

ETH Domain

AN INTERNATIONAL SUCCESS STORY

There are close links between academic excellence, international networking and openness. Thanks to the strong cooperation between the institutions of the ETH Domain and partners at home and abroad, they are able to hold their own internationally and attract the world's top talent as outstanding teaching and research institutions. This also has a positive impact on the Swiss economy with its demand for specialists in STEM fields. Maintaining stable international relations – especially with the European Union – is key to ensuring that excellent research and innovation policy conditions are guaranteed in the future as well.

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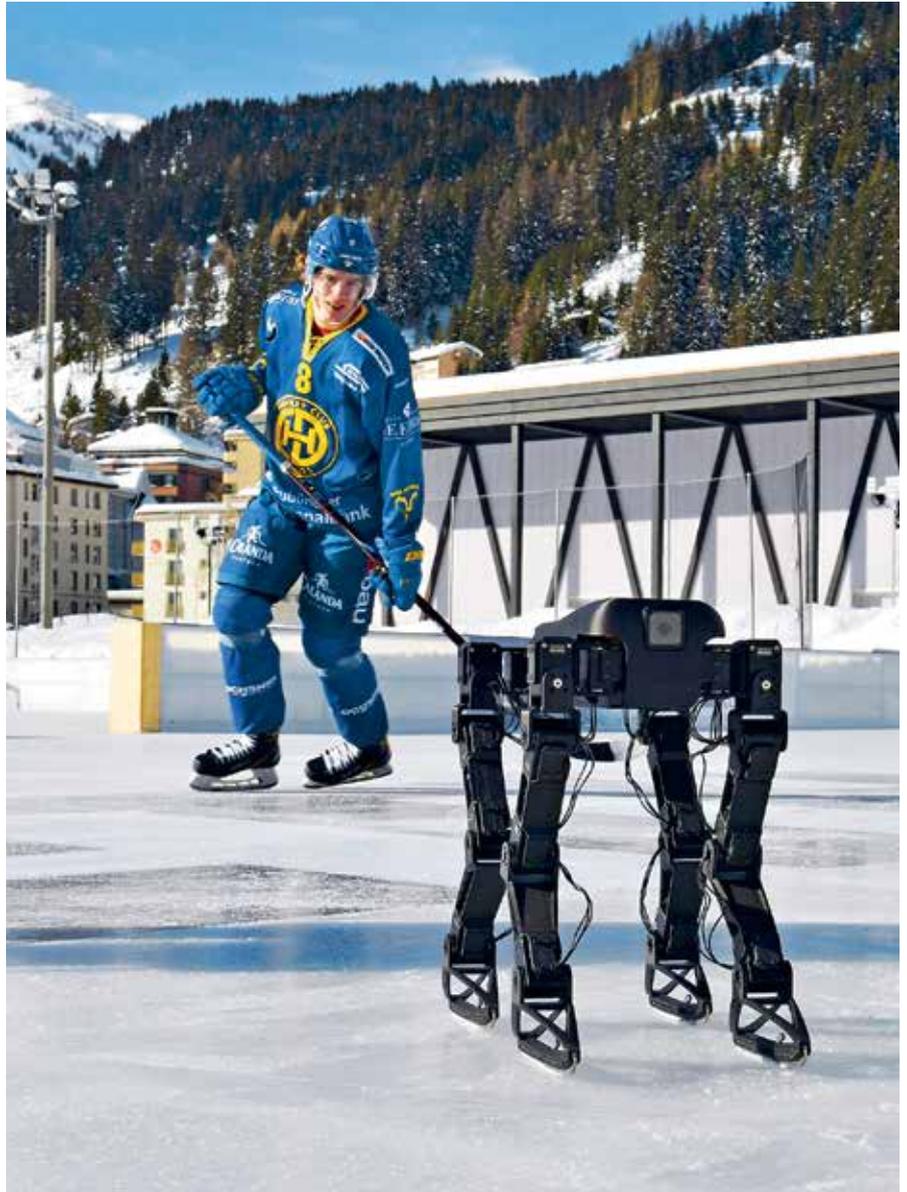
One third of the ETH Domain patents analysed are among the 10% of the world's most important patents in their respective technologies.

There are many ways and means of measuring the quality of universities and research institutions. The comparison with other academic institutions all over the world is an essential part of this. The ETH Domain performs impressively in this contest. Year on year, the two universities in Zurich and Lausanne occupy top positions in the rankings, which are compiled by different organisations applying different methods and benchmarks (see Fig. 16 and 17, p. 91). ETH Zurich came 11th in the THE World Ranking in 2018 and EPFL 35th. While the THE uses indicators for teaching, research and citations, the QS World Ranking focuses on the reputation of academic institutions and graduates among their employers. ETH Zurich achieved as high as seventh place in 2018, and the EPFL was ranked 22nd.

The excellent performance of the ETH Domain is also confirmed by other benchmarks. The results of the study on "Analysis of the patent portfolio of the ETH Domain" published at the end of 2018 are particularly encouraging. Commissioned by the ETH Board, BAK Economics AG analysed the portfolio of patents within the ETH Domain. Deviating from a purely quantitative method of counting, a Big Data approach was applied and the significance of the individual patents for 17 different technologies was weighted and compared, among other things, against the figures for ten of the world's leading universities and research institutions. The analysis shows that about one third of the ETH Domain patents analysed are among the 10% of the world's most important patents in the respective technologies. Only the two private American universities Harvard and MIT have higher figures. A close look at the distribution of patents reveals that the ETH Domain leads the international comparison in more than one third of the technologies analysed.

The Computational Robotics Lab at ETH Zurich has built the first robot with the ability to skate.

> Andreas Eggenberger/
ETH Zurich



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About two thirds of the publications from the ETH Domain are the product of international cooperation. This type of work has the most important impact.

Great importance of international networking in research

If quality and performance are measured by international comparison, this global element is a key aspect of academic activity and of central importance for top academic results. This is illustrated by the bibliometric analysis commissioned by the ETH Board with a view towards the intermediate evaluation of the ETH Domain in 2019. The study, prepared by the Centre for Science and Technology Studies (CWTS) at Leiden University, analyses the number of articles and reviews written by researchers from the six institutions of the ETH Domain between 2007 and 2016 and quantifies their impact on the basis of the number of citations up to and including 2017. The collaboration between scientists from the ETH Domain and specialist colleagues from research institutions all over the world is crucially important.

The bibliometric analysis shows that about two thirds of all publications were the result of international cooperation. This type of study has the greatest impact, it was therefore cited very frequently. Without exception, all the institutions of the ETH Domain achieve scores in the analysis of their scientific output that are well above the global average in some cases.

The European research framework programmes should also be mentioned in connection with the distinctly international cooperation culture that exists within the ETH Domain. Collaborative Horizon 2020 projects often involve universities, colleges and industrial partners from different countries working together. The institutions of the ETH Domain can not only point to an above-average success rate for the project proposals they have worked on, they also often take the lead in the multinational working groups.



WEF 2019:
EPFL President Martin Vetterli in discussion with moderator Patrizia Laeri, Marianne Janik, Country Manager Microsoft Switzerland and Olivier Bousquet, Head of Google AI Research in Europe (from left to right).

› Andreas Eggenberger /
ETH Zurich

The EPFL researchers Jenifer Miehbradt (left) and Carine Rognon with the fly jacket. A sensorised exoskeleton with artificial intelligence software for intuitive control of drones. The technology is patent pending.

› Markus Mallaun /
ETH Board

Worldwide appeal – specialists for Switzerland

The high quality of teaching and research in the ETH Domain enables the institutions to be successful in bidding to attract the “best minds”. Scientists often come from abroad to work in Switzerland’s outstanding research environment. Two thirds of the professors at ETH Zurich and EPFL are researchers from abroad. At the same time, the international make-up of staff is the result of the excellent standing of the teaching and research institutions compared to other institutions worldwide, and an essential basis for future academic excellence.

It is not only Switzerland as a research centre that benefits directly from the global appeal of the ETH Domain. One year after graduating from ETH Zurich or EPFL, some 60% of foreign students are employed in Switzerland. These STEM specialists are not only highly sought-after, they also make a significant contribution to keeping the innovative potential of the Swiss economy high. Former employees of the ETH Domain remain very active when employed as researchers in Swiss industry. According to the BAK study, 3,800 company patents list at least one researcher who used to work for the ETH Domain and previously filed patents there.

Education policy – securing international openness through agreements

The fact that Switzerland has held the top ranking in the “Global Innovation Index” for many years, thanks in part to its domestic and foreign graduates from the ETH Domain, should not disguise the fact that international competition for research and innovation-friendly framework conditions is tough. A study published this summer by the Swiss Academy of Engineering Sciences (SATW) showed that larger companies in Switzerland are increasingly outsourcing their research and development to countries offering more and more state incentives to do so.

The study commissioned by SERI on “Research and Innovation: Comparing Switzerland With Other Innovation Regions” (Centre for European Economic Research, May 2018) shows that other regions of the world are continually making up ground. The study concludes that Switzerland can only compensate for its structural disadvantages as a small state by opening itself up accordingly.

Maintaining this openness is of the utmost importance to the ETH Board. The success of the ETH Domain is essentially based on strong international cooperation and direct competition with the world’s leading research institutions. Stable and reliable relations, especially with the European Union, are vital for this. The report recently published by SERI on Switzerland’s participation in the European research framework programmes makes it clear that, as a result of the partial exclusion from Horizon 2020 following the adoption of the mass immigration initiative, our country was involved in significantly fewer projects overall and also saw a drop in project coordination. In order to ensure intensive academic exchange across national borders, it is very much hoped that Switzerland will be able to be involved in the next EU research framework programme as a fully associated country once again.