Programme for International Research by Scientific Investigation Teams. The programme aims to strengthen networks with low- and middle-income countries. Funding is awarded to original, team-oriented projects in all disciplines submitted by teams from two to four countries. Through the project, the SNSF is contributing to the education of young researchers and helping to promote equal opportunities. Each year, it will finance up to 12 projects lasting a maximum of four years and costing 500,000 francs.



Simplified submission of applications, smaller workload for evaluators: in Lead Agency projects, either the SNSF (dark blue) or the funding organisation in the other country takes the lead. As of 2019, a Lead Agency agreement is in place also with Poland and Slovenia.

Swiss research needs Europe

Horizon Europe, the next European research framework programme, is due to start in 2021. SNSF Director Angelika Kalt talks about how important it is for our country.

Swiss research is in an internationally leading position. Why is it so important for Switzerland to participate in Horizon Europe?

Horizon Europe will promote multinational cooperation between different research groups in globally challenging areas such as health or climate change. It will also contribute to developing and linking research infrastructures. Another aspect of Horizon Europe is the focus on innovation, which will open up opportunities especially for SMEs and start-ups. Fellowships will enable researchers to work abroad for some time. And: the programme will offer Swiss-based researchers the chance to continue competing with the best in Europe. This competition plays an important role in maintaining and enhancing scientific quality.

Would Swiss participation in Horizon Europe be at risk if Switzerland and the EU did not sign an institutional framework agreement?

The framework agreement is not directly linked to Horizon Europe. All the same, we would be expecting serious consequences should there be no agreement, similar to those triggered by the acceptance of the mass immigration initiative in 2014.

What happened back then?

The EU did not let Switzerland participate in the research framework programme Horizon 2020, which started in 2014. In the course of 2014, Switzerland was able to obtain partial association. A return to full association followed in 2017. But the partial exclusion had a harmful effect on research in Switzerland.

In what way?

Compared to the previous programme, Swiss participation in Horizon 2020 projects went down from 3.2% to 2.4% in

the period up to March 2018. Grants went down from 4.3% to 3.5%, and fewer Swiss researchers were invited to collaborate in research networks.

But the government took replacement measures?

Yes, it covered the costs of Swiss researchers participating in European projects. But the legal insecurity meant that many European researchers chose not to collaborate with Switzerland. Should Switzerland be excluded again, this is likely to repeat itself.

Couldn't the SNSF expand its funding if this happened?

That's what we did in 2014. But such measures are only a short-term fix. We cannot replace European collaboration and competition with national schemes. Swiss research needs both SNSF funding and European funding: in the absence of national funding, Swiss research would be less competitive. In the absence of European funding, Swiss research would

lack international integration and the necessary quality standards.

Swiss research needs Europe. Does Europe need Swiss research?

In order to compete with North America and Asia, Europe needs all countries to collaborate closely. If the EU excludes Swiss research, it will weaken European research.

SwissCore: link with Brussels

Since 1995, SwissCore has been operating as Switzerland's contact office in Brussels. One of the team's main goals is ensuring that Swiss researchers are able to participate in European framework programmes. SwissCore is funded by the SERI, the SNSF and Innosuisse.



SwissCore team (from left to right): Elisa Pérez Rastoll; Céline Bleiker; Jonathan Lamprecht; Julia Grünenfelder; Martin Müller (director); Rahel Byland; Anja Belaey; Tawanda Daka Eziwhou; Otto Bruun.