“An international, dynamic setting drives creative and innovative research.”

Dr Fritz Schiesser
President of the ETH Board
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**Driving Success**

The ETH Domain’s competitive advantage is derived from three things: the unparalleled talent of its students, faculty, and staff; its first-rate facilities and infrastructure; and a culture that encourages transdisciplinary collaboration. Together, these form the foundation for a group of six world-class institutions that are international leaders in developing solutions for many of today’s challenges.

People are certainly the most important component of this system. Developing young scientific talents and providing them with an excellent work environment is one of the key functions of the ETH Domain. The photographs that are shown throughout this report illustrate just this: smart and talented researchers shown in a few of the Domain’s state-of-the-art facilities — the birthplaces of rich and fruitful collaborations.

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**Page 6/7 | Eawag Dübendorf**

Prof. Juliane Hollender is Head of the Department of Environmental Chemistry at Eawag, and adjunct professor at RWTH Aachen, Germany. She received her EngD at the Technical University of Berlin. Her research focuses on assessing the environmental impact of organic components in water bodies, particularly relating to their fate and behavior in the hydrological cycle and the reduction of their accumulation in water bodies. Prof. Hollender is shown in Forum Chriesbach, the energy-efficient, 2000 Watt Society-compatible headquarters of Eawag.

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**Page 18/19 | EPFL**

Professor Olaf Blanke is Head of EPFL’s Laboratory of Cognitive Neuroscience. He studied medicine in Münster, Berlin and Paris, obtaining his MD and PhD from the Free University of Berlin. In collaboration with the University Hospital of Geneva, he investigates how self-consciousness is linked to brain mechanisms of multisensory bodily perception, using techniques from virtual reality, physiology, and brain imaging. He is shown in a student lounge in EPFL’s communications building.
Cathleen Hoffmann is a scientist at Empa’s construction chemistry laboratory. She received her master’s in civil engineering at the Technical University of Dresden, Germany, and her research includes the optimization of production methods for recycled concrete, reusing construction waste from civil engineering. Ms Hoffmann is shown in front of a 250 litre laboratory concrete mixer “Eirich R V 11” in the facilities of Empa’s lab of concrete/construction chemistry.

Prof. Lucas Pelkmans is an assistant professor at ETH Zurich’s Institute of Molecular Systems Biology. He studied medical biology at the University of Utrecht, the Netherlands, and received his PhD in Biochemistry at ETH Zurich. In his lab, he pioneers the field of human single cell genetics using image-based RNAi screening, particularly suited to study cellular communication pathways. Prof. Pelkmans is shown in the main lecture building of ETH Zurich’s Science City, currently being redeveloped as a sustainable campus.

Dr Cinthia Piamonteze is a beamline scientist at the Swiss Light Source (SLS) at PSI. Before coming to PSI she was a postdoctoral fellow at Lawrence Berkeley National Laboratory in California. She received her PhD in physics from the University of Campinas, Brazil. Her research topic is the study of nanomagnets under high magnetic field and low temperature using X-ray magnetic circular dichroism (XMCD). Dr Piamonteze is shown in the experimental hall of the SLS.

Dr Jens Turowski is a postdoctoral researcher at WSL. A native of Germany, he studied physics at the University of Cambridge, UK, where he also received his PhD in fluvial geomorphology. His current research focuses on bedload transport in steep streams. Dr Turowski is shown in the hydraulic laboratory of WSL.
Dear Reader

The sciences perpetually fascinate us. The popularity of scientific research becomes particularly obvious to us in the ETH Domain when we open the doors of our labs and research facilities to the public, pupils, and our alumni. The projects presented in this Focus 07/08 — many of which are conducted as collaborations with partners and users around the globe — illustrate perfectly this power to inspire. Examples of these include: ETH Zurich’s leading role in establishing sustainable land management systems in the Okavango Delta and Eawag’s project to help manage hazardous gases dissolved in Lake Kivu, both essential contributions to environmental studies and management in Africa; the employment of Empa technology to prevent severe vibrations of the world’s longest cable-stayed bridge spanning the Yangtze River; and the direct application of WSL’s erosion prevention methods in the Tibet autonomous region of China. In addition, the TCV tokamak facility at EPFL, a key component of the European Fusion Research Program, and the Solar Furnace Facility at PSI are examples of the many contributions the ETH Domain makes to understanding and shaping the future of the global energy system.

Strong Performance

For the performance period 2004—2007, the Swiss Federal Council and Swiss Parliament have decided on three priorities for the ETH Domain. These are: cultivating first-class teaching that can draw top international students; strengthening its leading position in international research; and creating excellent working conditions for leading researchers and promising junior scientists. The projects featured in this report prove how successful the ETH Domain has been in driving interdisciplinary research of great national and global importance during the performance period 2004—2007. In addition, the annual monitoring that the ETH Board conducts with the six institutions confirms the excellent performance of the ETH Domain in fulfilling its mandate in research and education in 2007. Two leading university rankings, the THES-ranking of the education magazine The Times Higher Education and the Shanghai Jiao Tong University ranking, regularly list ETH Zurich and EPFL in top positions. ETHZ has already been ranked as the best continental
European university for a number of years, and the Times recognized EPFL for the number of citations that its publications in engineering sciences received in 2007.

I am especially pleased that the research institutes also excel in top-level research. Consider the materials and technology research institute Empa as an example of the qualities exemplified by all four research institutes. According to a recent study by the Institute for Technology Management at the University of St. Gallen, Empa is among the top-ten research laboratories in Europe, making it an attractive destination for scientists from around the world. This is important, as an international, dynamic setting drives creative and innovative research.

Our students contribute directly to exciting innovations such as the development at ETH Zurich of a solar-powered microairplane — the SkySailor project — or in EPFL’s collaboration with the Alinghi team to develop new materials and software to analyze and optimize the shapes of sails. However, we need to recognize some areas where progress needs to be made. For example, despite its increasing importance in a variety of academic areas, information technology suffered a 19% decrease in enrollment since 2004. In this specialty, we must facilitate a quick turnaround, particularly by attracting more female students. High schools and universities, however, have already begun laying the groundwork for improving access to studies in information technology.

**Strategic Priorities**

I want to express my gratitude to the six institutions in the ETH Domain for all this work and for countless other accomplishments too numerous to mention here. I thank all the researchers, students, and staff for the outstanding commitment and performance they show every day on the job.

I also want to thank the previous ETH Board for its dedicated work over the past four years, and, in particular, my predecessor Prof. Alexander J.B. Zehnder. The Board, which was appointed for the first time according to the partially revised law governing the Federal Institutes of Technology from 2003, took its task very seriously, for example by setting strategic priorities with the founding of competence centers in the ETH Domain and by candidly supporting discussions about its own roles and responsibilities. These debates have raised questions that we want to answer in the coming performance period by an even more intense dialogue between the ETH Board and ETH Zurich, EPFL, and the four research institutes, PSI, WSL, Empa, and Eawag.

**Creativity and Collaboration**

Both Swiss society and politicians are quite aware of the value of the ETH Domain, but policy makers, more than ever, want accountability on priorities and expect results from science. From my service in the Swiss Council of States and the Swiss National Science Foundation (SNSF) I am very familiar with the ETH Domain, and I am convinced that the creativity and collaboration of its institutions will continue to enable future success and synergy, improving even further the reputation of the ETH Domain as an internationally and nationally acknowledged center of excellence for education, research, and technology transfer. The inherent complexity of the questions that modern science needs to answer calls for a close collaboration between basic and applied sciences. The ETH Domain can and will continue to tackle this task, and has already done so successfully, as evidenced in the present report.

Strategic leadership and oversight in this regard lie with the ETH Board, for universities are not only institutions based upon scientific freedom, but also think tanks to benefit society. To further the dialogue with society, even to demand it, is the task of the ETH Board.

But now I want to invite you to delve into this exciting report — in a sense, a small part of the above mentioned dialogue. And I want to conclude with special thanks for the foresight government shows by spending considerable resources on education, research, and the future of Switzerland.

Dr Fritz Schiesser, President of the ETH Board

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The ETH Domain is comprised of six Swiss research and teaching institutions dedicated to excellence in science and engineering. The Domain receives the majority of its funding from the Swiss Confederation, and is accountable to the Swiss Federal Council via a performance mandate agreement between the ETH Board and the Federal Council.

- The two large research universities in the Domain are based in the German and French speaking parts of Switzerland. Through their research and educational activities these institutions are strengthening the innovative foundation of Swiss society and economy and educating tomorrow’s leaders.

- The four national laboratories are focused on topics considered essential for the economic success and sustainable development of Switzerland and the international community. They collaborate closely with the two research universities and many researchers hold dual appointments between the institutions.

- The ETH Domain has established transinstitutional national Competence Centers that leverage the combined intellectual resources of the entire Domain to deeply study topics of great importance to Switzerland and the global community. The centers’ dynamic teams create solutions for increasingly vital issues that benefit society at large, and provide a competitive edge for their industry partners.

- Strategic oversight of the ETH Domain is the responsibility of the ETH Board.
**ETH Board (Board of the Swiss Federal Institutes of Technology)**
The ETH Board is the strategic unit elected by the Swiss Federal Council to manage the ETH Domain. It defines the Domain’s strategic direction and allocates the funding provided by the Swiss Confederation to the six institutions.

**Research Universities**
- **ETH Zurich** is a science and technology university with an outstanding research record. Eighteen thousand people from eighty nations study, research, and work at ETH Zurich. About 350 professors in sixteen departments focus their research and teaching mainly in the fields of engineering sciences and architecture, system-oriented sciences, and mathematics and natural sciences.
- Like its sister institution in Zurich, **EPFL** has three missions: education, research and technology transfer at the highest international level. The school brings together on campus more than 10,000 people from all over the world. By its novel structure, EPFL stimulates collaboration between students, researchers, and entrepreneurs. These interactions have given rise to new and groundbreaking work in science, technology, and architecture.

**Research Institutions (National Laboratories)**
- **Paul Scherrer Institute (PSI)** makes an important contribution toward managing energy resources in a manner that is safe, sustainable, and environmentally friendly. Several large-scale, world-class research facilities are located at PSI, making it one of the leading user laboratories for the global scientific community.
- **WSL** is dedicated to forest, snow, and landscape research. Its goals are to find ways to sustainably manage landscapes and forests, and to better understand natural hazards, such as avalanches, that typically occur in mountainous regions.
- **Empa** is a materials science and technology research institution. Its key research areas are nanotechnology, adaptive material systems, materials for health and performance, understanding the technosphere—atmosphere interface, and materials for energy technologies.
- **Eawag** is an aquatic research institute. It focuses on continuously improving concepts and technologies pertaining to water use, and aligning ecological, economical, and social water interests.
The ETH Domain experienced significant changes in its leadership in 2007. A new ETH Board was elected and four of its six institutions saw changes in their top leadership. Combined with continuing high-level accomplishments in research, teaching, and outreach, illustrated with just a few examples here, the position of the ETH Domain as a global leader in research and education has been strengthened.

Janet Hering becomes the new director of Eawag.

Empa technology is employed as part of a Swiss–Chinese collaboration to prevent severe vibrations of the world’s longest cable-stayed bridge, which spans the Yangtze River.

PSI researchers discover a short sequence of amino acids crucial for the folding of “coiled-coils.” These proteins are important in many biological processes including DNA transcription, signal transduction, and intracellular transport.

A study led by WSL researchers shows that on average Switzerland warmed at twice the rate of the Northern Hemisphere over the last 30 years, contributing to the decrease of alpine glaciers.
EPFL's Global Health Institute is one of eleven institutions worldwide to receive funding to fight tuberculosis from the Bill and Melinda Gates Foundation.

James Kirchner becomes the new director of WSL.

Ralph Eichler, the former director of PSI, assumes the presidency of ETH Zurich.

The Nobel Peace Prize is awarded to former U.S. vice president Al Gore and the Intergovernmental Panel on Climate Change. Sharing the honor was Andreas Fischlin of ETH Zurich, a "coordinating lead author" for the IPCC report's second book.

The Swiss Federal Council elects the new ETH Board with Fritz Schiesser as president.

Eawag supports the establishment of a research center in Senegal developing new sanitary systems for the city of Dakar and the surrounding region.

Joël Mesot is elected the new director of PSI. He will assume his position in summer 2008.
The nine objectives of the mandate are:

The ETH Domain will provide teaching which is top-class and attractive to students in an international comparison.
Training and developing young scientific and technical talent, serving the needs of Swiss society, contributing to sustainable development and the advancement of scientific knowledge form the core of the mission of the ETH Domain. For this it is important to promote new forms of teaching and learning, and to explicitly recognize the quality of teaching in appointing, promoting and remunerating faculty.

The ETH Domain will strengthen its leading position in international research.
Research is an intrinsically uncertain endeavor. Thus the ETH Domain recognizes that it must support novel methods and unconventional approaches in order to facilitate new discoveries. Collaborations across disciplines and institutions throughout Switzerland, Europe and the world are essential to achieve this.

In order to foster Switzerland’s innovative strengths, greater technological and commercial use will be made of the knowledge created in the ETH Domain and cooperation with industry will be strengthened.
Partnerships between the academic and private sectors have a critical role to play in innovation. Through operating centers of excellence in future-oriented fields, cooperation with national knowledge and technology transfer (KTT) offices, optimizing its ability to provide top-class services, and involving entrepreneurs and early stage capital providers, the ETH Domain seeks to convert research and development results generated in its laboratories into commercially exploitable products.

The ETH Domain will commit itself to bilateral international cooperation.
The institutions of the ETH Domain each have a role to play in strengthening teaching and research relationships with global partners including India, China, Russia and South Africa.
The ETH Domain will create attractive and family-friendly working conditions, promote equality of opportunity and develop young scientific talent. The workforce of the ETH Domain must reflect Swiss society. Towards that, the ETH Domain will increase the proportion of women in management, increase by one quarter the proportion of women at all stages in the academic career path, develop a strategy to achieve these quantitative goals, and promote flexible working patterns that make it possible to combine work and family life at all levels and for both genders.

The ETH Domain will actively commit itself to the creation of the Swiss Higher Education Area. Collaboration is at the core of the mission of the ETH Domain. Thus cooperation in teaching and research and the coordination of research and educational activities across Swiss institutions will maximize resources and increase efficiencies throughout the ETH Domain.

The ETH Board will allocate funds to the institutions on a performance basis. The ETH Board will develop a transparent and equitable system for the allocation of financial resources that is agreed upon with the institutions and will take both the core missions and strategic priorities of each institution into account.

The ETH Domain will strengthen its national and international profile by exploiting the dynamism of its autonomous institutions and thereby increasing its presence in society and the scientific community. The ETH Domain will maintain and foster an atmosphere, through shared values and mutual trust, which encourages the independent and responsible exercise of entrepreneurial freedom by its autonomous institutions for the benefit of science and society.

The ETH Domain will strengthen the role played by its institutions in society. The ETH Domain must continue to play a central role in society. This includes communicating the value of research, discovery and education, enhancing the image of engineers in society, and maintaining an open door culture with many and varied activities which enable an ongoing and rich dialogue between science and society.

The ETH Board is also responsible for managing the real estate portfolio in a manner consistent with the broader goals of the ETH Domain. In order to ensure the efficient and economic use of funds on individual buildings, the ETH Board coordinates actual requirements, guided by needs for functionality, quality, availability and economic viability. This includes taking into account the cultural value of a structure as well as maintaining its economic value.

Reporting, Evaluation and Monitoring

The ETH Domain must transparently report on its operations in three parts:

- An annual report which is a critical self-evaluation of the ETH Domain by the ETH Board, associated with a statement of account regarding the use to which annual federal funding has been put.
- Halfway through the term of a performance mandate, the ETH Board draws up a self-evaluation report which provides an overview of the extent to which the objectives of the performance mandate have been achieved.
- A final, comprehensive report on the achievement of the performance mandate, which may include participation by external experts.

The Federal Department of Home Affairs checks the extent to which the performance mandate has been achieved and, in the case of non-compliance, requests that the Swiss Federal Council take appropriate action.
ETH Zurich wants to become even more international in the future — not only among the faculty, but in the student body as well. With this goal in mind, how do you plan to select international students?

Eichler: Indeed, we want to become even better known and more attractive internationally, but not as a university for the masses. Rather, we are interested in the “high potentials”, the best talents — and their preselection is important. ETH Zurich is the leading house of all Swiss universities for academic relations with China and Japan, which means that we have rich experience in that region. In many other regions in the world, we preselect candidates in conjunction with local partners. Concerning talent search, strategic decisions regarding which international universities we want to build alliances with are, of course, important as well.

And what is the response, for example, in the Asian countries?

Eichler: Very positive. At the moment, we are even deliberating developing a campus in Singapore. We would like to initiate projects there that generate value precisely because they are led with an international perspective. The importance of this collaboration for our Asian partners is evident in the fact that Singapore might assume a major part of the financing. But it will take some time to hammer out all the details. EPFL is also involved here.

The Swiss Confederation is the main funder of ETH Zurich. What benefits does Swiss society gain from the international exchange?

Eichler: The needs of the private sector are important, for example. Our Swiss firms rely on 80 percent of their business from exports and also have branches abroad. Because of this, they want either Swiss engineers with an education that integrates an international perspective or foreign specialists that are familiar with Swiss culture, and thus can be particularly successful in subsidiaries of Swiss companies abroad.

Which topics does ETH Zurich currently see as priorities?

Eichler: Although we want to engage on all of the important topics of our time, ETH Zurich must define its strategic priorities. For example, we see energy technology, medical technology, integrated risk management, and instruments for environmental management as key research topics.

Which disciplines does this concern in particular?

Eichler: In many cases, this is not tied to individual disciplines. The major challenges of society such as climate change, mobility, or risk management can only be approached in an interdisciplinary manner. A key to this is appointing faculty members who come with the right ideas, and giving them the necessary freedom to implement those ideas. Students are usually glad to take part in such ventures.

Prof. Eichler, as president of ETH Zurich you are also a member of the ETH Board. What challenges do you see here?

Eichler: The ETH Board is a kind of bridge between the ETH Domain and the political arena. Policy makers would like to set guidelines, while the scientists would like to stay independent. The ETH Board filters and moderates both sides. On the one hand, we explain the activities of the ETH Domain to policy makers, and on the other, we explain the requests from the policy side to the ETH Domain. This is an exciting task in which the two university presidents have a special responsibility.
Within just a few years, EPFL’s ranking in the list of technology institutes rose significantly. What made this success possible?

Aebischer: It was in the second half of the twentieth century that we became a federal university and set the course for becoming one of the two major technology institutes in Switzerland. By taking advantage of our self-governed status, EPFL radically reorganized to gain a strong position in science and engineering. It has been able to play a pioneering role in Europe by offering its professors stimulating conditions, with a strong focus on young scientific talent. The introduction of assistant professorships and tenuretrack programs has been a primary draw. But in addition to young researchers, our rise in the rankings has also motivated many senior professors to leave other renowned institutes to embark on more, let’s say, adventurous work at EPFL, where they have the opportunity to spearhead completely innovative projects. Our ranking offers a glimpse of the productivity, creativity, and enterprising spirit at the EPFL. The growing number of doctoral students, which is a success of the postgraduate school we founded some years ago, also points to our success.

It is quite surprising to find oneself in a very Swiss environment — with the lake, the mountains, and the little villages — while at the same time in an astoundingly international setting.

Aebischer: That’s the Swiss paradox! We are located in a Swiss region with only some two million inhabitants. But, of course, we want to be counted among the most advanced global institutes, and therefore we have to attract the smartest brains. Thanks to our geographic and political environments, we do indeed attract people from all over the world, currently from about 110 countries. Joining EPFL means becoming part of a unique international experiment. But of course, we don’t try to do that single-handedly. In our region there are other global organizations such as the European headquarters of the United Nations, the International Olympic Committee, CERN and other top universities. Very few geographic areas offer a similar cosmopolitan culture and high quality of life. The conditions at Lake Geneva are really quite remarkable.

A Campus with a Clear Entrepreneurial Spirit

And that also attracts corporations?

Aebischer: It is certainly one of the main draws. We will soon start to construct an “Innovation Square” which will be comprised of four new buildings. Our Science Park houses about a hundred companies and is completely occupied — in fact, we have to provide new facilities in the fall to satisfy the demand. It’s not only start-ups, but also big companies that situate their incubators and research centers on campus in order to work closely with EPFL. Among the most recent new members are some renowned companies including Nokia, Swiss Post, Logitech, Debiopharm and several other investors. That is the fruit of long-term efforts, and our campus distinguishes itself with its clear entrepreneurial spirit. This begins with the training of our students in management principles, continues with efficient models of collaboration between academic research facilities and industry, and culminates in recent successes such as the selling of an EPFL start-up company for 100 million dollars or our contribution to the victory of the Alinghi at the America’s Cup. These achievements show the capacity of the campus to develop new technologies and spur on projects with a strongly competitive academic component.
The ETH Domain on the Global Stage

Global Alliances for Research and Education

In 2007, the ETH Domain continued to play a prominent role in research and education worldwide. Through global research alliances with other major academic institutions, partnerships with the private sector, and through the broad impact that its graduates have in business and society around the globe, the ETH Domain is a major contributor to the world’s intellectual, social, and economic development.

The ETH Domain as an Incubator

ETH Zurich has become a prolific incubator for innovative and durable start-up companies. In October 2007, the 20th and 21st companies emerged from its research and development laboratories, making this year the single most productive year in terms of spin-offs as of yet. Compared to 1996, when just six ETH Zurich-related companies were founded, it is evident that the research and development operations within the ETH Domain are producing results that have clear and direct application to societal demands. Even more impressive is that the companies that have emerged from ETH Zurich have tended to be enduring, speaking to the strength of the fundamental technology and economic models upon which they are based. With these companies now playing a role on the Swiss, European, and global stages, the ETH Domain can now claim a spot as a major incubator for new businesses, on par with other internationally renowned research institutions.

In a similar vein, in late 2007, two start-up enterprises from EPFL were invited to participate at the upcoming World Economic Forum in Davos, Switzerland. Selected from among thirty-nine companies, Anecova and Innovative Silicon planned to meet and network with some of the planet’s most powerful and influential leaders. Innovative Silicon specializes in ultra-dense memory technology and Anecova’s major innovative technology promises significant advances in the treatment of infertility.

User Laboratories

The international influence of the ETH Domain is not limited to start-ups and economic impacts. The Paul Scherrer Institute (PSI) is home to some of the most important user laboratories in the global research community. User laboratories are large-scale research facilities so complex and expensive that only a few of any given type exist in the world. The Swiss Light Source (SLS) is one of four such user laboratories located at PSI. Housing one of the most powerful synchrotron radiation sources in the world, the SLS provides high-powered photon beams of exceptional brightness and stability that are invaluable to a wide variety of different research programs. In 2007, hundreds of international scientists made use of the SLS facility in their research. With the development of the new X-ray
The research and education programs of the ETH Domain are contributing to global economic development as well as scientific discovery.
Refining Models of Forests and Oceans
ETH Zurich is playing a central role in a project that focuses on expanding knowledge of the topography and evolution of the ocean surface. The Ocean Surface Topography Mission is a satellite that will perform extensive altimetric measurements of sea level changes, providing new information on ocean tide models, improved understanding of ocean circulation and may possibly shed light on the potential impacts of global climate change. Central to the success of this mission is the work of a team at ETH Zurich that is designing and validating new protocols for how data from this satellite is calibrated and assimilated into ocean surface models. The GEdetic MOBILE Solar Spectrometer (GEMOSS) system is a new ground-based technology developed by ETH Zurich and collaborators at the Institute for Analytical Sciences (ISAS) in Berlin, Germany, that enables researchers to accurately measure and compensate for the presence of atmospheric water vapor when conducting space-based remote sensing experiments.

The landscape of Switzerland, Europe, and indeed the globe is continuously changing in ways that are directly or indirectly related to human influences. While much discussion has been given to how open space is disappearing and being replaced by constructed environments, researchers at WSL are using field monitoring and computer models to examine the dynamics of forests that reestablish themselves after land that has been used for agricultural or other purposes is subsequently abandoned by humans. If current rates of forest regeneration continue, Switzerland and Central Europe may for the first time in centuries see the reestablishment of large, continuous tracts of forest which could have unforeseen impacts on biodiversity and certain rare plant and animal species.

Monitoring the Built Environment
Empa is part of a large-scale international initiative to utilize new wireless monitoring technologies to assess the condition of highway bridges and integrate monitoring data into the latest generation of simulation systems. With the goal of enhancing the safety of highways and bridges, an international group of experts, including representatives from the U.S. Federal Highway Administration, met at Empa in late 2007 to discuss how improvements can be made in...
the monitoring and assessment of the condition of civil infrastructure. As part of the meeting, the participants visited several bridges including the Salginatobel bridge in the Prättigau region of Switzerland (designated a World Monument) and the Stork bridge in Winterthur, which has been fitted with a total of seven Empa-developed sensors that monitor the structure and can raise an alarm if any strong vibrations or other unusual motions are detected.

Understanding the Future of Global Energy
The TCV tokamak (Tokamak à Configuration Variable) is the largest experimental facility at EPFL and a major component of the European Fusion Research Program, which is exploring the viability of fusion-derived energy. This facility is home to a number of major research programs designed to bring us closer to realizing the potential of nuclear fusion as a clean, abundant energy source. The EPFL team has also been broadening the impact of its expertise in plasma physics, beyond fusion research. This diversification covers the development of processes suitable for industrial use, including the deposition of silicon films, the formation of decorative coatings for the watch industry, and the deposition of diamond coatings on tools.

PSI’s Solar Technology Laboratory is also engaged in research into possible future energy technologies. The Solar Furnace Facility and the High-Flux Solar Simulator are two technologies used at PSI to understand how solar energy can be harnessed for renewable energy production. The Solar Furnace Facility captures incident sunlight and concentrates it, so it can be used as a source of high-temperature process heat for interesting processes such as “solar cracking” and “solar gasification”. The High-Flux Solar Simulator is a tool that simulates the heat transfer characteristics of highly concentrating solar systems, such as the Solar Furnace, while enabling experimental work under controlled conditions and during the absence of sunlight.
From Measurement to Management of Environmental Systems

Protecting Natural Resources
Research at the ETH Domain has helped further our understanding of how environmental systems function and how they can be managed more effectively. By employing the latest technologies for monitoring the health and status of ecosystems, the Domain has taken great strides in designing sustainable management processes that can help ensure the long-term survival of Earth’s natural systems.

Studying Natural Systems in the Developing World
Using field monitoring data and computer modeling techniques, researchers at ETH Zurich are working to establish sustainable land and water management practices in the Okavango Delta region of Botswana—an area of vast wetlands and diverse flora and fauna that is threatened by human encroachment and global climate change. This research uses complex computer models to understand and reproduce the annual flooding patterns of the region as a function of local hydrology and climate. To validate the models, they were calibrated against the patterns of water coverage seen in satellite images. This modeling allows researchers to study scenarios and assess the potential impact of future interventions both upstream, where dams are to be built, as well as in the delta itself, where dredging, papyrus cutting, and other human activities are considered.

Eawag researchers have been studying Lake Kivu in East Africa for several years for its exceptional characteristics, including billions of cubic meters of carbon dioxide and methane dissolved in its deep waters. These gases may present a serious hazard, as an eruption could blanket the lake surroundings in noxious fumes and could kill—in the worst case—up to two million people. Eawag researchers are supporting the government of Rwanda and engineers through workshops and modeling studies to establish guidelines for how the methane—potentially worth 20 to 30 billion dollars—could be safely harvested. In addition, Eawag will support the local authorities in monitoring the effect of the gas extraction on the lake’s density stratification and ecological integrity.

At WSL, soil bioengineering—using plants to either prevent erosion and superficial sliding or to restabilize slopes affected by these processes—has been a research subject for over three decades. This research has recently found direct application in the Tibet autonomous region of China, where desertification poses a serious threat to the economy, the biodiversity and, particularly, to the local people. A new approach developed by WSL is currently being considered to reduce the impacts of wind erosion and subsequent desertification. In particular, efforts are focused on the reestablishment of a protective vegetation cover supported by symbiotic fungi.
The long-term objectives are to regain arable land, as well as to reduce dust emission and thus improve air quality and enhance living conditions for the local people.

**New Technologies for Environmental Monitoring**

ECOS, a joint venture between EPFL and WSL, is an interdisciplinary research laboratory focusing on the organization, functioning, and dynamics of terrestrial plant, animal, and microbial communities, particularly as they relate to population, habitat, and ecosystem processes. This type of multidisciplinary research involves ecologists, biologists, geographers, and hydrologists. On a related front, EPFL is also a key contributor to the Swiss Experiment project, an environmental monitoring initiative that involves researchers from EPFL, ETH Zurich, WSL, Eawag and Microsoft Research. In addition to gathering new experimental data, the project will develop a shared IT infrastructure — a common storage, management, and analysis platform, dedicated to environmental data — which will be made available to research teams and agencies across Switzerland.
Competence Centers of the ETH Domain

Research to Spur Innovation

The Competence Centers of the ETH Domain and the National Cooperative Projects couple basic scientific research and private sector activities with the goal of building alliances between basic and applied research and spurring innovation in business and society. The centers’ dynamic teams create solutions for increasingly vital issues that benefit society at large, and provide a competitive edge for their industry partners.

ETH Domain Research Partners with the Private Sector

The ETH Domain has cultivated extensive technological research capabilities in a variety of disciplines. However, like most academic institutions, the Domain can benefit greatly from increased cooperation with the private sector in order to realize the full economic and social benefit of the technologies and knowledge that it develops.

To address this, the ETH Domain formed Competence Centers, unique research enterprises that link the institutions of the ETH Domain, other Swiss academic and research organizations, and private sector enterprises, to collectively study topics of scientific, economic, or social importance.

The Competence Center Energy and Mobility (CCEM) (leading house: PSI) was founded in 2006 and focuses on technologies designed to increase energy efficiency, reduce greenhouse gases and other emissions, and lessen dependence on fossil fuels through the use of renewable energy sources. To accomplish these goals, research programs are currently organized around the themes of mobility, heat and buildings, fuels based on renewables, and electricity. Specific examples of CCEM research programs include studies of new diesel engine technologies, cost-efficient thin-film photovoltaics, advanced energy-efficient building techniques for new houses and retrofits, and the use of biomass for transportation fuel.

The Competence Center Environment and Sustainability (CCES) (leading house: ETH Zurich) was founded in 2006 and is organized around five major Education and Research Units: Climate and Environmental Change; Food, Environment, and Health; Natural Hazards and Risk; Natural Resources; and Sustainable Land Use. CCES research projects include studies of biosphere–geosphere interactions, efforts to understand the impact of environmental “stealth” pathogens on food safety and human health, and sustainable land-use practices in mountain regions. The CCES also engages in a number of strategic networking activities including establishing high-level strategic agreements with emerging countries, coordination with other large-scale initiatives and centers in the U.S. and Europe with similar focus and drive, and planning for strong cooperation with Swiss universities starting in 2008.
The Competence Center for Materials Science and Technology (CCMX) (leading house: EPFL) was founded in 2006 and aims to reinforce ties between academia and industry in Switzerland. It currently supports twenty-seven different research projects. The projects are organized around the themes of: Surface, Coatings, and Particles Engineering; Materials for the Life Sciences; Metallurgy; Materials for Micro- and Nanosystems; and Nano- and Microscale Materials Characterisation. CCMX is also committed to continuing education and provides training opportunities at all levels for students, engineers and scientists in line with the needs of industry and academia. A joint EPFL–ETH Zurich master’s orientation on molecular bioengineering/biomaterials has been initiated.

SystemsX.ch, founded in 2006, is a joint initiative of ETH Zurich, EPFL, PSI, the Friedrich Miescher Institute, the Swiss Institute of Bioinformatics, and the Universities of Basel, Berne, Fribourg, Geneva, Lausanne, and Zurich. Its goal is to make Switzerland a global leader in the field of systems biology. Systems biology is a multidisciplinary field that brings together researchers from biology, chemistry, physics, mathematics, engineering, and medicine to study the workings of entire biological systems.

Biomedical Imaging (NCCBI), founded in 2006, is to be developed into a major research and teaching initiative that includes (but is not limited to) the imaging activities at the Arc Lémanique, the Center for Biomedical Imaging at EPFL and the Center for Imaging Science and Technology at ETH Zurich. Its primary goal is to advance biomedical imaging processes to provide new capabilities in medicine and biology. Central to its research activities are programs to develop imaging technologies and analysis tools across multiple scales of biomedical relevance, i.e., from studies at the molecular and cellular level to applications in humans.

Nano-Tera.ch, the national cooperative project for information technologies and nanotechnologies, was founded in 2007. The ETH Board, EPFL, and ETH Zurich jointly organize this project with contributions from other universities and research institutions from all parts of Switzerland. Nano-Tera.ch comprises the institutional foundation for research, design, and engineering of novel electrical and mechanical components at the micro-/nanoscale, with the goal of integrating these new technologies into terabyte-scale data systems. This will allow rapid processing of huge amounts of data, revolutionizing environmental monitoring, weather forecasts, security systems, and the health care system.
Applying Student Research to Real-World Problems

Students in the ETH Domain have the opportunity to participate in all aspects of research projects focused on energy, mobility, and other sustainability-related topics. From formulating the early concepts to driving the final execution of an idea, students can play a central role in the development of cutting-edge technologies, or in the application of those technologies to interesting problems.

Cutting-Edge Mobility Research in the ETH Domain

Students in the ETH Domain frequently find themselves at the cutting edge of energy and mobility research. For example, at ETH Zurich, the SkySailor project has undertaken the design and construction of a solar-powered microairplane capable of exploration in a variety of physical environments, including possibly the exploration of Mars. SkySailor, which is fully autonomous in its navigation and power generation, is equipped with solar cells covering its wings. These allow it to capture energy from the sun to supply power to the propulsion system and the control electronics, and to charge a battery with surplus energy — an energy supply which is critical during night-time operation.

Students also played a central role in the America’s Cup victories of the Swiss yacht Alinghi. Leading up to the 2003 America’s Cup victory, EPFL collaborated with the Alinghi team on the development of new materials, software to analyze the shapes of sails and other key technologies. They built upon this relationship for the 2007 race, leading to massive efforts in terms of scientific research and strategic implementation of new technologies. More than fifty professors, scientists, and students from seven EPFL laboratories were directly involved in research or testing projects that contributed to Alinghi’s successful defense of the title in the 2007 races. The work included research projects of more than one dozen EPFL students, and was the subject of several bachelor’s and master’s degree theses.

Framework for Student Research Initiatives

Seed Sustainability is a program that provides students the opportunity to participate in research projects that focus on practical sustainability-relevant issues including energy and mobility.

Students, supervised by faculty to ensure scientific rigor, can participate in seed projects as part of their bachelor-, master- or PhD-level studies. Ideas for the projects are typically generated by external partners who play an important role as collaborators in the seed projects and provide practical perspectives that inform the development of applicable results. A coordinator from Seed Sustainability manages the project and mediates between the academic and
Students are the main driving force behind much of the research at the ETH Domain. They bring fresh approaches and new ideas to help tackle pressing research and technology challenges.

Seed Sustainability was initially launched at the first annual meeting of the Alliance for Global Sustainability (AGS) World Student Community in 2001 as a student initiative. In 2004, it became a spin-off of ETH Zurich. Since then, it has been professionally run as an independent non-profit organization with its business location at ETH Sustainability, the Centre for Sustainability at ETH Zurich. Seed Sustainability also offers its services to other Swiss universities with which Seed Sustainability maintains institutional partnerships.
Facilitating the Global Flow of Information

The ETH Domain offers a variety of opportunities for Swiss students to spend part of their academic careers studying abroad and for international students to visit Swiss institutions. Of particular interest are programs that provide opportunities to exchange ideas and information with students and colleagues from the developing world.

International Exchange Programs

International exchange programs in the ETH Domain are primarily based on the guidelines of the SOCRATES-ERASMUS program, of which Switzerland has been a silent partner since 1995. The exchange programs in the Domain, both for students from other institutions to study in the ETH Domain and for ETH students to study elsewhere, include more than 110 bilateral student exchange agreements with European partners. Funding is provided by the Swiss government for both outgoing and incoming students.

In addition to the student exchange programs, both ETH Zurich and EPFL offer their faculty and researchers opportunities to participate in international conferences, professional development programs, and other exchange activities in order to help them stay abreast of the latest developments from outside of Switzerland.

ETH Zurich leverages its participation in international networks such as the International Alliance of Research Universities (IARU), to forge partnerships with institutions such as the Imperial College of Science, Technology and Medicine in London and the Swiss Baltic Net, a program to provide support for young researchers from the Baltic countries to visit ETH Zurich.

EPFL also has more than thirty agreements with institutions outside Europe, including institutions in North America, China, India, and Russia. Last year, EPFL welcomed more than 440 incoming exchange students and sent more than 320 students abroad, most of whom spent a full year studying in a foreign institution.

International Professional Development Programs at the ETH Domain

Each summer, dozens of students from around the world spend their summer at PSI through a collaboration with the International Association of the Exchange of Students with Technical Experience. In addition to participating in research activities and lectures given by leading PSI researchers, the program also provides the visitors with social opportunities, including barbecues with Swiss colleagues and opportunities to stay with a host family to learn more about Swiss customs and culture. This type of program can serve as a valuable recruiting tool, as it helps participants in making an informed decision about potentially working at PSI at some stage of their career.
By providing a framework for university students, faculty, and staff from around the globe to interact with each other, the ETH Domain is well positioned to address many of the environmental, economic, and social challenges faced by the world.
Leading by Example

Each institution in the ETH Domain has one or more campus areas that facilitate cutting-edge research and education (see overleaf). To contribute to shaping the campus of the future, the ETH Domain also plays a central role in the International Sustainable Campus Network: a global platform for university and private sector organizations to meet, exchange ideas, and establish a network in order to facilitate the establishment and operation of truly sustainable campuses worldwide.

Education in a Sustainable Environment

The six institutions of the ETH Domain are each working to research and design solutions to the sustainability challenges faced by the global community. Whether it is through basic research and development activities, through the evaluation of new corporate or governmental policies, or through the multidisciplinary education provided to their students, all of the institutions of the ETH Domain are invested in plotting a course for a sustainable future.

The institutions of the Domain also recognize that in order for their research and education activities to realize their full potential, they must occur in a physical environment that reflects their commitment to sustainability. Students must see that the institutions are willing to invest resources and energy into campuses that are themselves sustainable. At the same time, public and private sector organizations are also recognizing the same need. If they are to publicly proclaim their commitment to environmental and social responsibility, they must also be willing to look inwards and critically evaluate their own sustainability footprint in a clear and unbiased manner.

The International Sustainable Campus Network

The International Sustainable Campus Network, hosted by Novatlantis — Sustainability in the ETH Domain, was organized to provide a framework within which any organization that operates a physical campus can meet, exchange ideas and work together on projects related to sustainable campuses and infrastructure. Started in 2007, the network already has a membership that includes some of the most prestigious academic institutions in the world, and in its next phase of growth is seeking the participation of major corporations.

Central to the success of the International Sustainable Campus Network are its four working groups. These working groups, which are comprised of individuals from the participating organizations, are focused on four topics:

- Finance and Decision Mechanisms
- Change Management
- Standards and Guidelines
- International Sustainable Campus Award Program
Through its support for the ISCN, the ETH Domain and its six institutions are playing a leadership role in encouraging the continued development of sustainable campuses worldwide. Whether in the academic, public or private sectors, the physical environments within which people live, work and play have great influence in how we learn, make decisions and live our lives.
The campus of ETH Zurich has two primary locations, central Zurich where 150-year old buildings designed by Gottfried Semper are the highlight, and the new Science City campus at Zurich Höngg, located seven kilometers away. The central campus houses the central administration for the university, as well as the departments of geosciences, electrical engineering, and the main library. Science City’s modern campus includes many buildings designed to meet strict standards for energy efficiency. Approximately 10,000 people both work and live on this campus which was carefully designed to create new ways for science, industry and the public to interact.

EPFL, in its idyllic location on the shores of Lake Geneva, brings together a campus of more than 10,000 people. Because its campus is contiguous with that of the University of Lausanne, the two campuses together have 25,000 students thus contributing nearly 10% of the population of the larger Lausanne metropolitan area. EPFL is rich in new technology, research infrastructure, academic partnerships and other numerous forms of collaboration, making it a particularly attractive environment for start-ups and technology enterprises. The Science Park on campus is home to more than 100 enterprises and numerous investors.

PSI is located in Villigen, Switzerland, approximately midway between Zurich and Basel. Its campus is located on both sides of the Aare with a bridge connecting the eastern and western section. More than 1,500 people work at PSI. Being Switzerland’s largest user laboratory it is home to four major large-scale facilities: a third generation X-ray synchrotron source (SLS), the only continuous spallation neutron source worldwide (SINQ), the world’s most powerful continuous-beam μSR facility (SμS) and a meson factory for fundamental nuclear and elementary particle physics (LTP). PSI hosts about 2,000 guest researchers annually, many of them visiting several times per year. Therefore PSI has set up a guest house to accommodate visiting scientists on site, enabling them to spend the maximum of their time utilizing PSI’s world-class research facilities.
Empa’s main campus is located adjacent to Eawag. Some important construction was completed over the past year, including the renovation of the laboratory and administration buildings and the continuing efforts to build a new engine test bed in the motor building. The Swiss Parliament also recently gave its approval to begin the renovation of acoustic building number 2. Empa maintains additional research facilities in St. Gallen and the Materials Technology Section in Thun. Altogether, Empa has approximately 850 staff members who work on its various campuses.

Eawag’s main campus, where 320 employees work, is located in Dübendorf Switzerland near Zurich. In 2006 the Eawag headquarters moved into a new building Forum Chriesbach, a state-of-the-art low energy building, which serves as a meeting center with offices, seminar and instruction rooms, a cafeteria and the shared library of Eawag and Empa. Eawag also runs research facilities with about 80 staff members at Kastanienbaum near Lucerne.

WSL’s primary campus is located in Birmensdorf. The campus consists of fifteen buildings including offices, labs, cafeterias, and lecture halls. The 10 hectare campus is landscaped and maintained in a manner consistent with its environmental mission. An arboretum that surrounds the campus contains more than 180 different kinds of trees and shrubs and numerous plants are grown in its test gardens for research purposes. Additional research facilities are located in Davos (SLF), Bellinzona, and Lausanne and WSL maintains test areas in Vallée de la Sionne in the canton Valais, Lochzeen on the Walensee, Alptal near Einsiedeln and Stillberg near Davos. Eighteen additional research areas throughout Switzerland are used for long-term research on forest ecosystems. About 500 people work at WSL.
## Organization Chart 2008

### Federal Department of Home Affairs

### Board of the Swiss Federal Institutes of Technology
- Dr Fritz Schiesser, president
- Prof. Paul Herrling, vice president

### Group of Research Institutions

<table>
<thead>
<tr>
<th>Institution</th>
<th>President/Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH Zurich</td>
<td>Prof. Ralph Eichler (president)</td>
</tr>
<tr>
<td>PSI</td>
<td>Prof. Joël Mesot (director from 1 August 08)</td>
</tr>
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<td></td>
<td>Martin Jermann, Dipl. Phys. (director ad interim until 30 July 08)</td>
</tr>
<tr>
<td>Empa</td>
<td>Prof. Louis Schlapbach (director)</td>
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<tr>
<td>EPFL</td>
<td>Prof. Patrick Aebischer (president)</td>
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<tr>
<td>WSL</td>
<td>Prof. James Kirchner (director)</td>
</tr>
<tr>
<td>Eawag</td>
<td>Prof. Janet Hering (director)</td>
</tr>
</tbody>
</table>
The ETH Board 2008

From left to right

Thierry Lombard, member since April 2006
Prof. Janet Hering, member since September 2007
Prof. Ralph Eichler, member since January 2004
Dr Barbara Haering, member since January 2008
Prof. Paul Herrling, vice president since January 2008, member since January 2004
Dr Fritz Schiesser, president since January 2008
Prof. Patrick Aebischer, member since January 2004
Dipl. Ing. Beth Krasna, member since January 2003
Dr Markus Stauffacher, representative of the university assemblies of ETH Zurich and EPFL, member since January 2007
Dr h.c., Dipl. Ing. Hans Hess, member since January 2008

One vacancy
On 28 November 2007 the Swiss Federal Council elected the president, the vice president, and the other members of the ETH Board for the performance period 2008–2011. Dr Fritz Schiesser was elected president; Prof. Paul Herrling, who has been a member since 2004, was elected vice president; and Dr Barbara Haering and Dr h.c., Dipl. Ing. Hans Hess were elected as new members of the board. In addition, six members were re-elected for this period. One vacancy is still to be filled.

Prof. Konrad Osterwalder stepped down from his position on the ETH Board when his obligation as the interim president of ETH Zurich was completed on 31 August 2007. At the end of 2007, Prof. Alexander J.B. Zehnder (president), Prof. Ernst Buschor (vice president), Prof. Adriano Aguzzi, and Dr Monica Duca Widmer also resigned from the ETH Board. The Swiss Federal Council acknowledged these participants for their contributions to the development of the ETH Domain and their great efforts in an environment that was, at times, challenging.

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Presidency and Members of the ETH Board 2008

Dr Fritz Schiesser
Swiss citizen (born 1954), president of the ETH Board

Fritz Schiesser received his PhD in law and has been a professional freelance lawyer and notary since 1998. He was elected schools inspector in 1984 and school president in Haslen in the canton of Glarus in 1986. In 1987 he was elected into the criminal court. From 1990 to 2007, Fritz Schiesser was a member of the Swiss Council of States and, in this function, was president of the committee for economy and taxes, and member of the committee for science, education, and culture, the committee for legal affairs, the delegation at the interparliamentary union, and the parliamentary senate of the European Council. From 2003 to 2004, he was president of the Swiss Council of States.

As a long-time president of the foundation council of the Swiss National Science Foundation (SNSF) and a member of the committee for science, education, and culture, Fritz Schiesser became very familiar with Swiss academic and research policy. Schiesser has been president of the ETH Board (with a 70 percent time commitment) since January 2008. He is elected until 2011. In addition, he is a member of the boards of directors of the Fondation de Famille Sandoz, Glarus, Grüenthal Group, Mittlidi in the canton of Glarus, Swiss Mobiliar, Bern, and Hefti AG, Haslen in the canton of Glarus.
Prof. Paul Herrling
Swiss citizen (born 1946), vice president of the ETH Board

After completing his PhD in natural sciences at the University of Zurich in 1975, Paul Herrling received a postdoctoral certificate from the University of California, Los Angeles in 1977. He joined Sandoz Pharma in 1975 and, ten years later, was elected director of the Sandoz Research Institute in Bern. Following that, he held numerous leading positions within this pharmaceutical company, until, in 1996, he was assigned to direct the integration of the research departments of Sandoz and Ciba-Geigy. From 1997 to 2002, Herrling was the director of research at Novartis Pharma AG and, since 2003, has been the director of corporate research at Novartis International AG. In addition to his assignments in the private sector, he became a professor for drug discovery science at the University of Basel in 2001. Since then, he has held additional positions at the Harold Dorris Neurological Institute, the Scripps Research Institute, and the School of Pharmacy in London.

Paul Herrling has been a member of the ETH Board since 2004 and vice president since January 2008. He is elected until 2011. Furthermore, he is the chairman of the board of directors of the Novartis Institute for Tropical Diseases, Singapore, and a member of the boards of directors of the Novartis Institute for Functional Genomics, La Jolla, Novartis Pharmaceuticals, New York, and Novartis Pharma Switzerland AG, Bern. Herrling is also a member of the boards of trustees of the Fondation Maison de la Chimie, Paris, and the Paul Ehrlich Foundation, Frankfurt, and a member of the university council of the Philipps-University Marburg.

Prof. Patrick Aebischer
Swiss citizen (born 1954), member of the personnel committee

Patrick Aebischer studied medicine and neuroscience at the Swiss universities of Fribourg and Geneva. In 1984 he continued his research at Brown University (Rhode Island, USA), where he ultimately became chairman of the Department of Artificial Organs, Biomaterials, and Cellular Technology. In 1992 he returned to Switzerland for an assignment as a professor at the University of Lausanne and director of the Division Autonome de Recherche Chirurgicale (DARC) and the Centre de Thérapie Génique at the University Hospital Vaud (CHUV). His research is focused on the development of cell and gene transfer methods for the treatment of neurodegenerative diseases. Aebischer is also the founder of three biotechnology companies and was elected to the board of directors of Lonza Group AG in March 2008. Since March 2000 he has been the president of EPFL.

Patrick Aebischer has been a member of the ETH Board since 2004 and is elected until 2011. He is also a member of scientific organizations in Europe and the United States, namely the Swiss Academy of Medical Sciences and the American Institute for Medical and Biological Engineering.
Prof. Ralph Eichler  
Swiss citizen (born 1947), member of the personnel committee

Ralph Eichler concluded his studies in physics with a PhD from ETH Zurich. After research assignments at Stanford University (California, USA), DESY (German Electron-Synchrotron), and the Institute for Intermediate Energy Physics of ETH Zurich, and an assignment as a project leader at PSI, he was elected professor of physics at ETH Zurich in 1989. His research career then led him back to DESY, this time as director of the international collaboration H1. Subsequently, he became vice director from 1998 to 2002 and director of PSI from 2002 to 2007. In September 2007 Eichler became president of ETH Zurich.

Ralph Eichler has been a member of the ETH Board since 2004, initially as the representative of the four research institutes and since September 2007 as president of ETH Zurich. He is elected until 2011. He is a member of the board of directors of Belenos Clean Power Holding AG in Biel and a member of the German Helmholtz Senate.

Dr Barbara Haering  
Swiss and Canadian citizen (born 1953), member of the audit committee

Barbara Haering studied natural sciences and geography from 1972 to 1975 at ETH Zurich and went on to receive a postdiploma degree in regional planning and a PhD from ETH Zurich. In addition to her research assignments, Haering became involved early on in political life. In 1979 she was elected into the Canton Council of Zurich and, from 1990 to 2007, she was a member of the Swiss National Council. Haering’s professional career includes research and consulting assignments as a freelancer and as an employee of INFRAS AG, before she became a delegate for the company management to the board of directors of the consulting company econcept AG, Zurich, in 1998.

Barbara Haering has been a member of the ETH Board since January 2008 and is elected until 2011. She is also president of the foundation board of the Institute des Hautes Etudes en Administrations Publique (IDHEAP), honorary member of the Academy of the Humanities, individual member of the Academy of the Technical Sciences, member of the foundation board of the Swiss National Science Foundation (SNSF), and, in April 2008, was elected by the EU Commission into the new European Research Area Board.
Prof. Janet Hering

American citizen (born 1958), member of the personnel committee

Janet Hering received a bachelor of arts degree from Cornell University and a master of arts degree (chemistry) from Harvard University. She received her PhD at the Massachusetts Institute of Technology – Woods Hole Oceanographic Institution Joint Program in 1988. Hering then came to Switzerland for three years for a postdoctoral research appointment at Eawag. For the next fifteen years she was professor of environmental sciences at the University of California and at the California Institute of Technology, where she ultimately also served as the executive officer for the Keck Laboratories for Bioengineering, Environmental Science and Engineering, and Materials Science. In 2007, Hering returned to Switzerland as a professor for environmental biogeochemistry at ETH Zurich and as director of Eawag. Her research includes the biogeochemical properties of trace elements in natural waters and technologies for the removal of inorganic contaminants from potable water. From 2004 to 2007, she was an associate editor of the scientific journal *Environmental Science and Technology*.

Janet Hering has been a member of the ETH Board as the representative of the four research institutes since September 2007 and is elected until 2011.

Dr h.c., Dipl. Ing. Hans Hess

Swiss citizen (born 1955), member of the audit committee

Hans Hess received a master’s degree in material engineering from ETH Zurich and an MBA from the University of Southern California. In 2005, he received an honorary professorship of Wuhan University in China, and in 2001 an honorary PhD from Ferris State University (Michigan, USA). His professional career began in 1981 in research and development at Sulzer. In 1983 he moved to Huber & Suhner, where he was a production manager until 1988 and later the director of a business unit. In 1996, seven years after he began working with the Leica Group, he was named CEO and in 1999 he became a board of directors delegate of Leica Geosystems AG. At the end of 2005, during the acquisition of this company by a Swedish corporation, Hess resigned from his functions and started his own internationally active consulting company Hanesco AG in Pfäffikon in the canton of Schwyz.

Hans Hess has been a member of the ETH Board since January 2008 and is elected until 2011. He is also president of the boards of directors of Burckhardt Compression, Comet, and Reichle & de Massari, as well as a member of the boards of directors of Geberit and Schaffner. Hess' other roles include: foundation board mandates at the Vontobel Foundation and the ISPRS-Foundation; vice president of Swissmem; a member of the management board committee of the Swiss Employer Union; president of the advisory board of WTT CH Ost; and a member of the Swiss armament committee.
**Dipl. Ing. Beth Krasna**  
Swiss and American citizen (born 1953), president of the audit committee

Beth Krasna received a master’s degree in chemical engineering from ETH Zurich in 1977 and a master’s degree in management from the Massachusetts Institute of Technology. From 1994 to 1996, she was CEO of Valtronic Holding; from 1996 to 1998, managing director of Symalit AG; from 1998 to 2000, general director of Sécheron SA; and from 2001 to 2003, CEO of Albert Inc. SA. Today she works as an independent board member.

Beth Krasna has been a member of the ETH Board since 2003 and is elected until 2011. In addition, she is a member of the boards of directors of the Banque Cantonale Vaudoise, Lausanne, Bonnard & Gardel Holding SA, Lausanne, COOP, Basel, and Raymond Weil SA, Grand-Lancy. She is a foundation board member of the Fondation en Faveur de l’Art Choréographique and a member of the Swiss Academy of Technical Sciences.

**lic. rer. pol. Thierry Lombard**  
Swiss citizen (born 1948)

Thierry Lombard studied economics at the University of Geneva. Subsequently, he worked for several banks in Switzerland, Canada, and the United States until he joined the private bank Lombard Odier & Cie in 1976. Since 1995 he has been a senior partner of the private bank Lombard Odier Darier Hentsch & Cie, which received its new name after a merger in 2002. He is the chairman of the board of partners and is responsible for the audit, risk management, and financial services. He is also responsible for the strategic leadership of human resources, is a chairman of the pension funds of the company, and is jointly responsible for the leadership of the communication unit.

Lombard was the chairman of the Geneva Financial Center and vice chairman of the Geneva Stock Exchange and the Swiss Admission Board.

Thierry Lombard has been a member of the ETH Board since 2006 and is elected until 2011. In addition, he is vice president of the international airport Geneva, president of the foundation Brocher, vice president of the foundation EPFL+, and a member of the strategic consulting board of EPFL. Lombard is also a member of the board of Family Business Network International, president of the Foundation for the International Committee of the Red Cross (IKRK), and a member of the Centre for Humanitarian Dialogue.
Dr Markus Stauffacher
Swiss citizen (born 1952), member of the personnel committee

Markus Stauffacher started his scientific career by studying zoology, botany, geology, and palaeontology at the University of Basel, followed by a PhD in zoology from the University of Bern. Subsequently, he built up a research group for laboratory animal ethology at the University of Zurich. As a senior scientist since 1994, Stauffacher is responsible for education and research in ethology, animal husbandry, and animal protection at ETH Zurich. He has teaching assignments in the departments of agricultural and food science, environmental sciences, and biology at the ETH Zurich, and is responsible for the research of the Vetsuisse Faculty at the University Zurich. For his education assignments he received the “Goldene Eule” of ETH Zurich in 2006 and 2007, a popularity award from students for faculty. He also won the award for scientific journalism of the University of Bern in 1988, the von Düring research award in 1993, and the Felix Wankel animal protection research award in 1994.

Markus Stauffacher has been a member of the ETH Board since 2007 as delegate of the university assemblies of ETH Zurich and EPFL. He is elected until 2011.
**Corporation Governance**

**Transparent Leadership and Information**
As the strategic leadership unit of the ETH Domain, the ETH Board is similar to a board of directors. Its reporting on corporate governance follows the corporate governance guideline of the Swiss Stock Exchange where this guideline is meaningfully applicable to the ETH Domain, which is not a stock-listed company.

**Organizational Structure and Ownership**
The ETH Domain consists of six institutions, each of which is an individually incorporated entity. These institutions include two large research universities, the Swiss Federal Institute of Technology Zurich (ETH Zurich) and the Swiss Federal Institute of Technology Lausanne (EPFL), as well as four research institutes: the Paul Scherrer Institute (PSI); the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL); the Swiss Federal Institute for Materials Testing and Research (Empa); and the Swiss Federal Institute for Environmental Science and Technology (Eawag). The owner of all the institutions of the ETH Domain is the Swiss Confederation.

**Strategic Leadership**
According to the law governing the Federal Institutes of Technology, the ETH Board is responsible for the strategic leadership of the ETH Domain. In this respect its role can be compared to that of a board of directors that oversees a group of companies that have science, education, and innovation as their core business. The president and the members of the ETH Board are elected by the Swiss Federal Council. Information regarding the executive and non-executive members of the ETH Board can be found on pages 41–47.
In December 2007, the Swiss Federal Council elected a new ETH Board. This new board assumed its responsibilities as of 1 January 2008, and consists of the following members:

<table>
<thead>
<tr>
<th>Name</th>
<th>Nationality</th>
<th>Member since</th>
<th>Elected until</th>
<th>Audit Committee</th>
<th>Personnel Committee</th>
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<tr>
<td>Prof. Alexander J.B. Zehnder (president)</td>
<td>CH</td>
<td>2004</td>
<td>2007</td>
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<tr>
<td>Prof. Ernst Buschor (vice president)</td>
<td>CH</td>
<td>2004</td>
<td>2007</td>
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<tr>
<td>Prof. Patrick Aebischer</td>
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<tr>
<td>Prof. Adriano Aguzzi</td>
<td>IT</td>
<td>2003</td>
<td>2007</td>
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<tr>
<td>Dr Monica Duca Widmer</td>
<td>CH</td>
<td>1998</td>
<td>2007</td>
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</tr>
<tr>
<td>Prof. Ralph Eichler</td>
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<td>Prof. Janet Hering</td>
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<td>Thierry Lombard</td>
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<td>Dr Markus Stauffacher</td>
<td>CH</td>
<td>2007</td>
<td>2011</td>
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</tbody>
</table>

- President of the committee □ Member of the committee

One member is still to be appointed by the Swiss Federal Council.

The executive management of each one of the ETH Domain's institutions is the responsibility of their executive committee members. More information on the people and processes involved can be found in the institutions' reporting.
Operating Principles of the Board and Its Committees
The ETH Board is responsible for the strategic leadership of the ETH Domain. It performs its functions led by its president, who is supported by the vice president, the other board members, and the board’s staff. The ETH Board usually holds five meetings per year, each lasting one to two days. In 2007, ten meeting days were held in total. Key issues discussed by the board include strategy and budget, the generation of nomination recommendations to the Swiss Federal Council, and the nomination of professors and executive committee members of the six institutions of the ETH Domain. Additionally, dialogues are held twice per year between the president of the ETH Board, the general secretary of the Federal Department of Home Affairs (EDi), the state secretary for education and science, and the director of the Swiss Federal Finance Administration.

The ETH Board has formed two committees, the audit committee and the personnel committee, in order to strengthen its strategic functions.

The Audit Committee supports the ETH Board in financial controlling and surveillance of risk management, internal control system and financial auditing work. The committee is usually comprised of three members of the ETH Board who are independent of the board’s executive group, and can involve additional people in a consultative capacity. The Audit Committee usually convenes for three to five days per year. In 2007, six meeting days were held. The head of the internal audit group also attends the meetings.

The Personnel Committee supports the ETH Board in the assignment of executive positions at the institutions, and in fulfilling its function as an employer. The committee also maintains contact with the social partners. The Personnel Committee is comprised of one of the ETH Board members as the committee president, the presidents of ETH Zurich and EPFL, a representative of the research institutes, and a representative of the university assemblies. The Personnel Committee usually convenes one to three days per year. In 2007, one meeting day was held. The head of the human resources service of the ETH Board usually attends the meetings.

ETH Appeals Committee
The ETH appeals committee is another committee in the ETH Domain. It is administratively assigned to the ETH Board, and rules on appeals against decisions or decrees of bodies of ETH, EPFL, and the research institutes. The complaints as a rule involve personnel and university law issues. The rulings of the ETH appeals committee can be appealed at the Swiss Federal Administrative Court level. The commission is an independent judicial authority that has its office in Bern. Its seven members are elected by the ETH Board. Until 31 December 2007, these were Theodor Keller (president), Françoise Chardonnens (vice president), Reto Caflisch, René Monnier, Yolanda Schärli, Moïra Monika Schuler, and Brigitte von Känel. The ETH appeals committee reports to the ETH Board.

Assignment of Responsibilities, Information, and Control Mechanisms
As the strategic unit of the ETH Domain, the ETH Board determines the strategy of the ETH Domain within the framework of the performance mandate, represents the ETH Domain in interactions with politicians and administrative agencies of the Swiss Confederation, enacts directives for and conducts the strategic controlling, approves the development plans of the ETH Domain, and supervises their realization. In addition, the presidents of ETH Zurich and EPFL and the directors of the research institutes are appointed by the Swiss Federal Council based on recommendations from the ETH Board. The ETH Board nominates all other members of the executive bodies of the two universities and the vice directors of the research institutes. It also nominates professors based on recommendations from the universities. The ETH Board concludes agreements on objectives with the universities and the research institutes and allocates the funding provided by the Swiss Confederation based on budget requests by the universities and the research institutes. All these and further responsibilities of the ETH Board are defined in the law governing the Federal Institutes of Technology. The two universities and the research institutes themselves fulfill all other responsibilities that are not explicitly assigned to the ETH Board.
To fulfill its controlling and supervision functions, the ETH Board uses the following instruments: regular reports from the institutions on resources (finances, human resources, real estate); annual reports from the institutions on the achievement of agreed-upon objectives; annual dialogue conversations between the ETH Board and the institutions with the purpose of strategic controlling; and reports from the institutions regarding their risk management systems according to specifications set by the ETH Board. Further, the internal audit group of the ETH Board evaluates the risk management processes, the internal control system, and the governance processes of the institutions and reports on them, to the Audit Committee in particular.

Compensation
In 2007, the president of the ETH Board received an annual salary of 322,506 CHF and an entertainment allowance of 5,000 CHF. The president is covered by the pension fund of the Swiss Confederation. The employer’s contribution is determined according to the regulation of this pension fund.

The five members of the ETH Board who are not employees of one of the universities or the research institutes received total fees of 191,000 CHF in 2007. Of this, 120,000 CHF were received by the vice president. The remaining 71,000 CHF represent the total of meeting attendance remuneration paid to ETH Board members in 2007. Those members of the ETH Board who are employees of the universities or the research institutes do not receive fees for their activities in the ETH Board.

Actual expenses of the ETH Board members are reimbursed according to the expense regulations.

Responsibility Toward the Swiss Confederation
Every four years the Swiss Federal Council submits a performance mandate and corresponding budget for the ETH Domain to the Swiss Parliament. At the end of the performance period, the ETH Board then generates a performance report which is given to the Swiss Federal Council. This report requires approval by the Swiss Parliament.

The annual consolidated budget and accounts of the ETH Domain are submitted to the Swiss Parliament for approval as an attachment to the budget and accounts of the Swiss Confederation.

Auditors
According to law governing the Federal Institutes of Technology, the accounts of the ETH Domain are audited by the Swiss Federal Finance Administration. This administration thus acts as the external auditing agency. The current director of the mandate and the director of the audit for the consolidated account have been in charge since 2001 and 2004, respectively.

In 2007, the total fees paid to the Swiss Federal Finance Administration for audits of individual accounts of entities in the Domain, as well as the consolidated account, were 492,162 CHF. The fees paid for additional services of the Swiss Federal Finance Administration were 15,976 CHF. While the Swiss Federal Finance Administration audits the accounts of ETH Zurich, WSL, Empa and Eawag, the accounts of EPFL are audited by PricewaterhouseCoopers and the accounts of PSI are audited by Ernst & Young Ltd.

The audit report of the Swiss Federal Finance Administration of the consolidated account is comprised of a confirmation report and a management letter. An annual meeting to discuss these reports is held between the director of the mandate and the director of the audit and the audit committee.

Information Policy
The ETH Board is committed to an information policy that actively promotes open and honest communication with the public and the Swiss Confederation. Under this policy, the ETH Board regularly reports to the Federal Department of Home Affairs and the Swiss Parliament on the achievement of the performance mandate. This reporting includes: an annual report and review of accounts; a self-evaluation and peer review by external experts every two years; and a final report at the end of the performance period. In addition, the president, supported by the head of strategy and policy and other members of the ETH Board’s staff, continuously informs politicians of any relevant events. Among other channels of communication, the website of the ETH Board, www.ethboard.ch, provides information to the broader public.
### Indicators for the ETH Domain

<table>
<thead>
<tr>
<th>Category</th>
<th>2002</th>
<th>2007</th>
<th>Change in % since 2002</th>
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<tr>
<td>Bachelor students</td>
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<td>Master students</td>
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<tr>
<td>Diploma students</td>
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<tr>
<td>Postgraduate students</td>
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<td>647</td>
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<tr>
<td>Total</td>
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</tr>
<tr>
<td><strong>Degrees</strong></td>
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<td>Bachelor</td>
<td>1,452</td>
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</tr>
<tr>
<td>Master</td>
<td>1,065</td>
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<tr>
<td>Diplomas</td>
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<td>890</td>
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<td>Doctorates</td>
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<td>Postgraduates</td>
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<td><strong>Staff</strong></td>
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<tr>
<td>Professors**</td>
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<td>609</td>
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<tr>
<td>Scientific staff***</td>
<td>7,006</td>
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<tr>
<td>Administrative and technical staff****</td>
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<td>4,987</td>
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<tr>
<td>Total staff****</td>
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<td>13,033</td>
<td>11.8</td>
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<tr>
<td><strong>Financial resources (CHF million)</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Federal financial contribution</td>
<td>1,756.2</td>
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<td>5.5</td>
</tr>
<tr>
<td>Second-/third-party funds</td>
<td>329.2</td>
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<td>28.7</td>
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<tr>
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<td>2,178.0</td>
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* Bologna reform: Diploma students in 2002 are compared to the total number of bachelor, master, and diploma students in 2007
** Swiss Universities Information System — categories I and II
*** Swiss Universities Information System — categories III–X
**** Swiss Universities Information System — categories XI–XXII
***** Equivalent number of full-time posts
## Indicators for the ETH and the Research Institutions 2007

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<thead>
<tr>
<th></th>
<th>ETH Board</th>
<th>ETHZ</th>
<th>EPFL</th>
<th>PSI</th>
<th>WSL</th>
<th>Empa</th>
<th>Eawag</th>
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<td>35</td>
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<td>Financial resources (CHF million)</td>
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<td>1,234.1</td>
<td>617.4</td>
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<td>132.8</td>
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<td>91.1</td>
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<td>2.0</td>
<td>14.2</td>
<td>1.7</td>
<td>132.7</td>
</tr>
</tbody>
</table>

* Equivalent number of full-time positions
### ETH Zurich — Students in Bachelor, Master and Diploma Courses per Department 2007

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Women</th>
<th>Men</th>
<th>Non-Swiss</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
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<td>749</td>
<td>258</td>
<td>1,330</td>
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<tr>
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<td>77</td>
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<tr>
<td>Engineering Sciences</td>
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<td>476</td>
<td>2,457</td>
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<tr>
<td>Informatics and Communication Technology</td>
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<td>769</td>
<td>153</td>
<td>857</td>
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<tr>
<td>Natural Sciences</td>
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<td>641</td>
<td>215</td>
<td>1,614</td>
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<tr>
<td>Life Sciences</td>
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<td>1,377</td>
<td>393</td>
<td>1,765</td>
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<td>System-oriented Natural Sciences</td>
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<td>781</td>
<td>71</td>
<td>1,594</td>
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<td>Management, Technology, and Economics</td>
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<td>150</td>
<td>71</td>
<td>181</td>
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<tr>
<td>Humanities, Social Sciences, and Political</td>
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<td>19</td>
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<tr>
<td>Other Sciences</td>
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<td>64</td>
<td></td>
<td>64</td>
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<tr>
<td><strong>ETH Zurich Total</strong></td>
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<td>7,448</td>
<td>1,733</td>
<td>10,627</td>
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</table>

### ETH Zurich — Number of Doctoral Students by Discipline 2007

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Women</th>
<th>Men</th>
<th>Non-Swiss</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
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<td>Engineering Sciences</td>
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<td>417</td>
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<tr>
<td>Informatics and Communication Technology</td>
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<td>111</td>
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<td>554</td>
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<tr>
<td>Life Sciences</td>
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<tr>
<td>Humanities, Social Sciences, and Political</td>
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<td>47</td>
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<tr>
<td>Other Sciences</td>
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<td>2,105</td>
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### EPFL — Students in Bachelor and Master Courses per Department 2007

<table>
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<th>Disciplines</th>
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<th>Non-Swiss</th>
<th>Total</th>
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<tbody>
<tr>
<td>Architecture</td>
<td>328</td>
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<td>236</td>
<td>761</td>
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<tr>
<td>Civil Engineering and Geomatics</td>
<td>59</td>
<td>261</td>
<td>128</td>
<td>328</td>
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<tr>
<td>Engineering Sciences</td>
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<td>1,104</td>
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<td>1,250</td>
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<tr>
<td>Informatics and Communication Technology</td>
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<td>Natural Sciences</td>
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<tr>
<td>Life Sciences</td>
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<td>209</td>
<td>97</td>
<td>386</td>
</tr>
<tr>
<td>System-oriented Natural Sciences</td>
<td>118</td>
<td>188</td>
<td>68</td>
<td>306</td>
</tr>
<tr>
<td>Management, Technology, and Economics</td>
<td>8</td>
<td>22</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Humanities, Social Sciences, and Political</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EPFL Total</strong></td>
<td>1,174</td>
<td>3,517</td>
<td>1,574</td>
<td>4,691</td>
</tr>
</tbody>
</table>

### EPFL — Number of Doctoral Students by Discipline 2007

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Women</th>
<th>Men</th>
<th>Non-Swiss</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>29</td>
<td>50</td>
<td>43</td>
<td>79</td>
</tr>
<tr>
<td>Civil Engineering and Geomatics</td>
<td>16</td>
<td>61</td>
<td>49</td>
<td>77</td>
</tr>
<tr>
<td>Engineering Sciences</td>
<td>89</td>
<td>360</td>
<td>283</td>
<td>449</td>
</tr>
<tr>
<td>Informatics and Communication Technology</td>
<td>35</td>
<td>192</td>
<td>164</td>
<td>227</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>104</td>
<td>280</td>
<td>258</td>
<td>384</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>65</td>
<td>99</td>
<td>122</td>
<td>164</td>
</tr>
<tr>
<td>System-oriented Natural Sciences</td>
<td>12</td>
<td>43</td>
<td>635</td>
<td>55</td>
</tr>
<tr>
<td>Management, Technology, and Economics</td>
<td>17</td>
<td>20</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>Humanities, Social Sciences, and Political</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EPFL Total</strong></td>
<td>367</td>
<td>1,105</td>
<td>986</td>
<td>1,472</td>
</tr>
</tbody>
</table>
A central task of the ETH Domain is to translate the knowledge that is generated in its institutions into forms useful to society and the economy. This can happen via different avenues, such as disseminating the knowledge in scientific papers, patenting technological innovations, and forming new companies based on intellectual property generated by ETH Domain researchers.

In the table below, some key indicators are highlighted regarding these translational activities. They illustrate the broader value the ETH Domain brings to Swiss society and the world, and demonstrate the return on the financial and human investment that has been made in the Domain.

---

### Indicators on Research and Knowledge Transfer 2007

<table>
<thead>
<tr>
<th></th>
<th>ETHZ</th>
<th>EPFL</th>
<th>PSI</th>
<th>WSL</th>
<th>Empa</th>
<th>Eawag</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Publications ISI 2003*</td>
<td>8,264</td>
<td>4,027</td>
<td>1,936</td>
<td>262</td>
<td>262</td>
<td>538</td>
<td>1,062</td>
</tr>
<tr>
<td>Publications non-ISI 2003**</td>
<td>200</td>
<td>49</td>
<td>319</td>
<td>58</td>
<td>626</td>
<td></td>
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<tr>
<td>Patents applied for</td>
<td>79</td>
<td>36</td>
<td>52</td>
<td>1</td>
<td>9</td>
<td>1</td>
<td>178</td>
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<tr>
<td>License and technology transfer contracts</td>
<td>42</td>
<td>64</td>
<td>5</td>
<td>19</td>
<td>9</td>
<td></td>
<td>139</td>
</tr>
<tr>
<td>Spin-offs and start-ups</td>
<td>21</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33</td>
</tr>
</tbody>
</table>

* Institute for Scientific Information, Thomson ISI (source CEST)
** Non-Thomson ISI
The Importance of Knowledge Transfer

Academia and the private sector — these were rather separate domains for a long time. Why is it so important that these now grow closer together?

Herrling: What has become more and more clear is how important the transfer of knowledge and technology is — from fundamental research into application, and from application into teaching and research. The road to application is becoming shorter as the private sector and academia inspire and challenge each other.

What would a successful interweaving of academia and industry look like?

Herrling: First we must understand what does not work: Simply providing money and expecting results in return is a flawed approach. This is about real collaboration, a true exchange. For this to happen, companies and academia have to provide the suitable framework. Ultimately researchers and developers from academia and private corporations are the ones who can enable this process. They have to talk with each other, stake off the path together, and initiate projects. For this, close contact is needed. I think physical proximity is an often underrated factor.

What do you see as the respective strengths and core tasks of academia and industry?

Herrling: Let us take the example of Novartis. Academic research is concentrated on understanding illnesses better. Novartis is focused on discovering and producing the molecules that fight those illnesses. Each side is very capable in its field, but you can achieve even better results when you combine those strengths. In explicit terms, the partners bring different contributions to the table. Academia and the private sector are partners of equal value, but with different roles. That is, if you will, the recipe for success.

What can the ETH Domain do to fulfill its part as effectively as possible?

Herrling: The core competence of the ETH Domain is in the natural sciences, engineering, and informatics. An exceedingly important field is modeling. In biology, like in many other fields, there are large inventories of data, but we don’t understand the systemic interconnections yet, or at least not very well. Recognizing connections, systems, and chains of effects greatly increases the marksmanship in industry development work, not only in pharmaceuticals and medicine, but also, for example, in nanoengineering.

And what does that mean for the ETH Domain as it positions itself internationally?

Herrling: To succeed in a global context, the ETH Domain has to try to attract the best students and professors. For this, Switzerland on its own is too small a net. The open secret for international success of universities is exactly the international exchange. Swiss students should be able to gain international experience abroad, and the best international students must find compelling conditions in Switzerland. The planned collaboration of the ETH Domain with Singapore is a good example of this approach.

Prof. Paul Herrling, vice president ETH Board and director of corporate research at Novartis International AG, member of the ETH Board since 2004.
Financial Overview

While the ETH Domain receives the majority of its funding from the Swiss Confederation and other government-related sources, additional funding is provided by private-sector partners. During the years 2004 to 2007, the expected federal contributions were repeatedly reduced, decreasing the annual average growth for the ETH Domain during that period from the originally planned 4% to an actual rate of 2%. However, the Domain experienced an encouraging 4.7% annual average increase in second- and third-party funds during the same period.

The Federal Council approved a payment framework of 7,830 million CHF for the ETH Domain for the 2004–2007 period, resulting in a projected annual average growth of 4%. However, actual annual budgets must be approved by the Swiss Parliament and recent difficulties in the federal financial realm led to a reduction of roughly 300 million CHF in the funds received during those four years, 156 million CHF of which was cut in the reported year. Including an additional credit freeze of 18.7 million CHF, the available funds in 2007 amounted to 1,853.6 million CHF, slightly below the 2006 total of 1,880.4 million CHF.

The ETH Domain’s total revenues for 2007 were 2,501.6 million CHF. The Swiss Confederation supplied roughly 90% of funding: 1,679.8 million CHF (67%) through the financial contribution; 269.9 million CHF (11%) through a housing contribution; and 277.2 million CHF (11%) through second-party funds. Approximately 146.4 million CHF (6%) were contributed by the private sector through research collaborations and 128.3 million CHF (5%) were provided through various revenues and financial results. The contribution to housing (estimated rent for real estate owned by the Swiss Confederation and used free of charge by the ETH Domain) is included in the 2007 budget for the first time. However, the contribution for construction expenditures is no longer part of the budget.

Personnel costs were the largest expenditure, accounting for 63% of total spending. Capital expenditures utilized 16% of funds. Other current expenditures — for materials, telecommunication, services, royalties, accommodation, and so forth — accounted for the remaining 21% of total spending.

Personnel costs were the largest expenditure, accounting for 63% of total spending. Capital expenditures utilized 16% of funds. Other current expenditures — for materials, telecommunication, services, royalties, accommodation, and so forth — accounted for the remaining 21% of total spending.
ETH Domain: 2007 Financing

Federal financial contribution 77%
Other revenues 5%
Second-/third-party funds 18%

Swiss National Fund 5%
Commission for Technology and Innovation 1%
Research assignments from federal offices 3%
European research programs 3%
Research with private-sector partners 5%
Special funds, gifts/bequests 1%

ETH Domain: Use of Funds, 2007

Current expenditures 84%
Staff expense 63%
Other current expenditures 21%
Capital expenditures 16%

Real estate 9%
Equipment 6%
IT 1%
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