



ANNUAL REPORT 2002

**ETH**

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich



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## Strategic Objectives

On the basis of its national responsibility and leading international status, ETH Zurich intends to bolster its position as an "international research university". This development will be led by the four subject areas Sciences and Mathematics, Engineering Sciences, System-oriented Sciences, as well as Architecture and Building Sciences, which, together with the Humanities, Social and Political Sciences, define the identity of the university. It is a strategic objective of ETH Zurich to appoint and train world-leading scientists and to attract the best-qualified students from within Switzerland and abroad.

To achieve these objectives, ETH Zurich has already initiated an extensive reform of its study programs. These include Bachelor's and Master's courses that satisfy the requirements of the Bologna Declaration and thus comply with the new European standard. ETH Zurich is committed to providing excellent specialist education and outstanding all-round leadership skills. To exploit the synergistic relationship between research and teaching to the full, it is ETH's intention to achieve a numerical balance between undergraduate students (Bachelor's courses) and graduate students (Master's and Doctorate courses) over the next few years. Innovative research methods and infrastructures will also be encouraged. These infrastructures give ETH Zurich a competitive edge, whose further development is central to future progress, and include the third extension phase at the Hönggerberg campus, which should be completed by autumn 2004. A joint project to completely redesign the university area in the city centre is also planned. This should further enhance the appeal of ETH Zurich and the city of Zurich as a centre of teaching and research activities.

The departments at ETH are in a state of constant flux. The start of 2003 saw the birth of the Department of Chemistry and Applied Biosciences from the amalgamation of the previous Department of Chemistry and Institute of Pharmaceutical Sciences. It is also planned to merge the Departments of Forest Sciences and Environmental Sciences, and a reorientation of the Department of Industrial Management and Manufacturing is also on the agenda. Cross-disciplinary developments have resulted in the creation of various new networks. The new internal networks include the "Centre for Environment and Natural Resources" in System-oriented Sciences and the "Centre for Cities and Landscape" in Architecture and Building Sciences. ETH and the University of Zurich jointly set up the "Life Science Zurich" network with the aim of further consolidating both universities' positions as internationally recognised leaders in this field. In addition, interdisciplinary cooperation is being specifically fostered and lived out in the areas of future strategic focus: Life Science and Medical Engineering, Financial and Entrepreneurial Science, Information Science and Computational Science and Engineering.

At university management level a strategic marketing plan is being developed to publicise ETH's strong position in teaching, research and services to further potential circles of interest.

Financial growth is essential if ETH Zurich is to maintain its national and international status as a leading university. Additional funding is required on the one hand to maintain and improve ETH's high standards, and on the other to allow it to continue to play its multi-faceted role in politics, business and society and to make its essential contribution to Switzerland's long-term future viability. Federal funding therefore has to grow, if resource planning is to be carried out with any degree of certainty. An increasing proportion of third-party funding and monies from private individuals and corporations offers ETH flexibility and entrepreneurial latitude.

## Executive Summary

ETH Zurich can look back over an eventful and successful year. Eleven years after Richard Ernst was presented with the Nobel Prize for Chemistry, ETH Zurich again found cause for celebration when Kurt Wüthrich, Professor of Biophysics, was presented with the 2002 Nobel Prize for Chemistry for his development of Nuclear Magnetic Resonance spectroscopy (NMR) for determining the three-dimensional structure of biological macromolecules in solution.

A number of assessments and benchmark studies awarded ETH Zurich excellent marks. A group of international experts evaluating the ETH domain stated in their final report that for more than a century ETH Zurich had maintained its position as an academic institution of the highest reputation and is recognised internationally as such.

In 2002, ETH Zurich continued to develop its cooperation with the University of Zurich in the field of teaching, with the two universities reaching an agreement to coordinate their microbiology and chemistry programs. Another agreement governs cooperation in the appointment of professors and the entitlement to award doctorates in the Humanities, Social and Political Sciences. Implementation of academic reform continues apace. A new admission ordinance, a performance monitoring ordinance and uniform guidelines for the credits system now form the basis of the Bachelor's courses. Five regular Bachelor's courses have been up and running since the winter semester 2002/03. Most of the departments which have not yet introduced tiered study courses intend to switch to the new system in 2003.

ETH Zurich rewrote its guidelines for the submission and approval of research projects. These new rules are intended to optimise the allocation of research funding.

2002 also saw ETH Zurich continuing to develop its research infrastructure, with the opening of three new large research facilities in the form of the new nuclear magnetic resonance magnet for the Institute of Molecular Biology and Biophysics, the ETH Laboratory for Radiogenic Isotope Geochemistry (ZRIGL) and the FIRST-Lab, Center for Micro- and Nanoscience. In addition, the builders topped out the second phase of the third extension stage at Hönggerberg and the renovation of the old chemistry buildings at ETH Zentrum is in progress.

ETH Zurich's financial situation was the cause of some concern, with funding falling in real terms over the planning period 2000 – 2003. However, ETH has to be able to invest in new projects if it is to maintain future viability. To give ETH the financial freedom to do this, the Executive Board introduced structural measures in 2002. Thus, over the next five years, a total of thirteen professorships which are already vacant or whose holders are set to retire in that period will be left unfilled.

In its autumn session 2002, the National Council discussed the new genetic engineering law. Together with other universities and research facilities, ETH Zurich made clear its wish to be involved in this political debate, being of the opinion that researchers should be provided with the freedom of action they need to be able to find scientific answers to the urgent issues concerning the opportunities and risks of genetic engineering. Freedom of research and social responsibility were, for ETH Zurich, the key concepts in the debate about the statutory regulation of genetic engineering.

**Dear Reader** We find ourselves at the end of a particularly memorable and successful year for ETH Zurich. Simultaneously, we are looking ahead to a time when our university will once again be called upon to mobilise its forces, take its fate in its own hands and go forth bravely into the future, whatever it may hold.

The dream of any university management is of course to see its researchers, and so also its university and its country, honoured objectively with the most prestigious awards on offer. How simple it would be if – as in the ancient Greek myth when Pallas Athene, goddess of wisdom, sprang fully grown and fully armed from the head of Zeus, the supreme god – a mature Nobel Prize Winner could be brought forth merely by particular effort of mind. Miracles don't happen in science, however. Instead, what is required is a good imagination and ambitious vision, creativity, determination, exceptional energy and a great deal of hard, continuous work. Conducive conditions are essential if this is to come about.

Obviously, conditions do not remain suitably conducive by themselves. The unquestioning belief in the fateful NASA slogan of Faster, Better, Cheaper and the general ideology of the end of the 1990s have left ETH with a funding level for the planning period 2000–2003 which has fallen in real terms. There is no doubt about it: we no longer have sufficient funds to fulfil our performance mandate properly since, to provide all our students with the best chances in the labour market in a few years' time and to ensure the future viability of ETH, we have to be able to invest in new projects. For this we need financial freedom. We now find ourselves having to create this freedom by leaving unfilled over the next five years a total of thirteen professorships which are already vacant or whose holders are set to retire. It goes without saying that this cannot happen without ETH giving up commitments dear to some people's hearts.

Switzerland's politicians do not believe in miracles either. Bravely and resolutely, they have adopted the only rational approach and intend once again to promote education, research and technology from 2004 and to allocate the additional funding desperately needed for that purpose. Together with all Switzerland's universities, we shall bear the responsibility for ensuring that the coming generation is given the best possible education and introduction to research. As a first-class research university, ETH is the international representative of a Switzerland of reliable and trustworthy quality. It is facing the future in the knowledge that technology and science are there for the benefit of humanity. For there is one miracle we can believe in: the talents of our students, professors, assistants and staff. They develop their talents with great creativity and loyalty in the service of ETH. Thank you, all of you, for your great dedication and your impressive work in 2002.

Olaf Kübler  
President ETH Zurich



KURT WÜTHRICH WINS THE NOBEL  
PRIZE FOR CHEMISTRY.

ETH HAS BEEN AWARDED VERY GOOD MARKS.

" WE WANT ETH ZURICH TO BE A PLACE WHERE PEOPLE FROM SWITZERLAND AND ABROAD CAN CARRY OUT RESEARCH AND TEACHING AT THE VERY HIGHEST LEVEL."

PROF. OLAF KÜBLER, PRESIDENT



## The Best People Win

ETH Zurich is working to provide its departments with greater autonomy. By allocating funds on a performance basis, the Executive Board intends to reward excellence in research and teaching at departmental level. In addition, various steps are being taken to appoint people of the highest calibre.

One of ETH Zurich's major objectives is to have top-calibre people from Switzerland and abroad carrying out excellent research and teaching. The Executive Board has initiated various measures to achieve this. On the one hand, performance-based allocation of funds will reward the departments for their achievements and encourage them to further excellence. On the other hand, innovative measures have been designed to help ETH Zurich obtain the best people.

**Dual Career Advice gives people an initial leg up.** The outcome of selection procedures for new professors depends more and more on whether suitable professional opportunities are available for their partners. For this reason ETH Zurich set up the Dual Career Advice service (DCA) in 1999 to address this issue professionally.

ETH Zurich's DCA is the only service of its type in Europe, though they are widespread in the USA. In addition to professional support, DCA offers comprehensive advice of a non-professional nature. Since its inception, DCA has been closely involved with the appointments procedure, being able to offer quick and efficient help in virtually all cases. Its success is clear from the many contented professorial families and the positive response both internally and externally.

**Areas of strategic focus (SEPs) strengthen Zurich's research status.** The projects planned in the four SEPs came to fruition in 2002. Two major centres of excellence and several teaching programs have been newly created. Since its opening in February 2002, the Functional Genomics Centre Zurich (FGCZ) has been offering a very successful infrastructure for research in the fields of proteomics and transcriptomics to users from all areas of the Life Sciences at ETH and the University of Zurich. The Computational Laboratory (CoLab), a centre for computer simulation in the fields of (cell) biology and materials sciences, seeks to use close collaboration between disciplines as a way of accessing and addressing more complex problems. Together with ETH's Medical Engineering activities, the two centres considerably enhance Zurich's attractiveness as a centre of the Life Sciences. Similarly, cooperation with Zurich's financial services industry allows ETH and the University to offer an attractive joint Master's course in Financial Sciences. Such was the demand for places that it was possible to accept only a fifth of applicants.

## ETH Zurich Awarded Excellent Marks

**ETH Zurich did well in 2002: it received a very good report in several different evaluations and comparative studies carried out at national and international level.**

Early in the summer, an international group of experts commissioned by the State Secretary for Science and Research took a close look at the ETH domain. ETH Zurich, EPF Lausanne and the four research institutions – PSI, EMPA, WSL and EAWAG – were evaluated, as was the ETH Board. This interim evaluation was intended to assess to what extent the objectives agreed with the Federal Government in the performance agreement for 2000 to 2003 had been achieved. The report painted a very positive picture of ETH Zurich. It noted that ETH Zurich had been established for over a century as an academic institution with the highest standards and reputation and was internationally recognised as such. As far as internationalisation was concerned, i.e. international visibility and collaboration as well as attractiveness to students, postdocs and professors from abroad, ETH Zurich was the Swiss leader. The addition of doctoral programs in the humanities and social sciences is also mentioned as a very positive development.

**Excellent engineering education.** The "Spine" (Successful Practices in International Engineering Education) study has its origins in an initiative by the ETH Board and the "Engineers Shape our Future" group. The aim of the study was to combine so-called Successful Practices. To this end, around 2000 interviews were carried out with professors, engineers and managers from ten European and US universities, including ETH Zurich. The results of the study revealed that respondents rated ETH Zurich as the second best university for engineering education after the Massachusetts Institute of Technology (MIT). A group product development project undertaken in the Department of Mechanical and Process Engineering was assessed as excellent and thus as a Successful Practice. The study makes equally positive mention of the internal and external assessment methods. ETH Zurich also stood out due to its high proportion of foreign lecturers. A further positive feature was that more than 50 percent of the full-time professorships were filled by headhunting.

**Various university rankings.** ETH Zurich was likewise well positioned in various benchmarking studies. In one university ranking study, for example, the Center for Science and Technology Studies (CEST), which advises the Federal Department of Home Affairs and the Federal Department of Economic Affairs on matters of research policy, provided a breakdown of internationally acclaimed publications by university. ETH Zurich was positioned in 28th place, the second-best non-American university after Cambridge.

## **ETH Researcher Wins Nobel Prize**

**Biophysicist Kurt Wüthrich was awarded the 2002 Nobel Prize for Chemistry. He was honoured for his research into the advancement of Nuclear Magnetic Resonance spectroscopy (NMR). Wüthrich's work in the early 1980s enabled NMR to be applied to proteins.**

The Royal Swedish Academy of Science bestowed half of the 2002 Nobel Prize for Chemistry on ETH professor Kurt Wüthrich, the other half being shared between an American and a Japanese researcher. Kurt Wüthrich gained his award in recognition of his development of Nuclear Magnetic Resonance spectroscopy (NMR) for determining the three-dimensional structure of biological macromolecules in solution. Back in 1991, another ETH researcher and colleague of Kurt Wüthrich (professor of chemistry Richard Ernst) was honoured with the Nobel Prize for Chemistry for his pioneering work in the field of NMR spectroscopy. Wüthrich, on the other hand, developed both a general method of systematically assigning fixed points in the protein molecule and a principle for calculating the three-dimensional structure of the protein on the basis of the distances between these points. In general, the great advantage of NMR methodology over X-ray crystallography is that the structure of proteins – and also nucleic acids – can be investigated in solution in their natural environment.

**ETH Zurich's 21st Nobel Prize Winner.** Kurt Wüthrich has been professor of biophysics at ETH Zurich since 1972. From 1995 to 2000 he was also head of the Biology Department. He is the 21st Nobel Prize Winner to be associated with ETH Zurich. In the year 2000, Wüthrich and his team succeeded in elucidating the structure of the human and bovine prion protein, which is suspected of being involved in diseases such as BSE or Creutzfeldt-Jakob. The research team's investigations at the Institute of Molecular Biology and Biophysics showed that healthy human and bovine prion proteins are very similar, thereby explaining how BSE could possibly be transmitted to humans at a molecular level. Kurt Wüthrich's group is carrying out further research into NMR methodology in order to investigate ever larger molecules. 2002 saw, for example, the elucidation of the structure of a protein which was 20 times larger than the previously accepted limit for NMR investigations. This advance may be used to investigate aggregate forms of prion proteins and thus to learn more about BSE and Creutzfeldt-Jakob.

**Future in Zurich secure.** For two years now, Kurt Wüthrich has been working not only as a professor at ETH but also as a guest professor at the Scripps Research Institute in San Diego (USA), for which he is released by ETH for four months each year. After his retirement in 2004, this ratio will be reversed, and he will spend one third of his time at ETH and two-thirds in California. ETH has thus been able to define with Kurt Wüthrich a future which respects the contracts concluded with the Scripps Research Institute while enabling him to continue to work in Switzerland.

ETH AND UNIVERSITY OF ZURICH ARE  
DEVISING JOINT PROGRAMS OF STUDY.



FIVE NEW BACHELOR'S COURSES  
INTRODUCED.

" WE WANT TO OFFER THE BEST  
TRAINING TO THE BEST BRAINS."

PROF. KONRAD OSTERWALDER, RECTOR



## Objective: an Attractive Education

Five regular Bachelor's courses, including a new course in Physical Education and Sports, have been up and running since the winter semester 2002/03. Other innovations have also been implemented. For instance undergraduates can register online.

As part of the IDEA League network (Imperial College, TU Delft, ETH Zurich and RWTH Aachen), a number of subject-specific working parties met in 2002 to discuss the Bologna Process and the objectives and contents of the Bachelor's and Master's courses as well as student mobility. At their Annual General Meeting, the four universities decided to create a number of grants for students who transfer to another IDEA university for their Master's studies. They also adopted guidelines for drawing up qualification profiles for Bachelor's and Master's degrees. These profiles will be a common component of the diploma supplements. In addition, a check list was approved for the introduction of the IDEA League Quality Assurance principles.

**Electronic registration.** Since the middle of September 2002 undergraduate students can register online except in special cases. From the very outset, electronic registration met with a high level of acceptance among students. It is even designed to cope with the course individualisation which academic reform will be bringing to ETH. With electronic registration, student administration at ETH has entered a new era.

**New course very popular.** ETH Zurich has been offering a new course in Physical Education and Sports since the winter semester 2002/03. This new interdisciplinary course takes account of the need for integrated education in this field. There were around 200 applicants in the very first year, which demonstrates amply that the Executive Board is in tune with the times in introducing this new program.

**Summary of activities in the ETH Teaching Centre.** A new central scientific service has been created within the rectorate under the name of ETH Teaching Centre (ETC). It embraces the following previous Central Authorities: Didactic Centre DiC, ETH Tools, Network for Educational Technology NET and the Centre for Continuing Education. The centre provides support to lecturers, non-professorial academic staff and students at ETH Zurich in all areas of teaching and learning methodology. It provides advice and support in didactics, the use of new technologies, curriculum and subject range development and quality assurance. The centre organises internal ETH courses on topics such as study methods, media didactics, management of research projects, efficient learning and personality development. The ETC also acts as a coordination and promotion facility for academic further education, such as postgraduate studies, postgraduate courses and further education courses, which are predominantly directed at an external, working target audience.

**UNITECH continues on its course to success.** The academic exchange programme UNITECH International, which was launched in the year 2000, has had a successful second academic year. A total of 53 students had the opportunity to visit partner universities and companies. 78 students have been selected for the academic year 2002/03. The first Graduation Ceremony took place on 6th September 2002 in Aachen. At this event, which took place under the patronage of Romano Prodi, President of the European Commission, 13 graduates received the UNITECH diploma. The next Annual General Meeting of UNITECH will take place in Zurich in September 2003.

## First Jointly Designed Program

In 2002, ETH Zurich continued to develop its cooperation with the University of Zurich. Since autumn 2002, the two universities have been offering a joint program in microbiology. In addition, an agreement to coordinate chemistry programs and an agreement to cooperate over the appointment of professors in the Humanities, Social and Political Sciences and to grant the right to supervise doctoral students to professors from the Department of Humanities, Social and Political Sciences have also been signed. Finally, the joint language centre has come into operation.

Research cooperation between the ETH and the University of Zurich has existed for a long time. However, the new microbiology program, which was first offered in the winter semester 2002/03, is the first jointly designed course for students from both universities. It has allowed complementary strengths to be exploited to improve educational quality to a degree that neither of the two universities could have achieved alone. It has also been possible for the first time to bring the different study rules and examination methods of the two universities into line to such an extent that joint teaching provision is possible while maintaining the individual "cultures" of the University and the ETH. In a second cooperative venture, agreed in 2002, the chemistry programs will be coordinated. The University and ETH are together redesigning the third academic year and coordinating the range of special and optional lectures on offer. Practicals are announced jointly and are open to students from both universities. This agreement will be implemented as soon as the University introduces tiered study courses with Bachelor's and Master's degrees in the winter semester 2003/04. This cooperation will also strengthen university studies of life sciences in Zurich.

## Academic Reform in Full Flow

**Humanities, Social and Political Science professors granted right to supervise doctoral students.** Another agreement covers cooperation between the University and ETH in the Humanities, Social and Political Sciences. The professors in the ETH's Department of Humanities, Social and Political Sciences (D-GESS) do not have the right to supervise subject-specific doctoral studies at ETH Zurich. Thanks to the new agreement, they are being given the possibility of supervising their doctoral students at the corresponding University faculties. Cooperation in research and teaching will also be intensified. In particular, there will in future be consultation over the planning and filling of professorships which are of mutual interest.

**New language centre exceeds expectations.** In April 2002, the language centre run jointly by ETH and the University of Zurich started administrative operation under the leadership of Dr. Andrea Dlaska. Thanks to great dedication on the part of the people involved, it was possible to put together a broad and improved range of language courses for the students of both universities for the start of the winter semester 2002/03. A new feature is that the number of participants per course is limited. Interest in the courses has far exceeded expectations. At the moment a range of courses is being developed for the employees of the University and ETH Zurich. These courses are based on the existing program of language courses offered by the ETH Personnel Office.

**ETH Zurich's academic reform is at the stage of broad implementation. Five more regular Bachelor's courses started up in the winter semester 2002/03. Most other departments want to switch over in 2003.**

ETH Zurich is revising its entire teaching concept. A central tenet is the tiered study model with Bachelor's and Master's degrees. In the winter semester 2002/03, the Departments of Mechanical and Process Engineering, Materials and Chemistry started their Bachelor's courses. In addition, the new course in Physical Education and Sports was started at the same time, as was a Bachelor's course for professional officers in the Department of Humanities, Social and Political Sciences. It is thus looking likely that the target of completing academic reform in the autumn of 2005 will be achieved.

**More commitment during the semester.** A new admission ordinance, a performance monitoring ordinance and uniform guidelines relating to the credits system were developed as the basis of the Bachelor's courses. These revised rules made it possible for the Executive Board to introduce the five Bachelor's courses at the start of the winter semester 2002/03. In addition to exams, performance monitoring will now involve practicals, exercises or essays. The students are thus able to gain their credits in various ways, so demonstrating their academic progress. ETH Zurich's academic reform is therefore bringing about a paradigm shift. After the first academic year, which ends with the basic examination, there are only individual examinations and smaller blocks of examinations. These will take place, as before, in examination sessions. The Physical Education and Sports program, for example, therefore logically offers just one individual examination for each subject. In addition, the new courses demand more commitment from the students during the semester. The Department of Materials has already firmly implemented this change to the system. The amount of time devoted to "chalk and talk" teaching has been drastically reduced in favour of seminars and practicals. The system provides the students with a greater range of options. For instance, they can gain a degree before the end of the usual course period, which is three years for a Bachelor's degree and one and a half years for a Master's degree. Altogether, that makes the same number of years as for the previous degree-type courses.

**Diploma Supplement with IDEA League.** The four universities in the IDEA League have got together to design a joint qualification which can be awarded in addition to a degree, the Diploma Supplement. The intention is to document not only what a graduate has achieved academically, but also what he or she is now capable of. The IDEA League focuses on this second element, which takes the form of a qualification profile listing both general and subject-specific skills.

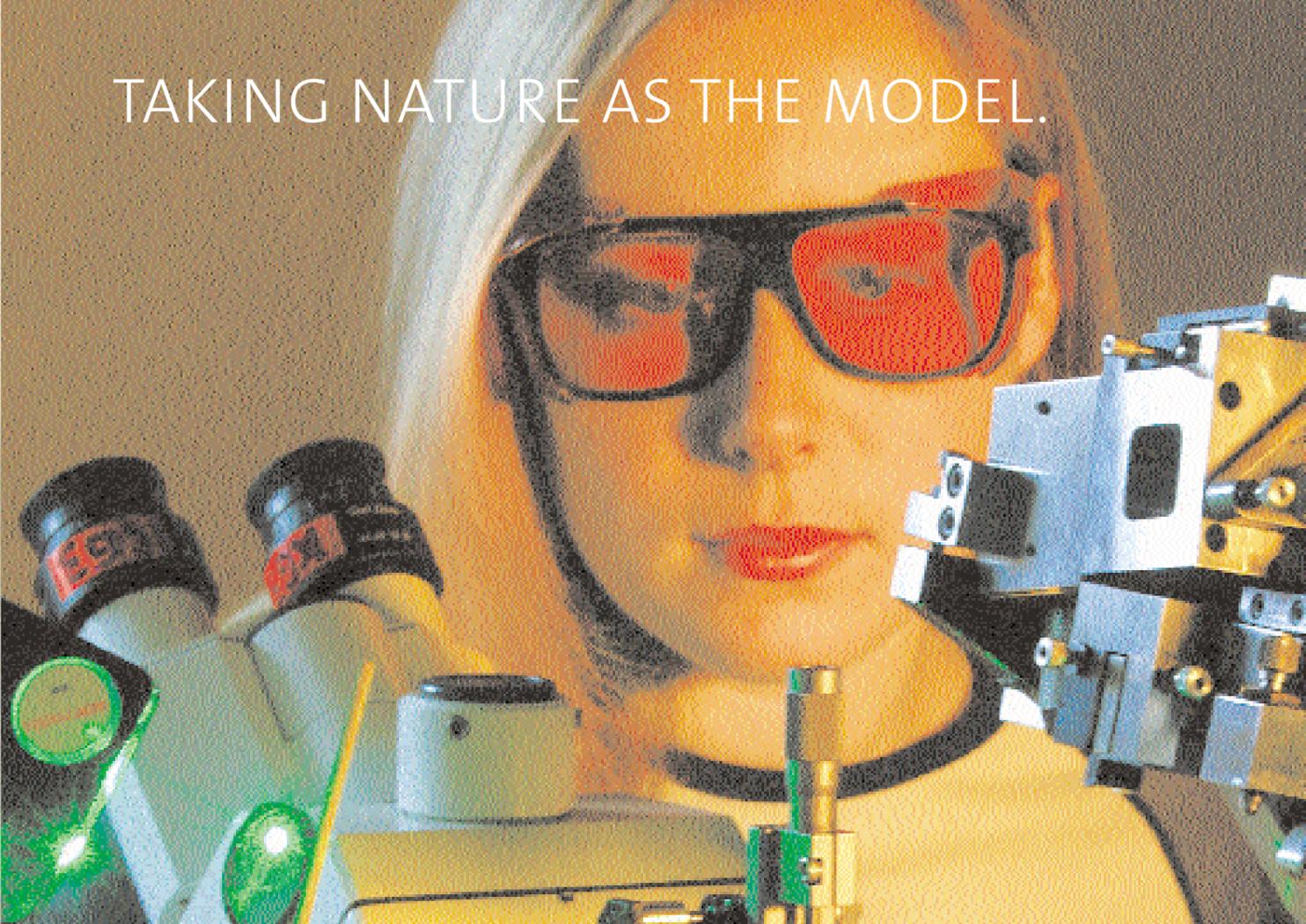
**Master's also as preparation for a doctorate.** At its examinations conference in August, the Executive Board discussed the basic principles behind the development of the Graduate School. What emerged from the discussion was that the graduate stage will include the doctoral and Master's stages. Like the close relationship between the Bachelor's and Master's stages in some programs, the Master's stage and the doctorate can be closely connected in other programs. The aim of the Master's course may therefore also be to determine the suitability of students for the doctoral stage. This should ensure that the thesis can be completed within a sensible time frame. Graduate students have increasingly to be multilingual, as more classes are being held in English. Joint Graduate Schools are also planned with other institutions, e.g. within the IDEA League.

PROFOUND INSIGHT INTO THE  
QUANTUM WORLD.





SETTING BONES IN VIBRATION.



TAKING NATURE AS THE MODEL.

ALZHEIMER'S DISEASE AND HEPATITIS C  
– A STARTING POINT FOR NEW  
TREATMENTS.



"ETH ZURICH IS ONE OF THE FEW UNIVERSITIES THAT IS IN A POSITION TO ALLOCATE INTERNAL BUDGET FUNDING FOR RESEARCH PROJECTS ON A COMPETITIVE BASIS."

PROF. ULRICH W. SUTER, VICE-PRESIDENT RESEARCH

INVESTIGATING THE INTERACTION  
BETWEEN TECHNOLOGY AND SOCIETY.

## Awarding Research Funding on a Competitive Basis

**ETH Zurich has rewritten its guidelines on the submission and approval of research projects with a view to fostering highly innovative, forward-looking projects. It has also fundamentally revised the existing guidelines on intellectual property.**

In an increasingly difficult economic situation, the benefits of improving efficiency in cutting edge research are not to be underestimated. This applies as much to universities as to the private sector. ETH Zurich is aware of the responsibility it bears in managing public funds and uses the resources made available to it efficiently and productively in research and teaching. It is one of the few universities with the option of allocating internal budget funding for research projects on a competitive basis.

**Objective: Top quality research projects.** In 2002, the guidelines on the submission and approval of research projects were revised and came into force in January 2003. Highly innovative, forward-looking projects will take precedence. The criteria determining which ETH researchers are entitled to apply for internal funding for research projects have been tightened up. The rewritten guidelines will allow research applications to be submitted electronically from the middle of 2003, an innovation that will simplify and speed up processing. All the factors mentioned will enable ETH Zurich to make still more focussed use of the research funding available to it for top quality research projects.

Research results are made available to the public through publications, presentations and in certain cases through practical implementation. To make this process of implementation more effective, ETH Zurich has also fundamentally revised its existing guidelines on intellectual property. It is worth mentioning that ETH Zurich is in principle the proprietor of any intellectual property created at the university, a factor that has also to be taken into account in cooperative ventures with the private sector. ETH gains a great deal from such interesting joint projects, since, among other things, they allow an exchange of specialist knowledge and discussion with partners with a different perspective on the matters in hand. In order to simplify and accelerate the drafting of suitable contracts and improve transparency for all the parties involved, the general contract guidelines have likewise been modernised considerably. Once the internal consultation process has been completed, the guidelines on patents and research contracts will probably come into force in the first half of 2003.

## New Findings in the Fight Against Alzheimer's Disease

**Intramembrane proteolysis, i.e. the cleavage of proteins in a cellular membrane, plays a decisive role in Alzheimer's disease and hepatitis C virus infection and is therefore a starting point for treatments. Researchers at the Institute of Biochemistry were the first to produce biochemical evidence that an enzyme catalyses such cleavage.**

Alzheimer's disease is the commonest degenerative brain disease. Due to the progressive loss of nerve cells, patients increasingly suffer from forgetfulness, speech disorders, concentration problems and disorientation. Deposits of beta-amyloid peptide in the brain are a characteristic feature of the disease. This peptide arises from cleavage of a precursor protein in a membrane. Presenilin has been mooted as an enzyme which may catalyse this reaction. Protein cleavage in a membrane was long thought to be impossible and the mechanism of this reaction is still remains unclear. A research group from the Institute of Biochemistry has now been able to identify a new protease and demonstrate that this enzyme can act as a catalyst for intramembrane proteolysis. It has thus been possible to confirm this operating principle and at the same time to characterise a new type of signal transmission in the cell.

### Converting Atomic Gas into a Crystal

**When a gas is cooled to a temperature just above absolute zero (-273.15°C), its properties change dramatically. The atoms in the gas lose their individuality and can condense in a single atomic wave, known as the Bose-Einstein condensate. This phenomenon provides a unique insight into quantum physics. A new research group which was set up in 2002 at the Institute of Quantum Electronics, specifically investigates this phenomenon. The team recently managed to produce Switzerland's first Bose-Einstein condensate using rubidium atoms.**

The researchers at the Institute of Quantum Electronics have developed and built a totally new research apparatus in their laboratory with the objective of converting an atomic gas into an artificial crystal. The atoms will be held in a lattice-like structure induced by laser light. The feasibility of introducing a Bose-Einstein condensate into such a light lattice was demonstrated together with a Munich research group back in 2001.

**Profound insight into the quantum world.** In the new experiment at the Institute of Quantum Electronics, researchers are now working on preparing the crucial step which will yield the artificial crystal. A particular potassium isotope will be mixed with the Bose-Einstein condensate, cooled to extremely low temperatures and introduced into the light lattice. The chosen potassium isotope is a fermion and therefore has the same statistical properties as the electrons in conventional crystals. In contrast to bosons, fermions cannot occupy the same quantum state. Therefore, instead of Bose-Einstein condensation, an abundance of subtle quantum phenomena are to be expected at extremely low temperatures. For example it should be possible to achieve a superfluid state whose mechanism is comparable with superconductivity in solids. The researchers expect the new crystal system to give them a deep insight into the quantum world, leading perhaps also to the observation of completely new phenomena.

**Interesting protein family discovered.** SPP, the protease that has been identified, is important in the human immune system. It is a key component in the control of body cells by the killer cells that eliminate faulty and sick cells.

The researchers were also able to demonstrate that SPP is related to presenilin, providing a strong indication that presenilin is indeed the protease which forms the beta-amyloid peptide. SPP is not only interesting because of its relationship to presenilin, but is also of medical significance because of its role in hepatitis C. Worldwide 170 million people are chronically infected with hepatitis C virus. The activity of SPP is indispensable to the biosynthesis of a building block essential to the survival of the hepatitis C virus.

### Does Technically Feasible Mean Socially Acceptable

**Nuclear power engineering has made enormous steps forward in the last 50 years. At the same time, however, the euphoria of the first days has given way to widespread disillusionment. A research project at ETH Zurich's Institute of History has taken this finding as a starting point for further investigating the interdependence between industry and society.**

Immediately after the Second World War, the industrialised nations had high hopes for the civilian use of nuclear energy. The ability to keep up scientifically, technologically and economically in this field became a question of national importance everywhere, including in Switzerland.

**First welcomed, then criticised.** Research work at the Institute of History has analysed the development of nuclear energy in Switzerland using two prominent examples. The first case study concentrates on efforts to develop a Swiss reactor system. The project fell behind internationally, and a serious accident in the Lucens (Vaud Canton) experimental nuclear power station in 1969 finally put an end to these ambitions. The second field of investigation is the Kaiseraugst commercial nuclear power station (Aargau Canton). The plans for this were generally welcomed when they were proposed by an international consortium in the mid-60s, but over the following decades the project developed into an object of political dispute of the first order. Finally, the project had to be abandoned 25 years after plans were first begun.

**Perceptions of risks have changed.** Historical analysis was able to provide a text-book demonstration of how the development of a new technology is not solely dependent on its technological feasibility. In technical development, general expectations for the future play just as big a role as the institutional organisation of innovation processes or changes in risk perception. Society's readiness to adapt to technology is directly related to technology's readiness to adapt to society. The compendious documents that were studied in the context of the research project are now being compiled into an archive of the history of nuclear energy in Switzerland (ARK) and will be transferred to ETH Zurich's archives.

## Mechanical Vibrations for Better Bones

**High-frequency vibrations improve bone quality. This has been substantiated by quantitative measurements performed at the Institute for Biomedical Engineering and opens up new options for the treatment of age-related osteoporosis. Genetic avenues of research are now being pursued.**

Good news for osteoporosis sufferers: the quality of the femur may be greatly improved just by standing on a vibrating plate for 15 minutes a day. Researchers from the Bioelectronics Group at the Institute for Biomedical Engineering have quantified this effect, which was first noted in experiments on sheep in the USA. It was demonstrated that mechanical bone quality improved by 37 percent, while the bone increased in density by only 15 percent. The "weak" bone direction, i.e. the direction which is not loaded during everyday movements, gained particularly in strength.

These results open up new possibilities for the treatment of age-related osteoporosis. However, they are also of interest in the field of manned space travel. At zero gravity, astronauts lose approximately one to two percent of bone mass per month, roughly corresponding to the amount of bone lost by a postmenopausal woman in a year.

**Search for a genetic basis.** In the USA are running clinical trials on these vibrating plates, while the ETH research group is more interested in the genetic basis of the effect. Investigations have shown that the effect, which takes place at a cellular level, promotes the formation of new bone rather than preventing bone loss. The aim is now to clarify which genes are activated by the vibrations and whether these genes could be activated by other stimuli, e.g. by a drug. The project is part of the area of strategic focus "Life Science and Medical Engineering".

## Nanomanufacturing - Taking Nature as the Model

**At present, nanomanufacturing takes place in special clean rooms and is therefore very expensive. In contrast, the researchers under the Professorship of Nanotechnology are working on manufacturing methods geared towards natural principles.**

Current methods of manufacturing on a micrometre and nanometre scale depend on clean room facilities and sometimes also on high vacuum systems to prevent deposits and accumulations of dust or other undesired particles. With cleverly devised masking and lithographic processes, non-specific interactions at undesired locations can be prevented. The production process entails very high costs, which could stop further miniaturisation before its physical limits are reached. Nature shows the way forward. Cells can synthesise nanostructures in an extremely "dirty" environment. Micro- and nanomanufacturing in nature is very clearly characterised by specific interactions.

**Neither masks nor clean rooms.** The researchers under the Professorship of Nanotechnology are working on manufacturing methods which require neither masks nor clean rooms and are suitable for a wide range of materials. One project is working on a method similar to photocopying. A scanning force microscope is used to "write" an electrically charged pattern onto a substrate. Particles or molecules which are also charged and are located in a liquid over the surface are attracted by this pattern and are deposited on it. The ETH researchers have already developed a simplified process, in which electrically non-conductive patterns may be written in thin aluminium films using lasers. This process takes place in pure water under normal laboratory conditions. In future, the process could supply low-cost electrical circuits for micro-electromechanical systems (MEMS) and chip-scale instruments for chemical analysis ("lab on a chip").

CREATING THE FRAMEWORK FOR  
KNOWLEDGE TRANSFER.





" ETH IS INVESTING IN THE EXPANSION OF RESEARCH INFRASTRUCTURE IN ORDER TO PROVIDE ITS RESEARCHERS WITH THE BEST POSSIBLE FACILITIES."

PROF. GERHARD SCHMITT, VICE-PRESIDENT PLANNING AND LOGISTICS

NEW JEWELS IN THE CROWN OF SWISS RESEARCH.

## Major Building Projects Underway: Real and Virtual

**In 2002, the Planning and Logistics office continued with their major building projects. The second phase of the third extension stage at Hönggerberg has been topped out. Renovation of the old chemistry building at ETH Zentrum is progressing.**

The third stage of ETH Zurich's Hönggerberg development is one of the largest construction projects undertaken by the Swiss Confederation. The topping-out ceremony for the second phase took place in November 2002, after only one year of construction work. This includes the extension of the existing chemistry building by two additional "fingers". The buildings provide a total of 600 work and 240 practical stations. In the summer of 2004, the Materials Sciences Department and the Institutes of Pharmaceutical Sciences and of Microbiology will move into the new buildings. The old chemistry buildings at ETH Zentrum are being renovated. From the winter semester 2005/06, the Institutes and professorships of Environmental Sciences, Agriculture and Food Sciences and Computer Science will move into the three renovated building complexes, bringing together departments which have long been scattered between different locations.

**Joint purchasing cuts costs.** The six Institutions of the ETH domain have been given additional procurement responsibilities as a result of the increased autonomy awarded to the ETH domain. From the very outset, however, it was thought likely that the purchasing potential of the ETH domain could be made substantially more effective by strategic coordination, joint approaches to suppliers and the simultaneous use of new opportunities for optimising procurement processes. This problem was made the responsibility of the "New Generation Procurement" project, headed by ETH Zurich's Vice-President for Planning and Logistics. Structural and procedural measures and related openings offered by new technologies were systematically examined. The "Implementation Program for Sustainable Optimisation of Procurement in the ETH Domain" is to be officially launched in spring 2003.

**ETH World – from vision to reality.** ETH World is a strategic program designed to establish a virtual communications and cooperation platform to support teaching, research and services independently of time and place. 24 projects have been begun since the start of the program three years ago. In 2002, nine projects came to an end and five new ones were launched, building bridges between the physical and virtual infrastructure. The ideas from the ETH World design competition are being implemented and are focussing on personalised access to information. Thus, ETH Zurich's Web identity is being revamped and extended by target group-specific portals and easy-to-handle personalisation tools. The "Neptun – personal laptops for students" and wireless LAN projects have continued to be successful. In the second year of the Neptun project, nine departments encouraged their students to buy laptops and provided their professors with software and support for these mobile teaching and research tools. The Universities of Zurich and Basel also took part in the Neptun project. Altogether 2500 laptops were purchased, more than 900 of these by ETH students. Thanks to these pioneering achievements in the field of virtual infrastructures, ETH Zurich now has over 2500 additional mobile work stations, and the largest wireless LAN in Switzerland. Early in the summer of 2002, Professor Bernhard Plattner from the Department of Information Technology and Electrical Engineering took over as Program Director of ETH World with the support of an advisory board.

## Pioneering Infrastructures Pioneering Achievements

**ETH is investing in the expansion of research infrastructures in order to equip its researchers with the best possible facilities. 2002 saw the opening of three new large research facilities in the form of the new nuclear magnetic resonance magnet for the Institute of Molecular Biology and Biophysics, the Zurich Radiogenic Isotope Geochemistry Laboratory (ZRIGL) and the FIRST-Lab, Center for Micro- and Nanoscience.**

Prion research at the Institute of Molecular Biology and Biophysics benefited from the acquisition of a new nuclear magnetic resonance magnet in February 2002, only the second in the world to be operated at a frequency of 900 megahertz and to generate a field strength of 21 Tesla. It replaces a temporary 800 megahertz magnet. The new superconductive magnet weighs approximately six tonnes and cost around CHF 10 million.

**On the trail of the origins of the solar system.** The Zurich Radiogenic Isotope Geochemistry Laboratory (ZRI GL) was equipped with a new mass spectrometer, a large geometry high resolution MC-ICPMS known as "BIG" for short. This was preceded by extensive renovation of the laboratory. The total cost of the new laboratory was around CHF 20 million. The new mass spectrometer makes the Zurich isotope laboratory one of the world's pioneering facilities. The laboratory was officially opened in March 2002. His Royal Highness Prince Andrew, The Duke of York, was a special guest at the opening ceremony. Isotope measurements allow the dating of geological processes, for example the formation of the Alps or the origins of raw material deposits, and can be used to explore the origins of the solar system.

**Ultramodern clean room for nanotechnology.** "Frontiers In Research, Space and Time - FIRST": travelling to the frontiers of time and space was the idea that inspired the name given to the new technology centre at ETH Hönggerberg. The FIRST-Lab provides ultramodern infrastructure, allowing ETH researchers to develop their skills in the micro- and nanosciences. Access to first-class nanotechnology is only possible with the assistance of top-quality instruments and laboratories which meet the highest standards of cleanliness. The FIRST-Lab has rooms in which the air contains fewer than 300 dust particles per cubic metre. ETH Zurich has invested around CHF 12 million in scientific instruments for this new facility, which was opened in July 2002. The FIRST-Lab is used by researchers from various disciplines, for which reason professors from the four ETH departments Physics, Mechanical and Process Engineering, Information Technology and Electrical Engineering and Materials were all involved in designing the laboratory. Biochemists and molecular scientists will in future also be involved in FIRST-Lab projects. Whether for basic research or applied projects, the new platform allows collaboration between industry and ETH Zurich over the entire spectrum of micro- and nanosciences. Students also stand to benefit from the new facility, since FIRST-Lab will enable them to take their education to the highest level.

## Combining Tradition with Growth Potential

**The 2004–2007 four-year plan, the keystone of ETH Zurich's planning activities, was submitted for internal consultation within ETH in summer 2002 and approved by the ETH Board in September.**

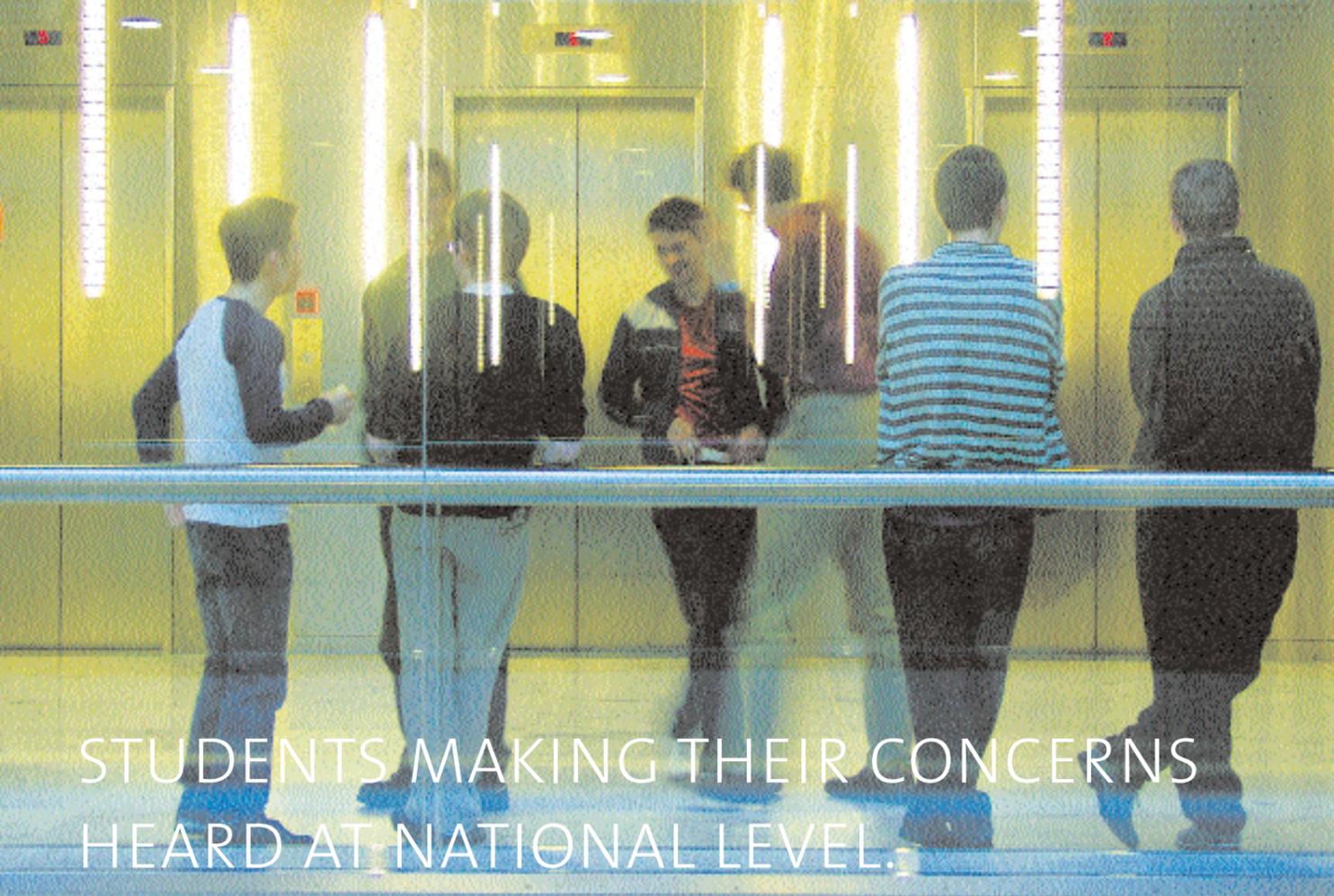
The four-year plan is the keystone of ETH Zurich's planning activities and, as the mandatory planning basis for all units at ETH Zurich, is the starting point for all professorship planning and the annual budget discussions as well as keeping the continuing planning process within sensible bounds. The plan is devised in a multi-stage process in close cooperation with the departments and the Central Authorities. By planning step-by-step from the top down and the bottom up, the objectives of the Executive Board and the departmental plans are brought into line with each other.

**Four-year plan – broad consultation.** ETH Zurich's 2004–2007 four-year plan is based on two pillars: the ETH Board's 2004–2007 Strategic Planning and ETH Zurich's 2002–2007 Strategic Postulate. At the end of May 2002, the Executive Board gave its approval for the first version of the four-year plan to be sent to the ETH Board for a first reading. In the summer of 2002, it was submitted for extensive internal consultation within ETH, and the University Assembly, the Conference of Lecturers, the Association of Non-professorial Academic Staff (AVETH), the ETH Zurich Students' Association (VSETH), the Personnel Commission, the departmental heads, the members of FORZA (directors and heads of the administrative units and the Central Scientific Services together with one staff representative from each) were invited to comment on it. The document was then revised and adopted by the Executive Board in mid-August 2002. On 18th September 2002, the ETH Board approved the 2004–2007 four-year plans for all the institutions within the ETH domain.

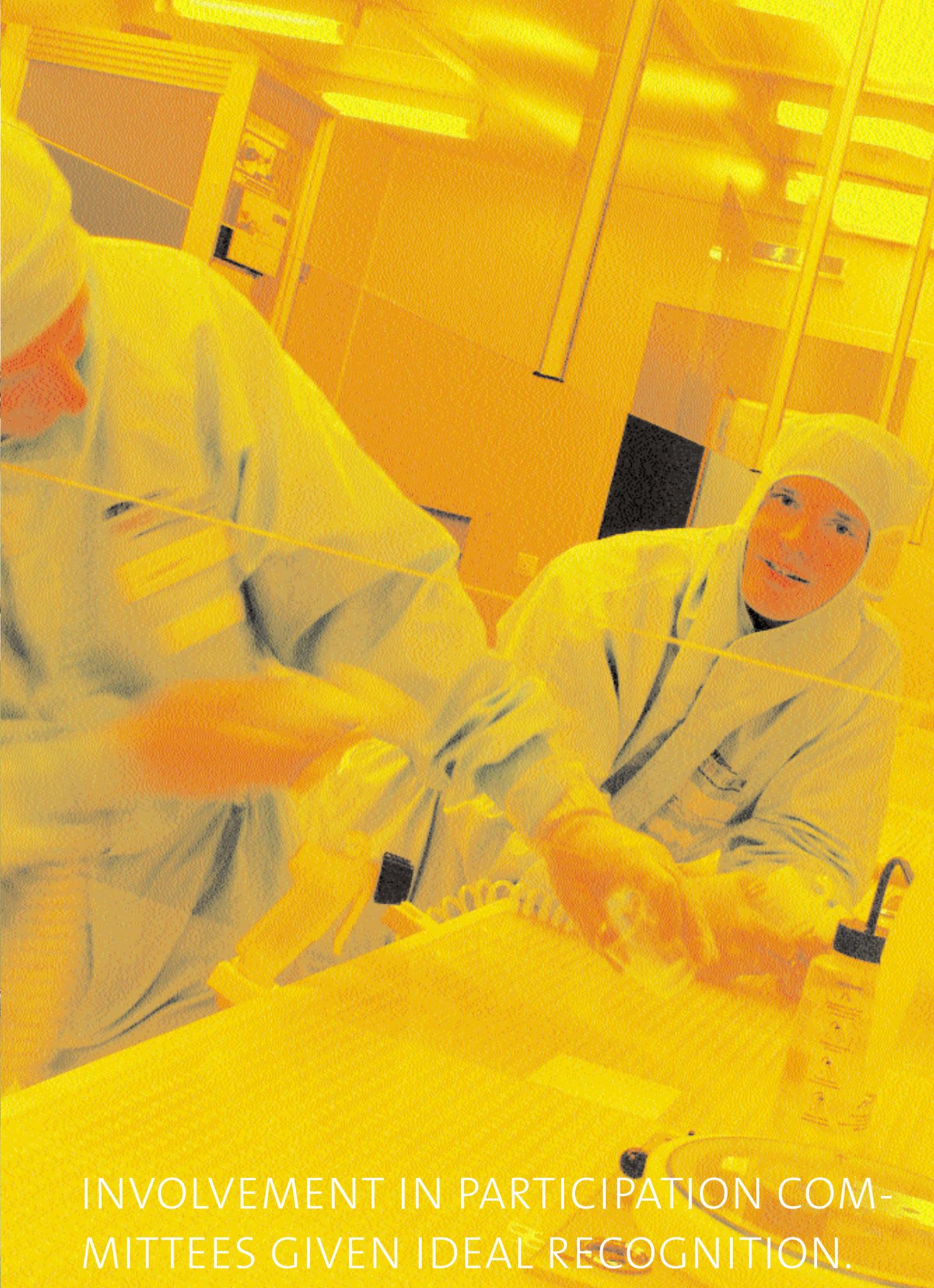
**Two main focal points.** An important principle which the Executive Board has committed itself to in the 2004–2007 four-year plan is to promote on an equal basis both long-term basic research and areas offering high short- and medium-term growth potential. These two focal points form the basis of sustainable development at ETH. Long-term basic research in engineering and natural sciences embodies a successful tradition at ETH Zurich and will essentially shape its future image too. On the other hand, areas of promising growth potential are of considerable social relevance and offer great potential for creating added value. The Executive Board also regards as one of its core duties the creation of contexts for knowledge transfer between ETH Zurich, the Universities and the private sector and the development of new models for financing research investment on the basis of this cooperation. Another essential basis for sustained success in research and teaching is professional, staged management. Autonomy gives ETH greater entrepreneurial freedom. In order ultimately to make optimum use of funding from the point of view of both business management and science, ETH passes specific areas of its autonomy on to its units. By the end of 2004, for example, all departments will have budget autonomy. The full four-year plan may be consulted on the Internet and downloaded from [http://www.planung.ethz.ch/planung/mehrjahresplan\\_d.htm](http://www.planung.ethz.ch/planung/mehrjahresplan_d.htm)



STAFF PONDERING ECONOMY MEASURES.

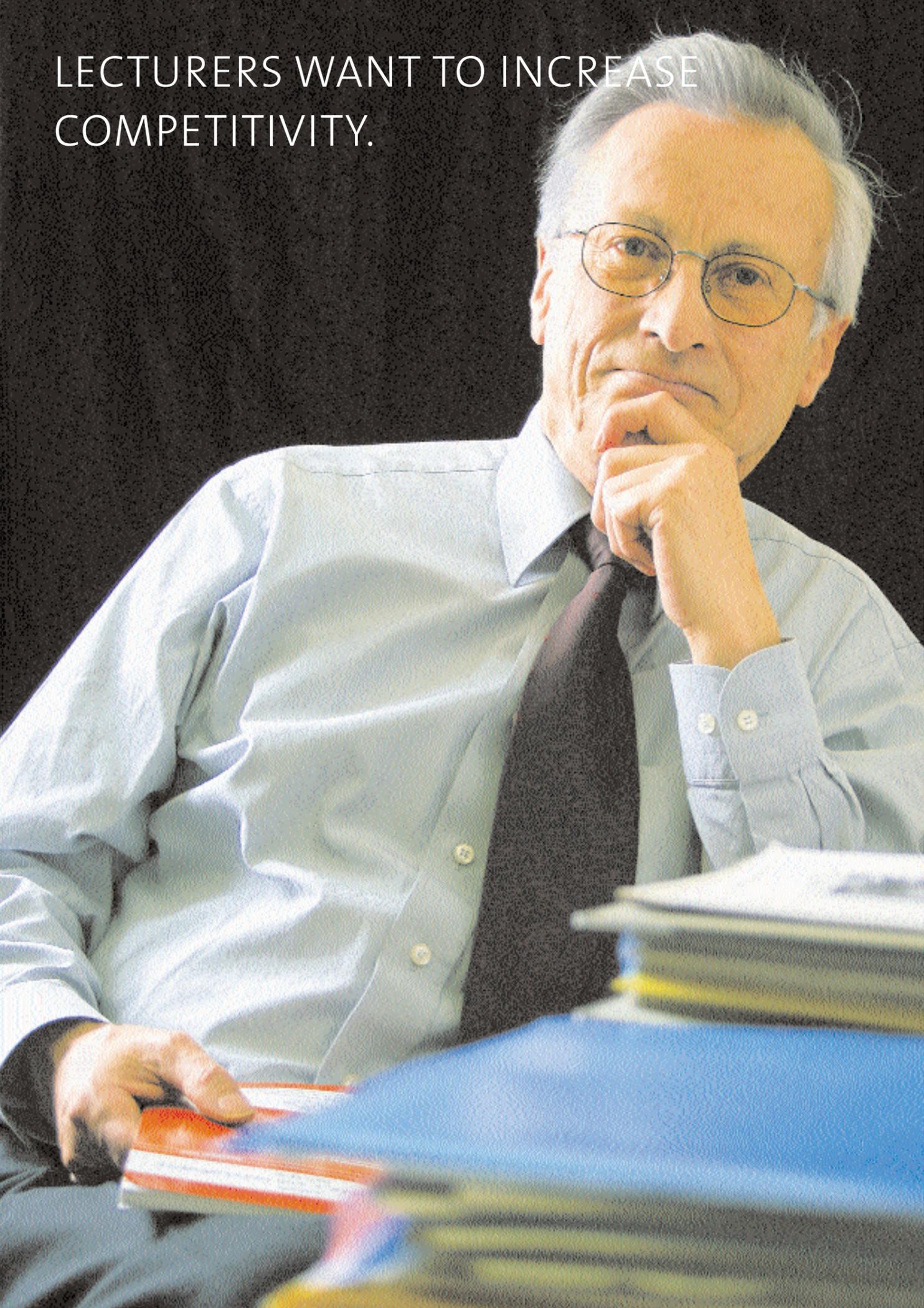


STUDENTS MAKING THEIR CONCERNS HEARD AT NATIONAL LEVEL.



INVOLVEMENT IN PARTICIPATION COMMITTEES GIVEN IDEAL RECOGNITION.

LECTURERS WANT TO INCREASE  
COMPETITIVITY.



ETH ZURICH AIMS TO SECURE ITS STAFF  
BASE IN THE LONG TERM BY GIVING  
STAFF THE FREEDOM TO DEVELOP AND  
BY PURSUING RESPONSIBLE PERSON-  
NEL POLICIES.

## University Assembly: Planning – Advising – Rewarding

In 2002, the University Assembly exercised three fundamentally different functions which can be summarised by the keywords planning, advising and rewarding.

**Planning:** 2002 saw the adoption of both ETH Zurich's four-year plan and the ETH Board's strategic plan for the 2004–2007 period. The University Assembly was critical of both documents. According to the revised ETH Law, which will probably come into force in 2004, the ETH Board is to have a new full member who will be proposed by the University Assemblies of ETH Zurich and EPF Lausanne. A joint working party was constituted from the two participation committees. The working party studied methods and models of how to arrive at a consensus nomination and how to prevent the elected member from influencing the carefully balanced ratio between Zurich and Lausanne.

**Advising:** In addition to their beneficial effects, restructuring and cost-saving programmes always result in uncertainties which may be perceived as real threats by those affected, even if their fears are groundless. It is one of the University Assembly's duties to point out such mechanisms. One such intervention in July 2002 led to the President writing an explanatory letter to all staff.

**Rewarding:** Working on participation committees has little immediately obvious effect and demands considerable idealism, which makes at least non-material recognition of the work done all the more important. The University Assembly has devised a way of documenting the work done on participation committees by issuing a certificate printed on an official letterhead and signed by the chair of the relevant committee and by the President of ETH Zurich.

## Economy Measures Cause Debate

In 2002, ETH Zurich's Personnel Commission (PeKo), like the Personnel Committee before it, expressed criticism of certain of the Executive Board's activities. October saw the selection, on the basis of the new voting rules, of PeKo's 14 members for the 2003–2006 period.

The Personnel Commission expressed an opinion on various Executive Board activities, such as the Environmental Systems project and the prospects for the development of the Applied Biosciences, Chemistry and Biology departments. The Personnel Commission was also involved in the consultation process for the 2004–2007 four-year plan, among other things supporting the Executive Board's strategy of making all departments autonomous by 2005. The Personnel Commission was very happy to note that ETH aims to secure its staff base in the long term by pursuing responsible personnel policies and by giving all staff the freedom to develop and stated that, as a rule, projects should not require staff cuts or that any staff changes should be made in a socially acceptable manner. The Executive Board's economy measures and their impact on staff were the focus of considerable discussion. Increased levels of staff uncertainty were also of concern to the Personnel Commission, which felt that such uncertainty could have been counteracted by better communication.

At the beginning of the year, the Personnel Commission devised new voting rules. These were required because, on the basis of the new Personnel Ordinance, the Personnel Committee became the Personnel Commission on 1 January 2002. September saw the announcement for the Personnel Commission elections for 2003 to 2006 and, in October, the 14 members had already been appointed after a secret ballot. After six years of service in the same team, five members had made themselves available for a further period. All the personnel representatives who stepped down were thanked for their hard work and commitment to ETH staff.

## Keeping the Tried and Tested and Seeking New Ways

2002 was a year of change and success for the ETH Students' Association (VSETH). In mid January, Bea Bründler took over the Presidency from Arnd Bätzner, who remained on the executive committee in charge of "external relations", so the executive committee will still be able to benefit from his valuable network of contacts. VSETH managed to strengthen its internal position in 2002. Following the preceding year's adoption of new statutes requiring among other things a new corporate identity for VSETH, this objective was pursued single-mindedly in 2002. In addition, cooperation with not only the Commissions and professional association but also with other student organisations and service providers was intensified.

The student associations of the IDEA League met for the first time on the occasion of the 120th anniversary celebrations for Technische Universiteit Delft. This meeting proved very instructive for VSETH's executive committee. Another meeting is already being planned for 2003. VSETH's revamped website went online punctually at the beginning of the 2002–2003 winter semester. In addition to providing information about the association, planned projects and events, this website also offers new services.

Seven members were also appointed to the new student centre committee (KSZ) this year. The committee was set up in 1999 to work for the construction of a successor to the VSETH building at Leonhardstrasse 19. The committee intends to submit its needs analysis to ETH by the beginning of the summer semester 2003. Advertising campaigns are also being carried out in order to encourage still more creative and committed students to join VSETH. Targeted lobbying is being used in order to build a broad base for what is VSETH's biggest project to date at ETH.

On 15 December 2002, the association of Swiss university student bodies (AES-VSH) was formed jointly with the student body at the University of St. Gallen (SHSG) and EPF Lausanne (AGEPoly). This new association gives the three founder members a voice at the national level so that they will be able to join in the debate on education policy. Membership of the new association is open to all umbrella organisations of Swiss Universities, Universities of Applied Sciences and Technical Colleges. VSETH also made its presence felt in internal university policy-making by making use of its seat on the ETH's planning and control committees. It also expressed its opinion in three consultations on current issues. The close contact cultivated with other national and international student bodies again demonstrated to VSETH that student involvement in ETH decision-making processes is of enormous significance. The voluntary contributions students make to professional associations and Commissions are also of great importance, and VSETH thus aims to ensure that appropriate compensation, for example the award of credits, is provided such work.

## Indicators as a Measure of Competitiveness

In 2002, the Lecturers' Conference focused principally on drafting comments on various consultation documents.

In 2003, the emphasis will be on ETH's competitiveness.

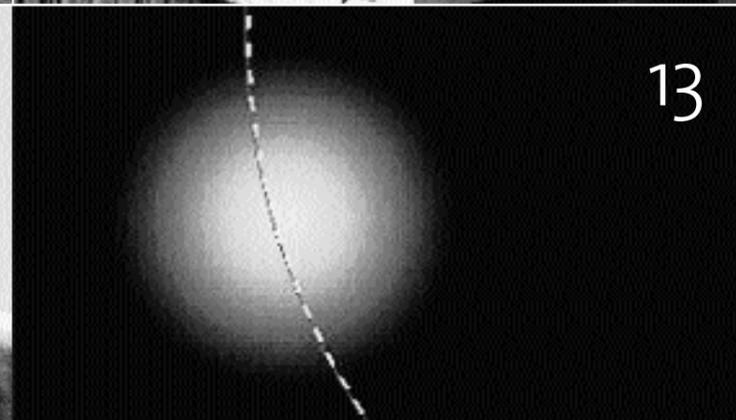
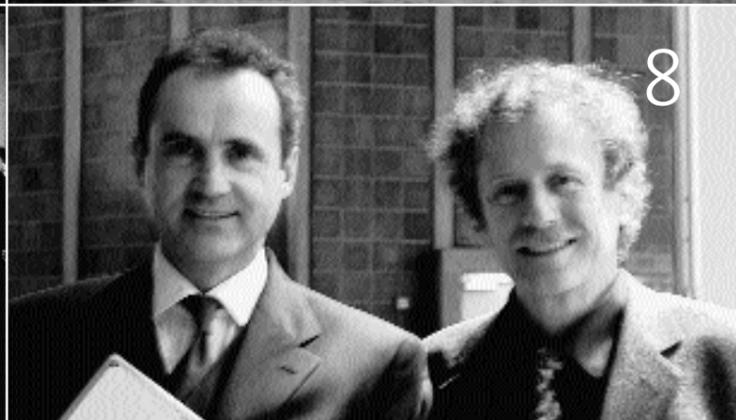
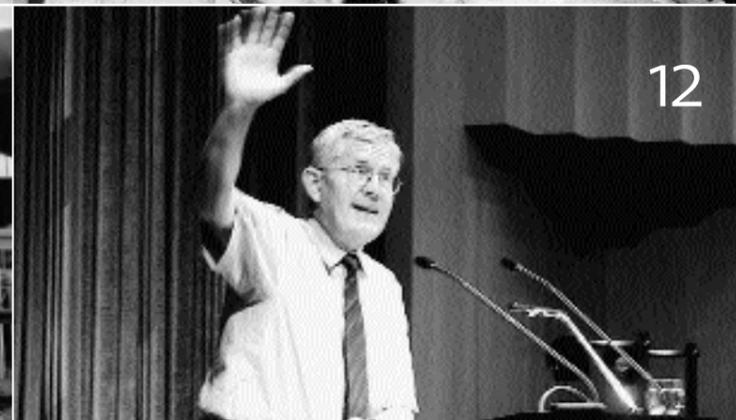
For example, the revised version of the ordinance on professors was submitted with the new ETH Law to Federal Council Member Ruth Dreifuss at the beginning of July. Comments on the consultation document on the new

"Framework ordinance on approval and performance monitoring at ETH Zurich" and on the "Environmental Systems" project were also drafted.

On 1 November 2002, Prof. Gérard Hertig took over the chair of the Conference of Lecturers from Prof. Peter Marti. In addition, the chairs of the subcommittees – Prof. Gernot Kostorz, Prof. Urs Nef and Prof. Paul Meyer – were confirmed for the period 2002 to 2004 and a new executive committee for the Conference of Lecturers was appointed.

The Conference of Lecturers would like to see ETH Zurich become more competitive both internally and externally. Internally, the primary aims are to improve teaching and research and to foster a sense of unity. Externally, the issue revolves around how attractive potential students, lecturers and the general public find ETH.

ETH's competitiveness primarily depends upon the quality of its students, lecturers and scientists. Indicators play an important part in making an objective evaluation, allowing quick comparisons to be made and creating transparency. In US universities in particular, "rankings" and lists of indicators influence university operations in a way that should not be underestimated. As a first step, the Conference of Lecturers will accordingly define, in addition to conventional criteria, four to five meaningful teaching and research indicators which will allow an assessment to be made of ETH's competitiveness. The intention in a second step is to assess whether these indicators bring about or prevent internal and external improvements and whether they change ETH's role relative to the Universities of Applied Sciences. The objective is to promote internal optimisation processes and to provide incentives to increase ETH's attractiveness to students and lecturers. This proactive approach is also an effective signal that ETH Zurich's lecturers are willing to see beyond the limits of their own institute and commit themselves to the quality of the university.



**ETH Day – Looking outwards to boost funding.** The New Economy has meant a drop in funding in real terms for ETH Zurich. Such was the critical conclusion drawn by ETH President Prof. Olaf Kübler in his speech on ETH Day 2002 (23 November) to 600 guests from the worlds of science, business and politics. In his address, ETH Rector Prof. Konrad Osterwalder called on his audience to be on the lookout for additional, non-governmental funding, saying that a more progressive approach to tax legislation by the government could make it substantially easier for third parties to support universities.

**Two new honorary doctors, one guest of honour.**

On ETH Day 2002, ETH Rector Prof. Konrad Osterwalder awarded honorary doctorates to two scientists: Richard M. Karp in recognition of his fundamental contributions to algorithmics and theoretical computer science. Gregory P. Winter for his ground-breaking work in protein engineering.

Hans Künzi, former member of the Zurich cantonal government, was pronounced a permanent guest of honour on the basis of his most fruitful and sustained political career in the service of the public and of his particular contribution to ETH Zurich as a professor and founding president of the Karl Schmid Foundation.

Photo 1

**Industry and Foundation Prizes.**

Asea-Brown-Boveri Research Prize: Jean-Samuel Hentz  
Plastics Technology Prize: Michael T. Wissler  
Heinrich-Hatt-Bucher Prizes: Federico Cippà, Dominik Weiss, Christian W. Studer  
Latsis Prize: Jöel F. Mesot  
Otto-Jaag Prize for the Prevention of Water Pollution: Marco C. M. Jaspers

**Medals for outstanding dissertations** Department of Architecture: Andreas Fries; Department of Civil, Environmental and Geomatics Engineering: Federico Cippà, Matthias Haldimann, Othmar Frey, David Naef, Matthias Thoma; Department of Mechanical and Process Engineering: Florian Herzog, Patrick Lochmatter, Eric Müller; Department of Information Technology and Electrical Engineering: Stefan Bleuler, Pascal Grieder; Department of Materials: Jonas Dorn, Markus Müller; Department of Industrial Management and Manufacturing: Michael Bhend; Department of Chemistry: Reto Müller; Department of Biology: Andreas Lingel, Christian Jakob, Katharina Quirin, Claudia Ruprecht; Department of Applied Biosciences: Marco Toigo; Department of Earth Sciences: Simon Scherrer; Department of Environmental Sciences: Malte Meinshausen, Andreas Näf; Department of Agriculture and Food Sciences: Corinne Hilti, Christine Müller; Department of Forest Sciences: Urs Kamm, Nancho Zimmermann

**Willi-Studer Prizes for the best final diplomas.**

Department of Architecture: Manuel Gysel; Department of Civil, Environmental and Geomatics Engineering: Matthias Haldimann, David Naef, Ralf Sigrist; Department of Mechanical and Process Engineering: Ivo F. Sbalzarini; Department of Information Technology and Electrical Engineering: Claudio Jeker; Department of Computer Science: Fabian D. Kuhn; Department of Materials: Thomas Etter; Department of Industrial Management and Manufacturing: Philipp Sidler; Department of Mathematics: Reto Aschwanden, Nicolai F. Meinshausen; Department of Chemistry: Matthäus U. Bähler; Department of Biology: Jessica Dessimoz, Claudia Ruprecht; Department of Applied Biosciences: Eva Geissler, Simone D. Leuthold, Marco Toigo, Bettina Wyss; Department of Earth Sciences: Simon Scherrer; Department of Environmental Sciences: Samuel Luzi; Department of Agriculture and Food Sciences: Alexandra Linda Kocher, Rainer E. Messmer; Department of Forest Sciences: Christian Hadorn.

**462 doctorates awarded.** A total of 97 female and 365 male doctoral candidates were awarded doctorates by ETH Zurich in 2002. Somewhat more than half of them were Swiss nationals, while the remainder hailed from 17 nations on four continents. The award ceremonies took place on 1 February and 28 June.

**"Vireal Lab" – a unique study environment.** February saw the opening of the Institute of Pharmaceutical Sciences' novel study environment, the "Vireal Laboratory". The lab provides presentation and interaction surfaces which make it possible to present three-dimensional models and work on them in a team.

Photo 2

**Diversity and synergy in plant sciences.** The centre of excellence for plant sciences, set up jointly by ETH and the University of Zurich in 1998, expanded to Basel in February. Institutes at the University of Basel and the plant group of the Friedrich Miescher Institute in Basel are now part of the centre of excellence. Cooperation in teaching and research is intended to promote interdisciplinary working and optimise the use of resources.

**Director-General of Expo.02 Nelly Wenger visits ETH.** In February, just three months before the opening of Expo.02, Nelly Wenger, the exhibition's Director-General, made a speech at ETH. On the occasion of this visit to ETH and the University of Zurich, she spoke about the transient nature of national exhibitions.

Photo 3

**New supercomputer at SCSC.** In February, the Swiss Centre for Scientific Computing (SCSC), ETH's high-performance computing centre in Ticino, ordered Switzerland's largest supercomputer from IBM, underlining SCSC's determination to develop its leading role in the national high-performance computing network. Thanks to the new supercomputer, universities, Federal agencies and industry will be able to address problems which could not be solved using the previous generation of computers.

**Royal guest inaugurates new laboratory.** On 21 March, ETH inaugurated its newly established Radiogenic Isotope Geochemistry Laboratory. The laboratory has been equipped with a new instrument, a particularly high resolution mass spectrometer. The first of its kind, it was manufactured in Great Britain and makes the facility one of the best equipped geochemistry laboratories in the world. One of its primary tasks is to research the origin of the solar system. His Royal Highness Prince Andrew, The Duke of York, was a special guest at the opening ceremony.

Photo 4

**ETH boat sinks on Lake Zurich.** At the beginning of April, an ETH Zurich research boat caught fire and sank on Lake Zurich. The boat belonged to Prof. Judith McKenzie's research group from the Institute of Geology, which is studying sediments from the bottom of lakes and oceans. The sediments can reveal information about climatic change or major earthquakes.

Photo 5

**"Ada - the Intelligent Space".** ETH Zurich and the University of Zurich were jointly responsible for a pavilion at the Swiss national exhibition site in Neuchâtel from 15 May until 20 October 2002. Partners in the project included the department store chain Manor SA, the Gebert Rûf Foundation, the Velux Foundation, the Swiss Foundation for Scientific Research and others together with the National Exhibition 2002 Association. Ada was a successful Expo exhibition project. Ada's 553,700 visitors were themselves part of the exhibit, which was designed as a research project, experiencing live research by interacting playfully with Ada. "Ada – the Intelligent Space" was named after the computer pioneer Lady Ada Lovelace (1815 to 1852). The project illustrated key functional principles of our brains and addressed the central meaning of intelligence. At the same time, Ada was also an example of up-to-date, interdisciplinary research and embodied a new way for society and research to interact.

The exhibit was primarily designed and implemented by the Institute of Neuroinformatics, set up by ETH and the University of Zurich. Led by Paul Verschure and Institute Director Rodney Douglas, some 20 scientists collaborated on the project.

There was also a wide-ranging schools campaign centred around the subject matter of the exhibition. This included not only teaching materials, but also an introductory film which was awarded four "Edis", the Swiss commissioned and promotional film prizes. Around 700 school parties received guided tours and introductory lessons. The exhibit's 50 presenters, with their skilled introductions and open manner, made a major contribution to its success. The project coordinators were Matthias Erzinger for ETH Zurich and Miriam Dahme for the University of Zurich.

Photos 6 and 7

**ETH World information lunches.** At the beginning of the summer semester and just before Christmas, ETH staff and students had the opportunity to get an update on the status of the ETH World program at two information lunches. ETH World's aim is to create a third, virtual campus where each and every ETH student or member of staff can participate in ETH when and wherever they want. Prof. Bernhard Plattner, the new ETH World Program Director, was introduced at the May lunch. The subject matter of the December event was recently approved projects and the new web corporate design for ETH Zurich.

Photo 8

**Annual media conference 2002: Educational mandate at risk.** At its 2002 annual media conference, ETH Zurich expressed its concerns about current trends in its finances. If an increase in funding is not achieved, ETH Zurich's educational mandate is at risk in the medium term. The Executive Board is working on the basis of annual growth in funding of at least 6.5%. Such growth is essential if the quality of teaching is to be maintained and ETH Zurich is to remain internationally competitive.

Photo 9

**Panel discussion on Internet privacy.** At the end of May, ETH, together with the daily newspaper "Tages-Anzeiger", organised a joint political panel discussion entitled "Danger from cyberspace – is there such a thing as privacy on the Internet?". Panel members included Prof. Ueli Maurer, ETH Zurich, Bruno Baeriswyl, data protection officer for Zurich Canton, Andreas Müller-Maguhn, hacker and ICANN ambassador, and Stefan Marti from the Media Lab at the Massachusetts Institute of Technology (MIT).

**ORL becomes NSL.** In June, ETH Zurich established a new centre of excellence for urban and landscape development. Known as the "Centre for Cities and Landscape" (NSL), it addresses issues associated with the design, use and development of urban and rural spaces in Switzerland and abroad. NSL includes five ETH Zurich Institutes, including the newly formed Institute for the Contemporary City in Basel. The Institute for National, Regional and Local Planning (ORL) has been incorporated into the new network.

**"Experiencing and understanding physics".** Some 4000 visitors attended the Physics open day in June at ETH Hönggerberg. Under the motto, "experiencing and understanding physics", the visitors gained a multifaceted view of the discipline from demonstrations, special lectures, tours through research laboratories and workshops or carrying out experiments on one of the many test setups. The real crowd pleasers turned out to be solar research, the quantum computer and the interface between physics and biology.

Photo 10

**Football fever used for field trial.** A unique picture was to be seen at the Rämistrasse entrance to the main ETH building in June when hundreds crammed in front of the big screen to watch the live transmission of the football world cup. ETH staff and students could, however, also watch the matches on their own computers thanks to a multicast streaming presentation jointly provided by ETH's Communication Section and the Network for Educational Technology, NET, on their world cup website. The aim was to test the multicast capacity of ETH's network under real-life conditions.

Photo 11

**Speech by the President of the Confederation, Kaspar Villiger.** At the end of June, the President of the Confederation, Kaspar Villiger, spoke in the Auditorium Maximum in favour of the solidarity foundation, as a kind of prelude to the debate on the Swiss People's Party (SVP) petition for a referendum on the use of Switzerland's gold reserves and the Federal Council's counterproposal. Voting on both proposals took place on 22 September.

Photo 12

**Researching the frontiers of space and time.** In July, as part of the expansion at Hönggerberg, ETH Zurich opened FIRST-Lab (FIRST: Frontiers In Research, Space and Time), a cutting-edge clean room centre that further develops its micro- and nanoscience facilities. FIRST-Lab is an interdisciplinary research centre which is intended to provide an impetus to this fast-moving area of research. Engineers and scientists from various disciplines are jointly using this new technology laboratory.

**First images of solar gamma rays.** For the first time since February's launch of the HESSI (High Energy Solar Spectroscopic Imager) satellite, the telescope recorded ultra-high energy rays in July. These rays originated from a huge eruption which occurred in the solar corona on 23 July. Researchers at ETH Zurich's Institute of Astronomy succeeded in processing the measurements to generate the first gamma ray image from the cosmos. Newly developed methods assisted with managing the vast quantities of data supplied by the satellite. The Paul Scherrer Institute (PSI) is also involved in the HESSI project.

Photo 13

**"Long Night of Museums" event in Zurich.** ETH's program of events at the Zurich museums' open night at the end of August was highly varied. Visitors to the geology/mineralogy collection had the opportunity to simulate an earthquake, while in the graphics collection they could have a look inside Tom Wasmuth's boxes or make one for themselves. A special tour of the city was on offer from the Institute for the History and Theory of Architecture.

Photo 14

**Genetically modified wheat trial approved.** In September, the Swiss Federal Department of Environment, Transport, Energy and Communications (UVEK) upheld ETH Zurich's administrative appeal against the Swiss Agency for the Environment, Forests and Landscape (SAEFL). According to the ruling, the field trial of genetically modified wheat is in principle admissible. As a result, SAEFL authorised the trial in December.

**Royal visitor from Asia.** The Crown Princess of Thailand, Maha Chakri Sirindhorn, visited ETH Zurich on 17 September. During her three hour visit, she was shown around various Institutes and laboratories.

Photo 15

**21st Nobel Prize to be won by an ETH researcher.** The Royal Swedish Academy of Sciences bestowed the 2002 Nobel Prize for Chemistry on ETH Professor of Biophysics, Kurt Wüthrich. He received the honour for his development of Nuclear Magnetic Resonance spectroscopy for determining the three-dimensional structure of biological macromolecules in solution. Wüthrich's work in the early 1980s enabled NMR to be applied to proteins.

Photo 16

**Strong competition for ETH apprenticeships.** In 2002, 115 apprentices, some 40% of whom were women, were in training in 12 trades at ETH. An ETH apprenticeship remains very popular. Some 1200 enquiries and applications were received for the 40 places due to become available in 2003. Business apprenticeships are most in demand, followed by those for biology and chemistry laboratory assistants. With the aim of promoting quality assurance, the professional training commission has commissioned an interview questionnaire for apprentices and for their teachers and instructors.

**ASVZ in 2002.** A survey of "sports and study" at university covering the whole of Switzerland revealed a very positive picture for Zurich: 91% of students are actively involved in sport, 61% with the Zurich academic sports association (ASVZ) and privately, 28% just with ASVZ. The primary motives are "keeping healthy" and "having fun". Over 50% of all participants train individually at ASVZ in combination with a led sports lesson. Fitness training remains the most popular option. Over 800,000 visits (up from the previous year's 780,000) confirm that the sports and services offered by ASVZ, combined with an ideal infrastructure, meet with the approval of the majority of those entitled to make use of them. These high occupancy rates and the good quality of the sports on offer also demand top-quality infrastructure to match. The planned new university sports centre at Höggerberg will be an additional boost to this infrastructure. Charly Schneiter, the co-founder and first director of ASVZ, died on 23 March 2002 at the age of 91. Many alumni have him to thank for their understanding of the value of a sensible approach to sport.

Photo 17

**gta – program of exhibitions.** An exhibition of the research work carried out in the Department of Architecture was a prelude to this year's program of exhibitions at the Department's Institute for the History and Theory of Architecture (gta). The "upper lawn pavilion" by Peter and Alison Smithson was presented and described in depth in the accompanying gta publication. The results of two competitions for students which had been staged jointly by the school and the construction industry were presented in the summer semester: the cemsuisse "01/02 photographic prize" and the "Eternit 01 architecture prize".

The "Europan 6" exhibition in the ETH main hall also documented competition results, this time from the "Europan" biennial competition for young architects coordinated from Lausanne.

Two further exhibitions, "Post-war modern Switzerland" and "Meili, Milan and the high-rise building" provided a thrilling insight into the projects of renowned Swiss architects from the 1950s to the 1970s.

The winter semester started with a presentation of videos which had been produced as part of the landscape architecture option. gta-Verlag published an accompanying DVD brochure. Finally, the December program focussed on a monographic exhibition on the famous Zurich architect Theo Hotz, who presented a Luginbühl sculpture from his wide-ranging art collection on the occasion of the opening of the exhibition.

Photo 18

**Collegium Helveticum.** In her speech on 21 May 2002 marking the fifth anniversary of the Collegium Helveticum, Federal Council Member Ruth Dreifuss asserted that the Collegium Helveticum's most important achievement was to have demonstrated that there were other ways to ensure knowledge transfer between disciplines and with the general public. The international symposium "Trading-Zones of Knowledge Production: What follows?" took place only a few weeks later, on 17 June 2002. This was Helga Nowotny's swansong before leaving the Board of the Collegium Helveticum and the professorship of Philosophy of Science and Science Studies.

In addition to these two main events, the Collegium Helveticum was host to guests from many different disciplines. In the winter semester, these included the scientists Aant Elzinga and John Ziman and the Bosnian artist Maja Bajevic, while the summer semester's guests were Ullica Segerstrale, Tom Peters, Vittorio Magnago Lampugnani and the author Walter Grond.

One attempt by the Collegium Helveticum to enter into dialogue with the general public was the "Writing on the Net" project led by Johannes Fehr, in which scientists and writers tried out new ways of making interdisciplinary use of the Internet. Their experience and findings were discussed in the international symposium "Writing on the Net. Literature in the digital age" from 5–7 June 2002. Since 1 October 2002, the Collegium Helveticum has been temporarily headed by Prof. Peter Rieder.

Photo 19

**Collection of Prints and Drawings.** Souvenir of Pompeii was the title of the first exhibition in 2002, which showed "veduti" or views painted by the Zurich artist Jacob Wilhelm Huber. In 18th century Pompeii, veduti, keepsakes and printed, sometimes coloured views provided a new livelihood for local and immigrant artists. Veduti can be considered the first beginnings of the souvenir industry. "Walking Day" was the title of an exhibition of works by the artist Boris Rebetez, who was born in 1970. The exhibition provided a first-time opportunity to see a comprehensive collection of his collages together with individual drawings and groups of drawings. ETH's Collection of Prints and Drawings has been acquiring Boris Rebetez works on paper since 1995. In the "Worlds in a box" exhibition, the Collection of Prints and Drawings showed drawings, paintings and sketches by the American artist Tom Wasmuth. The small format original drawings and photographs revealing the artist's cosmos emerge from 36 wooden boxes, some made by the artist himself. The publication "Tom Wasmuth: Selected Works, volumes 1–10, 1995–2002" was published by Galerie & Edition Marlene Frei and Verlag Buschö. 2002's final exhibition was "Poliakoff, Tàpies, Chillida and others", presented by Erker-Presse St. Gallen owned by Franz Larese and Jürg Janett. A concentrated exhibition could be drawn from the Erker-Presse's rich resources and shown for the first time in ETH's Collection of Prints and Drawings. The exhibition focussed on abstract-expressive lithographs. Many of the prints, portfolios and books will subsequently remain in the collection as a generous gift.

Photo 20

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