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ETH

Swiss Federal Institute of Technology Zurich

Annual Report

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Cover Image: ETH Zürich in the City Center

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MANAGEMENT STRUCTURE

As of December 31, 1993

President

Rector	Vice President of Planning and Development	Vice President of Research

Teaching Area:	Prorectors	Personnel	Operational	IT	Research Area:
19 Departments with 11,444 Students Architecture Civil Engineering Mechanical Engineering Electrical Engineering Computer Science Materials Science Business and Production Sciences Chemistry Pharmacy Forestry Agriculture Environmental Engineering and Surveying Mathematics and Physics Biology Environmental Sciences Earth Sciences Military Sciences Physical Education and Sports Teachers Humanities and Social Sciences	Rectorship	Service Financial Service Library Services	Services Security Service	Services Swiss Center for Scientific Computing (CSCS)	19 Departments with 83 Institutes and over 319 Professorships Agricultural and Food Sciences President: Prof. Dr. Jakob Nüesch Rector: Prof. Dr. Hans von Gunten Vice President for Research: Prof. Dr. Ralf Hütter Vice President for Planning and Development: Prof. Dr. Fritz Widmer General Secretary: Dr. Peter Kottusch Architecture Civil and Environmental Engineering Biology Chemistry Electrical Engineering Energy and Process Engineering Earth Sciences Geodetic Sciences Humanities Computer Science Mechanical Engineering, Operations, and Production Mathematics Pharmacy Physics Law and Economics Environmental Sciences Forest and Wood Research Materials Science

School Leadership

President:	Prof. Dr. Jakob Nüesch
Rector:	Prof. Dr. Hans von Gunten
VP of Research:	Prof. Dr. Ralf Hütter
VP of Planning and Development:	Prof. Dr. Fritz Widmer
General Secretary:	Dr. Peter Kottusch

REFLECTIONS

[Photo]
Prof. Dr. Jakob Nüesch, President

Dear Reader,

In 1993, ETH Zurich faced the challenge of virtually no financial growth. Today, we can proudly say that the measures we implemented—budget cuts for everyone, supplemented by various targeted cost-reduction efforts—have proven successful without impairing the dynamism and flexibility of our institution. Thanks to the new ETH Act, it is now possible for the first time to carry over certain financial reserves from 1993 into 1994. This positive outcome in economically difficult times is the result of a shared insight and effort from all staff members.

We live in a society undergoing transformation, a transformation that has repeatedly occurred at certain intervals throughout human history. The opportunities we must seize and the crises we must overcome have their own unique character. Key elements lie in the need to transition from quantitative, expansive growth to qualitative, subsidiary growth. This fact, coupled with the necessity to achieve adequate value creation with a reduced input of non-renewable resources in order to preserve the resource potential of our Earth, represents a major and demanding challenge for society and individuals. Courage for unconventional action, creativity, and a spirit of innovation will be determining success factors.

Success, however, is not only characterized by economic indicators. Meaning and, by extension, the affirmation of life and joy in life are equally important. In fact, these social components are significant elements of sustainable and harmonious development. Yet, in today's world of vanishing jobs and the resulting unemployment, they are extremely vulnerable.

Given the challenges of our time, the question arises as to the role of a university. A university is especially committed to the long term and, in a sense, to the unplannable. Nevertheless, it cannot avoid engaging with the major challenges of the present. It is precisely its long-term nature and independence that legitimize the university's active participation in shaping the necessary changes.

Undoubtedly, it must develop a culture of sustainability within its own ranks. But that alone is not enough. A great opportunity also arises from the fact that its graduates are not only trained as academic specialists but also experience an educational process that leads them to become personalities who, thanks to their skills and social competencies, develop into creators, not just highly qualified specialists.

In research, there are also opportunities for contribution from technical and natural sciences universities. There is a wide range of research needs, from the “dematerialization” of future products to new approaches in operations and production design, as well as the examination of the impact of technology on sustainability. At the same time, it must always be kept in mind that such problem-oriented activities can never replace free, knowledge-driven research.

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A university must continuously reassess its mission. Its planning is based on disciplinary diversity and long-term frameworks. It must not lose sight of the fact that it is planning for the unplannable. Short-term goals should only be pursued in light of the long-term mission and vision.

Finally, the university is a true cultural workshop. ETH Zurich’s opportunity lies in its diversity and the possibility of integrating technology, natural sciences, art, and humanities into a positive relational field.

The fact that in 1993, we took a step closer to our goals is largely due to the professors, all the members of the intermediate staff, and the administration. Most importantly, it is due to our students, who must embrace the demanding process of education and personality development. Teaching, learning, and researching form a network of relationships, which is essential for actively shaping our society and our environment.

[Signature]
Jakob Nüesch

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[Photo] [Photo] [Photo]

TEACHING

Vibrant Teaching

An Overview

[Photo]
Prof. Dr. Hans von Gunten, Rector

Not only as a center of research but also as a place of teaching, ETH is a learning organism: embedded in an educational landscape that is constantly changing, it nurtures the existing and creates new. It presents a picture that corresponds to its outward appearance: opposite the venerable main building, the new Institute Building for Mechanical Engineering and Production Technology on Clausiusstrasse is nearing completion – both part of the ensemble of ETH buildings, an integral part of the Zurich city center, this ever-evolving construction site. The following sections present an overview focusing on the new; however, this should not diminish the importance of what already exists.

In the discussed changes in the educational landscape, two things stand out globally—colleagues I meet at rector conferences confirm this—: the demands on schools are rising, but the resources are becoming scarcer. To avoid significant loss of substance, technical universities argue their economic importance: training engineers and natural scientists as key factors in the global competition of nations.

I do not deny this, but I advocate for understanding education in the natural and technical sciences also as a cultural achievement, a contribution to the formation of personality. ETH Zurich can proudly boast a strong department for humanities and social sciences, whose educational offerings are increasingly incorporated into the study programs of our degree-granting departments – a trend I support (though an optimum must be found, as some subjects can only be studied during the few years of a technical degree program, while for others, a broader "time window" in life is available).

However, it would be wrong to grant a monopoly on culture to the linguistically, historically, and philosophically oriented disciplines, or even to invoke a contrast with the "utilitarian" natural science and engineering fields. No: subjects like analysis, mechanics, or general biology are also part of our culture. In this sense, not only the graduates of our Department of Agricultural Engineering and Surveying (whom I hope not to offend with this statement) but those of the entire ETH are "cultural engineers"!

Recognizing that mathematical and natural sciences are an essential part of our culture, one concludes that they must also be given sufficient space in the curriculum of secondary schools.

The project for a revised high school diploma recognition regulation initially proposed a significant reduction in this space, which provoked many warnings, including from ETH Zurich. I am pleased to note that these warnings were taken seriously by the project managers.

The New ETH Law

The ETH Law, which came into effect on February 1, 1993, has also had an impact on teaching: The responsibility for issuing study plans and diploma examination regulations now lies with the school management. The ETH Board is responsible for the selection and re-election of professors, who are regularly reviewed for their suitability. The term "student" has been redefined, which necessitated adjustments to the status of listeners and has particularly benefited the departments for physical education teachers and military sciences.

Study Plans and Diploma Examination Regulations

The management of ETH Zurich issued three new study plans and two new diploma examination regulations. Additionally, changes were made to nine study plans and seven diploma examination regulations, reflecting both the greater autonomy and the adaptability of our university.

Credit System

In the Department of Computer Science, a credit system was introduced for the third and fourth years of study with the new diploma examination regulations. The total of 120 credit units required for the diploma is primarily earned through examinations, which must be completed in the examination session following the course. To obtain the diploma, it is no longer necessary to achieve a sufficient average grade but rather a sufficient performance in each individual subject. This, along with the closer timing between teaching and examinations, represents an approach similar to the credit systems used in American universities. It differs from the credit system introduced in 1992 in the Department of Electrical Engineering, where credits are awarded less for exams and more for required coursework (e.g., submission of solved exercises).

This now provides two models for collecting experience and later applying them in other departments. Both systems promote mobility, as both fulfill the European standard for credit systems.

Department of Military Sciences

Political and societal changes in recent years have led to a greater emphasis on humanities and social sciences in the training of officer instructors for the Swiss army,

alongside military technical training. This was addressed by revising the federal regulation for the Military Leadership School, which now formalizes the collaboration between the Federal Department of Defence (EMD) and ETH Zurich. The Department of Military Sciences at ETH Zurich, for which the school management has implemented a new study plan (with the diploma examination regulations still under preparation), is responsible for the humanities and social science components as well as the natural sciences and technological foundation subjects of the six-semester program, which concludes with a federal diploma.

Teaching Evaluation

In compliance with a legal requirement, the school management has decided to regularly and comprehensively evaluate teaching after a successful pilot project. The responsibility for this lies with the individual departments, while the administration of the process—particularly the student surveys, which are a key component—will be handled by the Didactics Center.

Mobility

After two years of preparatory work by the Mobility Office, the number of participants in mobility programs continues to rise significantly. Currently, ETH students and visiting international guests have access to twenty-five different programs under the ERASMUS (the European Union's mobility support program), covering almost all academic fields.

A significant step toward further developing mobility was made with the introduction of an article in the General Examination Regulations in 1993, which governs the recognition of exams taken abroad. In addition to academic recognition, two other factors are crucial: language training and housing availability.

The offering of intensive German courses has been expanded (thanks in part to ERASMUS funding), and the Mobility Office sought accommodations for 50 incoming students.

Agreements with Universities

In addition to a number of department-specific agreements, two new agreements were signed at the university management level in 1993: One with the Technical University of Helsinki focuses on research collaboration and student and faculty mobility, while an agreement with Purdue University in West Lafayette, Indiana, establishes a faculty exchange program supported by travel cost contributions from a Swiss-American foundation.

Continuing Education

ETH Zurich is well on its way to meeting the goals of the federal continuing education initiative—such as doubling the continuing education offerings by 1996—already at the "midway" point of this initiative.
In 1993, the Continuing Education Center launched a new post-graduate program in Work and Health, organized in collaboration with the University of Lausanne. Also newly introduced was the post-graduate program in Information Technology, replacing the former post-graduate studies in Automation and Communication Technology. Revised regulations and updated content concepts for post-graduate studies in Electrical Power Engineering and Urban Water Management and Environmental Protection were approved by the university management for 1994. The post-graduate program in Patent Law was prepared for introduction as soon as the necessary conditions at ETH Zurich are met. Further post-graduate studies or courses are also in preparation, with three existing programs currently being revised.

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In addition to the post-graduate studies and courses, ETH Zurich conducted around 150 one- or multi-day continuing education courses in 1993, with thousands of participants from practical fields. These courses were often organized in collaboration with other domestic and international universities, professional associations, or as part of the European continuing education program COMETT.
Led by the Continuing Education Center and supported by the Federal Office for Education and Science, the nationwide continuing education information system AGORA was established, making the continuing education offerings of all Swiss universities and technical colleges electronically accessible to the public.

Doctoral Studies at the Other ETH

With a new doctoral exchange program, the ETH Board aims to strengthen contacts between research groups at the two federal universities and encourage prospective doctoral students to benefit from living in a different linguistic and cultural environment after their degree. Up to eight attractive three-year scholarships are available, subject to the following conditions: excellent diploma qualification, a mother tongue different from the language of the doctoral university, a proposal for the planned research work, and confirmation of supervision from the responsible dissertation advisor.
Following the announcement in spring 1993, six scholarships were promptly awarded: one to a graduate and three to graduates of ETH Zurich for doctoral studies in Lausanne, and two to graduates of EPF Lausanne for doctoral studies in Zurich.

Housing for Students and Guests

The Bülachstrasse project, which will provide approximately 260 rooms for students of the University and ETH Zurich starting in fall 1994, celebrated its topping-out ceremony

in September 1993. Additional projects, including a guesthouse, are currently in development.

Administrative Matters at the Rectorate

The lecturer services now use a new computer program to process teaching assignments. This has temporarily led to increased workload, particularly at department secretariats; however, in the future, this will significantly ease the work.
The Rector is now responsible for allocating budgets for teaching assistants. To ensure a needs-based allocation of the increasingly limited resources, uniform evidence of need has been required across ETH. Although this led to temporary additional work, it will simplify the allocation process in the future.
As of January 1, 1993, the responsibility for granting credits for teaching-related tasks was transferred from the research area to the Rectorate.
Through the increased use of modern IT tools, the work of the Rectorate's office and the admissions office has been streamlined.
A newly developed appeals database assists the Vice Rector for Diploma Studies in decision-making.

Supervision Ratios (1982–1993)

Students, postgraduate students, and doctoral candidates per professor

Students, postgraduate students, and doctoral candidates per professor

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	**1993**
Number of Students, Postgraduates, and Doctoral Candidates	7,984	8,580	9,157	9,696	10,265	10,704	10,997	11,187	11,189	11,238	11,360	**11,444**
Number of Professors	263	269	268	272	276	274	278	280	287	291	304	**319**
Ratio (Students, Postgraduates, and Doctoral Candidates per Professor)	**30.40**	**31.90**	**34.20**	**35.60**	**37.20**	**39.10**	**39.60**	**40.00**	**39.00**	**38.60**	**37.40**	**35.90**

Development of New Admissions

New admissions refer to students who are newly enrolled at ETH Zurich, including re-entries. In the winter semester of 1993/94, the ETH part of the Military Leadership School (MFS) program was introduced in the Department of Military Sciences. Students entering higher semesters of the MFS in the 1993/94 winter semester are also considered new admissions. The number of new admissions in 1993 increased by 45 compared to 1992, which is solely attributed to the inclusion of MFS students. The number of new admissions is approximately average for the past four years.

The Department of Architecture remains at the top with 300 new entrants, followed by the Departments of Electrical Engineering, Mechanical Engineering, Mathematics, Physics, and Computer Science. Larger percentage changes compared to 1992 were seen in the departments of Materials Science (+90.5%), Earth Sciences (+32.3%), Mechanical Engineering (+22.9%), Electrical Engineering (-14.2%), Cultural Engineering and Surveying (-15.6%), and Environmental Natural Sciences (-35.7%).

In the last three years, the number of new admissions in the Departments of Agriculture, Earth Sciences, and Physical Education has steadily increased, while the number of new admissions in the Departments of Architecture and Civil Engineering has steadily declined.

Out of the 1,971 new admissions, 66 students were admitted to the first semester after passing an entrance exam, and 76 students were admitted to higher semesters. All other students held documents granting them direct admission without exams. The number of new foreign students decreased by 10.1% compared to 1992, while the number of female students decreased by 9.0%.

Distribution of the 1,971 New Admissions in 1993:

Architecture	**300**
Civil Engineering	**103**
Mechanical Engineering	**177**
Electrical Engineering	**199**
Computer Science	**134**
Materials Science	**40**
Business and Production Eng.	**7**
Chemistry	**82**
Pharmacy	**63**
Forestry	**55**
Agriculture	**115**
Environmental Engineering and Surveying	**92**
Mathematics and Physics	**151**
Biology	**117**
Environmental Natural Sciences	**108**
Earth Sciences	**45**
Military Sciences	**78**
Physical Education and Sports Teaching	**105**

Newly Enrolled Degree Students by Departments and Percentages

As of Mid-December	Total Newly Enrolled Students						Foreign Newly Enrolled Students		
Department	1985	%	1992	%	**1993**	**%**	1985	1992	**1993**
Architecture (I)	321	15.9	316	16.4	**300**	**15.2**	37	65	**44**
Civil Engineering (I)	81	4.0	116	6.0	**103**	**5.2**	8	18	**9**
Mechanical Engineering (IIIA)	153	7.6	144	7.5	**177**	**9.0**	29	34	**44**
Electrical Engineering (IIIB)	305	15.1	232	12.0	**199**	**10.1**	31	36	**24**
Computer Science (IIIC)	200	9.9	133	6.9	**134**	**6.8**	22	26	**23**
Materials Science (IIID)	26	1.3	21	1.1	**40**	**2.0**	3	2	**6**
Business and Production Engineering (IIIE)	---	---	4	0.2	**7**	**0.3**	---	4	**3**
Chemistry (IV)	86	4.2	81	4.2	**82**	**4.2**	15	15	**15**
Pharmacy (V)	132	6.5	71	3.7	**63**	**3.2**	14	4	**10**
Forestry (VI)	41	2.0	46	2.4	**55**	**2.8**	2	3	**2**
Agriculture (VII)	184	9.1	105	5.5	**115**	**5.8**	9	9	**8**
Cultural Engineering and Surveying (VIII)	48	2.4	109	5.7	**92**	**4.7**	2	6	**4**
Mathematics and Physics (IX)	163	8.0	150	7.8	**151**	**7.7**	24	22	**32**
Natural Sciences (X)	197	9.7	---	---	**---**	**---**	24	---	**---**
Biology (XA)	---	---	106	5.5	**117**	**5.9**	---	19	**13**
Environmental Natural Sciences (XB)	---	---	168	8.7	**108**	**5.5**	---	16	**15**
Earth Sciences (XC)	---	---	34	1.8	**45**	**2.3**	4	3	**1**
Military Sciences (XIA)[1]	---	---	---	---	**78**	**4.0**	---	---	**---**
Physical Education and Sports Teachers (XIB)[2]	88	4.3	90	4.7	**105**	**5.3**	5	4	**4**
Total	2025	100	1926	100	**1971**	**100**	229	286	**257**
Share of the Total Number of Newly Enrolled Students							11.3%	14.8%	**13.0%**

[1] The participants in the Military Leadership School are first listed as students in the Department of Military Sciences in 1993 with the introduction of the study program.
[2] Until 1992, only those students who were exclusively enrolled at ETH Zurich were considered in the Department of Sports and Physical Education. The numbers for 1993 include all students enrolled at ETH Zurich.

Entrance Examinations

As of Mid-December	Admission to the 1st semester			Admission to a higher semester		
Department	Total Candidates	Passed	Failed	Total Candidates	Passed	Failed
Architecture (I)	39 (2)	15 (2)	24	15 (5)	7 (3)	8 (2)
Civil Engineering (II)	5	3	2	12 (4)	8 (4)	4
Mechanical Engineering (IIIA)	28	14	14	20 (7)	15 (5)	5 (2)
Electrical Engineering (IIIB)	11	3	8	18 (6)	12 (5)	6 (1)
Computer Science (IIIC)	18	7	11	11 (2)	9 (2)	2
Materials Science (IIID)	5	4	1	1	---	1
Chemistry (IV)	5	2	3	8 (3)	6 (3)	2
Pharmacy (V)	6	2	4	1	1	---
Forestry (VI)	1	---	1	2	1	1
Agriculture (VII)	1	---	1	3	3	---

Cultural Engineering and Surveying (VIII)	3 (1)	2 (1)	1	2	2	---
Mathematics and Physics (IX)	11 (3)	6 (1)	5 (2)	8	7	1
Biology (XA)	5 (1)	2 (1)	3	3	3	---
Environmental Natural Sciences (XB)	11	3	8	1	1	---
Earth Sciences (XC)	5	2	3	2	1	1
Physical Education and Sports Teachers (XIB)	2 (1)	1 (1)	1	---	---	---
Total	156 (8)	66 (6)	90 (2)	107 (27)	76 (22)	31 (5)

( ) The numbers in parentheses indicate the number of HTL graduates.

Total Number of Students

The total number of students, postgraduate students, and doctoral candidates has increased slightly by 84 (+0.7%), with the increase being entirely attributed to the newly introduced Military Leadership School program for the Winter semester of 1993/94. Starting in the Winter semester of 1993/94, all students of the Department of Physical Education and Sports Teachers will be classified as students and included in the statistics, regardless of whether they are also enrolled at the University of Zurich. This results in a slight increase in the total number of students in Department XIB.

Noteworthy is the further increase in the number of doctoral candidates by 3.3% compared to 1992, while the number of postgraduate students has decreased by 10.7%, returning to the level it was at in 1991. The largest departments remain the Department of Architecture and the Department of Electrical Engineering.

Significant changes over the past three years include departments such as Environmental Natural Sciences (+52.9%), Business and Production Sciences (+50.2%), Physical Education Teachers (+36.5%), Cultural Engineering and Surveying (+33.5%), Forestry (+24.0%), and Electrical Engineering (-14.3%), Agriculture (-16.5%), and Computer Science (-22.2%). These changes are partly due to the newly established programs in "Business and Production Engineers," "Environmental Sciences," and "Environmental Engineering."

The number of female students continues to increase, with the percentage of the total rising from 19.9% in 1992 to 20.4%. The same trend is seen among foreign students, whose percentage of the total has risen from 16.9% to 17.5%.

Students, Postgraduate Students, and Doctoral Candidates
Distribution of the 11,444 students in the Winter semester 1993/94.

Architecture	**1733**
Civil Engineering	**629**
Mechanical Engineering	**835**
Electrical Engineering	**1194**
Computer Science	**729**
Materials Science	**190**
Business and Production Eng.	**359**
Chemistry	**663**
Pharmacy	**427**
Forestry	**274**
Agriculture	**707**
Environmental Engineering and Surveying	**510**
Mathematics and Physics	**900**
Biology	**786**
Environmental Natural Sciences	**763**
Earth Sciences	**291**
Military Sciences	**78**
Physical Education and Sports Teaching	**355**
Humanities and Social Sciences	**21**

Total Number of Students

(Students, Postgraduate Students, and Doctoral Candidates)

As of Mid-December	Students, Postgraduate Students, and Doctoral Candidates					
Departments	1985[3]	%	1992	%	**1993**	**%**
Architecture (I)	1401	14.4	1680	14.8	**1733**	**15.1**
Civil Engineering (II)	480	5.0	655	5.8	**629**	**5.5**
Mechanical Engineering (IIIA)	907	9.4	792	7.0	**835**	**7.3**
Electrical Engineering (IIIB)	1249	12.9	1286	11.3	**1194**	**10.4**
Computer Science (IIIC)	713	7.4	791	7.0	**729**	**6.4**
Materials Science (IIID)	103	1.1	188	1.7	**190**	**1.7**
Business and Production Eng. (IIIE)	---	---	344	3.0	**359**	**3.1**
Chemistry (IV)	557	5.7	647	5.7	**663**	**5.8**
Pharmacy (V)	535	5.5	453	4.0	**427**	**3.7**
Forestry (VI)	190	2.0	250	2.2	**274**	**2.4**
Agriculture (VII)	960	9.9	746	6.6	**707**	**6.2**
Environmental Engineering and Surveying (VIII)	295	3.0	510	4.5	**510**	**4.4**
Mathematics and Physics (IX)	930	9.6	902	7.9	**900**	**7.9**
Natural Sciences (X)	1110	11.4	---	---	**---**	**---**
Biology (XA)	---	---	792	7.0	**786**	**6.9**
Environmental Natural Sciences (XB)	---	---	748	6.6	**763**	**6.7**
Earth Sciences (XC)	---	---	283	2.5	**291**	**2.5**
Military Sciences (XIA)[1]	55	---	82	---	**78**	**0.7**
Physical Education and Sports Teaching (XIB)[2]	266	2.7	272	2.4	**355**	**3.1**
Humanities and Social Sciences (XII)	---	---	21	0.2	**21**	**0.2**
Total	9696	100	11360	100	**11444**	**100**

[1] Up until 1992, participants in military schools were not included in the total. Starting in 1993, participants in the Military Leadership School were first counted as students in the Military Sciences Department.
[2] Up until 1992, the Physical Education and Sports Teaching Department only included students who were exclusively enrolled at ETH Zurich. The 1993 figures include all students enrolled in the department at ETH Zurich.
[3] Excludes postgraduate students
(this also applies to the table below).

Students by Group

(Students, Postgraduate Students, and Doctoral Candidates)

As of Mid-December	Students			Postgraduate Students		Doctoral Candidates			Foreign Stud., Postgrad. Stud., & Doc. Stud.			Female Stud., Postgrad. Stud., & Doc. Stud.		
Departments	1985	1992	**1993**	1992	**1993**	1985	1992	**1993**	1985[3]	1992	**1993**	1985[3]	1992	**1993**
Architecture (I)	1370	1613	**1651**	26	**37**	31	41	**45**	161	233	**250**	363	534	**570**
Civil Engineering (II)	447	568	**564**	27	**4**	33	60	**61**	65	120	**96**	12	44	**44**
Mechanical Engineering (IIIA)	810	634	**651**	12	**21**	97	146	**157**	166	184	**214**	8	23	**26**
Electrical Engineering (IIIB)	1140	1089	**990**	49	**55**	109	148	**149**	167	210	**205**	16	23	**25**
Computer Science (IIIC)	680	718	**657**	-	**-**	33	73	**72**	99	134	**128**	28	39	**26**
Materials Science (IIID)	94	122	**130**	-	**-**	9	66	**60**	18	33	**37**	5	13	**17**
Business and Production Eng. (IIIE)	-	209	**195**	95	**111**	-	40	**53**	-	56	**76**	-	15	**22**
Chemistry (IV)	310	342	**329**	2	**2**	247	303	**332**	102	198	**217**	67	106	**104**
Pharmacy (V)	483	396	**370**	-	**-**	52	57	**57**	48	59	**59**	363	320	**308**
Forestry (VI)	172	224	**245**	-	**-**	18	26	**29**	10	21	**22**	13	29	**41**
Agriculture (VII)	794	569	**546**	21	**-**	166	156	**161**	71	74	**82**	214	264	**252**
Environmental Engineering and Surveying (VIII)	276	433	**461**	50	**22**	19	27	**27**	16	42	**35**	26	81	**86**
Mathematics and Physics (IX)	743	645	**646**	3	**2**	187	254	**252**	130	191	**212**	77	88	**84**
Natural Sciences (X)	681	-	**-**	-	**-**	429	-	**-**	128	-	**-**	264	-	**-**
Biology (XA)	-	462	**474**	-	**-**	-	330	**312**	-	205	**185**	-	267	**280**
Environmental Natural Sciences (XB)	-	628	**615**	-	**-**	-	120	**148**	-	88	**103**	-	216	**226**
Earth Sciences (XC)	-	146	**159**	3	**1**	-	134	**131**	-	56	**60**	-	55	**56**
Military Sciences (XIA)	1	48	**82**	78	**-**	-	-	**-**	-	-	**-**	-	-	**-**
Physical Education and Sports Teaching (XIB)	266	272	**355**	-	**-**	-	-	**-**	12	8	**14**	136	138	**156**
Humanities and Social Sciences (XII)	-	-	**-**	21	**21**	-	-		-	5	**6**	-	11	**11**
Total	8266	9070	**9122**	309	**276**	1430	1981	**2046**	1193	1917	**2001**	1592	2266	**2334**
Percentage of the Total Number of Students									12.3%	16.9%	**17.5%**	16.4%	19.9%	**20.4%**

Diplomas from ETH Zurich

1993	1992	1985	
183	196	96	Architects (Dept. I)
86	98	53	Civil Engineers (Dept. II)
85	97	112	Mechanical Engineers (Dept. IIIA)
232	195	164	Electrical Engineers (Dept. IIIB)
111	119	20	Computer Engineers (Dept. IIIC)
20	26	3	Materials Engineers (Dept. IIID)
57	18	---	Industrial and Production Engineers (Dept. IIIE)
20	21	15	Chemical Engineers (Dept. IV)
52	44	37	Chemists (Dept. IV)
3	---	---	Natural Scientists (Dept. IV)
55	76	82	Pharmacists[1] (Dept. V)
25	29	27	Forestry Engineers (Dept. VI)
78	73	104	Agricultural Engineers (Dept. VII)
39	25	19	Food Engineers (Dept. VII)
56	43	34	Cultural Engineers (Dept. VIII)
3	4	2	Surveying Engineers (Dept. VIII)
22	32	25	Mathematicians (Dept. IX)
76	79	69	Physicists (Dept. IX)
86	81	*	Natural Scientists (Biology Dept./Dept. XA)
65	44	*	Natural Scientists (Environmental Science/Dept. XB)
28	32	*	Natural Scientists (Earth Science/Dept. XC)
1382	1332	954	**Total**

[*] In 1985, a total of 92 diplomas were awarded in the field of Natural Sciences in the then Department of Natural Sciences (Dept. X).
[1] Foreign nationals and state exams for Swiss graduates; of those, state exams for Swiss graduates: 1985 = 78; 1992 = 59; 1993 = 53.

Teacher Diplomas in Physical Education and Sports

	1985	1992	**1993**
• Federal Physical Education and Sports Teacher Diploma I	75	4	**2**
• Federal Physical Education and Sports Teacher Diploma II	46	73	**66**

Certificates of Pedagogical Examinations Passed

	1985	1992	**1993**
• Electrical Engineer (IIIB)	---	---	**1**
• Computer Engineer (IIIC)	---	---	**1**
• Chemist (IV)	1	11	**8**
• Agricultural Engineer (VII)	50	28	**37**
• Food Engineers (VII)	1	4	**4**
• Mathematicians (IX)	4	5	**7**
• Physicists (IX)	5	6	**5**
• Natural Scientists (Biology/ XA)	*	16	**15**
• Natural Scientists (Environmental Science/XB)	*	1	**2**
• Natural Scientists (Earth Science/XC)	*	3	**7**
Total	70	74	**87**

Pedagogical exams are taken in addition to the diploma exam, either before or after.
[*] In 1985, a total of 9 certificates were issued by the former Department of Natural Sciences (Dept. X).

Doctoral Degrees

1993	1992	1985	
3	1	1	Architecture (Dept. I)
8	11	14	Civil Engineering (Dept. II)
29	25	17	Mechanical Engineering (Dept. IIIA)
36	25	23	Electrical Engineering (Dept. IIIB)
8	11	4	Computer Science (Dept. IIIC)
24	8	3	Materials Science (Dept. IIID)
6	1	---	Industrial and Production Engineering (Dept. IIIE)
63	54	44	Chemistry (Dept. IV)
12	6	12	Pharmacy (Dept. V)
4	3	4	Forestry (Dept. VI)
32	38	30	Agriculture (Dept. VII)
7	4	4	Cultural Engineering and Surveying (Dept. VIII)
49	58	36	Mathematics and Physics (Dept. IX)
78	60	*	Biology (Dept. XA)
15	25	*	Environmental Science (Dept. XB)
28	13	*	Earth Sciences (Dept. XC)
402	343	244	**Total**

** In 1985, a total of 52 doctoral degrees were awarded by the former Department of Natural Sciences (Dept. X).*

Certificates for Completed Postgraduate Studies

	1985	1992	**1993**
• Architecture (I)	---	---	**7**
• Civil Engineering (II) ---	1	11	
• Urban Water Management and Water Protection (II)	12	14	**13**
• Technical Business Administration (IIIA)	32	---	**---**
• Mechatronics (IIIA)	---	3	**2**
• Automation (IIIB)	2	4	**3**
• Communications Engineering (IIIB)	6	4	**4**
• Electrical Power Engineering (IIIB)	---	2	**---**
• Business Administration (IIIE)	---	31	**35**
• Human Nutrition (VII)	---	12	**15**
• Urban Planning (VIII)	11	1	**---**
• Biology (XA)	---	1	**1**
• Earth Sciences (XC)	---	1	**1**
• Developing Countries (NADEL) (XII)	26	12	**21**
Total	89	86	**136**

Certificates for Completed Postgraduate Courses

	1985	1992	**1993**
• Spatial Information Systems (VIII)	-	-	**16**
• Applied Statistics (IX)	-	-	**22**
Total	0	0	**38**

Swiss Students by Department and Home Canton

Abt./ Heimat	I		II		IIIA		IIIB		IIIC		IIID		IIIE		IV		V		VI		VII		VIII		IX		XA		XB		XC		XIA		XIB		Ges. Tot.	
	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT		TOT	W	TOT	W
ZH	348	125	79	6	99	2	180	3	95	2	18	2	33	0	56	10	95	72	33	9	88	43	76	14	111	7	82	41	132	47	26	3	11		99	46	1661	432
BE	187	43	52	2	50	0	86	0	67	1	16	1	20	0	29	4	31	27	31	4	85	26	55	9	53	6	38	10	81	22	17	3	20		22	11	940	169
LU	89	24	33	2	30	1	72	1	43	1	7	0	19	0	12	4	14	10	15	5	39	11	37	6	51	6	28	8	47	14	11	2	4		24	10	575	105
UR	6	1	5	0	2	0	9	0	3	0	1	0	2	0	1	0	4	3	3	1	4	1	8	1	6	2	1	0	2	1	3	0	2		6	1	68	11
SZ	30	14	17	0	10	0	17	0	19	1	6	1	4	0	5	1	10	8	7	3	11	7	13	1	8	1	16	6	12	5	6	3	0		6	2	197	53
OW	8	2	4	0	1	0	3	1	1	0	2	0	1	0	1	1	3	3	1	0	2	0	1	0	0	0	3	0	0	0	1	0	0		3	2	35	9
NW	12	2	4	1	4	0	6	0	6	0	2	0	2	0	2	1	2	2	2	0	3	0	3	0	2	0	1	0	6	2	1	0	0		6	4	64	12
GL	16	4	7	0	8	0	15	0	2	0	1	0	2	0	3	0	4	3	1	1	5	3	3	2	1	1	5	1	5	2	1	0	1		5	2	85	19
ZG	20	4	7	0	5	0	13	0	3	0	0	0	5	0	2	0	4	2	1	0	10	6	6	2	9	1	6	1	3	1	5	2	2		5	1	106	20
FR	18	8	7	1	6	0	7	0	6	0	0	0	2	0	4	1	4	4	7	1	15	5	5	3	12	0	2	2	8	4	2	1	2		0	0	107	30
SO	50	20	17	1	13	0	20	0	25	1	4	0	3	0	8	0	10	8	5	0	17	7	23	3	11	0	7	4	27	6	5	1	2		5	3	252	54
BS	78	31	20	3	30	0	30	1	35	3	5	0	6	0	5	1	2	2	4	0	23	9	14	1	16	1	9	6	27	11	5	0	4		3	2	316	71
BL	38	12	13	1	23	1	27	0	14	0	2	0	1	0	5	1	3	3	2	0	15	7	12	0	14	2	2	1	17	5	6	2	0		4	1	198	36
SH	18	5	6	0	6	0	10	0	10	0	1	0	3	0	3	0	3	2	2	0	8	1	5	2	11	0	18	6	6	1	2	0	1		5	2	118	19
AR	18	4	6	0	10	0	9	0	9	1	1	0	5	0	4	1	6	4	3	0	6	3	9	3	10	1	3	2	5	2	1	0	2		9	3	116	24
AI	7	3	1	0	6	0	7	0	7	0	1	0	1	0	0	0	3	3	4	0	5	1	2	0	5	1	6	0	5	1	1	0	0		1	1	62	10
SG	100	35	49	2	62	0	89	2	52	2	9	0	14	2	26	4	30	20	11	0	26	8	39	12	50	3	32	8	51	12	8	3	4		33	16	685	129
GR	63	17	33	1	28	0	40	0	27	1	5	1	5	0	12	5	17	13	19	2	12	5	27	1	23	3	17	8	27	5	6	1	2		26	11	389	74
AG	126	42	33	2	49	0	85	2	59	3	12	2	15	1	29	4	40	32	7	0	50	18	36	4	32	3	37	12	51	14	15	5	7		31	15	714	159
TG	54	14	15	0	14	0	38	0	26	0	7	1	10	0	13	2	9	9	4	0	23	7	11	1	16	1	18	7	13	4	3	0	1		13	5	288	51
TI	92	38	66	7	37	2	67	4	37	0	4	0	4	0	25	3	33	22	30	2	22	14	31	3	61	8	50	21	17	3	13	4	5		23	7	617	138
VD	17	7	1	0	5	0	2	0	3	0	2	0	4	1	3	0	1	0	9	2	13	3	3	1	7	0	4	1	5	3	3	1	1		0	0	83	19
VS	29	4	20	0	12	2	18	0	4	0	3	0	4	0	15	0	1	1	23	1	9	3	12	1	21	1	10	4	8	1	2	0	6		10	2	207	20
NE	3	1	4	0	5	0	5	0	1	0	0	0	0	0	3	1	1	1	2	0	6	5	6	1	1	0	4	2	3	0	2	0	0		1	1	47	12
GE	8	2	1	0	4	0	2	0	4	0	4	0	1	0	1	1	1	1	3	1	5	3	1	0	3	1	3	2	1	0	1	1	0		0	0	43	12
JU	5	1	3	0	5	0	8	0	3	0	0	0	0	0	1	1	0	0	5	1	6	0	2	0	9	0	2	1	2	0	0	0	1		1	0	53	4
Total	1440	463	503	29	524	8	865	14	561	16	113	8	166	4	268	46	331	255	234	33	508	196	440	71	543	49	404	154	561	166	146	32	78		341	148	8026	1692

Swiss Postgraduate Students and Doctoral Candidates by Department and Home Canton

Abt./ Heimat	I		II		IIIA		IIIB		IIIC		IIID		IIIE		IV		V		VI		VII		VIII		IX		XA		XB		XC		XII		Ges. Tot.	
	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W	TOT	W
ZH	10	5	6	0	25	2	27	1	10	0	16	1	28	2	30	5	8	4	1	0	12	6	9	2	30	0	48	20	24	4	27	4	4	3	315	59
BE	6	2	2	1	15	0	17	0	2	0	2	0	17	2	17	3	4	3	6	0	24	2	4	1	10	1	13	5	13	0	5	1	1	1	158	22
LU	4	1	4	0	2	0	9	0	0	0	3	0	8	0	13	0	1	0	0	0	13	1	2	1	8	0	12	5	5	1	3	0	1	1	88	10
UR	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	8	0
SZ	1	1	1	0	1	0	1	0	1	1	0	0	4	1	2	0	4	0	0	0	2	0	0	0	4	0	8	3	3	0	0	0	0	0	32	6
OW	1	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	6	0
NW	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	1	7	2
GL	0	0	0	0	3	0	0	0	0	0	1	0	4	0	3	2	2	1	1	1	2	0	0	0	1	0	4	0	1	1	4	0	0	0	26	5
ZG	0	0	0	0	0	0	4	0	0	0	0	0	2	1	4	1	1	0	0	0	0	0	0	0	3	1	1	0	2	0	1	0	0	0	16	3
FR	0	0	0	0	1	0	0	0	0	0	2	0	2	0	4	1	0	0	0	0	1	0	1	0	2	1	2	1	2	0	1	0	0	0	18	3
SO	0	0	1	0	10	0	6	0	4	0	0	0	5	0	5	2	4	3	0	0	3	0	2	0	4	0	5	2	2	0	0	0	0	0	51	7
BS	3	0	1	0	3	1	6	0	4	0	1	0	5	2	6	1	1	1	0	0	5	1	0	0	3	0	9	2	8	1	3	2	1	1	59	12
BL	0	0	3	1	3	0	4	0	0	0	2	0	3	0	1	0	0	0	1	0	3	0	0	0	1	0	5	2	2	1	1	0	1	0	30	4
SH	0	0	0	0	4	0	1	0	1	0	1	0	0	0	6	2	0	0	0	0	2	0	4	1	5	1	7	4	1	0	8	0	2	0	42	8
AR	1	0	0	0	3	0	2	0	0	0	0	0	2	0	1	0	0	0	1	1	2	1	0	0	3	0	3	0	0	0	0	0	0	0	18	2
AI	0	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	2	0	0	0	10	0
SG	4	3	2	0	8	0	9	0	3	0	2	0	5	0	16	1	3	2	1	0	8	3	3	0	14	0	19	3	9	5	6	0	0	0	112	17
GR	0	0	2	0	3	1	6	0	1	0	1	0	7	1	6	2	2	0	2	0	2	0	3	0	6	1	10	2	3	1	5	0	0	0	59	8
AG	4	3	4	0	8	1	13	0	2	0	7	0	9	2	17	3	3	2	3	1	12	3	3	0	18	0	22	7	9	4	7	1	2	0	143	27
TG	1	0	1	0	1	0	5	0	4	0	1	0	4	0	5	0	2	1	1	0	2	0	0	0	6	0	7	3	5	0	3	0	0	0	48	4
TI	6	2	1	0	2	0	5	0	2	0	0	0	6	1	19	3	0	0	0	0	4	1	2	1	7	1	8	0	4	3	7	1	0	0	73	13
VD	0	0	0	0	1	0	2	0	2	0	0	0	1	0	4	0	1	1	1	0	3	3	0	0	2	1	2	0	1	1	0	0	0	0	20	6
VS	0	0	1	0	4	1	3	0	1	0	0	0	1	0	9	0	1	0	0	0	4	0	0	0	11	0	3	1	0	0	0	0	1	0	39	2
NE	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	5	0	0	0	1	0	2	1	0	0	2	1	0	0	13	2
GE	2	1	0	0	0	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	3	0	0	0	3	0	2	0	0	0	0	0	1	0	15	1
JU	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	3	1	0	0	1	0	1	0	1	0	0	0	0	0	9	1
Total	43	18	30	2	97	6	124	1	40	1	40	1	117	12	178	27	37	18	18	3	117	22	35	6	145	7	197	61	99	22	85	10	15	7	1417	224

Foreign Students

		Foreign Students			Foreign Postgraduate Students and Doctoral Candidates		
Country		1985	1992	**1993**	1985	1992	**1993**
Europe	Albania	-	1	**-**	-	2	**2**
	Belgium	4	4	**4**	-	-	**-**
	Bosnia-Herzegovina	-	-	**2**	-	-	**-**
	Bulgaria	-	2	**3**	-	2	**2**
	Denmark	5	5	**9**	2	2	**3**
	Germany	251	324	**347**	118	431	**474**
	Finland	1	3	**5**	2	7	**3**
	France	46	29	**27**	9	6	**8**
	Greece	23	22	**22**	14	11	**11**
	Great Britain	9	12	**16**	4	8	**9**
	Ireland	-	-	**-**	-	3	**3**
	Iceland	-	-	**-**	1	1	**1**
	Italy	149	173	**172**	16	42	**46**
	Yugoslavia	15	19	**21**	5	6	**6**
	Croatia	-	6	**7**	-	3	**5**
	Liechtenstein	22	38	**35**	4	5	**4**
	Lithuania	-	-	**-**	-	-	**1**
	Luxembourg	62	108	**106**	6	26	**29**
	Macedonia (FYR)	-	-	**1**	-	-	**-**
	Netherlands	21	25	**26**	7	23	**21**
	Norway	25	14	**14**	2	4	**4**
	Austria	74	99	**98**	11	34	**38**
	Poland	15	2	**7**	9	18	**11**
	Portugal	2	1	**1**	2	3	**4**
	Romania	4	4	**7**	1	5	**5**
	Russia	-	-	**1**	-	-	**2**
	Sweden	-	4	**9**	8	3	**7**
	Slovakia	-	-	**-**	-	-	**5**
	Slovenia	-	-	**1**	-	-	**3**
	Spain	22	25	**28**	4	5	**3**
	Czech Republic	-	-	**7**	-	-	**11**
	Czechoslovakia	11	7	**-**	8	18	**-**
	Turkey	17	31	**29**	8	16	**16**
	Hungary	8	5	**6**	-	7	**6**
	Cyprus	-	-	**-**	1	1	**-**
Africa	Egypt	4	1	**1**	1	1	**1**
	Algeria	-	1	**1**	1	-	**-**
	Ghana	1	2	**2**	-	2	**1**
	Cameroon	-	-	**-**	1	1	**1**
	Kenya	-	-	**-**	2	-	**1**
	Liberia	1	-	**-**	-	-	**-**
	Libya	-	-	**-**	1	1	**-**
	Madagascar	1	-	**-**	-	1	**-**
	Morocco	-	2	**4**	1	-	**1**
	Nigeria	-	1	**1**	-	-	**-**
	South Africa	-	-	**-**	2	1	**1**
	Tanzania	-	-	**-**	1	-	**-**

	Zaire	-	1	**1**	-	1	**-**
America	Argentina	-	2	**2**	-	6	**4**
	Bolivia	2	-	**-**	1	1	**1**
	Brazil	3	1	**1**	2	4	**4**
	Chile	4	3	**3**	1	3	**3**
	Costa Rica	-	-	**-**	-	1	**1**
	Ecuador	2	-	**-**	-	3	**2**
	El Salvador	-	2	**1**	-	1	**1**
	Guyana	-	-	**-**	1	1	**1**
	Honduras	1	1	**2**	-	-	**-**
	Canada	3	2	**2**	5	8	**5**
	Colombia	-	1	**1**	-	-	**1**
	Cuba	-	-	**-**	-	2	**2**
	Mexico	3	-	**-**	2	1	**2**
	Peru	2	3	**2**	1	1	**-**
	Uruguay	-	1	**1**	2	2	**3**
	USA	12	14	**14**	19	21	**26**
Asia	Afghanistan	-	1	**1**	-	-	**-**
	Bangladesh	-	1	**1**	-	-	**-**
	Bhutan	-	-	**-**	-	-	**2**
	Taiwan (China)	-	-	**-**	1	2	**1**
	China (PRC)	6	19	**17**	17	72	**71**
	India	2	2	**2**	2	3	**3**
	Indonesia	2	1	**-**	-	-	**-**
	Iraq	-	1	**1**	-	-	**-**
	Iran	19	14	**10**	7	6	**9**
	Israel	-	2	**2**	-	1	**1**
	Japan	-	1	**1**	3	4	**4**
	Kazakhstan	-	1	**2**	1	-	**1**
	Korea	-	-	**1**	-	-	**-**
	Lebanon	-	2	**3**	-	1	**1**
	Malaysia	3	-	**2**	-	1	**1**
	Nepal	-	-	**2**	2	-	**-**
	Philippines	1	3	**5**	3	4	**2**
	Pakistan	3	3	**1**	5	5	**4**
	Saudi Arabia	-	-	**-**	1	-	**1**
	Sri Lanka	2	2	**2**	1	1	**1**
	Syria	-	-	**1**	1	-	**-**
	Thailand	5	4	**5**	1	3	**3**
	Turkey	-	-	**1**	4	5	**6**
	Uzbekistan	-	-	**-**	2	2	**2**
Oceania	Australia	10	14	**14**	5	7	**6**
	New Zealand	4	2	**1**	3	3	**3**
Stateless		1	-	**-**	1	-	**-**
Total		874	1058	**1096**	319	857	**905**
- of which women		159	237	**257**	49	157	**161**

Student Services

Scholarships, Tuition Waivers, and Loans

Scholarships for Undergraduate Students

	1992 Number	1993 Number	1993 Amount
To Swiss Students			
- Federal Funds	168	**161**	**178,222**
- Funds and Foundations	174	**178**	**338,340**
Total	342	**339**	**516,562**
To International Students			
- Federal Funds	19	**18**	**50,150**
- Funds and Foundations	11	**9**	**14,750**
Total	30	**56**	**64,900**
Mobility Students			
- Swiss Program	55	**49**	**98,000**
- ERASMUS	26	**66**	**155,136**
Total	81	**115**	**253,136**
Tuition Waivers			
- Number of Approvals	1,680	**1,706**	**----**

Scholarships for Graduate Students

	1992 Number	1993 Number	1993 Amount
- Research Scholarships	15	**17**	**229,200**
- Other Scholarships	34	**39**	**385,903**
Total	49	**56**	**615,103**

Scholarships for Doctoral Students

	1992 Number	1993 Number	1993 Amount
- Federal Funds	133	**137**	**901,313**
- Scholarships from Industry Funds	69	**68**	**654,479**
- Funds and Foundations	44	**39**	**326,279**
Total	246	**244**	**1,952,071**
National Fund Scholarships			
- Early Career Scholarships	45	**49**	**1,488,050**
- Scholarships for Advanced Researchers	9	**7**	**86,727**
Total	54	**56**	**1,574,777**
Exchange Scholarships			
Approvals	66	**71**	**423,620**
Loans for Upper-Year Students and ETH Zurich Graduates			
Approvals	24	**46**	**140,600**

Internship Services

Mandatory Internships

	1991/92 Number	**1992/93 Number**
Students in departments supervised by the Internship Service (excluding doctoral students)		
- Mechanical Engineering (IIIA)	634	**657**
- Electrical Engineering (IIIB)	1089	**990**
- Materials Science (IIID)	122	**130**
- Teaching Candidates in Departments IV, IX, XA, XC	53	**78**
Total	1898	**1855**
Workshop Basic Courses (IIIA/IIIB/IIID/IIIE)		
- Number of Courses	90	93
- Conducting Companies	87	86
- Participating Students	341	344

Student Exchange for Internships Abroad (IAESTE)

	1991/92 Number	**1992/93 Number**
- Participating Countries	40	**45**
- Total Swiss Students Sent Abroad	164	**160**
- of which from ETH Zurich	80	**81**
- Participating Swiss Schools in Exchange	16	**17**
- Total Foreign Students Received in Switzerland	189	**176**
- Participating Swiss Companies	104	**98**

Exchange Service

Exchange Scholarships

	1991/92 Number	**1992/93 Number**
Graduates and Advanced Students of ETH Zurich at Foreign Universities (excluding USA)		
- Exchange	11	**12**
- Funds and Foundations	1	**2**
Graduates and Advanced Students from Swiss Universities at American Universities		
- Exchange	20	**20**
- Of which from ETH Zurich	16	**17**
- Exchange	10	**12**
- Funds and Foundations	6	**5**
Graduates and Advanced Students from Foreign Universities at ETH Zurich (excluding USA)		
- Exchange	28	**23**
- Funds and Foundations	8	**6**
Graduate and Advanced Students from American Universities at Swiss Universities		
- Exchange	20	**22**
- Of which at ETH Zurich	12	**17**
Guest Stays (1-3 months)	10	**7**

Federal Scholarships

	1991/92 Number	**1992/93 Number***
Total Federal Scholarships	37	**36**
- Regular Students,	1	**-**
Doctoral Students, and Auditors	36	**36**
- Recipients from Developing Countries	16	**15**
Recipients from Other Countries	21	**21**
- Female Recipients	10	**10**
Male Recipients	27	**26**

* Including Special Program for Eastern Europe

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Mobile Students

Swiss Mobility Promotion Program

	1991/92 Number	**1992/93 Number**
- ETH Zurich students at host universities	35	**24**
- Foreign students at ETH Zurich	8	**19**

European Mobility Promotion Program ERASMUS

	1991/92 Number	**1992/93 Number**
- ETH Zurich students at host universities	---	**48**
- Foreign students at ETH Zurich	---	**58**

Student Support

Supervised Students ETH/UNI

	1991/92 Number	**1992/93 Number**
- Federal scholarship students	67	**81**
- Visits by students seeking advice	approx. 550	**approx. 850**
- Scholarship students from the Refugee Student Aid Program in Zurich	6	**3**
- Scholarship students from the Solidarity Fund for Foreign Students in Zurich	46	**58**

Room Placement

	1991/92 Number	**1992/93 Number**
- Average rent in CHF	**492**	**490**
- Rooms placed	2,303	**2,385**
- Registered students seeking rooms	2,022	**1,939**
- ETH-owned guest lecturer apartments	40	**37**
- ETH-owned student rooms	7	**17**

Study Advice

Group Information

- Orientation events at secondary schools Orientation for high school graduates about studying at ETH Zurich
- High school graduate visit days at ETH Zurich
- University internal seminars
  (Introduction to studies, study techniques, exam preparation)

Individual Advising

	1991/92 Number	**1992/93 Number**
Prospective students: Orientation on course structure, study requirements, teaching and learning methods, study and career situations	154	**140**
Students: Individual advising for study and work planning, study techniques, exam preparation, elective course combinations, career preparation, job applications	200	**233**
Informants (graduates, lecturers, parents of students, etc.): Study environment, career entry, further education, triage, etc.	81	**51**

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Health Insurance of Both Universities in Zurich

The rising costs and declining reserve ratio of the health insurance of both universities in Zurich, along with urgent federal measures regarding risk compensation, have led to an increasingly deteriorating financial situation. After comprehensive investigations, the board of the extraordinary delegates assembly proposed the merger of the health insurance, which was approved on December 7, 1993.

The merger of the health insurance of both universities in Zurich with KONKORDIA, Swiss Health Insurance and Accident Insurance, will take place on January 1, 1994.

Membership Numbers as of December 31

	1992 Number	**1993 Number**
Women ETH Zurich	1,341	**1,176**
Men ETH Zurich	5,505	**4,504**
Women University of Zurich	5,879	**4,482**
Men University of Zurich	7,447	**5,264**
Total	20,172	**15,426**

Health Care Costs

(Including voluntary insurance benefits, excluding administrative costs and depreciation) in CHF	1992 Amount	**1993 Amount**
Per Member	889.21	**954.25**
Total	18,851,135.00	**18,775,002.00**

Psychological Counseling Center for Students

Counseling ETH/UNI

	1992 Number	**1993 Number**
- Students	444	**420**
- Beginning of studies (1st-2nd semester)	106	**109**
- Completion of studies/Advanced semesters	101	**126**
- Doctorate/Assistants/Others	48	**36**

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[Photo] [Photo] [Photo]

RESEARCH

New Trends

[Photo]
Prof. Dr. Ralf Hütter, Vice President for Research

An Introduction

The year 1993 brought new impulses for our international relations and collaboration with the economy. Although international relations have always been diverse and fruitful, as demonstrated by the special issue "International Technical University Zurich" published in January 1993, new elements have been added.
Firstly, stronger participation in EU projects is worth mentioning, despite the negative referendum result of December 6, 1992. Secondly, increased collaboration with research groups in Eastern Europe should be highlighted, with examples such as the support for the Euler Institute for Mathematics in St. Petersburg and the environmental sciences of the Baikal International Center for Ecological Research (BICER) in Irkutsk near Lake Baikal. Thirdly, the important collaborations with NEC (Nippon Electric Company, Tokyo) and the European JRC (Joint Research Center, Ispra, Italy) for the development of the national high-performance computing center CSCS (Centro Svizzero di Calcolo Scientifico) in Manno/TI are notable. These various additional contacts and collaborations aim to enhance the performance and attractiveness of our university.
With the collaboration agreement between CSCS and the Japanese company NEC, we are entering new territory by signing the first major cooperation contract with an Asian industrial partner. Considering the rapidly growing international interconnectedness of the economy and the significant relocation of research and production facilities by Swiss companies abroad, ETH Zurich is expected to increasingly enter into such collaborations. This contrasts with the many efforts to contribute to maintaining and strengthening the Swiss industrial base alongside Swiss companies. The LESIT (Focus Program on Power Electronics, Systems Engineering, and Information Technology) and ZIP (Center for Integrated Production Systems at ETH Zurich) programs launched in 1992 have been complemented by the 1993 initiative ZIPBAU (Center for Integrated Planning in Construction) and participation in the Technopark Zurich, where groups from electrical and mechanical engineering, production technology, and materials science are primarily active.
Lastly, concentrated efforts to strengthen biotechnology, massively parallel computing, and materials technology should be highlighted. The evaluations conducted in 1993 for the departments of Earth Sciences and Pharmacy also provided significant impulses for reorientation and a shift of focus in these areas.

Research and Industry Contacts Staff

The new organization of the staff, based on departmental advisors, has proven successful.

Throughout the reporting year, the staff maintained contact with external research funding organizations, such as the Commission for the Promotion of Scientific Research (KWF), the Swiss National Science Foundation, various federal offices, among others. In addition to participation in internal and external working groups and committees at ETH, and the organization of numerous events at ETH, one of the main tasks was the evaluation of credit applications for acquisitions. In the reporting year, there were a total of 243 applications for approximately 27 million Swiss Francs, with approvals granted for around 17 million Swiss Francs.

International Research Collaboration

The participation of ETH Zurich researchers in projects under the EU's Third Research and Development Framework Programme has developed positively. Many project proposals have been submitted, and 30 collaborations have been contractually established so far. ETH Zurich will receive around 8 million Swiss Francs from the "Message on the Financing of Switzerland's Participation in the Research and Education Programs of the European Community 1993-1996". The largest ETH involvement is in the fields of information and communication technology as well as industrial and materials technologies.

ETH research groups have continued to collaborate with foreign research institutes and industrial companies within the framework of COST, EUREKA, ESA, CERN, ERCOFTAC, and others. Active participation also occurred in various Technical Committees, such as COST and the EU's third framework program.

Starting in January 1994, thanks to funding from the Federal Office for Education and Science, Jan Moens will manage the so-called Euro-Guichet, which is embedded in the Research and Industry Contacts staff.

Collaboration with Industry / ETH Transfer

ETH Transfer promotes collaboration between ETH Zurich and the industry as a central point of contact. Particularly for small and medium-sized enterprises that have limited direct access to ETH Zurich research groups, around 250 inquiries were handled, with responses provided and contact persons referred after clarification of issues.

In collaboration with TE-CH (Association of Swiss Technology Transfer Offices), a visit to the ETH Zurich project groups at the Technopark Zurich was organized, and a contact meeting in the field of reliability engineering was held in conjunction with ASMNSM. Another contact meeting with ASMNSM introduced the Technopark Zurich, the ETH research groups based there, and the GFF-AFIF (Association for Industrial Research). In

the fall, participation in the international JETT '93 (European Technology Transfer Days) in Solothurn strengthened new and existing contacts with industrial firms and intermediaries.

Collaboration with technology transfer offices in Switzerland and abroad was further enhanced, both through involvement in the board of TE-CH and with organizations such as the Technopark Zurich, AFIF, CIM centers, and international associations like TII (Luxembourg) and ADT (Berlin).

As ETH Zurich's representative in the Swiss Standards Association (SNV), the staff also facilitated contacts with professors for expert advice on developing standards.

Technology Transfer:
At the initiative of Prof. Dr. R. Hütter, a group of nine professors, in collaboration with the British company Scientific Generics, has sought to identify potential commercialization opportunities for their research activities, combined with existing technologies and interested industrial partners, on a global scale. The experiences from this pilot project, which will continue, have been very positive.

The commercialization of inventions outside the framework of collaboration agreements with industry partners has been clarified in 14 cases. In matters related to commercialization within the framework of such agreements, various institutes and staff members have been consulted.

Research Commission 1993

Under the chairmanship of Prof. Dr. Richard R. Ernst, the Research Commission of 1993 reviewed over 30 research proposals and scholarship applications from ETH Zurich and ETH-related research institutes during more than 30 meetings. The commission also discussed fundamental issues regarding research funding. Additionally, the selection of the Latsis Prize laureate of ETH was part of the commission’s work. One member had to resign due to new commitments as President of the University Assembly and was replaced. The reviewed proposals were distributed as follows:

- For the ETH Zurich leadership: 158 research proposals (requested amount: 42 million Swiss Francs). Around 14.5 million Swiss Francs were allocated to 89 research proposals, either partially or fully approved.

- For the Swiss National Science Foundation (SNSF): 136 research proposals (47 million Swiss Francs). Of these, 117 proposals were recommended for full or partial support. Additionally, 52 out of 76 applications for scholarships for early-career researchers were approved (one scholarship was withdrawn later). Of the 25 applications for advanced researcher scholarships, 18 were recommended for funding (partially with cuts or conditions).

- For the Commission for the Promotion of Scientific Research (KWF): 44 funding requests (around 20 million Swiss Francs). 31 requests were recommended for acceptance, some with conditions.

- For the ETH Council: 3 proposals (around 6 million Swiss Francs). One proposal was recommended for support, while two were returned for revision.

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The number of research proposals reviewed by the ETH Zurich leadership and the total amount requested for funding is exceptionally high and surpasses the average of previous reporting periods. In contrast, the number of KWF applications is lower than in recent years, indicating that it is becoming increasingly difficult to attract industrial partners for joint research.

Computer Science Commission

The Computer Science Commission consists of ten members and three permanent guests and met six times in 1993. The focus was on the activities of various working groups and strategic decisions, including the development of an IT concept for ETH Zurich, recommendations for the acquisition of a massively parallel computer, and decisions regarding the renewal of the library computer system and the procurement of two workstation farms.

The IT concept for ETH Zurich outlines the foundational base for software, hardware, and networking, presents new developments, and sets priorities for teaching and research. Ultimately, it creates a new vision for IT services as a collaborative center of expertise.

The working group for IT resource procurement developed a new form for IT requests and suggested improvements to the IT procurement process.

The Computer Science Commission implemented its previously expressed support for enhancing expertise in massively parallel computing by recommending the purchase of a system. In December 1993, an Intel Paragon Massively Parallel Computer with 96 processors was installed in the data center and is now available for applications.

In the summer, discussions began regarding the future of the IBM 3090 environment, which is used by various groups. For the Chemistry Department and the continuation of the C4 project, the commission recommended a workstation farm consisting of 20 IBM RS 6000/590 machines. For CADETH, the existing environment was recommended to be maintained, in conjunction with a pilot installation. Another workstation farm, consisting of 16 HP 735 computers, was recommended for the Department of Electrical Engineering.

The Computer Science Commission also recommended the expansion of the existing library computer system. To ensure forward-looking development, it called for a new IT concept for the library.

Computational Research at IPS

The Interdisciplinary Project Center for Supercomputing (IPS) is involved in research across various fields of scientific computing, including numerics, quantum chemistry, quantum chromodynamics, solid-state physics, financial mathematics, and signal processing. The different groups work both within IPS and in collaboration with researchers inside and outside of ETH Zurich. At the beginning of the year, the software package Zurich Information Processing (ZIP), developed under the leadership of Privatdozent Dr. Würtz, was introduced. This program system for real-time data processing based on artificial neural networks has not only gained significant interest from the sponsor of the doctoral fellowship, the Swiss Bank Corporation, but also from computer companies such as Sun Microsystems and Parsytec, who made large hardware donations to Dr. Würtz's group. The system also attracted attention from visitors at CeBIT in Hannover. The Chemistry Group (Dr. H.P. Lüthi) has developed new methods and incorporated them into existing software packages, enabling the resolution of previously inaccessible quantum chemical problems. Professors from various ETH Zurich institutes expressed great enthusiasm for these new methods, which offered solutions to their complex problems.

In numerics (PD Dr. M. Gutknecht), new algorithms were developed for the fast solution of large, non-symmetric linear systems of equations with Toeplitz structure. Such systems appear, for example, in control theory and signal processing. For the non-symmetric case, highly efficient and numerically stable fast $O(n^2)$ algorithms were developed, as well as the first stable super-fast $O(n \log^2 n)$ solvers.

In numerical quantum chromodynamics and solid-state physics, new algorithms for solving equation systems and eigenvalue problems of large sparse matrices, developed by Dr. M. Gutknecht between 1989 and 1991, are being applied.

Swiss Center for Scientific Computing, CSCS ETH Zurich

With the upgrade of the high-performance computer NEC SX-3 installed at CSCS, making it one of the most powerful (vector) computers in Europe, and the integration of a frontend/fileserver computer system with data archiving and a local high-performance network, the infrastructure development under the HLR-91 message was completed by the end of 1993. The Swiss Parliament approved the purchase of CSCS as part of a property ownership agreement.

Despite staff shortages, the service for universities and research institutes continued to improve. Over 20 user programs were adapted and optimized for the high-performance computer to ensure cost-effective resource utilization. Various workshops and training

courses on high-performance computing and visualization were conducted by CSCS. Of the available monthly net computing capacity of approximately 1,100 hours, 30% was consumed by cantonal universities, and 60% by ETH and research institutes. Today, about 40% of applications are in physics, 32% in chemistry, 13% in engineering, 11% in environmental sciences, and 4% in biology.

The development of the research environment was further advanced with the establishment of the Research and Development section. Various European (Human Capital & Mobility, Esprit 3) and national research projects were integrated. In collaboration with the Japanese computer manufacturer NEC, the most significant software development center for massively parallel computing in Switzerland was established. Partnerships with other industry players, such as ABB, Electricité de France, Agusta, and Passera & Pedretti, were initiated as part of the Industry Partnership Program. A convention was signed with the Canton of Ticino for collaboration between cantonal organizations and CSCS, leading to concrete actions being undertaken.

LESIT: Leading-Edge Research in Collaboration with Industry

In early 1992, the four-year focus program LESIT (Power Electronics, Systems Engineering, and Information Technology) was launched under the patronage of the ETH Council. At the second annual conference in December in Bern, the latest results were presented. It is gratifying to note that the LESIT team has already achieved extraordinary success in a short time. Notably, the close collaboration with industry and the rapid implementation of developments for the Swiss workplace stand out.

Dr. Franz-Peter Steiner, LESIT Director

Vital for Switzerland

The focus program (SPP) LESIT aims to achieve and maintain a global academic and industrial leadership position for Switzerland in selected areas of power electronics, systems engineering, and information technology.
These high-tech fields are of vital importance for Switzerland's intellectual and industrial base.

Experts for Industry

LESIT focuses on projects that can be implemented by companies in Switzerland. This ensures a practical education of the required specialists at universities, facilitating their transition into professional careers.

8 Modules, Around 50 Projects

LESIT was designed as a flexible, modular program. By creating an efficient nationwide research network between the involved companies and universities, maximum synergy can be achieved, and the existing infrastructure can be optimally utilized. This allows available resources to be used strategically and efficiently for applied research and development, making the results and findings accessible to Swiss industry.

Module Title	Module Coordinator	No. of Projects	% of the budget '93
Power Semiconductor Devices	Prof. Dr. W. Fichtner	12	41
Power Electronic Circuits	Prof. Dr. J. Hugel	8	7
Power Electronic Systems	Prof. Dr. H. Stemmler	11	9
Microsensor Technology	Prof. Dr. H. Baltes	8	18
Wireless Communication Systems	Prof. Dr. P. Leuthold	3	10
Microwave and Gigabit Electronics	Prof. Dr. W. Bächtold	1	4
Technology of Dielectric Sensor Materials	Prof. Dr. P. Günter	2	3
Reliability and Electromagnetic Compatibility	Prof. Dr. A. Birolini	3	9

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Example: Modular BiCMOS Technology

In collaboration with EM Microelectronic-Marin SA, a new modular BiCMOS technology has been developed at the Institute for Integrated Systems.

BiCMOS refers to the combination of conventional bipolar technology with CMOS (Complementary Metal-Oxide-Semiconductor) technology.

The developed process modules can be integrated into the manufacturing process based on the voltage for which a component is designed. This covers a wide voltage range from 5 to 120 volts, making it possible to meet a wide variety of customer specifications cost-effectively. As a result, it is no longer necessary to establish a separate process line for each application.

Example: Microelectronic Switches for 4500 V

In collaboration with ABB Semiconductors AG, voltage-controlled thyristors (MCTs) have been developed and manufactured for a blocking voltage of 4500 V. These are expected to replace the widely used GTO (Gate Turn-Off Thyristors) in locomotive construction, which must be triggered by high currents.

In many LESIT projects, computer simulations play a significant role. Using advanced measurement technology, the computer models are verified and adjusted. These models enable the computationally supported optimization of designs with minimal technological effort. Development time can also be drastically shortened (see Fig. 1).

Example: Integrated Microsensors

In collaboration with Cerberus AG, EM Microelectronic-Marin SA, and Ascom Microelectronics SA, an infrared sensor was developed at the Laboratory for Physical Electronics, which will be produced in wafer-scale beginning in February 1994. In December 1993, a novel vacuum sensor for the Pirani measurement range was presented to the scientific community at the IEDM conference in Washington DC (see Fig. 2).
One of LESIT's guiding philosophies is to avoid special processes, some of which are only available at the lab scale, and instead to largely use commercial CMOS and bipolar processes. These are offered by companies in Switzerland such as EM Microelectronic-Marin and Ascom Microelectronics. This approach allows for a significant reduction in the cycle time between idea and production.

Another advantage is the ability to integrate electronic circuits for capturing and processing sensor signals directly on the same chip, using standard libraries. The short connection paths improve the signal-to-noise ratio, thus enhancing the sensitivity of the sensor. Additionally, power consumption can be kept low, which is particularly important for battery-operated sensor modules.

Microsensors represent a huge market potential for Swiss industry if they can be produced cost-effectively in large volumes. Application areas range from heating, ventilation, and air conditioning, meteorology, process monitoring in the semiconductor industry and food production, to environmental protection and wristwatches with integrated altimeters.

[Photo]
Fig. 1
Comparison of a normal switching operation (top) and a switching failure (bottom) in an MCT (MOS Controlled Thyristor). The simulation tools developed at the Institute for Integrated Systems were the first to reveal the exact mechanisms responsible for such switching errors.

Example: Superspeed Transistors

At the Institute for Field Theory and High Frequency Technology at ETH Zurich, a superspeed HEMT (High Electron Mobility Transistor) has been developed (see Fig. 3).

This fast switch is based on indium phosphide and features a transit frequency of 150 GHz. This achievement set a world record in the 0.25 µm gate-length class. While there are faster transistors with smaller gate lengths, they are still far from being ready for production.

First circuits utilizing this fast transistor are already available, such as a two-stage amplifier for millimeter waves. Such components are becoming increasingly important for wireless communication in the microwave range (e.g., satellite TV, mobile telephony, as well as short-range wireless connections between computers, etc.).

It is impossible to fully recognize all the promising research activities carried out by the institutes, companies, and their employees involved in the SPP LESIT. The examples provided here represent the significant efforts of a dynamic team.

[Photo]
Fig. 2
Multi-range vacuum sensor. Clearly visible are the pits etched into the silicon beneath the membranes from the front. The two opposite jumpers (bottom) have a width of about 0.1 mm and house an integrated heater and a temperature sensor. The heat conduction of the surrounding air, which depends on air pressure, is measured. For lower pressures, the damping of an oscillating membrane (top) caused by the surrounding air is measured.

[Photo]
Fig. 3
REM image of an indium-phosphide HEM transistor pair in 0.25 µm technology. The two T-gates, visible as thin rods under the gold air bridge that serves as the ground conductor, are clearly visible. Great care was taken in the design process to dimension the layer sequence precisely. The layer systems simulated at the Institute for Field Theory and High Frequency Technology were subsequently commercially manufactured by specialists. A high-quality manufacturing technology, developed at the IFH, was used for the thin lateral structures.

ZIPBau - Center for Integrated Planning in Construction

Planning and construction are becoming increasingly complex and dynamic, and are therefore associated with growing risks. The working methods and approaches of architects, engineers, and contractors have not kept pace with this development everywhere: Holistic, interconnected thinking and actions are often called for, but have not yet been fully implemented among construction professionals. This gap between expectations and reality was the catalyst for the establishment of the Center for Integrated Planning in Construction at ETH Zurich.

Prof. Dr. Hans-Rudolf Schalcher, Institute for Building Planning and Construction Management

Why Integration in Construction?

Since the beginning of industrialization in the mid-20th century, the construction industry has been marked by increasing fragmentation into predominantly smaller and medium-sized architectural and engineering offices, construction companies, and craft businesses. In earlier times, this was far less pronounced, as the architect and master

builder were typically responsible for both the planning and realization of a construction project. With this simple and transparent organizational structure, countless large and small buildings have been erected from antiquity to the modern era, many of which remain intact today.
As a result of industrial development, a strong specialization and associated division of labor has emerged in nearly every profession. This trend has been further reinforced in recent decades in the construction industry by rapid technological advancements, rising demands from users and operators, increasing complexity of buildings, and a growing web of laws and regulations.
Today, a vast array of professionals from various fields is involved in specific aspects of planning and construction. Each contributes their expertise to the success of a construction project, hoping that the individual contributions will naturally come together into a coherent whole. With this increasingly narrow focus among many construction professionals, the holistic, interconnected thinking, planning, and acting that was once the rule for ancient master builders has largely been lost. Therefore, it is no surprise that more and more clients, as well as broad segments of the public, share the opinion that planning and construction are too slow, too expensive, and often not in line with the needs of users and operators. The call for a shift in thinking is also reaching the construction industry! The demand for higher quality, performance, and competition in construction is growing louder and more unmistakable.

A promising approach to solving these problems points towards integration, understood as the bringing together of parts into a meaningful whole. These "parts" can include not only the increasingly numerous and complex building components of a structure but also the sometimes divergent goals of clients, operators, users, construction professionals, and the public, or the many professionals and companies involved in planning and construction. No matter the perspective, the call for holistic, interconnected thinking and actions is growing stronger and concerns all phases of a building's life—from the initiation of the project to its liquidation—and all those involved.

[Photo]
The Tower of Babel Already Failed Due to Communication Problems

An impulse from ETH Zurich
In the summer of 1992, some professors from the Departments of Architecture and Civil Engineering at ETH Zurich concluded that the university must take the initiative on integration in construction to initiate the much-needed development towards closer collaboration in the industry and enhance the performance and competitiveness of the Swiss construction sector.

From the outset, the initiators were clear that the university's contribution should primarily focus on researching and developing methods and tools, as well as disseminating the results achieved. However, the concrete implementation in practice must be carried out by the clients, architects, engineers, contractors, and their professional associations.

Therefore, it is obvious that the desired development must be supported by both the involved disciplines and the university, in collaboration with the construction industry. This insight led to the goal of creating a platform that would bring together the construction departments and faculties within ETH Zurich while also building a bridge between academia and the construction industry. This platform aims to identify future research and development focuses in the field of integrated planning in construction and, from these, derive concrete research projects, as well as support the corresponding research teams in obtaining funding and implementing the results.

Purpose and Work of ZIPBau

After extensive discussions within ETH Zurich and with interested parties from the construction industry, the Center for Integrated Planning in Construction (ZIPBau) was founded on November 11, 1993. The purpose of ZIPBau is described in its statutes as follows:

- ZIPBau initiates and promotes interdisciplinary research and development in the fields of design, planning, execution, and management of buildings and civil engineering works.

- ZIPBau provides a forum for cooperation between academia, clients, design offices, and the construction industry with the goal of enhancing the quality of the construction industry in the broadest sense.

- ZIPBau aims to make a particularly effective contribution to improving collaboration and communication between clients, planners, and contractors, and to develop corresponding tools to improve the performance and competitiveness of the construction industry.

- ZIPBau ensures that insights gained from research and development projects, as well as from the construction industry, are directly incorporated into education and communicated to practice.

ZIPBau is led by an interdisciplinary board, supported by an office at the Institute for Building Planning and Construction Management at ETH Zurich. A scientific advisory board, with 15 members from academia and the construction industry, supports the board, especially in identifying research and development priorities. The direct support of individual projects regarding organization, funding, and implementation of results is provided by topic-specific project groups.
The founding of ZIPBau has generated great interest in Switzerland and has received positive feedback.

Today, in addition to eight professorships at ETH Zurich, over 60 large and small architecture and engineering offices, companies from the construction industry and its subsidiaries, and both public and private clients are members. Important institutions in

the construction industry, such as the Swiss Master Builders Association and the Swiss Engineers and Architects Association, also actively participate in ZIPBau.

Current Focus Areas

In 1994, a comprehensive survey was planned to determine what efforts are being made or planned both domestically and internationally at universities, in technical committees, private companies, and public agencies to increase integration in the construction industry. This overview aims to ensure that future research priorities and projects of ZIPBau are optimally embedded and coordinated on a national and international level, enabling the use of existing synergies.

To also inform a broader public about ZIPBau's activities, a bulletin is planned to be published twice a year. Additionally, lectures and workshops on selected issues will be organized, providing ZIPBau members with an opportunity for direct information and collaboration.

Another focus for 1994 is expanding ZIPBau's relationships with ETH Lausanne and interested parties in the Romandy region and Ticino. The already existing international network will also be further developed. Currently, there are close contacts and an intensive exchange of knowledge between ZIPBau and the following foreign institutions:

- CIFE Center for Integrated Facility Engineering, Stanford University, Palo Alto, USA
- CCRE Center for Construction Research and Education, MIT Massachusetts Institute of Technology, Boston, USA
- VTT Building Technology, Espoo, Finland
- Technical Universities of the cities of Darmstadt and Stuttgart, Germany
- EG/Esprit 3 Project Group ATLAS: Architecture, Methodology and Tools for Computer Integrated Large-Scale Engineering.

Ongoing Research Projects

Before the foundation of ZIPBau, a larger research project was started as a pilot initiative, which aligns perfectly with the goals of ZIPBau and is intended to demonstrate the desired working approach. The project is:

Integrated Planning and Communication in the Construction Process,

which is supported by ETH Zurich's Institute for Building Planning and Construction Management, the Institute for Structural Engineering, and the Chair for Architecture and

CAAD. Industry partners, including the client, architects, and engineers, are involved in a specific construction project. The project is financed partly by these industry partners and partly through the Commission for the Promotion of Scientific Research (KWF) from the Federal Office for Economic Affairs.

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[Photo]
Buildings as Complex Technical Systems (High-rise near Schanzenbrücke)

The three main objectives of the ongoing research project are as follows:

- Increasing Effectiveness and Efficiency in Construction Planning. Achieved through an integrated approach, goal-oriented project management, and the optimal use of today's information technology and communication tools.

- Development of a Product Model for High-rise Construction. The model will represent all necessary data and their interconnections throughout all stages of a building's life cycle.

- Provision of Integrated Tools for IT-Supported Asset Management in the Operational Phase of a Building.

The following concrete outcomes are being pursued:

- Reduction of the effort required for acquiring, processing, transferring, storing, and evaluating project information during the planning and execution phases of a construction project.

- Reduction of the overall volume of project information.

- Definition of the interface where project information transitions from the realization of a construction project to its operational use.

- Identification of the data required for the operation and management of a building.

- Efficient management, updating, and processing of data in asset management.

The theoretical results are continuously applied and verified through a case study. The research project began in the fall of 1992 and will run until the end of 1995.

Renovation of ETH Buildings

A second research project within the ZIPBau framework was launched in early 1994.

The aim of this project is to develop innovative visions, approaches, and methods for the technical, physical, and energy-efficient renovation of over 20 university buildings constructed between 1964 and 1975. The focus is on the needs and requirements of the owners, users, and operators, as well as modern technologies and ecological, as well as economic, criteria in the context of sustainable restoration and adaptation of existing buildings.

The ETH project team includes the chairs of Design, Construction Realization, Building Physics, and Building Services from the Department of Architecture, the Institute for Electrical Energy Transmission and High Voltage Engineering, and the Chair of Building Planning from the Department of Civil Engineering. The extended project group includes representatives from ETH Zurich's users and operators, the Federal Buildings Office, and the Energy 2000 program.

Key results aim to include a universally applicable objective system with the relevant framework conditions, a specification sheet, and an approach concept for the renovation of ETH buildings. The first phase of this project is scheduled to be completed by the end of 1994. The findings and tools are expected to be implemented in a concrete renovation project as a pioneering pilot project.

[Photo] [Photo] [Photo]

PLANNING AND BUILDINGS

Regarding the Development of the University

[Photo]
Prof. Dr. Fritz Widmer
Vice President for Planning and Development

The development of ETH Zurich since 1979 — the completion of the last new building with a significant increase in usable floor area — can be summarized by the following changes in key figures:

- Increase in the number of students by 59.5%
- Increase in the number of professorships by 4.9%
- Increase in staff (primarily doctoral candidates) by 2.9%
- Increase in main usable floor space by 7%, with 5% allocated to leased spaces.

These figures reflect both the deterioration of the student-to-professor ratio and the precarious space conditions. The goal of the planning bodies is to initiate planning measures in both areas.

Planning

Planning in 1993 was characterized primarily by two measures that affected all Swiss universities and colleges:

- The implementation of special measures approved by the Federal Council in December to promote academic advancement.
- The development of the strategy and multi-year plan for the years 1996-1999.

The most significant internal ETH project was the planning and decision-making process regarding the personnel redistribution measures initiated in the summer of 1992.

Through the special measures to promote academic advancement, ETH Zurich was allocated annual financial resources starting in 1992, which allowed for the creation of 15 assistant professor positions (for 3 years) and 6 senior assistant positions (for 1 year, with the possibility of extension). By mid-1993, all 21 positions had been filled, three of which were held by 6 individuals with 50% employment. As specified in the parliamentary resolution, one-third of the 24 employees were women.

On November 23, 1993, the school administration adopted the strategy and multi-year plan for 1996-1999, to be presented to the ETH Board. This marked the completion of an important planning phase, during which all departments and divisions, as well as the planning commission, were intensively involved in several steps over the past 18 months. The development of the strategy and multi-year plan for 1996-1999 differed from previous planning rounds in that it involved intensive dialogue between the planning bodies and the department heads or their representatives. The strategic guidelines of the ETH Board also posed a challenge, encouraging individual areas within ETH Zurich to come up with specific intentions, statements, and preliminary decisions. The strategy for each department and division (grouped into so-called subject areas) therefore focused not only on the overarching goals and initiatives but also on the specific professional and volume-related content of the submitted multi-year plan.

The measures based on the strategy are reflected in interdisciplinary projects and professor planning. The submissions from the departments and divisions, after analysis by the planning commission, led to the proposal of three new competence centers (Natural Hazards, Air, Regional Sciences) and twelve key focus areas to be expanded in the form of polyprojects, including:

- Sustainable primary production, using the Alpine region as an example
- Sustainable building materials and resource management
- Medical technology
- Massively parallel computing
- Production and process systems
- Process control and control system technology
- Mechatronics and microsystem technology

The professor planning was implemented as a rolling planning process. To flexibly address new developments and challenges, only the professorships to be filled in 1996 and 1997 were prioritized initially. In the subsequent coordination phase, ETH Zurich is expected to submit 21 applications for authorization to fill professorships. Approximately 58 retirements (including 11 assistant professorships) are countered by 45 professorships (including 3 assistant professorships) planned to be filled (among which are the 21 mentioned professorships). Around 50 additional applications (including 15 for assistant professorships) are under review.

Based on the models developed in 1991-92 for estimating the basic funding for the allocation of personnel positions to the institutes, three departments (Civil and Environmental Engineering, Biology, and Physics) underwent further analysis as part of a fine-tuning process. The findings from this analysis led to proposals for personnel redistribution measures, primarily affecting the institutes for Particle Physics, Applied Physics, Solid State Physics, Geotechnics, and Hydraulic Engineering. These personnel redistributions, along with additional measures (reduced staffing levels, refraining from filling previous professorships), are intended to provide ETH Zurich with the necessary flexibility and leeway regarding available personnel positions for new tasks and activities. By the end of 1995, approximately 100 positions will be affected by the initiated personnel redistributions.

As part of the 1992-95 planning, the planning commission identified several interdisciplinary areas to promote and coordinate at ETH Zurich. In this context, the broad field of Regional Sciences and the area of Sports Science (Department of Physical Education and Sports Teacher Training) were analyzed by working groups with the involvement of external experts. In the field of Regional Sciences, ETH Zurich envisions the creation of a competence center focused on the Institute for Spatial, Regional, and National Planning (Spatial Planning/Regional Research) and a network of further professorships and teaching assignments, which will also contribute to the postgraduate program in Spatial Planning, along with strengthening Regional Economics. In the field of Sports Science, discussions focused on consolidating existing educational opportunities into a study program in "Sports and Movement Science" with a degree in Natural Sciences, as well as the establishment of an appropriate institute.
Additionally, the planning office worked on two revisions of the professor planning for 1992-95 and continued the development of a leadership information system at ETH Zurich.

Professor Planning (As of December 31, 1993)

Planning Period 1988-1991
(Backlog)

- Filled Professorships in 1993 10
- Election for 1994 2
- Ongoing Procedures 9
- Pending Procedures 1

Planning Period 1992-1995

- Professorships authorized for filling by the ETH Council..... 108
  (including 17 special measures for young talent promotion)
- Filled Professorships in 1992 (including 9 young talent professorships)... 18
- Filled Professorships in 1993 (including 7 young talent professorships)..... 29
- Election for 1994 3
- Ongoing Procedures 36

- Pending Procedures (including 1 young talent professorship) ……...18
- Professorships removed from the planning ……...4

Planning Commission

The Planning Commission is an advisory body to the university administration on matters of medium- and long-term development. It is chaired by Prof. K. Osterwalder. In the reporting year, the commission consisted of 17 members: 14 professors and one delegate each from the students, assistants, and staff. Members of the Planning Commission are appointed individually by the university administration. Based on the planning of individual subfields, the commission provides recommendations regarding priorities and development in teaching and research, as well as personnel, financial, and spatial planning for the university, its departments, and divisions.
In 1993, the Planning Commission held ten plenary sessions, primarily dedicated to developing the "Planning 1996-99". During these planning discussions, positions were taken regarding the objectives of the Swiss Science Council and the ETH Council, as well as on various coordination areas of ETH Zurich. Several competence centers and interdisciplinary focal points (polyprojects) were proposed and incorporated into the planning document. Additionally, the Planning Commission provided feedback on specific consultations and worked on two revisions of the professor planning for 1992-95.

The Planning Commission's activities were again significantly supported by the Planning Office.

Strategic Controlling

The year 1993 brought ETH Zurich some surprises and financial challenges. On a positive note, the new ETH Act provided additional freedoms in credit management, which contributed to a positive year-end result. The institutes and independent professorships, with exemplary discipline, implemented the cost-saving measures decided by the university administration, which also played a role in the favorable outcome. In addition to internal savings targets, staff in research, teaching, and administration had to cope with the effects of the hiring freeze.

The budget discussions for 1994 were less tumultuous in the Federal Council and Federal Parliament compared to the previous year. The budget for 1994 was increased by 3%.

Spatial Expansion of ETH Zurich

The anticipated shortage of space led to the development of a medium- and long-term expansion plan for ETH Zurich in 1985. The following projects were included, in the order of their planned execution:

- Renovation and expansion of the Institute of Toxicology in Schwerzenbach
- Renovation of the Agricultural West building (ETH Zentrum) for the Institutes of Plant Sciences and Animal Sciences (in 2 stages)
- Relocation of the Institute of Pharmacy to a new building on the Irchel campus
- Construction of a new institute building on Clausiusstrasse (ETH Zentrum), in 2 stages, for the needs of Mechanical Engineering and Production Engineering
- Renovation of the Natural Sciences West building (ETH Zentrum) after the relocation of the Institute of Pharmacy
- Expansion planning for the 3rd stage of ETH Hönggerberg.

In 1993, the first measures of this expansion plan were successfully completed:

- With the completion of the second renovation stage of the old building, the Institute of Toxicology gained appropriately furnished facilities in sufficient quantity, which also included the needs of the planned fourth professorship (ETH Building Report 1986, 36 million CHF).
- By the beginning of the winter semester 1993/94, the construction work on the Agricultural West building was completed ahead of schedule, allowing the final professorship in Plant Sciences to be integrated into the building (ETH Building Report 1989, 2nd stage, 27.8 million CHF). This also marked the end of the long ordeal for users who had to endure the five-year construction period.
- On August 1, 1993, the ownership of the newly completed building for the Institute of Pharmacy was transferred on the Irchel campus (ETH Building Report 1986, 50.6 million CHF). The move to the new premises was completed as planned by the end of September 1993. The renovation work on the NW building, which became available due to the Institute of Pharmacy's relocation, began immediately (ETH Building Report 1992, 20.5 million CHF). This building was planned to house the Institute of Entomology and the Institute of Hygiene and Occupational Physiology.

The first stage of the Clausiusstrasse Institute building (ETH Building Report 1989, 98.4 million CHF) is nearing completion, and the new building is expected to be ready for

occupation by the Institute for Robotics, the Institute for Machine Tools and Manufacturing Engineering, and the Institute for Construction/Building Systems of the Department of Mechanical Engineering, Operations, and Production by August 1994. With the civil building report of 1993, the Swiss Federal Council approved the second stage of this institute building (82 million CHF). This second stage, expected to be completed by 1997, will extend the new building from the first stage to the NW building. For this expansion, the "old student dormitory" will be demolished. The network replacement facility included in the first stage of the Clausiusstrasse Institute building (a diesel-powered grid power system with heat recovery and electricity generation during peak hours) will begin test operations as planned in spring 1994 (output: approx. 1350 kW electrical power; approx. 1370 kW thermal power). This innovative system was equipped with an elaborate exhaust gas cleaning system.

3rd Expansion Stage ETH Hönggerberg

The 3rd expansion phase on the ETH Hönggerberg campus involves the relocation of the Department of Chemistry and the Department of Materials Science from the city center to newly constructed buildings on Hönggerberg, as well as the creation of additional central facilities for teaching and infrastructure. In a later phase, the Department of Biology will also be consolidated on the Hönggerberg campus.
The space program for the first two phases includes a total usable area of approximately 48,000 m². Of this, around 7,500 m² are designated for central facilities (lecture halls, library) and infrastructure facilities (cafeteria, services).

[Photo] [Photo] [Photo]

The buildings that will be freed up by the relocation of the Departments of Chemistry and Materials Science at the ETH Center will undergo renovations and will be used to expand engineering sciences, consolidate environmental sciences, and return areas currently housed in rental properties to the university campus.
Following the proposal from an expert commission (2nd phase of the project competition), the Swiss Federal Office of Buildings, in collaboration with ETH Zurich, assigned the architectural office of Prof. Campi/Arch. Pessina the task of developing the project for the first phase (space for the Department of Chemistry, the auditorium building, and the service building with approximately 36,000 m² of usable space) as part of their ELEMENTAR project.
The ELEMENTAR project is characterized by a linear teaching and research building with five institute sections (fingers), an attached auditorium building, and a separate service building.
The design of the teaching and research building results in a clear separation of research and teaching areas. It facilitates the merging of chemistry and materials science departments and allows for flexible use. The design also promotes efficient spatial relationships with short distances between functional areas, enabling the centralization of

infrastructure typically associated with chemistry (chemistry counters, disposal). The five institute sections will accommodate the Departments of Chemistry and Materials Science. The linear part of the building will mainly house laboratory spaces for teaching and practical work.
Courtyards between the institute sections are planned to house the departments' infrastructure areas such as material storage, waste disposal, workshops, large experimental halls, and the computer center.
The linear part of the teaching and research building, designed as an open loggia on the ground floor and largely on the first floor, connects the institute sections with one another and with the auditorium building. The auditorium building will house lecture halls, small auditoriums, the chemistry library, the cafeteria, and other communal areas. The six lecture halls, with capacities of 100 to 300 seats, as well as smaller seminar rooms, will serve the Departments of Chemistry and Materials Science but will also meet the additional needs of lecture halls for departments that were previously located on the Hönggerberg campus, including Architecture, Civil Engineering, and Physics.
The separate service building will house retail shops, administration offices, student organization offices, a multipurpose room aimed at student events, a bistro/cafe, and four staff apartments. A user commission, representing all university groups, was formed to oversee this central construction project.
After the Swiss Federal Council approved the concept message in 1992 with a budget request of 19.7 million CHF for the necessary preparatory work, the construction loan for the first expansion phase, which includes spaces for the Department of Chemistry, the auditorium building, and the service building (totaling 597 million CHF), was submitted to Parliament in the civil building report of 1993. Both the National Council and the Council of States approved this large expansion project without opposition. The Federal Office of Buildings was able to submit the building application for the first expansion phase of the 3rd expansion stage to the authorities in Zurich in December 1993.

[Photo]
3rd Expansion Stage ETH Hönggerberg: Building submission project for the ETH Hönggerberg campus, featuring the auditorium building, teaching building, 5 research sections (HCI), and service building (HPI).

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Space Management

In 1993, the leased space of ETH Zurich only increased slightly by 380 m². By the end of 1993, it amounted to 22,100 m², spread across 43 locations. This leased space does not include the Centro Svizzero di Calcolo Scientifico (CSCS in Manno/TI) with 4,300 m² and the share of the Technopark with 7,600 m².

With the gradual occupancy of new buildings (such as the Clausiusstrasse Institute building), the tense space situation was expected to ease somewhat starting in 1994. However, rental properties are likely to only be returned after the completion of the 3rd expansion phase at Hönggerberg, Phase 1. The current space situation demands

increased flexibility from all parties involved and the willingness to accept partial double occupancy.

New Telecommunication System for ETH Zurich

In the fall of 1993, after several years of preparation, ETH Zurich successfully switched to a new telecommunication system. After most of the necessary structural adjustments were completed in 1992, installation adjustments and further technical preparations were made until late summer. Starting in late August, the two existing electromechanical telephone exchanges in the city center and on the Hönggerberg campus were gradually replaced by four fully electronic digital exchanges of the Siemens HICOM 300 type, which are connected via a fiber-optic network. In parallel with the commissioning of the new exchanges, around 3,500 new telephone devices were installed throughout ETH Zurich, mostly replacing old devices, though some were additional units. The new system has a capacity of 8,800 connections, of which about 7,000 are currently in use.

In addition to the standard telephone functions, users have access to several additional features that significantly improve the ability to reach the desired party. Over 900 ETH members attended courses that explained how to use the new telephone devices.

[Photo]
Institute Building Clausiusstrasse

[Photo]
Main Hall of the Agriculture-West Building *Photographer: Balz Murer*

FINANCES

Annual Financial Report

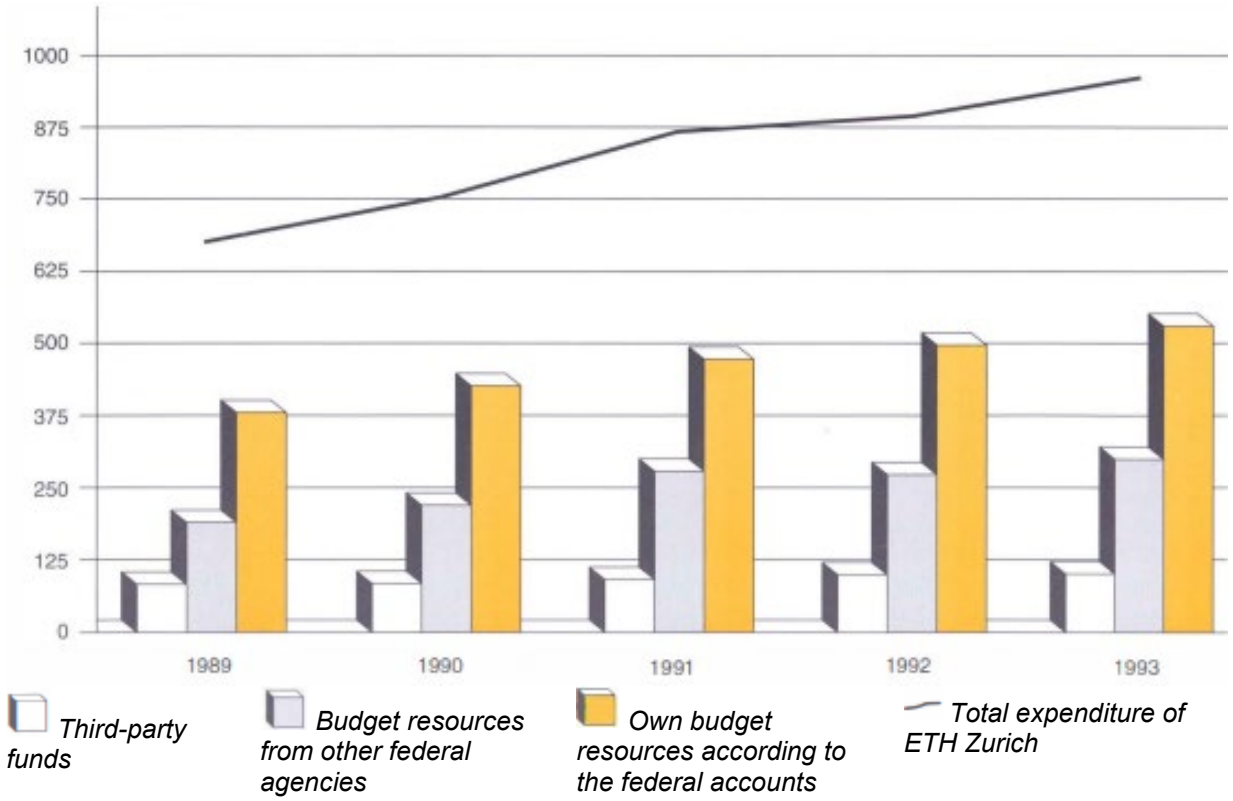
Overview: Revenues/Expenditures (in CHF)

	1993 (CHF)	1992 (CHF)	Change (CHF)
Revenues according to the federal accounts (1)	**14,843,903**	13,813,281	1,030,622
Own budget resources according to the federal accounts (2)	**532,765,988**	515,773,504	16,992,484
Budget resources from other federal agencies (3)	**314,409,148**	283,074,727	31,334,421
Third-party funds (4)	**112,872,000**	103,339,000	9,533,000
Total (Expenditures from items 2-4)	**960,047,136**	902,187,231	57,859,905

Introduction

The year 1993 concluded a turbulent period, with the recession leaving deep marks on the financial balance. The federal budget for 1993 ended with a deficit of 8 billion Swiss francs.
No improvement is expected for 1994. Even in the third consecutive year of recession, ETH Zurich is forced to adapt its mission for teaching and research to the new financial constraints of the reduced annual budget. ETH Zurich views this as a challenge, striving to achieve its goals for teaching and research—especially regarding the planning of professorships—despite reduced funding and without compromising quality.
Financial management has already taken measures in 1991 to address the challenging financial conditions. The new ETH Law, effective as of February 1, 1993, significantly helps to make the allocation of resources more flexible and manageable. This is primarily achieved through the redistribution of funds during the year and the transfer of credits to the following year.

Expenditure Development of ETH Zurich (1989-1993)
(in million CHF)



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Revenues: CHF 14.8 million

Revenues increased by 7.2% compared to the 1992 financial report. This increase was mainly due to the rise in parking fees for ETH employees and students, as well as the correction of the billing period for rents.

Expenditures: CHF 960.0 million

Compared to the previous year, total expenditures rose nominally by 6.4%. Since the own budget resources were only adjusted for inflation, new and expanded areas of responsibility had to be increasingly financed from other sources. This trend had already been evident in previous years due to the massive financial deficits in the federal budget.

- *Own budget resources according to the federal accounts (CHF 532.8 million):*

The increase in expenditures was slightly above the inflation rate (+3.3%). To align the planning figures with the approved budget, the school leadership took measures, such as cutting back on staff allocations and imposing stricter quotas for teaching assistants. This led to savings on additional personnel expenses for teaching and research (-6.3%). The cost-cutting concept for operational maintenance also resulted in lower costs.

- *Budget Resources from Other Federal Agencies: CHF 314.4 million:*

The significant increase in costs was primarily due to higher expenditures from the Federal Office for Buildings. These included installation work for the new telephone system as well as additional rental costs for the Technopark. Additional funds were also required for the maintenance of buildings in need of renovation. Moreover, there were increased expenditures for construction and facility investment projects. A large portion of central procurement credits was allocated to information technology resources. Compared to the previous year, these costs decreased slightly. There is still a considerable demand for IT equipment procurement. The price drop in hardware was the main cause of this cost reduction.
A notable expenditure item is the employer's contributions to social benefits, centrally managed by the Federal Finance Administration, on the salaries of permanent, temporary, and additional staff, as well as on the retirement pensions of professors. Due to the increase in total salary expenses for the reporting year, these contributions automatically rose.

- *Third-Party Funds: CHF 112.9 million:*

Third-party funds are crucial for ETH Zurich. The 9.3% increase compared to the previous year is encouraging, and the trend for the future remains positive. If one considers the services provided by third parties in the form of personnel or equipment, the share of third-party contributions to the overall budget would be significantly higher. The proportion of third-party funds in total expenditures for the reporting year is 11.8%.
Many projects can only be realized in collaboration with external funding sources. As in the previous year, half of the accrued costs were financed either by the Swiss National Science Foundation (SNSF) or through industrial participation. Other federal agencies or commissions, such as the KWF, also enabled numerous studies and research projects.

Revenues

1. Revenues according to the State Budget		1993 (CHF)	1992 (CHF)	Change (CHF)
	52 Income from Assets	**4,008,757**	**2,516,361**	**1,492,396**
5210.001	Rent from Third Parties	4,008,757	2,516,361	1,492,396
	53 Fees	**10,835,146**	**11,296,920**	**-461,774**
5330.001	Tuition Fees	5,422,582	5,367,924	54,658
5340.001	Contract Research (various institutes)	1,644,938	1,755,241	-110,303
5340.002	Data Centers: Services for Third Parties	13,033	0	13,033
5350.001	Supply of Heat Energy to Third Parties	1,230,803	1,777,147	-546,344
5360.001	Refunds	2,085,742	1,946,090	139,652
5390.001	Other Fees	438,048	450,518	-12,470
Total Revenues		**14,843,903**	**13,813,281**	**1,030,622**

Expenditures

2. Own Budget Funds according to the State Budget	1993 (CHF)	1992 (CHF)	Change (CHF)
30 Personnel Expenditures	**401,536,221**	**396,225,842**	**5,310,379**
3020.001 Salaries of Regular Staff	324,439,700	314,964,529	9,475,171
3020.005 Salaries of Auxiliary Staff	8,556,459	8,150,779	405,680
3020.009 Salaries of Supplementary Staff in Teaching & Research (T&R)	68,540,062	73,110,534	-4,570,472
31 Material Expenditures	**91,861,649**	**89,410,824**	**2,450,825**
3100.001 Books, Magazines	8,584,996	8,610,073	-25,077
3120.001 Water, Energy, Heating Materials	22,124,536	20,768,162	1,356,374
3130.001 Material Expenditures for T&R	44,133,880	42,302,114	1,831,766
3130.009 Consumables	3,040,712	3,516,339	475,627
3145.001 Maintenance of Machinery, Equipment, Vehicles, Facilities	3,416,035	3,580,505	-164,470
3160.001 Per Diem Allowances	523,096	508,084	15,012
3180.001 Services and Fees	6,576,242	6,502,018	74,224
3190.001 Collaborative Tasks Executed by Third Parties	2,361,014	1,955,024	405,990
3190.003 Furniture Damage in Case of Fire at the Cooling Center in Hönggerberg	0	523,464	-523,464
3190.009 Other Material Expenditures	**1,248,063**	**1,145,041**	**-43,903**
36 Contributions to Ongoing Expenditures	1,101,138	1,347,027	-98,964
3600.001 Scholarships	**38,120,055**	**1,347,027**	**-98,964**
40 Investment Goods	1,248,063	28,789,811	9,330,244
4010.001 Equipment and Facilities for T&R	38,120,055	28,789,811	9,330,244
Total Expenditures	**532,765,988**	**515,773,504**	**16,992,484**

3. Budget Funds from Other Federal Entities	1993 (CHF)		1992 (CHF)	Change (CHF)
3.1 Swiss Federal Printing and Material Center (EDMZ)		**80,745,652**	**84,621,438**	**-3,875,786**
3.11 Printed Materials, Office Supplies	4,302,108		4,673,702	-371,594
3.12 IT Equipment	72,562,938		77,274,918	-4,711,980
3.13 Office Automation	3,880,606		2,672,818	1,207,788
3.2 Federal Office for Buildings (AfB)		**137,398,977**	**108,507,123**	**28,891,854**
3.21 - General Property Expenses		55,324,705	44,207,988	11,116,717
3.211 - Evaluation of Construction Projects	76,303		0	76,303
3.212 - Furniture for New Buildings	3,419,978		2,077,533	1,342,445
3.213 - Maintenance of Buildings	36,929,474		30,999,097	5,930,377
3.214 - Rent and Lease Payments	12,944,457		7,330,790	5,613,667
3.215 - Construction Work on Leased Properties	1,954,493		3,800,568	-1,846,075
3.22 Construction Investments		**82,074,272**	**64,299,135**	**17,775,137**
3.221 - Buildings and Facilities	53,603,979		44,907,216	8,696,763
3.222 - Property Acquisitions	8,574,600		11,900,000	-3,325,400
3.223 - Planning	8,082,788		4,818,131	3,264,657
3.224 - Expansion of Telephone Systems	11,812,905		2,673,788	9,139,117
3.3 Swiss Federal Finance Administration		**68,962,008**	**66,022,941**	**2,939,067**
3.31 Employer Social Benefits Contributions	59,633,128		55,431,791	4,201,337
3.32 Flat Rate Postage	3,755,743		3,640,379	115,364
3.33 Telephone Fax Charges	3,500,083		3,742,100	-242,017
3.34 Various Material Expenditures	2,073,054		3,208,671	-1,135,617
3.4 Other Federal Entities		**27,302,511**	**23,923,225**	**3,379,286**
3.41 Other Federal Entities	1,361,511		1,266,225	95,286
3.42 Embassies	25,941,000		22,657,000	3,284,000

Total		**27,302,511**	**283,074,727**	**31,334,421**

* See details on embassies, page 41

4. Third-party funds		**1993 Francs**	**1992 Francs**	**Changes**
4.10	Swiss National Science Foundation	34 614 000	31 362 000	3 252 000
4.20.	Comm. for the Prom. of Scient. Research (KWF)	16 347 000	14 311 000	2 036 000
4.30.	Federal agencies	**19 679 000**	**18 747 000**	**932 000**
4.311.	• Departmental research (federal government)	13 430 000	10 556 000	2 874 000
4.312.	• COST	1 389 000	1 591 000	- 202 000
4.313.	• DEH	2 748 000	2 984 000	236 000
4.314.	• SBB, PTT, EAV (public utilities)	2 112 000	3 616 000	- 1 504 000
4.40.	Cantons and municipalities	716 000	679 000	37 000
4.50.	Funds and foundations	4 396 000	5 106 000	- 710 000
4.60.	Industry	**30 847 000**	**28 319 000**	**2 528 000**
4.611.	• Contractual relationships	981 000	4 110 000	- 3 129 000
4.612.	• Ownership structures	29 866 000	24 209 000	5 657 000
4.70.	Other institutions and associations	6 273 000	4 815 000	1 458 000
4.711.	• NEFF	4 909 000	3 929 000	980 000
4.712.	• Cancer League/NAGRA	1 364 000	886 000	478 000
Total		**112 872 000**	**103 339 000**	**9 533 000**

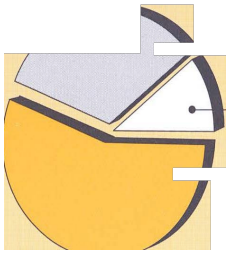
Additional information on expenses

Details of the global credit for teaching & research		**1993 Francs**	**1992 Francs**	**Changes**
3020.009	Remuneration of additional staff in t.&r.	68 540 062	73 110 534	- 4 570 472
3130.001	Material expenses for t.&r.	44 133 880	42 302 114	1 831 766
4010.001	Equipment and facilities in t.&r.	38 120 055	28 789 811	9 330 244
Total		**150 793 997**	**144 202 459**	**6 591 538**

*** Details of embassies (see 3.42)**		**1993 Francs**	**1992 Francs**	**Changes**
3.421.	Center for Continuing Education (ZfW)	**4 880 000**	**3 992 000**	**888 000**
3.421.1.	• Personnel expenses	1 498 000	2 391 340	- 893 340
3.421.2.	• Operating expenses	2 743 000	1 204 660	1 538 340
3.421.3.	• Scholarships	639 000	396 000	243 000
3.422.	Initial equipping of new buildings	3 578 000	**3 369 000**	**209 000**
3.423.	Priority programs (SPP)	**14 867 000**	**15 124 000**	- 257 000
3.423.1.	• LESIT	11 552 000	14 724 000	- 3 172 000
3.423.2.	• Materials	1 084 000	280 000	804 000
3.423.3.	• Optics	2 231 000	120 000	2 111 000
3.424.	Mobility funding	162 000	97 000	65 000
3.425.	Promotion of young talent	2 454 000	75 000	2 379 000
Total		**25 941 000**	**22 657 000**	**3 284 000**

FINANCES

Structure of the source of funds in 1993

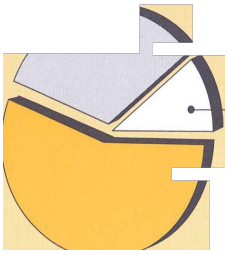


32.7% budget funds from other federal offices

11.8% third-party funds

55.5% own budget funds according to state budget

Structure of the use of funds in 1993



33.6% Operating expenses

8.6% Construction investments

57.8% Personnel expenses

Distribution of costs by department

(All figures in CHF 1000)	1993 Total	Sources of credit			Types of expenses	
		Own budget credits according to state financial statements	Third-party credits	Budget credits 1) of other federal agencies	Personnel expenses	Material expenses
D-Mathematics	19 023	16 244	863	1 916	17 499	1 524
D-Physics	76 071	49 545	14 775	11 751	54 150	21 921
D-Chemistry	58 060	43 311	7 825	6 924	41 075	16 985
D-Biology	54 472	39 823	9 377	5 272	35 247	19 225
D-Law and Economics	6 907	5 502	529	876	5 603	1 304
D-Human Sciences	7 360	6 298	514	548	6 344	1 016
D-Architecture	33 347	26 502	2 523	4 322	28 467	4 880
D-Civil and Environm. Engineering	43 805	29 963	9 754	4 088	36 138	7 667
D-Mechanical, Industrial and Production	43 739	27 832	9 906	6 001	33 923	9 816
D-Energy and Process Engineering	26 211	15 021	9 054	2 136	19 042	7 169
D-Electrical Engineering	60 282	32 281	12 331	15 670	44 997	15 285
D-Computer Science	17 702	10 576	2 548	4 578	12 659	5 043
D-Materials	17 312	11 898	2 987	2 427	12 365	4 947
D-Geodetic Sciences	8 267	5 967	834	1 466	6 150	2 117
D-Agricultural and Food Sciences	37 581	27 459	6 743	3 379	30 542	7 039
D-Pharmacy	7 815	6 091	420	1 298	5 425	2 390
D-Forest and Wood Res.	11 175	8 899	1 243	1 033	9 699	1 476
D-Earth Sciences	21 706	16 881	3 696	1 129	15 747	5 959
D-Environmental Sciences	28 313	21 384	5 082	1 847	24 310	4 003
Total Departments	**579 148**	**401 483**	**101 004**	**76 661**	**439 382**	**139 766**
Teaching Departments	12 726	9 000	655	3 071	9 142	3 584
Administration/Central Services	126 342	94 910	8 200	23 232	82 461	43 881
General Expenses	62 452	27 373	3 013	32 066	24 112	38 340
EDMZ (IT etc.)	41 980			41 980		41 980
AfB Building Maintenance	55 325			55 325		55 325
AfB Building Investments	82 074			82 074		82 074
Overall total	**960 047**	**532 766**	**112 872**	**314 409**	**555 097**	**404 950**

1) for departments and divisions: includes social security contributions by the employer (AHV/IV/EO/ALV/EVK/SUVA), embassy funds and the expenditure of the EDMZ, the central procurement office of the federal government.

Daily life at university

[IMAGE] [IMAGE] [IMAGE]

Important legal norms and administrative decrees; Administration of justice

Study plans and examination regulations for the diploma program

According to the new ETH Law, the Executive Board of the ETH is now responsible for issuing, amending and repealing curricula and examination regulations (cf. Art. 27, para. 4, lit. a ETHG).
On September 28, 1993, the Executive Board issued a new curriculum for the Department of Military Sciences as well as new curricula and diploma examination regulations for the Departments of Computer Science and of Agricultural Engineering and Surveying. Furthermore, it amended the curricula of the Departments of: Architecture, Chemistry, Pharmacy, Agricultural Engineering and Surveying, Mathematics and Physics, Biology and Environmental Sciences, as well as the diploma examination regulations of the Departments of: Civil Engineering, Pharmacy, Agriculture, Mathematics and Physics, and Earth Sciences. As already mentioned in the 1991 Annual Report (page 59), future changes to these enactments could impair legal certainty. Finally, on December 21, 1993, the Executive Board suspended various outdated standard curricula and diploma examination regulations in the interest of legal revision. This concerned the departments of: Electrical Engineering, Forestry, and Land Management and Surveying.

Continuing Education

The Executive Board issued - under the new ETH Law also at its own authority - various new regulations for postgraduate studies. These included new regulations for the postgraduate studies in Occupational Health and Safety (February 9, 1993), Computer Science (August 31, 1993), Electrical Power Engineering (August 31, 1993) and Urban Water Management and Water Pollution Control (December 21, 1993). In addition, the Executive Board amended the implementation provisions for the postgraduate program in Business and Management (December 21, 1993) and discontinued the postgraduate programs in Biology (March 9, 1993) and in Earth Sciences (July 13, 1993). On July 13, 1993, the Executive Board approved the Rector's decision to limit the number of participants in the postgraduate program in Business Administration.

Research structure

On August 17, 1993, the Executive Board of ETH Zurich decided to merge the Institutes for High Energy Physics and for Medium Energy Physics into a single Institute for Particle Physics (ITP). According to the new ETH law, the Executive Board, and no longer the higher authority, is responsible for such organizational acts (see Art. 15, para. 4 of the ETH Ordinance of January 13, 1993). Furthermore, on November 23, 1993, the Executive Board amended the organizational regulations for the Thomas Mann Archive.

Management and administration

On the basis of donations received by ETHZ, the Executive Board set up two funds and regulated their administration and use with the appropriate regulations. These were the Willi Studer Fund (March 4, 1993) and the August Karolus Fund (July 13, 1993). Under the new ETH law, the authority for these actions also lies with the Executive Board. Under the old law, the Swiss School Board was responsible for these matters.

Enforcement of the new ETH Law

On February 1, 1993, the new ordinances of the Federal Council of January 13, 1993, concerning the ETH domain and ETH Zurich, as well as an amendment to the Lecturers' Ordinance, came into force. On March 31, 1993, the ETH Board issued a new ordinance concerning the election of employees of the ETH domain and regulated the collection of tuition fees at the two Federal Institutes of Technology by means of a transitional law. On May 18, 1993, it also issued a transitional decree concerning the delegation of authority in the area of studies and habilitation at the two Federal Institutes of Technology.
During the year under review, a new decree concerning the organization of the ETH Zurich was drafted and an extensive consultation procedure was carried out. The ETH Board will adopt this decree at the beginning of 1994.

Administrative jurisdiction

As a judicial body, the Executive Board of the School rules on administrative complaints against the Rector's decisions on admissions and examinations.
During the year under review, it dealt with 36 complaints (previous year: 59). In addition, there were numerous requests for reconsideration, which were dealt with by the Rector, Professor Dr. Hans von Gunten.

[IMAGE]

University Assembly

The new ETH law brought decisive changes for the University Assembly/Reform Committee (HV/RK). This body, now simply called the University Assembly, is now the main participatory body of ETH Zurich and has extended competencies, in particular the extremely important right of representation of all university groups in the ETH Board.

In addition, it submits proposals to the Executive Board and the ETH Board and deals with complaints regarding participation. It can complain to the ETH Board about internal ETH decrees or to the ETH Appeals Committee about resolutions of the ETH Board (the latter, however, only exists on paper).

After the new ETH Law came into force, the old General Assembly/Recourse Committee was dissolved and the new University Assembly was constituted on April 29, 1993. Under the leadership of the President of the General Assembly/Recourse Committee, Professor Hans Werner Tobler, official business was handed over to the newly elected University Assembly, which now consists of five elected representatives each from the four university groups:

• students and auditors

• assistants, scientific staff and doctoral students

• administrative and technical staff

• lecturers.

Prof. Ulrich W. Suter was elected President of the new University Assembly. Dr. Thomas Eichenberger, a member of the Executive Board, is responsible for administrative matters. The committee consists of the President, Fritz Weber (students and auditors), Dipl. Informatik-Ing. Michael Rys (assistants, scientific staff and doctoral students) and Peter Wägli (administrative and technical staff).

We would like to take this opportunity to thank the former representatives of the bodies in the General Assembly/Board of Governors for their committed and long-standing service.
A number of important matters were dealt with last year. The most important were the planning for the years 1996 to 1999, the new Matura Recognition Ordinance, which was largely and unanimously rejected in the form presented at the time of the consultation, the changes to the Lecturers' Ordinance of the two Federal Institutes of Technology, which gave rise to extensive discussions, the rules of procedure of the ETH Board, the ETHZ Ordinance and the organization of the ETH Library.
Participation can only function if all members of the university turn to the university assembly in the event of conflicts that cannot be resolved by mutual agreement. Since it can neither be nor wants to be a controlling body, its performance as a supervisor of participation depends on those affected pointing out the injustice done to them and informing the University Assembly of violations of the right to a say.

Lecturers' Committee

The Lecturers' Committee represents the interests of the professors, senior lecturers and lecturers at ETH Zurich. The main issues addressed by the Lecturers' Committee during the year under review were as follows:

Enforcement of the ETH Law: autonomy

The lecturers noted that the enforcement of the ETH Law provided completely inadequate support for the autonomy of the ETH as defined by the ETH Law. They expect a clear functional distinction between the duties of the ETH Board as a supervisory body and those of the Executive Board as the management body. The “Ordinance on the Swiss Federal Institutes of Technology” came into force on February 1, 1993, along with the revised “Lecturers' Ordinance”. The specific form of the autonomy desired by the legislature is now a cause for concern. It is still giving rise to heated discussions.

University Assembly

The election of the five lecturer representatives to the new University Assembly was carried out by postal vote in spring 1993. The University Assembly, as a body with equal representation from the two sites, will in future represent their concerns to the new ETH Board. It will be an important advisory partner for the Executive Board. The following representatives of the teaching staff are members of the GA: Prof. U. Suter (President of the GA), Prof. K. Hepp, Prof. P. Jenny, Prof. T. Koller and Prof. H. Wunderli-Allenspach. Following the election of Heidi Wunderli-Allenspach as President of the DK (as of October 1, 1993), she was replaced as an active member of the GA by Prof. H. Eppenberger.

Lecturers' Rules of Procedure - Transitional Arrangements

The new ETH Law and the associated implementing ordinances at the level of the ETH Domain and ETH Zurich have made it necessary to amend the Rules of Procedure. The Lecturers' Committee agreed that these amendments should only be made after the various implementing ordinances have been issued, and that until then the previously valid Rules of Procedure should continue to apply.

Ordinance on the Organization of ETH Zurich

In the summer semester of 1993, the Lecturers' Committee commented on the Ordinance on the Internal Organization of ETH Zurich. The Lecturers' Committee suggested that the parts of the ordinance concerning divisions and departments should be worded in such a way that it would be possible to merge divisions and departments without further adjustments. Furthermore, the lecturers wanted their work in the current lecturers' and professors' conferences to be explicitly recognized as such and not to take place in a “gray area”. This should be ensured by appropriate wording in the regulation on the organization of ETH Zurich. So far, neither of the proposals has been adopted by the Executive Board.

Lecturer Ordinance

The ETH Board would like to see a further revision of the revised Lecturer Ordinance that was only passed in January 1993. The main issue is the stipulation of the retirement age of professors at 65. The professoriate has spoken out clearly against this rigid solution. They would much prefer a more flexible solution between 62 and 67. Unfortunately, the opportunity to hold a fundamental discussion on this important topic before the new revision was carried out was missed. Furthermore, the amended ordinance is concerned with the creation of a new lecturer category, “Scientific Experts (WE)”. The Lecturers' Committee fundamentally supports the creation of such a category as a management tool and to promote the non-professorial teaching staff. However, it would prefer a regulation outside the Lecturers' Ordinance, since the group in question is not actually lecturers in the strict sense. For quality assurance purposes, it proposes that applications for future WE should be reviewed by the Conference of Department Heads.

Study guidelines

In the winter semester of 1993/94, the Lecturers' Committee began work on the ETH Board's statement on the ETH study guidelines and found that the draft contained a wide range of levels of detail.

On its own behalf

The Lecturers' Committee consists of 37 members elected by the departments and the General Lecturers' Conference. The business of the Committee is conducted by the Lecturers' Committee, represented by the President, Prof. H. Wunderli-Allenspach, and the Vice-President, Prof. H. Böhni. The following are also members of the committee: the rector, Prof. H. v. Gunten (ex officio), Prof. A. Bauder (actuary), Prof. H. R. Ott (treasurer), Prof. Genevieve Defago, Prof. U. Maurer, Prof. P. Jenny (representative of the University Assembly in the DK) and the rectorate secretary, R. Caflisch. Until September 30, 1993, the following were members of the committee: Prof. G. Schweitzer, Prof. P. Leuthold, Prof. G. Semenza, Prof. H. Primas and Prof. K. Winterhalter (until April 29, 1993, as representative of the Reform Commission).
The sub-committee for the organization of studies (chaired by Prof. W. Schaufelberger) dealt in detail with the comprehensive teaching evaluation required by the new ETH law and the preparatory work already carried out by the Center for Teaching and Learning. It followed with concern the discussions about the revision of the Matura recognition ordinance.
The sub-committee for the Dozentenfoyer (chaired by Prof. G. Geier, deceased) thanks the manager, Heidi Wilhelm, for the excellent management of the Dozentenfoyer. The financial situation is good, so that no price increases will be necessary in 1994.

The most important problem the committee still faces is the high number of visitors during the lunch hour. The precarious spatial conditions, especially in the winter semester, are increasingly leading to complaints from users. The committee has analyzed the situation and would like to implement various improvements.
The sub-committee for salary matters (chaired by Prof. C. Hidber) focused its activities on preparing and conducting a survey among the professoriate regarding the urgency and design of a flexible regulation for early retirement from 62 years of age. Two options were presented, both with a financial incentive for professors. The evaluation showed that 54% of professors welcomed the possibility of a flexible retirement age, 43% were clearly against it and 3% of those surveyed did not express an opinion. The excellent cooperation and coordination of opinions with the EPF Lausanne deserves special mention.

[IMAGE]

Public relations

The two new publications are called “BULLETIN - Magazin der ETH Zürich” and “POLYKUM + ETH-INTERN”, which have emerged from the previous ETH-Bulletin in the course of intensive preparatory work.

The newspaper “POLYKUM + ETH INTERN” is intended to improve internal information for university members, while the magazine “BULLETIN” is designed to inform a scientifically demanding audience about the achievements of ETH Zurich.

Thanks to the willingness of VSETH to make its newspaper “POLYKUM” available to all university groups, today all ETH members can be informed in detail and up-to-date about life at the university in the VSETH newspaper, which appears every two weeks during the semester (circulation 21,000 copies), with a separate “ETH-INTERN” section editorially prepared by the ETH Zurich press service. This brought us a step closer to realizing a long-standing postulate of the Personnel Committee.

The Executive Board has given ETH-INTERN the status of an official journal and granted the project a preliminary term of two years.

The time-consuming preparatory work for the new publications has pushed direct public relations work into the background somewhat. Nevertheless, 87 press releases were sent to the editorial offices of mass media, and five press events were held.

ETH Zurich's good media presence was documented in the “Medienecho”, which appeared every 14 days. The Press and Information Office supported the Executive Board and ETH institutes in public appearances and in looking after important guests of the university, prepared the annual report for the Executive Board, the new study brochure “With ETH Zurich into the Future” for the Rectorate and made a significant contribution to informing the public by providing information, advice, telephone information and various printed materials.

Operating services

The tasks of the Operational Services include, in particular, the management and maintenance of the facilities for the supply and disposal of media, the maintenance of the technical installations, the provision of the domestic services and the fulfillment of central infrastructure tasks. The latter includes the post office, the reprographic centers, the motor vehicle service, the parking service, the real estate administration and the telephone system. In addition, premises are rented to third parties by the Operational Services staff. Since February 1993, the Operating Services have been headed by Dr. Philippe Warnez, who succeeded Dr. Peter Häni.

Housekeeping

The trend towards outsourcing more and more building cleaning continues due to the restrictive personnel policy and the ever-increasing cleaning area. The number of cleaners is still limited to 110 positions. Now, wherever possible, window cleaning has been reduced to once a year. Of the total cleaning costs of around 12.3 million francs (the same as the previous year), contracts with cleaning companies account for just over 3.1 million francs, or about 25%. This result was achieved thanks to savings in window cleaning, basic cleaning and through the more economical and targeted use of cleaning chemicals. *(see Table 1).*

A significant amount of work for the building services is the one- or multi-day events held at ETH Zurich, which took place outside of teaching hours, i.e. during off-peak hours and during the semester break. Most of these events were held in the main building at ETH Zentrum and in the lecture hall building (HIL) on the Hönggerberg. The takings from these events amounted to CHF 280,000 in the reporting year (1992: CHF 194,000).
The implementation of the computer-controlled cleaning concept is in full swing and provides a detailed overview of the cleaning costs of individual rooms, floors and buildings.

Table 1

Costs of external cleaning (in thousands of CHF)	1991	1992	**1993**
Contract cleaning			
• Maintenance cleaning	2006.00	2399.00	**2396.00**
• Basic and intermediate cleaning	425.00	316.00	**284.00**
• Window cleaning	620.00	562.000	**461.00**
Cleaning materials, machines and laundry	620.00	682.00	**656.00**
Total	3671.00	3959.00	**3797.00**
Total in % of the previous year	119.00	107.00	**96.00**
Cleaning costs per m2 and year (in CHF)	20.60	21.90	**20.93**
Total in % of previous year	107.60	106.30	**95.60**
Gross floor area cleaned in m2	577.799.00	587 266.00	**589 340.00**

Table 2

Electricity and heating requirements	1991	1992	**1993**
Electricity requirements in GWh			
• City	48.80	* 49.10	*** 49.90**
• Hönggerberg	27.40	27.00	**26.00**
Total	76.20	76.10	**75.90**
Total in % of the previous year	101.50	99.90	**99.70**
Heating requirements in GWh			
• City	78.70	74.10	**69.30**
• Hönggerberg	49.80	49.50	**42.80**
Total	128.50	123.60	**112.10**
Total in % of the previous year	101.50	96.20	**90.70**

* Excluding the heat pump at Walche and the data center
Heat pump at Walche: 12.23 GWh
Heat pump at data center: 0.80 GWh

Table 3

ETH Zentrum heat source (GWh)	1991	1992	**1993**
• Data center heat pump system			**2.80**
• Hagenholz waste incineration plant	12.00	11.80	**9.00**
• Walche heat pump system	40.00	38.20	**31.80**
• ETH Zentrum boiler system	2.70	1.40	**4.20**
• Aubrugg heating plant	24.00	22.70	**21.50**
Total	78.70	74.20	**69.30**

Table 4

Town water, sewage, waste*	1991		1992		**1993**	
	a)	b)	a)	b)	**a)**	**b)**
• City	765	3.95	602	2.68	**540**	**2.27**
• Hönggerberg	261	0.85	145	0.77	**130**	**0.82**
Total	1026	4.80	747	3.45	**670**	**3.09**

* The years 7990-1992 incl. waste (1992: 0.7 million CHF), 1993 excl. waste
a) 7000 m3 city water
b) costs of city water, wastewater and waste in millions of CHF

In addition, it is possible to compare in-house cleaning with external cleaning, and uniform cleaning standards can be enforced.
The costs for the disposal of operational waste for the entire ETH Zurich amount to around CHF 650,000 per year, excluding hazardous waste, or approximately CHF 1.10 per m2.

[IMAGE]

Technical Services

Technical Services are responsible for preventive maintenance, repairs and the operation of building systems. The policy of preventive maintenance that has been pursued for years bore fruit in the year under review. For the first time, the number of repair orders fell (by approx. 10% to 18,500), despite the fact that the number and complexity of the systems increased. The orders for preventive maintenance - based on a computer program - increased to approx. 32,000 orders per year.

Energy, water supply

The consumption of electrical energy has once again slightly decreased. The years 1988-1991 were characterized by constant growth. In 1992 and 1993, a slight reduction in electricity consumption was measured. The demand for heat was drastically reduced in the reporting year (-9%). This is partly due to efforts to save and optimize at all levels, and partly to the mild weather last winter (5% fewer heating degree days) and the cool summer *(see page 47, Table 2).*

For the first time, the heating needs of the center (2.8 GWh) were also covered by the data center's heat pump system during the reporting year. This is the first heat pump to use the environmentally friendly coolant R134a as a process medium. In addition, the boiler system in the center had to be used selectively because another steam line was installed in the energy channel of the main building's electrical engineering system, and during this time no heat supply was possible via the Zurich North heating network. The expansion of the aforementioned line serves, among other things, as an emergency supply for the municipal and cantonal buildings of the University Hospital, University Center and Irchel, Rämibühl School and Veterinary Hospital in the event that the heat supply from Zurich North were to fail and the district heating power plant of ETH Zurich had to feed the grid instead *(see page 47, Table 3).*

Water consumption was reduced by a further 10% compared to the previous year. This is because the cooling of systems is no longer done with city water, but via closed circuits and also because of the favorable climatic conditions *(see page 47 table 4).*

Further projects

The combined heat and power plant on the premises of the machine laboratory will be put into operation in April 1994. It is planned to operate the plant for research purposes as well as for the heat supply with electricity production.
The expansion of the new CLA institute building is proceeding according to plan. The building services equipment has been largely installed, so that from the point of view of the technical service, nothing stands in the way of the planned commissioning.
In the coming year, the construction of two block heating and power plants will begin on the Hönggerberg, with commissioning scheduled for 1995. The operating services also expect a further optimization of energy production there.

Central Services

The real estate management department manages just over 100 apartments and over 300 rooms. In 1993, for the first time in several years, the rent was reduced for several apartments.
The utilization of parking spaces at the ETH Zentrum differs from that at the Hönggerberg. At the ETH Zentrum, a total of 1,750 parking permits were issued for 839 parking spaces, while on the Hönggerberg, 700 permits are available for over 1,200 parking spaces. In May 1993, a new parking regulation came into force, which included a fee increase of more than 100%. Total income from parking amounted to 673,000 CHF (1992: 400,000 CHF).
In 1993, the “Motor Vehicles” group had 94 vehicles at its disposal, not including vehicles borrowed from the AMP. Of these vehicles, 36 were in a common pool. The total mileage in 1993 was again 1.1 million km. The utilization of the pool vehicles has improved in recent years.
In the two reprographic centers in the city and on the Hönggerberg campus, 36 million offset prints and copies were produced in the reporting year, almost exclusively on recycled paper. A full-color copier has been in use at the Hönggerberg reprographic center since the beginning of 1993. As in previous years, the ETH mailroom handled approximately the same volume in 1993 (3 million incoming and 3.1 million outgoing items). A new development is the distribution of the VSETH newspaper “POLYKUM + ETH INTERN” to ETH members every 14 days during the semester.

Security Service

ETH Zurich's Security Service is responsible for guaranteeing, ensuring and monitoring compliance with legal requirements, official orders and internal directives concerning safety and environmental protection. Other services provided to the institutes include the disposal of chemical and radioactive waste (hazardous waste) and scientific equipment. In addition, the Security Service is responsible for the protection of persons and property, as well as operational and cultural assets. The night shift and the alarm organization ensure a 24-hour, 365-day-a-year operational readiness.

Environmental protection

As a service for all institutes of ETH Zurich, over 80 tons of hazardous waste were separated into the appropriate waste categories according to their chemical and physical properties and disposed of in an environmentally friendly manner in our central disposal warehouse. The new, stricter environmental protection ordinances (technical ordinance on waste, ordinance on the handling of hazardous waste) again entailed significant expenses. The compilation of the basic data for the environmental impact report for the third phase of the ETH Hönggerberg expansion and for the emissions declaration was completed on time and the data was handed over to the planning engineers. The instruction of new students on the environmentally friendly disposal of laboratory chemicals has been very well received.

Fire protection

The year under review was marked by an unusually high number of deliberate acts of arson. In two cases, the affected room was so badly damaged that it had to be temporarily put to a different use. Four other arson attempts caused minor damage, which fortunately did not affect operations thanks to early intervention. In addition, two major water ingress events caused significant damage to parts of the building and inventory, meaning that operations had to be interrupted. In the case of four explosions in the laboratory ventilation hoods, the effects were contained within the laboratory, which is the aim of the safety concept.

In order to become more familiar with the sometimes complicated building conditions, a rescue exercise was carried out with the intervention forces of the fire brigade, in which an injured person had to be rescued under difficult conditions. As part of the annual fire protection course, the security service was able to train around 400 students and external participants in a half-day course (see picture).

Personal security

In close cooperation with the police authorities, various national and international major events were managed in terms of security. Thanks to special surveillance measures at neuralgic points, it was possible to stabilize the number of thefts at the low level of the previous year, despite an upward trend. However, an increase in the number of violent burglaries was recorded. The night shift managed to apprehend some of the perpetrators and hand them over to the responsible authorities.

[IMAGE]

Exercise for rescuing an injured person under difficult conditions

Organizing protection

The downsizing of around 70% planned as part of the 1995 civil defense reform was initiated. In accordance with the transitional provisions of the Federal Office for Civil Defense, no major exercises were conducted this year either. The renovation of shelters, which are to be handed over to the municipalities, was initiated.

IT Services

A significant step into the future of research and teaching at ETH Zurich was the introduction of two new IT technologies: massively parallel processing (MPP) and the coupling of workstation computers (WS Cluster). ETH Zurich can contribute to the development of new methods and algorithms in several research areas and especially in interdisciplinary research.
This year's personnel situation was dominated by the three percent budget cutback in the personnel sector ordered at the beginning of the year, as well as the reduction of auxiliary personnel, which reduced the personnel contingent of the IT Services by another three positions. The reduction in positions could be realized by retirements as well as by task redistribution and restructuring in several sections.
The changing and increasing demands on the IT procurement of ETH Zurich required the development of an efficient purchasing organization within the IT services. On June 1, 1993, the new "ID Procurement Coordination and Consulting" department was set up. Since then, this department has been responsible for all IT procurements, from registration and credit control to ordering. This reorganization of the IT procurement process has resulted in faster and more efficient IT procurement and increased productivity in IT services.
A total of CHF 84.6 million was invested in IT resources at ETH Zurich. The investments for the CSCS from the special credit for the promotion of IT were completed in 1993.
A new record was set with over 2,000 IT requests from research, teaching and administration, which resulted in over 5,200 individual orders.

Data centers

The operation of the CRAY Y MP, including the connection to the StorageTek silo and the Data Migration Facility (DMF), has proved successful. Not only a few large-scale users (SMA) who use the DMF to archive their large data inventories, but also all the other CRAY users benefit from this. The daily back-up is carried out quickly and reliably at night, outside normal operating hours.
When the CONVEX C220 was replaced by a C3820 in April, it was possible to increase this service by a performance factor of 2.4 and to make it more attractive with additional software and application packages.
The IBM 3090-600J computer system was reduced to two processors and limited to use in the CADETH area. With the installation of a workstation cluster (20 IBM RS/6000-590 workstation computers) in December, the hardware equipment for computer-aided chemistry (Project C4) was comprehensively renewed and the previous performance was increased many times over.
In November, an Intel PARAGON XP/S5 system with 96 CPUs was installed as part of the PARETH project. This allowed ETH Zurich to take a major step towards massively parallel systems. PARAGON is designed not only to help develop algorithms, but also to accelerate computationally intensive programs that are difficult to vectorize.
The VPP service, with over 120 installed stations, was also actively used last year. The conversion of output devices server to the TCP/IP communications protocol with FTP to improve and generalize accessibility has seen significant progress.
The file server function of AFS (Andrew File System) was transferred to a Silicon Graphics Risc-based server system with a HEWLETT PACKARD robot for optical disks. After extensive clarifications, a significant step could be taken in the direction of a Distributed Computing Environment (DCE).

Communication Systems

The section's area of responsibility includes system management for central computing facilities and maintenance of the ETH Zurich communications network. During the year under review, the section was restructured to better reflect its tasks. It is now divided into the groups System Management, Network Management, Network Planning and Network Operations.

IT investments over the last five years

Investments in IT resources (in CHF million)	1989	1990	1991	1992	1993	**Total 1989-93**
Budget (incl. third-party loans)						
• Hardware	31.0	36.2	50.9	50.5	41.3	209.9
• Software	5.0	4.6	6.3	7.8	7.7	31.3
• Services	1.2	1.2	1.3	1.7	1.2	6.6
• Rent	0.3	0.5	0.4	0.4	0.4	2.0
Information package (IDA)						
• Hardware	4.7	8.2	7.7	-	-	20.6
• Software	0.5	1.6	0.8	-	-	2.9
Information package (HLR)						
• Hardware	-	0.5	24.0	12.2 *	12.2 *	37.1
• Software	-	-	0.4	0.3	0.3	1.0
• Services	-	0.2	0.5	0.1	0.1	1.1
Subsequent costs						
• Hardware	8.4	9.0	10.0	15.6	15.6	57.4
• Software	3.1	3.1	3.7	5.8	5.8	19.6
Total Investments in IT resources	**54.2**	**65.1**	**106.0**	**79.6**	**84.6**	**389.5**

* incl. CHF 3.5 m provisions from 1991

40 projects were worked on, as well as about 50 building applications for local networks.
16 projects have not yet been completed because they extend over several years, such as the renewal of the communication network of the ETH Zurich. Some projects consist of many individual projects, e.g. RNETH (new backbone network); 35 buildings were newly connected via fiber optics. Central systems were adapted to changing requirements (renewal of the gateway for e-mail and news).
The workload of the employees increased sharply again in 1993. The number of subnets, for example, rose from 180 (at the end of 1992) to over 220, and the number of IP (Internet Protocol) interfaces rose from 3500 to 4500. The number of PCs and Macintosh integrated into the network rose from 1500 to well over 2000. Since the rationalization possibilities have now been exhausted, there are serious staff shortages, especially in network management, which, among other things, supports the integration of PCs and Macintosh into the network. The network planning group (RNETH projects and renovation of building cabling) and the network operations group have been working at the limit of their capacity for three years.

Interdisciplinary Project Center for Supercomputing (IPS)

While high performance computing was still largely limited to Cray supercomputers and similar vector computers just a few years ago, today large computing power is also available on high performance workstations and on parallel computers, although in both cases the price advantages are associated with restrictive functional disadvantages. Optimal use of the computers therefore requires not only a thorough knowledge of the various architectures, but also of the methods and algorithms that are used or could be used. This problem is currently being addressed not only at the IPS, but also at various computer-oriented institutes at ETH Zurich. Together with these institutes, a comprehensive evaluation of commercial parallel computers with distributed memory was carried out in 1993, which ultimately led to the installation of an Intel Paragon with 96 processors. This machine has a theoretical peak performance of 7.2 GFLOPS at a cost of about one tenth of that of a conventional supercomputer with the same peak performance. It is very difficult to achieve anything like this performance with a user program. Furthermore, the new computers are not nearly as good as conventional computers in terms of reliability and the user software available. The IPS will therefore have to continue its traditional task of providing user support for “shared memory” vector computers at ETH Zurich for some time to come. The main focus of this support is on the choice of modeling, data organization, algorithms, techniques for vectorization and parallelization, and, last but not least, visualization. In order to offer state-of-the-art advice, many staff members of the IPS perform their own research tasks in their specialist areas in coordination with ETH institutes. This is reported on in the “Research” section.

Advice and training

In addition to the daily IT consulting tasks such as troubleshooting, migration assistance, and hardware/software installation and testing assistance, the following developments in the advice and training section should be mentioned:
The section was restructured. The previous assignment of IT specialists to platforms (Grass systems, Midi systems, workplace systems) was abandoned. The training group remained unchanged. The consulting functions were now divided into the two groups “operating systems” and “user programs”.
Demand for EDP user training remained undiminished. A total of 295 courses were conducted, with 1487 course participants registered. Compared to the 1992 reporting year, there was a noticeable increase in demand for advanced courses (system and application software); the largest increase was in UNIX courses.
Due to the increased demand for modern visualization software, packages such as PV-Wave and AVS were tested and made available to users.
CATIA users were given access to SCUD (Simple CATIA Utility Desktop) – a portable, graphic user interface from B&S for use at the workplace. SCUD is a software product developed by B&S. This CATIA utility was presented by B&S at the annual conference of the European CATIA Users Association and was met with great interest by industry representatives.

Computer Service

In 1993, Computer Service continued to offer its well-known services for the traditional “line products” Vax, Sun, Olivetti and Macintosh. And in 1993, it was also found that the upward trend in the workload continues in line with the growing number of installations. The maintenance and repair effort rose by 10% to over 2600 interventions (repairs, warranty cases, etc.).
The information system ezInfo, which is maintained by over 30 part-time and volunteer employees and students, was expanded and now offers more ETH-specific information. However, due to heavy use, the CPU performance is being severely strained. The ezInfo introductory course was held six times.

Administrative IT

In the area of the Rectorate, the addition of applications for creating semester programs and managing teaching assignments was completed in the reporting year. This resulted in improved processes within the Rectorate and with the departments. The new application was used for the first time to create the program for the winter semester 1993/94 (starting in February 1993). The Mac application (Notabene) for the departmental secretariats was again significantly expanded. This application was used in the fall of 1993 in almost all diploma departments. In the area of studies and examination administration, many adjustments to new regulations and standard curricula were necessary.

In the area of the personnel department, some improvements were made within the existing applications: the processing of paid and unpaid vacations and the accounting of occupational and non-occupational accidents via SUVA. The changes in job management in the previous year made it possible to cope with the hiring freeze decreed by the Federal Council at the beginning of 1993 without additional expense. A great deal of work also had to be done for two central projects of the Federal Personnel Office (PERIBU) and the Federal Insurance Fund (SUPIS).
For the first time, the responsibility of administrative information technology in the reporting year also extended to the IT needs of the operating services. This work was characterized by the introduction of the new digital telephone system. A separate management system was introduced for this purpose, which, among other things, can be used to manage the configuration of the system and to bill for calls. New or expanded solutions were implemented for various other areas (construction, building cleaning, collection and evaluation of energy measurement data).
With the two computers available, stable and efficient operations were once again offered in 1993. In the middle of the year, the production computer for the administrative services was renewed. The company's own Ethernet cabling for the administrative services was completed in the reporting year.

ETH Library

With the ETHICS serial control program introduced at the beginning of the year, the library has taken a further important step towards becoming an “electronic library”. Users can now check the availability of individual journal issues in the network libraries; previously, this was only possible for journal holdings. This would pave the way for recording data (author and title information) on individual articles, importing it into the system or even storing full texts of the individual issues. However, this is associated with a very large amount of recording and storage work.

ETHICS network

The ETHICS network has continued to grow. By October 1993, 31 libraries were cataloging together with the ETH Library or had decided to join during the current year. These include the libraries of EMPA St. Gallen, the Swiss National Museum and the Swiss Institute for Art Research in Zurich. The inclusion of the Swiss Social Archives in Zurich has already expanded the previous focus on technology and natural sciences to include the humanities and social sciences.
This trend is reinforced by the inclusion of the Zentralbibliothek Zürich in the network. When the new building opens at the end of 1994, the Zentralbibliothek will include its machine-readable holdings in the union catalog and make them available for ordering in the medium term. Thus, the two largest scientific libraries in Switzerland, the Zentralbibliothek and the ETH library Zurich, present themselves to their users as “one” library. Their holdings complement each other perfectly and will be closely aligned in the future through the joint ETHICS acquisition system.

Library Switzerland

A milestone on the way to the “Library Switzerland”, at least in Zurich, is thus taking shape. The librarians of many Swiss scientific libraries associate the term “Library Switzerland” with the creation of a virtual library whose information can be accessed via telecommunications without the user having to be interested in where this information is stored. But even without the link to the Zentralbibliothek, the demand for research in the ETHICS online catalog continued to increase, so that at the end of the year the library received the green light to further expand the library's computer system. This is now to be successively expanded for the new network requirements with cost contributions from the Zentralbibliothek.

Some figures

In 1993, 435,089 ETHICS orders (online) were registered, which corresponds to an increase of 5.5%. In addition, there were 80,153 orders by loan ticket (excluding special collections). At the time step counter, 34,057 notebooks were borrowed “home” and 3,338 for the reading room. The reprographics center processed approximately 1.3 million copies during the year under review. The library collection increased to approximately 4.8 million documents.

CD-ROM network

Progress was also made in other areas of information provision in 1993. Among other things, a local CD-ROM network was installed, allowing 28 CD-ROMs to be accessed centrally and permanently from six user workstations. This allows several users to access a disk simultaneously and eliminates the need to change individual CD-ROMs at the workstation. This new information medium is currently so popular that the library already offers over 40 bibliographies and other reference works in this form (including 22 specialized bibliographies). A further conceivable step would be to connect this network to the university's LAN.

The projects mentioned above, as well as others aimed at improving access to technical and scientific information, are described in the concept paper “ETH library as a Center for Information Provision in Science and Technology”.

[IMAGE]

New information medium: CD-ROM network

User courses

In 1993, courses on how to use the library and its information resources were again held for the institutes of ETH Zurich. This information service has proved its worth, as it allows the needs and wishes of these user groups to be addressed in a very subject-specific way. Some of the 28 lectures also took place outside the library (including Kastanienbaum LU, Dübendorf, Schlieren, Schwerzenbach).

On December 3, a public memorial service was held at the ETH to mark the 100th anniversary of the death of Rudolf Wolf (1816-1893), who was not only a teacher and researcher, but also the first librarian of the Federal Polytechnic. An exhibition in the foyer of the library is running parallel to this until the end of April 1994. The “first decades of the ETH Library” were also the subject of one of the four internal continuing education events offered by the library.

[IMAGE]

Introductory courses on how to use the library and its information resources

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Centro Stefano Franscini / Monte Verità (Ascona)

A contract with the Canton of Ticino allows ETH Zurich to use the Monte Verita seminar center in Ascona for 15-20 weeks per year to hold research colloquia and scientific workshops. The Centro Stefano Franscini is responsible for organizing and coordinating these events. In the reporting year, 16 one-week conferences were held in a wide range of university research areas (see box) and 10 smaller events were held.
The basic concept of the Centro is that the conferences usually last one week and that any topic that is the subject of research at a Swiss university is allowed. Not only the natural and technical sciences, but also the humanities are to have their place. Interdisciplinary topics are particularly encouraged and supported. Lecturers from Swiss universities organize the individual conferences in collaboration with colleagues from Switzerland and abroad. A scientific advisory board decides on the selection of events.

Events and conferences

07.03.-13.03.	Jeunes et Religion en Europe
07.03.-13.03.	Computational Methods in LiE Theory
14.03.-20.03.	The scholars in the society of the Old Kingdom of the 14th to 16th century
21.03.-27.03.	Risk Theory
29.03.-04.04.	Sciascia, scrittore europeo
06.06.-12.06.	Stochastic Analysis, Random Fields and Applications
13.06.-18.06.	The Irrational in Science
20.06.-26.06.	CIRP 5: Topical Conference on Infrared Astrophysics CIRP 5 = 5th International Conference on Infrared Physics
29.08.-03.09.	Cultural Change and Progressive Education at Fin de Siecle
05.09.-11.09.	Local Theory of Banach Spaces and Related Topics
12.09.-18.09.	Second International Conference on Magnetoelectric Interactions Phenomena in Crystals
19.09.-25.09.	Low-dimensional Quantum Field Theory and Applications in Condensed Matter Physics
26.09.-03.10.	Cultura d'elite e cultura popolare nell'arco alpino tra '500 e '600 Incontri di culture conflitti di culture
03.10.-09.10.	Temperature Adaptation of Proteins of Organisms in Extreme Biotops. Relationship to adaptation of proteins in general and to experimental and theoretical studies on protein stability and dynamics
10.10.-15.10.	The Monte Verita Conference on Biocompatible Materials Systems: Key Principles - Technologies - Drug Delivery
21.11.-26.11.	PASE - Parallel Applications in Statistics and Economics Explorations of Complex Systems Dynamics

Office for Equal Opportunities for Men and Women

In the fall of 1993, the Women's Office became the “Office for Equal Opportunities for Men and Women.” It is staffed by 40% by the Equal Opportunities Officer, Dipl. Natw. ETH Silvia Wyler, and 20% by her advisor, Prof. Dr. Katharina von Salis.

In addition to advising female students, assistants and lecturers, an analysis of the current situation regarding gender representation in the various salary classes was carried out in collaboration with the Human Resources Department. This revealed the need for action in order to comply with the new directives of the Federal Department of Home Affairs (EDI), according to which women should not only make up 30% of employees in quantitative terms, but also in qualitative terms.

Initial contacts have been made between the equal opportunities officers and the existing women's groups and the four university groups, with the aim of creating a communication network within ETH Zurich and obtaining broad support in devising promotional measures to achieve equal opportunities in all university groups.

ETH Zurich provided information on women's issues internally and externally in the press, on the radio and on television, among other things on the occasion of the second anniversary of the women's strike on June 14, during which the VESADA (Association of ETH Female Students, Assistants, Lecturers and Graduates) presented the ETH President with a petition on the reconciliation of motherhood and work with over 1,800 signatures.

Cooperation with the ETH Board's Equal Opportunities Group has become established.

The Conference of Women's Representatives at the Universities (KOFRAH) tried to bring the women's point of view into the discussion about the numerus clausus and discussed with the Swiss National Science Foundation (SNSF) the achievement of equal opportunities at the SNSF - both in terms of the participation of women and the research directions and projects that are approved/planned.

[IMAGE]

On the 14th of June, ETH President J. Nüesch received 1800 signatures of the "Resolution for the reconciliation of work and family life" - as well as 14 roses, one for each ETH female professor.

Print Room

Two key events shaped the Print Room in 1993: the donation of Bernhard Luginbühl's complete print works and the collaboration with institutes in Bonn, Innsbruck, Frankfurt and Switzerland.

Exhibitions

Until February, works on the theme of "Nocturnes. Visions and Representations of the Dark" were on display, selected from the collection itself. Since darkness and light are an intrinsic part of the essence of prints, this exhibition also provided an opportunity to illustrate the characteristics of printmaking.

The American Matt Mullican is known for his cosmological model, which he has been transforming into drawings, pictures and room installations since the 1970s. An early 19th-century encyclopedia inspired him to question and organize the sum of human knowledge according to its categories. This extensive series of graphics was shown for the first time in Europe and acquired for the collection.

Since 1986, Franz Gertsch of Bern has been creating woodcuts that develop and expand on the themes of his photorealistic paintings from the 1970s. The exhibition was dedicated to his latest landscape motifs. The catalog was published in collaboration with the Department of Prints and Drawings at the Städelsches Kunstinstitut in Frankfurt.

Gegendruck – Swiss Graphic Art from Alberte Giacometti to Urs Lüthi was the title of the exhibition after the summer holidays. It brought together early prints by eleven internationally renowned Swiss artists, supplemented by loans from Bern, Chur, Zurich and Grenchen. A carefully designed and richly illustrated catalog was published for the exhibition, which traveled to Bonn and Innsbruck.

The watercolors of the Zurich-based artist Ian Anüll were presented exclusively for the first time. The focus on a single group of works was very well received by the public and the press. The publication, which includes more than 60 color plates, was designed by the artist himself.

[IMAGE]

Mixed media on paper, Ian Anüll

At the end of the year, as at its beginning, there was a thematic exhibition offering insights into the richness of the collection: Of Animals and Men. An illustrated brochure was published for the first time, number one in a new series.

Events

Two lectures were organized for the Mullican exhibition, one of which was given by the artist himself, making use of almost all the audiovisual means available: on the blackboard, with slides and video. Three to four guided tours were offered for each exhibition. Independently of the exhibition program, various school classes and groups were once again able to view and discuss original works from the collection this year.

New acquisitions

The most significant addition of the year was the donation of Bernhard Luginbühl, comprising hundreds of prints, the processing of which for the purposes of an oeuvre catalog will continue well into 1994. No less extensive was the purchase of a series of prints by Matt Mullican: 449 sheets, including a print box designed by the artist. In addition, Swiss prints from the 19th century were acquired, an important focus of the collection. Two large woodcuts were added to the existing group of works by Franz Gertsch, which had already been expanded in 1992. The artist himself donated five further woodcuts. Twenty-three watercolors were added to the collection of drawings, prints and multiples by Anüll, with funding for fifteen of them coming from the Jubilee Fund of the Union Bank of Switzerland. Thanks to the support of the Foundation for Graphic Art in Switzerland, it was possible to acquire the printed works of the Lausanne artist Jean-Luc Manz. Groups of works by contemporary artists were expanded or new ones purchased, by John Armleder, Guido Nussbaum, Monica Studer and Christoph van den Bergh.

[IMAGE]

Bernhard Luginbühl (right) and ETH President Jakob Nüesch sign the deed of gift. The donation to the ETH Zurich Graphical Collection comprises several hundred original graphic works.

University sports

Three events shaped the 1992/93 academic year – the 54th financial year – of the Academic Sports Association of Zurich (ASVZ):

New management

The new director, Kaspar Egger, took over the management of the ASVZ a year ago. With the change in the presidency of the ASVZ from Prof. Dr. Hans Hugi (ETH Zurich) to Prof. Dr. Marcel Wanner (Uni Zurich) taking place in the same year, a reorientation made sense. The trend: a consistent course direction with slight course corrections - towards a modern and forward-looking sports operation.

New working style

Especially internally, a lot has been set in motion by emphasizing transparency, teamwork and tolerance. The increased say and the associated assumption of even more responsibility is a task that costs the entire team a lot of time and energy and that will have to be worked on again and again in the future. A practical expression of this new management style is the establishment of five new working groups with responsible leaders:

- Fitness (Heiner Iten, university sports instructor)
- Administration (Peter Meier, administrator)
- Information (Yvonne Bühler Kliebenschädel, university sports instructor)
- Ecology (Sylvie Spahr, board member until 1993)
- Public relations (Walter Hättenschwiler, board member).

The fact that Sylvie Spahr and Walter Hättenschwiler, members of the board, could be won as heads of working groups (AG) illustrates the increased integration of the board into the running of the organization. The ecology working group plays a particularly important role: in fall 1993, a group from the postgraduate course in environmental studies chose “ASVZ and the environment” as the topic for their final thesis. In doing so, they provided very interesting and valuable basic material which should be implemented in the near future. ASVZ users were gradually confronted with ideas in this direction, e.g. a flea market for used sports equipment in the winter semester 1993/94 and an ecological landscape design at the university sports facility in Fluntern.
As a special project entitled “ASVZ 95” - under the direction of university sports instructor Rene Stocker - the entire team of university sports instructors is working on the reorganization of the sports program with the aim of implementing it at the beginning of the 1994/95 academic year. It was determined in several meetings that this task is very important and central, but also very tradition-bound. Future-oriented measures are required.

New financial situation

It was to be expected that the new general economic and financial situation would also have an effect on ASVZ. However, it was not foreseeable that it would impact so quickly and to such a high degree on ASVZ operations. The biggest blow was undoubtedly the decision of the cantonal parliament to cut the subsidy to ASVZ by CHF 490,000 (38%!). Despite the immediate introduction of cost-saving measures - the financial year had already been underway for three months - the ASVZ management was pleased that in July 1993 the cantonal council granted a supplementary credit of CHF 200,000 with the help of the education department, which enabled the accounts to be balanced to some extent. Additional income was generated by increasing semester fees and prices for various services, courses and camps.

The importance of consolidating ASVZ's financial base and ensuring continuity and stability in the area of permanent staff has now become clear.

In the future, ASVZ must be better publicized in all the relevant committees as an institution with a clear mandate from the federal and cantonal governments to develop and operate voluntary university sports as an integral part of studies at the University of Zurich and ETH Zurich.

In response to the demand by the federal and cantonal governments to increase self-sufficiency, ASVZ has introduced a significant innovation: for the first time in the 54-year history of the association, an attempt is being made to have some of the costs covered by sponsors.

Personnel, administration

In the personnel sector, the following events characterized the ASVZ:
Prof. Dr. Hans Hugi handed over the presidency of the ASVZ to the vice-president Prof. Dr. Marcel Wanner on July 1, 1993. In the future, Prof. Dr. Urs Boutellier will represent the professors of the ETH Zurich on the board as the new vice-president.

Urs F. Freudiger, the former director, was appointed an honorary member at the 52nd association meeting on February 2, 1993. With his appointment as “permanent guest of honor of ETH Zurich” on the occasion of the
137th ETH Day on November 21, 1992, he was also able to accept a very special thank you from the university.

Sports operations

The following points are worth mentioning from the ASVZ's sports operations:

- Fitness activities have increased significantly. In addition to the test offer, the fitness equipment in the Polyterrasse and in the Fluntern university sports facility were particularly well used.
- The special self-defense courses for women with a particular focus on psychological and physical training have been a great success.

- The following statistics are of interest: With 673,265 visits in the academic year 1992/93, participation in ASVZ sports activities increased slightly again. This was despite the many restrictions and price increases. Statistically, these will only be fully reflected next year. A clear increase can be seen in individual sports (from 73,000 to 80,000 people) - a fact that makes us feel positive. One of the goals of ASVZ is to provide everyone who is eligible to participate in sports with the perfect tools for doing so.

Events

- For the first time in the 46-year history of the Uni Poly rowing match, the university team was able to repeat last year's victory.
- Once again a huge success for the SOLA relay: 447 teams competed for victory in the 20th event, which was excellently organized by university sports instructor Rene Stocker, the new technical director, and his team.

Facilities

Due to the difficult financial situation, the ASVZ management decided to close all facilities for an additional one to several weeks during the holidays. The resulting reduction in sports activities was generally well understood and had a very positive effect on training costs in particular. The closures did not have a significant impact on the statistics: apparently, the desired shift to other training sessions and facilities took place. However, this has the disadvantage of overcrowded halls.

The most surprising development at the Polyterrasse is the extraordinary increase in individual use of the fitness area (over 300%), due to the opening of the fitness facilities on the gallery.
Torrential rainfall on the last day of the summer semester caused unpleasant flooding throughout the entire Hönggerberg University Sports Facility building. The hall floor had to be repaired and the floor coverings in two rooms had to be replaced.

For the Irchel University Sports Center, the approval of the building loan for the fencing and small sports hall is particularly noteworthy.

Looking to the future

In the future, the current conditions must be integrated into the overall operation of the ASVZ:

- Realization of a modern range of sports
- Cost-cutting efforts at all levels
- Innovation in the central issues and tasks of sport (quality of life, prevention, sense of community).

Solving these tasks - combined with the new management style - is a real challenge for all ASVZ members.

[IMAGE]

University Events

ETH Day 1993
138th ETH Zurich Foundation Ceremony (November 20, 1993)

[IMAGE]

In his speech, Prof. Dr. Riccardo Jagmetti talked about the topic of "More public spirit".

[IMAGE]

Award of eight honorary doctorates and the naming of a guest of honor. Front row from left: Prof. Dr. Alexander Rich, Prof. David Landes, Prof. Dr. Hans von Gunten, the Rector of ETH Zurich and Walter Reist. Back row from left: Prof. Dr. Brian Anderson, Prof. Dr. Günther Dibelius, Prof. Dr. Klaus Linkwitz, Prof. Dr. Richard Zare and guest of honor Marc Andre Houmard. Not in picture: Prof. Dr. Eugenio Garin.

Doctoral graduation ceremonies

Winter Semester 1992/93

At the 67th doctoral graduation ceremony, 205 graduates, 28 of whom were women, received their doctorates from ETH Zurich. Ten male doctoral students and one female doctoral student received silver medals for their excellent work. In his speech, Pierre Borgeaud, Chairman of the Board of Directors of Gebrüder Sulzer AG and Chairman of the Board of Trustees of Technorama Schweiz, pointed out that the position of ETH graduates as specialists and generalists was not always easy, emphasized their responsibility towards nature and encouraged the newly graduated to practice a pioneering spirit with creativity and a willingness to take risks (January 29, 1993).

Summer Semester 1993

At the 68th doctoral graduation ceremony, 184 graduates, including 21 women, received their doctoral diplomas from ETH Zurich. Fourteen male doctoral students and two female doctoral students received the silver medal for their excellent work. The keynote address, entitled "Politics and Urban Development," was given by Prof. Benedikt Huber, Professor of Architecture and Urban Development at ETH Zurich (July 9, 1993).

Special events

Challenge EPFL-ETHZ
A skiing competition between the EPF Lausanne and the ETH Zurich (January 10 and 11, 1993).

11th GEP Lecture
Dr. Jacques Santer, Prime Minister of the Grand Duchy of Luxembourg, spoke on the topic: "The role and task of small countries in the EC" (January 21, 1993).

Wolfgang Pauli Lectures
Prof. Elliott H. Lieb, Princeton University, USA, spoke on the topics: "The Pauli Principle and the Stability of Matter, from Atoms to Stars", "Atoms in Large Magnetic Fields: Same Surprise and Same Open Problems" and "The Flux-Phase Problem" (Jan. 25, 26 and 28, 1993).

"More space for the ETH Zurich"
Information event about the third expansion phase on the Hönggerberg
(February 3, 1993).

Technopark Zurich
Official opening ceremony (ETH Zurich occupies a larger rental area here)
(March 25, 1993).

Visit by the head of the EDI
Federal Councillor Ruth Dreifuss, head of the Federal Department of Home Affairs, visited ETH Zurich
(May 3, 1993).

PolyContact'93
Meeting between ETH students and companies in the main hall of ETH Zurich. The information fair offered companies the opportunity to present themselves and to seek contact with young academics.
(June 30, 1993).

2nd Swiss smartROB Championships
Seven student teams competed against each other with their self-built, autonomous, mobile, smart robots
(July 14, 1993).

Zurich holiday pass 1993
ETH Zurich participated in the PRO JUVENTUTE youth holiday program (July 19-21, 1993) with the events "Experiments with high voltage," "The little Sculptor," "Drawing with the computer" and "Computer experiments for girls."

Tour of the experimental station in Eschikon
The Institute of Plant Sciences conducted a public tour of its CO2 experiment, which is designed to provide insights into the growth and change in the botanical composition of meadows under conditions expected to exist in 50 to 100 years (September 25, 1993).

2nd Zurich Economic Forum
Joint event of the University of Zurich and ETH Zurich on the topic: "Switzerland's Technological Competitiveness - Opportunities and Threats" (October 12, 1993).

Latsis Symposium 1993
Topic: "Horizons in Structural Biology". The 1993 Latsis Prize was awarded to Dr. Peter Schurtenberger, Institute for Polymers (October 18 and 19, 1993).

From the Atom to the Environment
Symposium on Physical Chemistry in honor of Professor Richard R. Ernst's 60th birthday
(October 25, 1993).

Albert Einstein:
The Swiss Years, 1895-7914
At an event organized by ETH Zurich and Princeton University Press, volumes three and five of the "Collected Papers of Albert Einstein - The Swiss Years" were presented (November 6, 1993).

[IMAGE]
Challenge ETHZ-EPFL in Verbier. Center: Federal President Adolf Ogi, left: Prof. Jakob Nüesch, ETHZ, right: Prof. Jean-Claude Badoux, EPF Lausanne (Jan. 10 and 11, 1993).

[IMAGE]
The new head of the EDI, Federal Councillor Ruth Dreifuss attended the ETH Zurich

Karl Schmid Symposium
First symposium of the Karl Schmid Foundation, which was set up to raise awareness of the wide-ranging work of Karl Schmid among a broader public
(November 16, 1993).

ETH European Week
As part of the "European Week for Scientific Culture" initiated by the EC, ETH Zurich presented a diverse cultural program including a literary evening, a symposium and an exhibition of scientific drawings
(November 22 to 27, 1993).

Information day for career advisors
The program included speeches by Professor Dr. H. von Gunten on "Maturity reform and university access" and Professor Dr. W. Schaufelberger on "Innovations in teaching"
(September 30, 1993).

Celebration for the President of the Council of States
On the occasion of the newly elected President of the Council of States, Prof. Dr. Riccardo Jagmetti, the Government Council of the Canton of Zurich hosted a ceremony at ETH Zurich
(December 1, 1993).

From Rio to Sustainable Development
Lecture series 1993/94. Prof. Dr. Jakob Nüesch and Prof. Dr. Meinrad K. Eberle spoke on the topic "Sustainable Development - Challenge for Science"
(December 2, 1993).
Prof. Dr. Franz Blankart, Secretary of State, spoke on the topic "Trade and Environment"
(December 9, 1993). The series will be continued in 1994.

Rudolf Wolf (1816-1893)
Memorial service held by ETH Zurich and the Rudolf Wolf Society on the hundredth anniversary of the death of the versatile scholar, whose name is still closely associated with the terms sunspot and sunspot cycle (December 3, 1993; exhibition until April 1994, in the foyer of the ETH Library).

[IMAGE]
Exhibition marking the end of the two-year field test of hybrid vehicles (Nov. 9, 1993)

[IMAGE]
Architecture exhibition on the occasion of the 100th birthday of Hans Schmid (1893-1972).
(Dec. 10, 1993 to Jan. 20, 1994)

Exhibitions

2000 Years of Soapstone - Extraction and Use
An exhibition from the Museo di Valmaggia showed the occurrence and extraction of soapstone.
It also showed how a wide variety of appliances, decorative stones and stoves have been made from soapstone over the centuries (February 18 to May 15, 1993).

Forgotten Room
Faces of a City - Squares in Zurich
Two exhibitions in connection with the ORL planning seminar "Stadtbild - Sinnbild" (Cityscape - Symbol).
(February 8 to March 6, 1993).

Hybrid Experiment II
Exhibition by the Laboratory for Combustion Engines and Combustion Technology at the conclusion of the two-year practical test with hybrid drives, a combination of electric and diesel drives (November 9, 1993).

Hans Schmid (7893-1972)
Exhibition by the Department of Architecture on the occasion of the 100th birthday of Hans Schmid, which showed a first retrospective of his complete works.
(From December 10, 1993 to January 20, 1994).

Larger scientific conferences

Hypermedia '93
International conference with the aim of providing a representative overview of current research and development activities in the field of hypermedia. Organized by ETH Zurich (March 2-3, 1993).

Software quality of technical systems
Conference of the Information Technology Society (ITG) with the aim of discussing the state of the art, promoting the exchange of experience and providing new impulses and suggestions (March 11, 1993).

Protection of waters - New laws and solutions
Conference at which, among other things, the main innovations with regard to the enforcement of the new Water Protection Act are explained. Organized by the Swiss Association for Water Protection and Air Hygiene (VGL) (March 24, 1993).

Natural products as medicines - Right to health
Scientific symposium on the occasion of the anniversaries “125 years of the Pharmacists' Association of the Canton of Zurich” and “100 years of the Association of Pharmacists of the City of Zurich” (June 10, 1993).

Are we already living in the “Global Village”?
The world is being re-networked
14th Symposium of Alcatel STR (June 16, 1993).

Energy Consumption and Risk Production. Is the Disposal of Radioactive Waste Justifiable?
Symposium of the Group for Responsibility for the Disposal of Radioactive Waste (vera) (September 1, 1993).

Deregulation in Compensation - Curse or Blessing?
Anniversary Conference of the Zurich Society for Human Resource Management, together with the BWI Foundation (October 5, 1993).

Awards

Asea Brown Boveri
Research Prize 1993
Dr. Cuno Pfister in recognition of his outstanding work “Callas: A Physical Design Framework for Configurable Array Logic” and Dr. Beat Heeb in recognition of his outstanding work “Debora: A System for the Development of Field Programmable Hardware and its Application to a Reconfigurable Computer”.

Plastics Technology Prize
Remy Stall for his excellent diploma thesis “Preparation of samples for testing the mechanical properties and biocompatibility of a thermoplastic polyurethane”.

Heinrich Hatt-Bucher Prize 1993
Sabina Staehlin for her excellent diploma thesis “Childcare Center, Kindergarten, Daycare Center Zurich-Fluntern” and Gian Mauro Maurizio and Phillipp Esch for their excellent diploma thesis “Concert Hall in Ascona”.

Fritz Kutter Award
Alex Birrer for his diploma thesis “Draft of a Data Model for the Management and Analysis of Bee Health Data”.

Walter Saxer Insurance University Prize
Bernhard Locher for his dissertation on the topic “Procedure for Solving Quadratic Restrictions” and Hans Peter Schmidli for his work “A General Insurance Risk Model”.

31 silver medals
On the occasion of ETH Day, thirty male graduates and one female graduate of ETH Zurich were awarded the silver medal of ETH Zurich for their excellent diploma theses.

Human Resources - Accents 1993

1993 was marked by various austerity measures, some of them far-reaching. The recession-related tightening of budgetary resources forced the school's management to approach its tasks within the framework of a financial zero growth. This could only be achieved with a rigorous austerity program. Even the funds for basic equipment, i.e. ordinary credits and basic endowment posts, had to be included in the austerity measures. However, in order to ensure that the school retained its momentum despite the sometimes significant savings, it was necessary to carefully and purposefully exploit the potential for savings in both administration and in the areas of teaching and research. The additional hiring freeze for budget positions that was decreed by the Federal Council in the spring for a period of six months resulted in further savings in infrastructure positions.

Redistributions

Despite the consistent implementation of the prescribed austerity measures, serious hardship measures such as layoffs could be avoided. So far, no jobs have had to be cut. Rather, the savings were realized through personnel redistributions, reductions in working hours or compensatory financing through third-party funds. The major challenge of 1993, namely to solve both existing tasks and new, demanding objectives with constant or decreasing resources, was successfully overcome. It is also gratifying that, despite the changed conditions, the safeguarding of research-based education for students - an objective that the Executive Board is pursuing with the highest priority - could be fully guaranteed thanks to the redistribution of resources. In the administrative area, for example, a significant number of administrative positions have been cut, which is reflected in the reduction from 858 to 844 full-time positions. By contrast, the number of positions in the area of teaching and research was increased, with a total increase of 159 positions. On the one hand, assistant positions increased from 756 to 782 full-time equivalents. This was possible because this category of staff (doctoral students) was excluded from the six-month hiring freeze.

Third-party funding

On the other hand, the increase in this area is mainly due to positions that were financed by third-party funds. As in previous years, professors have increasingly sought the funds necessary for their research from research funding institutions, as well as from industry and the private sector. Thus, in addition to funding from industry, the Swiss National Science Foundation provided funds for 330, the Commission for the Promotion of Scientific Research 142, other federal offices 13 and other sources from funds, foundations, cantons and municipalities 213 staff positions. These third-party funds were used almost exclusively for the creation of project-oriented scientific positions. The number of positions for scientists, who are employed for a limited period for the duration of their respective projects, increased from 1796 to 1949 full-time equivalents. This increase in project-oriented funding has somewhat alleviated the pressure to cut budget positions and teaching and research budgets.

New appointments as an opportunity

Another medium-term goal of the Executive Board, namely the renewal and expansion of the teaching staff, was also achieved through redistribution. The number of professorships, for example, rose from 304 to 319 in 1993.

[IMAGE]

[IMAGE]

[IMAGE]

The Executive Board has thus set a clear course in terms of the student-to-professor ratio, but also with regard to teaching activities. Between 1990 and 1993, a total of over 100 new professors were appointed at ETH Zurich. In most cases, these were reappointments due to retirements, but new professorships were also created. But even in the case of reappointments, the successors were not chosen a priori in the sense of a continuation of the subject, but clearly on the basis of the actual needs in the subject area. This always offered the opportunity to take up groundbreaking new research directions. Another encouraging fact is that the number of assistant professorships financed under the federal government's special measures to promote young academics up to the end of 1995 has been increased from 9 to 14. This, too, is an indication that new, innovative ways are being sought to anchor quality and performance in the fields of teaching and research.

Key Figures

On the reporting date of December 31, 1993, a total of 7,082 employees worked at ETH Zurich (1992: 6,871). This figure does not include people who were involved in teaching on a contractual basis, such as guest lecturers and adjunct lecturers. Despite the cost-cutting measures, the total number of positions was increased slightly year-on-year due to increased third-party funding, namely from 5,062 to 5,207 full-time positions. With the increase in third-party financing, the number of employees hired for the duration of a project has also increased accordingly. In 1993, 4557 people were employed in this capacity, accounting for 64% of the total workforce (1992: 60%).
Compared to the previous year, the average age of employees has increased slightly, namely from 37 to 37.4 years. The average length of service remained the same. As in 1992, employees worked at ETH Zurich for an average of 6 years in 1993. With 1988 employees being foreigners, the percentage of foreigners has increased slightly compared to the previous year (1992: 27.7%), namely to 28 .1%. Depending on the personnel category, the percentage of foreigners varies. Among the 329 professors, 128 are foreign nationals, which corresponds to a percentage of 38.9% (1992: 37.8%).

Staff in positions in 1993

[BAR CHART]

13 319
Professorships, of which women

407 2731
Assistants/research staff (project work), of which women

345 794
Technical and administrative staff in teaching and research, of which women

16 75
Student assistants in teaching and research, of which women

308 844
School management and administration (incl. operating staff), of which women

Breakdown of staff

(As of December 31, 1993)	1992				**1993**			
	Budget positions	Above budget resources (teaching and research, assistants, junior-staff development)	Third-party funds	Total	**Budget positions**	**Above budget resources (teaching and research, assistants, junior-staff development)**	**Third-party funds**	**Total**
1. Professorships								
• Full professorships	256		1	257	**262**	**1**		**263**
• Associate professorships	24			24	**21**			**21**
• Assistant professorships	13	9	1	23	**20**	**14**	**1**	**35**
Total (1)	293	9	2	304	**303**	**15**	**1**	**319**
2. Teaching and research staff (departments, institutes, professorships)								
• Assistants	756			756	**782**			**782**
• Scientific staff (infrastructure)	466			466	**454**			**454**
• Scientific staff (project work)		738	1058	1796		**829**	**1120**	**1949**
• Technical and administrat. staff	786	7	14	807	**770**	**5**		**784**
• Assistants		75		75		**75**		**75**
• Apprentices, interns, trainees	[73] *			[73] *	**[85] ***	**[3] ***		**[88] ***
Total (2)	2008	820	1072	3900	**2006**	**909**	**1129**	**4044**
Total teaching and research (1+2) In positions (full-time equivalent)	2301	829	1074	4204	**2309**	**924**	**1130**	**4363**
3. School management and rectorate								
• School management and staff	43			43	**43**	**1**		**44**
• Rectorate	37	2	10	49	**37**		**9**	**46**
Total (3)	80	2	10	92	**80**	**1**	**9**	**90**
4. Services								
• Human Resources, Financial Services	52	2		54	**48**	**2**		**50**
• Operational Services (including Facility Management)	243	116	1	360	**234**	**118**		**352**
• ETH Library	159	3	9	171	**159**	**2**	**15**	**176**
• IT Services	105	5	15	125	**101**	**1**	**17**	**119**
• CSCS Manno, Center for Teaching and Learning, Center for Continuing Education	18	5	16	39	**24**	**6**	**12**	**42**
• others (ASVZ, KIKRI etc.)	1	2	14	17	**2**	**3**	**10**	**15**
Total (4)	578	133	55	766	**568**	**132**	**54**	**754**
Total administrat. and services (3+4) in positions (full-time equivalents)	658	135	65	858	**648**	**133**	**63**	**844**
Overall total (1-4) in positions (full-time equivalents)	2959	964	1139	5062	**2957**	**1057**	**1193**	**5207**

[ ] * Do not count towards the quota

A similar distribution is to be seen among the other scientific staff in the field of teaching and research. Here, too, the percentage has risen slightly, from 37% to 38%. This fact can certainly be taken as an indication that ETH Zurich continues to enjoy a high reputation at the international level, which is ultimately decisive for the quality and currency of scientific exchange.

Women at ETH Zurich

In 1993, the Executive Board of the School continued its efforts to enable women to access teaching and research. It is encouraging to note that the number of female professors increased again, from 10 to 14. This means that the proportion of women in this area has risen continuously in recent years. While the proportion of female professors was still 1.7% in 1990 and 1991, it increased to 3.3% in 1992 and 4.3% in 1993. Overall, however, the percentage of women employed at ETH Zurich has remained the same and, as in previous years, is 25%. In order to increase the proportion of women in areas in which they are still significantly underrepresented, the position of the Equal Opportunities Officer was expanded in the fall of 1993 and officially integrated into the Human Resources Department. Various measures are being taken to further motivate and encourage women to work in science and technology.

Election and promotion of professors

(in brackets: date and date of taking office)

Full Professors

New elections:

- BURG, Jean-Pierre, Dr., French national, in Geology, previously Detache du CNRS a l'enseignement (9/1/1993).
- DÄLLENBACH, Lucien, Prof. Dr., from Bevaix NE, in French Language and Literature, previously Professor of French Language and Literature at the University of Geneva (4/1/1993).
- EDWARDS, Peter, Ph.D., British national, in Plant Ecology, formerly Senior Lecturer in Ecology at the Dept. of Biology, University of Southampton, UK (9/1/1993).
- EWALD, Klaus, Prof. Dr., of Basel and Känerkinden BL, for Nature and Landscape Conservation, formerly Professor of Landscape Management at the Albert Ludwig University of Freiburg/Germany (4/1/1993).
- HOFER, Helmut, Prof. Dr., German national, for Mathematics, formerly Dean and Professor of Mathematics at the Ruhr University of Bochum/Germany (8/1/1993).
- INGENSAND, Hilmar, Dr., German national, in geodetic measurement technology, previously development engineer and head of the Fundamentals and Applications Department at Leica, Heerbrugg (9/1/1993).
- JÄCKEL, Heinz, Dr., of Basel, in analog electronics, previously Manager Optical Storage Devices, IBM Zurich Research Laboratory (8/1/1993).
- KÜNZLE, Otto, Dr., of Zurich and Winterthur, for Structural Engineering, previously co-owner of SKS Ingenieure AG, Zurich (8/1/1993).
- LÜTHI, Hans-Jakob, PD Dr., of Rüderswil BE, for Operations Research, previously co-owner of Lüthi, Mandel & Partner in Baden and Senior Lecturer at ETH Zurich (8/1/1993).
- MEYER, Urs, Dr., of Niederglatt ZH, for textile machine construction, previously Head of the Engineering Division at Maschinenfabrik Rieter AG, Winterthur (1/1/1993).
- RUCH, Alexander, PD Dr., of Basel, for law, previously Head of the Legal Department of the Federal Department of the Canton of Basel City (10/1/1993).
- SCHIPS, Bernd, Prof. Dr., German national, in Economics, previously Professor of Econometrics at the University of St. Gallen (4/1/1993).
- SCHOLZ, Roland W., PD Dr., German national, in Environmental Natural and Social Sciences, previously Akademischer Rat at the University of Bielefeld, Germany (10/1/.1993).
- SPENCER, Nicholas, Dr., British and American national, for Surface Technology, previously Research Associate at Analytical Research Dept., W.R. Grace & Co., Columbia/USA (8/1/1993).
- STEURER, Walter, Prof. Dr., Austrian national, for Crystallography, previously Professor at the Institute for Mineralogy at the University of Hannover/Germany (10/1/1993).
- TRÖSTER, Gerhard, Dr., German national, in Electronics, previously Head of Basic Circuit Technology at Telefunken electronic, Heilbronn/Germany (8/1/1993).
- VASELLA, Andrea T., Prof. Dr., from Poschiavo GR, in Organic Chemistry, previously Full Professor at the University of Zurich (3/1/1993).

Appointments:

- BENNER, Steven, Prof. Dr., American national, for Bio-Organic Chemistry, previously Associate Professor of the same subject (10/1/1993).
- EICHLER, Ralph, Prof. Dr., of Basel, for Experimental Physics, previously Associate Professor of the same subject (10/1/1993).
- STRUWE, Michael, Prof. Dr., German national, for Mathematics, previously Associate Professor in the same subject (10/1/1993)

Associate Professors

Newly elected:

- BLATTER, Johann W., Dr., of Brig-Glis/Ried-Brig VS, for Theoretical Physics, previously research associate in the Theoretical Physics Group at ABB Corporate Research and at the Institute for Theoretical Physics at ETH Zurich (1/1/1993).
- KELLER, Ursula, Ph.D., of Zurich, for experimental physics, previously a member of the research staff (MTS) at AT&T Bell Laboratories, New York/USA (3/1/1993).
- SCHETT, Wolfgang, Dipl. Arch. ETH, of Malix GR, for architecture and design, previously an independent architect in Basel (9/1/1993).

Assistant professors

Newly elected:

- BACHER, Rainer, Dr., of Windisch AG, for Network Control Systems, previously Lecturer and Senior Assistant at the Dept. of Electrical Engineering, Institute for Electrical Energy Transmission at ETH Zurich (10/1/1993).

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PERSONNEL

- ALADI, Viviane, Dr., of Corsier sur-Vevey and Geneva, for Mathematics, previously Chargee de recherche at the CNRS, Ecole Normale Superieure de Lyon/France (10/1/1993).
- BLUM, Elisabeth, Dr., of Pfaffnau LU, for Architecture and Design, previously an independent architect in Zurich and a guest lecturer at ETH Zurich (4/1/1993)
- BRONSTEIN, Manuel, Dr., French national, in computer science, formerly Senior Assistant at the Institute for Scientific Computing at ETH Zurich (3/1/1993).
- DE HAHN, Henri T., Dipl. Arch., Canadian national, in architecture and design, formerly Assistant Professor at the University of Kentucky/USA (5/1/1993).
- EBERLE, Hans, Dr., from Häggenschwil SG, for Informatics, previously Principal Engineer at Digital Equipment Corporation Systems Research Center in Palo Alto/USA (8/1/1993).
- FRAUENFELDER, Paul M., Dr., from Henggart and Dübendorf ZH, for Business Administration, previously Head Central Technology, Sulzer Infra Management AG, Winterthur (12/1/1993).
- FRITSCH, Martin S., Dr., of Basel, in cultural engineering, previously design engineer at Niederer + Pozzi AG, Uznach SG (3/1/1993).
- GERIG, Guido, PD Dr., of Bütschwil SG, in image data analysis, previously Senior Lecturer at the Institute for Communication Technology at ETH Zurich (10/1/1993).
- GUZZELLA, Lino, Prof. Dr., of Dietlikon ZH, for Motor Electronics, previously Head of Department at Hilti AG, Schaan (8/1/1993).
- HUANG, Qiuting, Dr., Belgian national, for Electronics, previously Research Associate at the Institute for Integrated Systems at ETH Zurich (3/1/1993).
- KOPP, Thomas J., Dr., of Oberuzwil SG, for Thermodynamics, previously Senior Assistant at the Institute for Process Engineering and Refrigeration Technology at ETH Zurich (4/1/1993).
- KUSTER, Niels, Dr., of Diepoldsau SG, for Electrical Engineering, previously Senior Assistant at the Institute for Field Theory and High-Frequency Engineering at ETH Zurich (10/1/1993).
- PAUSS, Felicitas, Dr., Austrian national, for Experimental Particle Physics, previously Scientific Adjunct at the Institute for High Energy Physics at ETH Zurich (3/1/1993).
- STOJANIK, Petra, German national, for Architecture and Design, previously Senior Assistant at the Department of Architecture at ETH Zurich (5/1/1993).
- SUTER, Ulrich, Dr., of Oftringen AG, for Cell Biology, formerly Postdoctoral Fellow at Stanford University, California/USA (1/1/1993).
- TROPEANO, Ruggero, Dipl. Arch. ETH, Italian national, for Architecture and Design, formerly responsible architect at Itten + Brechbühl AG, Zurich (4/1/1993).
- ZÜST, Rainer, Dr., of Wolfhalden AR, for Industrial Engineering, previously Scientific Adjunct at the Institute for Industrial Engineering at ETH Zurich (12/1/1993).

New titular professors

- ALTORFER, Hans R., Dr., of Rüti ZH, Lecturer at the Dept. of Pharmacy.
- BADER, Christian, Dr., German national, Lecturer in the Department of Electrical Engineering.
- BENZ, Arnold, PD Dr., of Winterthur ZH, Senior Lecturer and Lecturer in the Department of Mathematics and Physics.
- JAECKLIN, Andre, PD Dr., of Baden AG, Senior Lecturer and Lecturer in the Department of Electrical Engineering.
- KUNSZT, Zoltan, Dr. (assistant professor), Hungarian citizen, lecturer and Dr. (assistant professor) in the Department of Mathematics and Physics.
- MEIER, Beat, Dr. (assistant professor), from Wetzikon TG, lecturer and Dr. (assistant professor) in the Department of Pharmacy.
- MEYER, Armin, Dr., from Zurich and Rüdlingen SH, lecturer in the Department of Electrical Engineering.
- PFIRTER, Hans-Peter, Dr., of Prateln BL and Seegräben ZH, Lecturer in the Department of Agriculture.
- RICHTER, Christoph, PD Dr., German national, Lecturer and Senior Lecturer in the Department of Biology.
- URNER, Klaus, Dr., of Stein am Rhein SH, Head of the Contemporary History Archives at ETH Zurich.
- WALLIMANN, Theo, Dr., of Alpnach OW, Lecturer and Senior Lecturer at the Dept. of Biology.

New Senior Lecturers

Habilitations:

- BILLETER, Martin, Dr., of Männedorf ZH and Basel, in Molecular Biophysics (10/1/1993).
- BRUNISHOLZ, Rene Albert, Dr., of Fribourg, in Molecular Biology of Proteins (10/1/1993).
- FRIES, Hans Rudolf, Dr., of Alberswil LU, in Animal Breeding of Livestock (4/1/1993).
- GERIG, Guido, Dr., of Bütschwil SG, for Multimodal Image Analysis (4/1/1993).
- GÖTTFERT, Michael, Dr., German national, for Microbiology (4/1/1993).
- KLÜPPELBERG, Claudia, Dr., German national, for Mathematics (4/1/1993).
- KÖHL, Hans-Michael, Dr., German national, for Forest Inventory with an Emphasis on Large-scale Surveys (10/1/1993).
- KÖNIG, Gabriele Maria, Dr., German national, for Pharmacognosy and Phytochemistry (4/1/1993).
- KRAMER, Jürg, Dr., of Leibstadt AG, in Mathematics (10/1/1993).
- MANDALLAZ, Daniel, Dr., of Plan les-Ouates GE, in Forest Biometry (10/1/1993).
- MARTINI, Rudolf Klaus, Dr., German national, in Neurobiology (4/1/1993).

- MEIER, Beat H., Dr., of Lotzwil BE, for Physical Chemistry (4/1/1993).
- MEYER, Elisabeth, Dr., German national, for Aquatic Biology and Ecology (4/1/1993).
- NEUHAUS, Gunther, Dr., Austrian national, in developmental plant biology (10/1/1993).
- SCHÜPBACH, Heinz, Dr., of Lyss BE, in work and organizational psychology (10/1/1993).
- SUTER, Dieter, Dr., of Winterthur ZH, in experimental physics (4/1/1993).
- UGGOWITZER, Peter J., Dr., Austrian national, in Physical Metallurgy (10/1/1993).

Academic guests

A further 433 scientists and scholars from 43 countries spent shorter or longer periods as academic guests at ETH institutes or ETH laboratories.

Resignations

Professors (upon reaching retirement age)

[PHOTO] Prof. Dr. Hans R. HUGI
Resignation: October 1, 1993
Position: Professor of Structural Engineering
1969-76: Associate Professor of Structural Engineering
1976-93: Full Professor of Structural Engineering
1979-81 /1987-91: Head of the Institute of Building Technology

[PHOTO] Prof. Dr. Marc H. GRÜNENFELDER
Resignation: October 1, 1993
Position: Prof. of Petrography
1972-93: Prof. of Petrography
1958-63: Curator of the Mineralogical-Petrographical Collection
1972-74: Head of the Natural Sciences Department
1976-80: Member of the Planning Commission
1985-87/1990-91: Head of the Institute of Crystallography and Petrography
1991-93: Head of the Earth Sciences Department

[PHOTO] Prof. Dr. Giorgio ANDEREGG
Resignation: October 1, 1993
Position: Prof. of Inorganic Chemistry
1964-67: PD of Special Inorganic Chemistry
1967-73: Ass. Prof. of Inorganic Chemistry
1973-93: Prof. of Inorganic Chemistry
1987- 91: Head of the Laboratory for Inorganic Chemistry

[PHOTO] Prof. Dr. Karl BÄTTIG
Resignation: October 1, 1993
Position: Prof. of Comparative Physiology and Behavioral Biology
1962-65: PD for exper. Pharmacology and Applied Physiology
1965-69: Ass. Prof. of Hygiene and Occupational Physiology
1969-72: Prof. for Hygiene and Occupational Physiology
1973-93: Prof. for Comparative Physiology and Behavioral Biology
1973-75 /1977-79: Head of the Institute for Behavioral Sciences
1975-77/1988-89: Head of the Department of Natural Sciences

[PHOTO] Prof. Dr. Walter GUGGENBÜHL
Resignation: October 1, 1993
Position: Prof. of Electronic Circuitry
1959-73: PD for Circuitry
1973-93: Full Prof. for Electronic Circuitry
1974-93: Head of the Institute of Electronics
1978-80: Head of the Department of Electrical Engineering

[PHOTO] Prof. Dr. Peter LÄUCHLI
Resignation: October 1, 1993
Position: Prof. of Computer Science
1961-64: PD of Applied Mathematics
1964-68: Ass. Prof. of Applied Mathematics
1968-74: Prof. of Computer Science
1974-83: Prof. of Computer Science 1983-93: 0. Prof. of Computer Science
1985-88: Head of the Department of Computer Science
1989-91: Head of the Institute of Theoretical Computer Science

PERSONNEL

[PHOTO] Prof. Dr. Andre CORBOZ
Resignation: October 1, 1993
Position: Prof. of the History of Urban Development
1980-93: Prof. of the History of Urban Development

[PHOTO] Prof. Dr. Georg A. BENZ
Resignation: October 1, 1993
Position: Prof. of Entomology
1966-68: **PD** of Insect Physiology and Pathology
1968-72: Prof. of Entomology
1972-93: Prof. of Entomology
1972-74/1976-78/1980-93: Director of the Institute of Entomology

[PHOTO] Prof. Benedikt HUBER
Resignation: November 1, 1993
Position: Prof. of Architecture and Spatial Planning
1973-93: Prof. of Architecture and Spatial Planning
1976-88: Member of the Planning Commission
1980-82/1987-92: Head of the Institute for Local, Regional and National Planning
1984-86: Head of the Department of Architecture

[PHOTO] Prof. Dr. Herbert J. MATTHIAS
Resignation: April 1, 1993
Position: Professor of Surveying
1974-93: Professor of Surveying
1976-78/1984-86: Head of the Institute of Geodesy and Photogrammetry

[PHOTO] Prof. Dr. Henri Louis LE ROY
Resignation: October 1, 1993
Position: Professor of Biometrics and Population Genetics
1957-59: PD for Biometrics and Population Genetics
1959-67: Prof. for Biometrics and Population Genetics
1967 93: Prof. for Biometrics and Population Genetics
1980-81: Head of the Department of Agriculture

[PHOTO] Prof. Dr. Walter SCHNEIDER
Resignation: April 1, 1993
Position: Professor of Inorganic Chemistry
1963-64: Senior Lecturer in Special Inorganic Chemistry
1964-69: Professor of Inorganic Chemistry
1969-93: Professor of Inorganic Chemistry
1973-74: Head of the Chemistry Department
1977- 83: Head of the Laboratory of Inorganic Chemistry
1989-92: Head of the Department of Environmental Sciences

[PHOTO] Prof. Dr. Jakob J. OERTLI
Resignation: October 1, 1993
Position: Prof. of Plant Production
1979-93: Full Prof. of Plant Production
1983-84: Head of the Institute of Plant Production

[PHOTO] Prof. Dr. Mohamed A. MANSOUR
Resignation: October 1, 1993
Position: Prof. of Automatic Control
1968-73: Prof. of Automatic Control
1973-93: Prof. of Automatic Control
1976-78: Head of the Department of Electrical Engineering
1980-82/1984-85/1989-91: Head of the Institute of Automatic Control

[PHOTO] Prof. Dr. Martin Ch. ROTACH
Resignation: October 1, 1993
Position: Prof. of Transportation Engineering
1964-93: Prof. of Transportation Engineering
1964-71: Director of the ORL Institute
1975-79/1986-88: Head of the Institute for Transport Planning and Technology
1976-78: Head of the Department of Civil Engineering

PERSONNEL

Professors

(in brackets: date of resignation)

- HAMER, Geoffrey, Prof. Dr., British national, Full Professor of Technical Biology (10/1/1993).
- WEDER, Hans Georg, Prof. Dr., of Diepoldsau SG, Associate Professor of Pharmacy (10/1/1993).
- [Handwritten addition - not legible]

Honorary Professors

- GRÜEBLER, Willi, Prof. Dr., of Zurich, Lecturer in Physics, especially Nuclear Physics (10/1/1993).
- OBERHOLZER, Walter F., Prof. Dr., of Wald ZH, Lecturer in the Department of Earth Sciences (4/1/1993).
- STUTZ, Theo, Prof. Dr., of Volketswil ZH, Lecturer in Electronic Circuit Technology (4/1/1993). Private lecturers
- GRÜEBLER, Willi, Prof. Dr., of Zurich, Lecturer in Physics, in particular Nuclear Physics (10/1/1993).
- GÜNTHERODT, Hans-Joachim, Professor Dr., German national, Lecturer in Experimental Physics of Condensed Matter (10/1/1993).
- KRÄUTLER, Bernhard, Prof. Dr., Austrian national, Lecturer in Organic Chemistry (10/1/1993).
- LEISOLA, Matti S.A., Prof. Dr., Finnish national, Lecturer in Biotechnology (10/1/1993).
- STUTZ, Theo, Prof. Dr., of Volketswil ZH, Lecturer in Electronic Circuit Technology (4/1/1993).

Guest lecturers

- AZHANG, Behnam, Ph.D., associate professor at Rice University, Houston, Texas, USA,6/15/1993-7/31/1993, Institute of Communication Technology.
- ADEM, Alejandro, Ph.D., Assistant Professor at the University of Wisconsin, Madison, Wisconsin/USA, 10/1/1993 to 3/31/1994, Department of Mathematics.
- AGATHOKLIS, Panajotis, Dr., associate professor at the University of Victoria, Canada, 2/1/1993 to 7/31/1993, Automatic Control Laboratory.
- ANTOULAS, Athanassios, Dr., Associate Professor at Rice University, Houston, Texas/USA, 5/1/1993 to 7/31/1993, Institute of Automatic Control.
- ARTOLA, Alain, Dr., Associate Professor, Group Leader at the Max Planck Institute for Brain Research, Frankfurt am Main/Germany, 10/1/1993 to 9/30/1994, Professorship in Neurobiology.
- AUBRY, Andre, Dr., Professor and Directeur de Recherche, University of Nancy/France, 10/15/1993 to1/14/1994, Department of Pharmacy.
- AUFHAUSER, Elisabeth, Dr., Lecturer and Assistant at the University of Vienna/Austria, 10/1/1993 to 12/31/1993, Institute of Geography.
- BLAHUT, Richard, Dr., Adjunct Professor at Cornell University, Ithaca, New York, and the University of Illinois, Urbana, Illinois/USA, 4/15/1993 to 7/14/1993, Institute of Signal and Information Processing.
- BREITBART, Yuri, Ph.D., professor at the University of Kentucky, Lexington, Kentucky, USA, 5/1/1993 to 4/30/1994, Institute of Information Systems.
- CASAVANT, Thomas L., Dr., associate professor at the University of Iowa, Iowa, USA, 7/1/1993 to 6/30/1994, Institute for Scientific Computing.
- CILETTI, Michael, Dr., Professor at the University of Colorado, Colorado Springs/USA, 6/1/1993 to 8/31/1993, Institute for Atmospheric and Climate Science.
- CIUCCI, Giorgio, Professor of the History of Architecture at the University Institute of Architecture, Venice, Italy, 10/1/1993 to 7/31/1994, Department of Architecture.
- CORNELL, David Hugh, Dr., professor at the University of Natal, Durban, South Africa, 4/1/1993 to 9/30/1993, Institute of Crystallography and Petrography.
- DENTON, Denice, Ph.D., Assistant Professor at the University of Wisconsin, Madison, Wisconsin/USA, 5/1/1993 to 7/31/1993, Institute of Quantum Electronics.
- FINKE, Lothar, Dr., Professor at the University of Dortmund/Germany, 3/1993, Institute of Spatial Planning.
- FLOUDAS, Christodoulos, Dr., Associate Professor at Princeton University, New Jersey/USA, 1/1/1993 to 6/30/1993, Technical Chemical Laboratory.

PERSONNEL

- FRIND, Emil 0., Dr., Professor at the University of Waterloo, Ontario/Canada, 2/1/1993 to 7/31/1993, Institute of Hydromechanics and Water Resources.
- MUNK, Morton E., Dr., Full Professor at Arizona State University, Tempe, Arizona, USA, 10/1/1993 to 11/30/1993, Laboratory of Organic Chemistry.
- HARDING, Sandra, Dr., Professor at the University of Delaware, Newark, Delaware/USA, 4/20/1993 to 7/19/1993, Dpt. of Humanities and Social Sciences.
- KIRTLEY, James L., Professor at the Massachusetts Institute of Technology, Cambridge, MA/USA, 9/1/1993 to 6/30/1994, Institute for Electrical Machines.
- KREMER, Ilja S., Dr., Visiting Prof. at the Free University of Berlin/Germany, 1/1/1993 to 3/31/1993, Dpt. of Military Sciences.
- MALOBERT I, Franco, Dr., Prof. of Electronics at the University of Pavia, Italy, 3/1/1993 to 5/31/1993, Institute of Quantum Electronics.
- MAMAEV, Yuri A., Dr., Full Professor at the St. Petersburg Technical University, St. Petersburg/Russia, 4/15/1993 to 7/14/1993, Laboratory for Solid State Physics.
- MATTICE, Wayne L., Ph.D., Professor at the University of Akron, Ohio/USA, 4/15/1993 to 8/14/1993, Institute for Polymers.
- MODYANOV, Nikolai, Dr., Professor at the Russian Academy of Sciences, Moscow/Russia, 1/1/1993 to 12/31/1993, Biochemistry Laboratory.
- MOERNER, William E., Dr., Manager IBM Almaden Research Center, San Jose, California/USA, 10/1/1993 to 5/31/1994, Laboratory for Physical Chemistry.
- MÜLLER, Germar, Dr., Prof. at the Technical University of Dresden, Germany, 3/1/1993 to 5/31/1993, Inst for Elect. Machines.
- OEZISIK, M. Necati, Dr., Professor at North Carolina State University, Raleigh, North Carolina/USA, 6/1/1993 to 7/31/1993, Institute for Process Engineering and Refrigeration.
- PFEIFER, Peter, Dr., Associate Professor at the University of Missouri, Columbia/USA, 8/1/1993 to 7/31/1994, Institute for Theoretical Physics.
- REDINBO, George R., Dr., Professor at the University of California, Davis, California/USA, 9/1/1993 to 8/31/1994, Institute for Reliability Engineering.
- RENN, Jürgen, Dr., Assistant Professor at Boston University, USA, 4/1/1993 to 3/31/1994, Dpt. of Humanities and Social Sciences.
- SCHRAMM, Werner, Dr., Professor at the Academy for Spatial Research, Hannover, Germany, March 1993, Institute for Spatial, Regional and National Planning.
- SENN, Lanfranco, Dr., Professor at the Universita di Milano/Italy, March 1993, Institute of Local, Reg. and Nat. Planning.
- TRINDER, John, Dr., Professor at the University of New South Wales, Sydney/Australia, 7/1/1993 to 10/15/1993, Institute of Geodesy and Photogrammetry.
- T SINOBER, Arkady A., Dr., Professor at Tel Aviv University, Tel Aviv, Israel, 8/1/1993 to 8/31/1993, Institute of Hydromechanics and Water Resources.
- VON ZUR GATHEN, Joachim, Dr., Professor at the University of Toronto, Canada, 1/1/1993 to 8/31/1993, Institute for Scientific Computing.

We remember

[PHOTO] Prof. Dr. Auguste VIATTE
from Porrentruy JU
Born on: June 27, 1901
Died on: November 21, 1993
Position: Prof. of French Language and Literature
1952-67: Prof. of French Language and Literature

[PHOTO] Prof. Dr. Kurt EIBERLE
from Zurich
Born on: March 25, 1930
Died on: May 26, 1993
Position: Professor at the Department of Forestry
1961-71: Lecturer in Wildlife and Hunting
1971-93: Senior Lecturer in Wildlife
1976: Awarded the title of professor

[PHOTO] Prof. Dr. Hans LEIBUNDGUT
from Affoltern i.E. BE
Born on: June 28, 1909
Died on: March 26, 1993
Position: Prof. of Forestry
1940-79: Prof. of Forestry
1940-79: Head of the Institute of Silviculture
1941-44/1952-54: Head of the Department of Forestry
1965-69: Rector of ETH Zurich
1969-78: former Rector of ETH Zurich

PERSONNEL

[PHOTO] Prof. Dr. Gerhard GEIER
from Ramsen SH
Born on: March 19, 1935
Died on: December 1,1993
1993 Position: Prof. of Inorganic Chemistry
1970-76: Ass. Prof. of Inorganic Chemistry
1976-93: Prof. of Inorganic Chemistry
1985-86: Head of the Inorganic Chemistry Laboratory

[PHOTO] Prof. Dr. Dr. h.c. Karl BERGER
from Sennwald SG
Born on: November 30, 1898
Died on: December 1, 1993
Position: Prof. of High-Voltage Technology
1936-49: PD of High-Voltage Technology
1949-69: Prof. of High Voltage Engineering

[PHOTO] Prof. Dr. Dr. h.c. Arthur LINDER
from Reichenbach BE
Born on: October 26, 1904
Died on: February 8, 1993
Position: Prof. of Mathematical Statistics
1948-69: Prof. of Mathematical Statistics
1969-73: Prof. of mathematical statistics

[PHOTO] Prof. Dr. Walter SIEGFRIED
from Schaffhausen
Born on: April 17, 1907
Died on: April 6, 1993
Position: Prof. at the Dept. of Mechanical and Process Engineering
1948 77: PD for practical materials science
1971: awarded the title of professor

[PHOTO] Prof. Dr. Albert PFLUGER
from Oensingen SO
Born on: October 13, 1907
Died on: September 14
1993 Position: Professor of Mathematics
1938-39: Lecturer in Mathematics
1943-78: Full Professor of Mathematics

[PHOTO] Prof. Dr. Carl MARTIUS
German national
Born: March 1, 1906
Died: April 10, 1993
1993 Position: Prof. of Biochemistry
1956-76: Prof. of Biochemistry
1962-64: Head of the Dept. of Chemistry

[PHOTO] Prof. Dr. Hermann ROTH
from Pizy VD
Born: June 16, 1917
Died: October 15, 1993
Position: Professor at the Department of Forestry
1970 79: Lecturer in Fisheries Science and Fish Farming
1971: Awarded the title of professor

Staff

- Bertschi Ruth, born 1942, died on 4/1/1993, last employed at the Institute of Food Science
- Blau Reto, born 1952, died on 7/27/1993, last employed as a technical assistant at the Institute of Electronics
- Eisler Richard, born 1954, died on 8/13/1993, last employed as a scientific official at the Institute of Spatial, Regional and National Planning
- Häusler Kurt, born 1931, died on 6/6/1993, last employed as an adjunct scientist in the Department of Electrical Engineering
- Honegger Anny, born 1938, died on 4/27/1993, last employed as a secretary at the Institute of Geobotany
- Job Kurt, born 1942, died on 10/25/1993, last employed as a technical officer at the Laboratory of Organic Chemistry
- Müdespacher Alfred, Dr., born 1952, died on 5/30/1993, last employed as Senior Assistant at the Institute for Local, Regional and National Planning
- Seiler Ruth, born 1940, died on 4/10/1993, last employed as Secretary at the Institute for Integrated Systems

- Sigrist Paul, Dr., born 1943, died on 4/27/1993, last employed as a scientific officer at the Institute for Metal Research
- Schmid Willy, born 1946, died on 7/30/1993, last employed as a technical officer at the Laboratory of Hydraulics, Hydrology and Glaciology
- Schucany Tönet, born 1949, died on 4/23/1993, last employed as a library secretary at the ETH Library
- Wegmüller Anton, Dr., born 1938, died on 5/1/1993, last employed as a senior assistant at the Institute for High-Rise Construction Technology

Students

- HERMANN, Michael Adrian, Dept. of Architecture, died on 02/26/1993
- MAURER, Benno, Dept. of Electrical Engineering, died on 04/28/1993
- SÖHNER, Luzius K., Dep. of Agriculture, died on 10/8/1993
- SCHÄPPER, Christian, Department of Informatics, died on 04/15/1993
- ZÜRCHER, Andreas, Department of Architecture, died on 04/22/1993

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