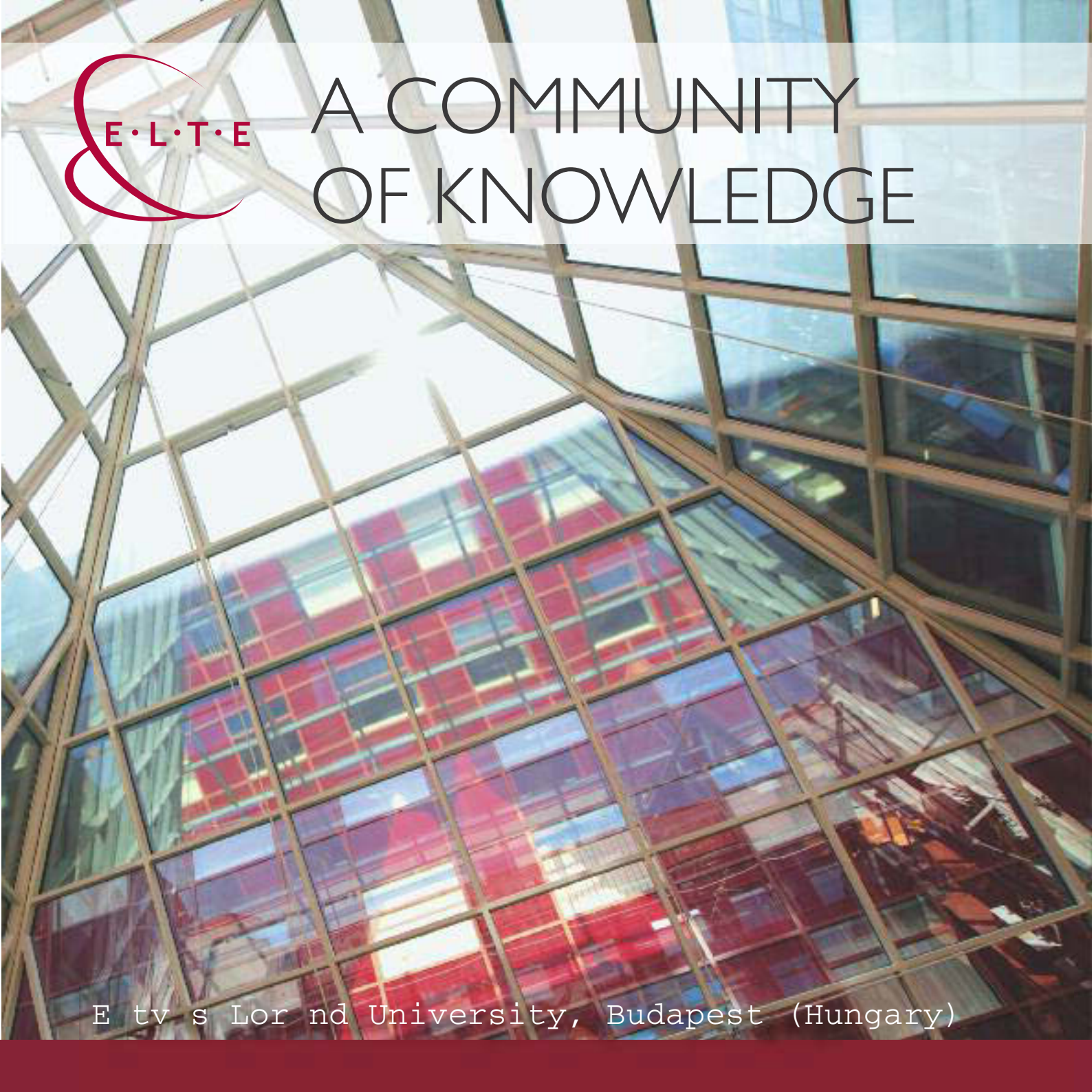

E·L·T·E
A COMMUNITY
OF KNOWLEDGE
E tv s Lor nd University, Budapest (Hungary)

RECTOR'S PREFACE

Dear Reader,

Welcome to a virtual tour of Eötvös Loránd University (ELTE), the oldest, continually working university in Hungary. A true national institution, it was founded in 1635, in an era when multidisciplinary universities were established in Europe. It has a clear leading role in all the fields of science in which it provides instruction. It has assumed the traditional roles of educating future generations of scholars, scientists, teachers, decision-makers and artists, which has always done at a high level. With its eight faculties, ELTE covers most fields of natural sciences, humanities, law, social sciences, informatics and pedagogy.

Research is on a par with education at ELTE. Research activities were given new momentum by the institution's designation as a research university in 2010. By obtaining this classification, our university has also officially become one of Hungary's five top institutions. This publication also contains a separate chapter highlighting the diversity and important role of research here, several results of which have found their way to the world's leading scientific journals addition to its research and educational duties, a modern university also helps its students by offering a variety of services. The following pages outline our extensive international contacts, our nurturing of talent, and our cultural activities. In this regard, ELTE is a university of a European standard: a university that deserves attention and is worth cooperating and collaborating with.

Dr. Barna Mezey

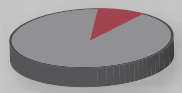
Rector

EÖTVÖS LORÁND UNIVERSITY (ELTE) IN NUMBERS

One of Hungary's largest universities

- *29,500 students*
- *26,558 new applicants/academic year*

  representing 9.8% of all applicants to higher education institutions

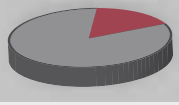


- *15,109 applicants/year listed ELTE as their university of first choice.*

  This represents 10.5% of all applicants to higher education institutions.

- *9,700 students admitted per academic year.*

  These represent 20% of all the Hungarian Academy of Sciences members who are instructors.



Hungary's largest centre of scholarship

- *1,098 qualified instructors*
- *68 instructors who are members of the Hungarian Academy of Sciences. These represent 20% of all the Hungarian Academy of Sciences members who are instructors.*

Hungary's largest selection of educational programmes

- *8 faculties*
- *32,238 courses*
- *69 bachelor's degree programmes*
- *91 master's degree programmes*
- *34 master's-level modules for teachers*
- *72 post-graduate specialised studies*
- *29 foreign language study programmes*
- *17 doctoral schools offering 95 doctoral programmes*

ERC GRANTS

European Research Council (ERC) aims at encouraging and supporting top-level research. There are two ERC core funding schemes: ERC Advanced Grants allow exceptional established research leaders of any nationality and any age to pursue groundbreaking, high-risk projects that open new directions in their respective research fields or other domains. On the other hand, ERC Starting Grants aim to support up-and-coming research leaders who are about to establish or consolidate a proper research team and to start conducting independent research in Europe. There are two outstanding scientists at ELTE who have won ERC Advanced Grants

László Lovász, mathematician

He proved the Perfect Graph Theorem, which became famous the world over. A pioneer in algorithmic reasoning, he is one of the leading figures of theoretical computer science. His area of expertise includes combinatorics and graph theory. In 1999, he was awarded the Wolf Prize, considered the Nobel Prize of mathematics. In 2010, he won the Kyoto Prize, a Japanese award similar to the Nobel Prize. He served as President of the International Mathematical Union from 2007–2010, a collaborative member of the Microsoft Research Center from 1999–2006, and Director of the Mathematics Institute of Faculty of Science at ELTE from 2006–2011.

ERC ADVANCED GRANT
FROM DISCRETE TO CONTINUOUS: understanding discrete structures through continuous approximation (DISCRETECONT)

Important methods and results in discrete mathematics arise from the interaction between discrete mathematics and "continuous" areas like analysis or geometry. Classical examples of this include topological methods, linear and semidefinite optimization generating functions and more. More recent areas stressing this connection are the theory of limit objects of growing sequences of finite structures (graphs, hypergraphs, sequences), discrete and continuous processes on networks, geometric representations of graphs. Perhaps most promising is the study of limits of growing graph and hypergraph sequences. In recent work by the PI and his collaborators, this area has found highly non-trivial connections with extremal graph theory, the theory of property testing in computer science, to additive number theory, the theory of random graphs, and measure theory as well as geometric representations of graphs. The goal of this research is to explore these interactions, with the participation of a number of researchers from different areas. Supervisor: **László Lovász**

ERC ADVANCED GRANT
THE STRUCTURE AND DYNAMICS OF COLLECTIVE MOTION (COLLMOT)

The main goal to be achieved in this multidisciplinary research is the identification and documentation of new unifying principles describing the essential aspects of collective motion, being one of the most relevant and spectacular manifestations of collective behaviour. To do so, the researchers will carry out novel types of experiments, design models that are both simple and realistic enough to reproduce the observations and develop concepts for a better interpretation of the complexity of systems consisting of many organisms as well as such non-living objects as interacting robots. Supervisor: **Tamás Vicsek**

TWO YOUNG AND TALENTED ELTE RESEARCHERS HAVE WON ERC STARTING GRANTS:

ERC STARTING GRANT
QCD THERMODYNAMICS ON THE LATTICE

About 10 microseconds after the Big Bang, protons and neutrons were formed from their quark and gluon constituents. Understanding the details of this transition is relevant both for the evolution of the early Universe as well as for present and upcoming heavy-ion experiments.
The ERC project aims to study this transition between protons and neutrons and the quark-gluon plasma using computational methods. The numerical solution of the equations relevant for the transition requires significant computer resources. A cluster has been built to exploit the great computational performance of modern graphics cards. This way a system of almost two hundred PCs becomes competent with today's best supercomputers.

Using this graphics card–based cluster we hope to provide for the first time conclusive answers to questions such as the temperature of the transition or the pressure of the high temperature quark-gluon plasma. Supervisor: **Sándor Katz**

András Málnás-Csizmadia, whose research topic is Intramolecular force mapping of enzymes in action: the role of strain in motor signaling mechanisms, is the other winner of ERC Starting Grants.

ELTE has extensive links with organisations abroad.

In addition to the 370 European universities participating in the Erasmus programme, we cultivate ties with 140 institutions of higher education around the world. Thanks to such cooperation, there is not a part of the world today where we are not able to engage in common projects. Despite these large numbers, it is not quantity but quality that counts. Among our partners are universities placed at the top of international rankings, such as University College London, the University of California – Berkeley, Kyoto University, Utrecht University, Humboldt University of Berlin, Heidelberg University, Lomonosov Moscow State University, La Sapienza University of Rome, Complutense University of Madrid, and the Sorbonne in Paris. Every day ELTE receives official visitors—diplomatic delegations, ambassadors, and university representatives—from every corner of the globe.

MOBILITY

ELTE University coordinates a number of mobility programmes. Our institution's most important grant programme is the Erasmus programme, which offers university students, instructors, and administrative staff opportunities for exchanging ideas and experience on an international level. The annual budget of this programme exceeds 1 million euros. ELTE sends the most scholarship students abroad of all Hungarian institutions. Cooperation with other mobility programmes such as CEEPUS, the Norwegian State Education Loan Fund, and other bilateral student mobility schemes, allows our university to receive and send abroad more than 1,000 students each year. In addition to the different international and national mobility programmes, ELTE is the only university in Hungary to receive and send abroad visiting instructors and researchers via the so-called "Foreign Competition" framework, the goal of which is to strengthen the university's international character.

UNIVERSITY NETWORKS

ELTE is a member of major university networks such as the Coimbra Group (CG), the Utrecht Network (UN), the Universities from the Capitals of Europe (UNICA), the European University Association (EUA), the Danube Rectors' Conference (DRC), and the Central European Initiative University Network (CEI UniNet). Through these networks, ELTE is in contact as an indirect partner institution with organisations such as the University of Cambridge, the University of Oxford, and the University of Bologna. On the one hand, these networks offer universities possibilities for representing their interests on an international level. Moreover, they also offer opportunities to participate in programmes such as the ExchangeAbility Project within the UNICA network, which aims to involve students with disabilities in mobility programmes and to improve the quality of such schemes.

JOINT STUDIES

In accord with the latest directives of the European Higher Education Area, ELTE has been expanding its offering of joint study programmes to draw the most talented students from the European Union. Our Erasmus Mundus programmes ensure mobility and closer ties among higher education institutions, such as the master's programme of the Atelier Department of the Faculty of Humanities and the doctoral programme of the Criminology Department of the Faculty of Law. The Atlier master's program is the first Erasmus Mundus programme coordinated by a Hungarian university, while the criminology doctoral program is the first doctoral-level Erasmus Mundus course of study in Hungary. In addition, our university offers a wide range of interesting joint courses of study, such as the Faculty of Humanities' cooperation with the University of Florence and the Faculty of Science's multidisciplinary Forensic Science course of study.

8 DEGREE PROGRAMMES IN ENGLISH

Eötvös Loránd University offers degree programmes at undergraduate (BA/BSc), graduate (MA/MSC) as well as post-graduate (PhD) levels. A wide range of programmes and courses – either full-time or part time – are available in English and other foreign languages. Some programmes offer special preparatory courses. A successfully completed preparatory programme is acknowledged with a certificate and automatically ensures admission to the BA/BSc programmes. *Please visit the website of the relevant programme.*

Degree programmes in English (* avaliable)

http://www.elte.hu/en/degree-programmes

Name of the Programme	Preparatory year	Bachelor level	Master level
Biology	*	*	*
Chemistry	*	*	*
English and American Studies	*	*	
English and American Studies (American Studies)			*
English and American Studies (English Studies)			*
Ethnic and Minority Studies			*
TEMA Erasmus Mundus Master Course (JOINT PROGRAMME) European Territories (Civilisation, Nation, Region, City): Identity and Development			*
French (major of Romance Studies)*		*	*
German (major of Germanic studies)*		*	*
German as a minority language and literature (major of Germanic studies)*		*	*
History			*
Hungarian Studies			*
Italian (major of Romance Studies)*		*	
Logic and Theory of Science			*
Mathematics			*
Physics	*	*	*
Polish Language and Literature*			*
Portuguese (major of Romance Studies)*		*	*
Postgraduate Master's Course in Forensic Science (JOINT PROGRAMME)			*
Psychology		*	*
Romanian (major of Romance Studies)*		*	*
Russian Language and Literature*			*
Software Information Technology (Computer Science)	*	*	
Spanish (major of Romance Studies)*		*	*

**Linguistic programmes (French, German, Italian, Polish, Portuguese, Romanian and Russian are taught in the relevant language)*

Ph.D. level http://www.elte.hu/en/degree-programmes

DCGC Erasmus Mundus Doctoral Programme
(JOINT PROGRAMME) Doctorate in Cultural and Global Criminology (from 2012)

Doctoral School of Literary Studies
German literary and linguistic studies

Doctoral school of Linguistics
Doctoral School of History
Doctoral School of Philosophy
Doctoral School of Ethnography
Doctoral School of Art History
Doctoral School of Biology

Doctoral School of Chemistry
Doctoral School of Earth Sciences
Doctoral School of Environmental Sciences
Doctoral School of Mathematics
Doctoral School of Physics

http://www.elte.hu/en/summer_university

ELTE HTA (Health Technology Assessment)
1-week course
25–29 June 2012

1-week short-term programme about the implementation of Health Technology Assessment in middle-income Central Eastern European countries (25–29 June 2012)
This intensive English language course was designed for health care professionals from Central-Eastern European countries with serious resource constraints to understand how health technology assessment (HTA) can be applied locally to make the pricing and reimbusement decisions of new health technologies more appropriate. The pragmatic course, featuring internationally recognized lecturers, offers practice-oriented knowledge for representatives of public health care decision-makers, academic centres and manufacturers of health technologies.

ELTE Carpathian Basin Hungarian Summer University
1-week course, 2 ECTS (planned)
2–8 July 2012

The one-week-long summer university programme is the only summer university programme taught in Hungarian. Participating students can select from four scientific areas: law, humanities, science, and IT. The aftenoon cultural programmes are held together. The programme geared particularly towards Hungarian students from foreign (neighbouring) countries.

ELTE HLCCP
Hungarian Language Course and Cultural Programme
4-week language course, 6 ECTS (planned)
5-31 August 2012

This 4-week programme offers an intensive Hungarian language course with many cultural components. The intensive language course is designed for students of various levels of Hungarian language proficiency: beginner, elementary, intermediate, and advanced. In the aftenoons students can opt for various cultural programmes, classes, folk dance or visits to museums. The HLCCP Hungarian language course is designed for the individual development of the student, whose learning performance is monitored throughout the programme.

ELTE EILC
Erasmus Intensive Language Course for incoming Erasmus Students
3-week language course, 5 ECTS (planned)
5–31 August 2012

This 3-week intensive Hungarian language course was designed for incoming Erasmus students to start to learn the Hungarian language and increase their knowledge of Hungarian culture. Incoming Erasmus students can apply for EILC grant at their home university Institutional Erasmus Co-ordinator, but it is also possible to join the programme as an exchange student or as an individual (without student status).

ELTE – Ruprecht Karls University Heidelberg
2-week course; 3 ECTS (planned)
2-14 September 2012

In 2009, ELTE and Ruprecht-Karls-University Heidelberg signed an agreement on a joint summer university programme, and since then, students of both universities have taken part in the two-week-long interdisciplinary course. The summer university programme is open only to students of ELTE and Heidelberg University.

10 "ATELIER" FRANCO-HUNGARIAN SOCIAL SCIENCES CENTRE

Since 1988, the Atelier has been active in fostering international cooperation between ELTE, the Hungarian Academy of Sciences, the French Institute of Budapest, and the School for Advanced Studies in the Social Sciences (EHESS) in Paris. In 2000, the doctoral programme was expanded to include the Social Sciences Centre, whose primary focus is scholarly research, networking, and publications linked to the Atelier. Today the Atelier is a department of ELTE's Faculty of Humanities, with the goal of supporting dissertations that analyse Hungary-related topics and use the approach of the French Annales School. The Atelier Department of European Social Studies and Historiography of ELTE's Faculty of Humanities is coordinating the first Hungarian Erasmus Mundus project, which has been a great success. The title of this programme is "Building Blocks of European Territories: Civilisation, Nation, Region and City." The competition entry entitled "Identity and Development" received funding of €150,000 for 2011–2016. ELTE has launched a joint European master's programme with the School for Advanced Studies in the Social Sciences (EHESS) in Paris, the University of Catania in Italy and Charles University in Prague.

ATELIER

THE CONFUCIUS INSTITUTE AT ELTE

The Confucius Institute at ELTE is China's only official cultural institute in Hungary. Its mission is to allow as many people as possible to learn Chinese and to discover Chinese culture through classes, scholarly programmes, and publication of books and study materials. In doing so, it aims to foster ties between Hungary and China. The Chinese government itself decides where to establish Confucius Institutes around the world. In this manner, in 2004 a number of Confucius Institutes were set up all over the world. ELTE's Confucius Institute was inaugurated in December 2006 with the cooperation of our university and the Beijing Language and Culture University, as well as the support of the Chinese National Office for Teaching Chinese as a Foreign Language (Hanban). In 2011, the directors of all the Confucius Institutes in Europe gathered at ELTE to discuss current issues affecting their Institutes, which highlights the central role of ELTE's Confucius Institute in Chinese-related studies.

RUSSIAN STUDIES CENTRE AND LIBRARY

In 2008, the different organisational units at ELTE involved in Russian studies merged under the name of the Russian Studies Research and Methodology Centre. With financial support from the Russkiy Mir (Russian World) Foundation, the Russian Studies Centre and Library opened in February of 2009. The foundation had already inaugurated 18 similar institutes around the world, but ELTE's Russian Studies Institute was the first in Central Europe. The Russian Studies Centre and Library aim to promote education at the university and is also open to anyone interested in the Russian language and culture. The Russian Studies Centre organises national and international conferences and round table discussions, and it provides instruction to history majors at the bachelor's, master's, and doctoral levels. In 2010, a master's programme in Russian Studies was launched, and a joint Russian Studies MA Programme is planned for the autumn of 2013, in cooperation with the Russian State University for the Humanities (RGGU). By completing the course, graduates will earn two degrees: one from ELTE and another from RGGU.

12 UTILIZING THE RESULTS OF RESEARCH

In a modern, knowledge-based society, higher education plays a crucial role in making use of knowledge. The role of knowledge, technology transfer, and the need to create organisational units at the university to nurture this have become increasingly important over the last decade. Following this line of reasoning, ELTE has set itself the goal of introducing a new business-scholarly culture in its knowledge and technology transfer plan. In operation since 2006, the main task of the Office of Knowledge and Technology Transfer is to bridge the gap between the university and industry, thus helping to make the university's research results useful to businesses. In order to do this, it maintains and cultivates strategic partnerships with large corporations, small and medium-sized enterprises, and state and other non-profit organisations. The role of technology transfer is not primarily to generate income. It is instead to catalyse the process by which a discovery leads to a product.

PRIZE FOR INNOVATIVE RESEARCHERS AT ELTE

The basis of successful technology transfer is, of course, researchers and innovations they introduce. To recognise excellence in research, in 2009 ELTE established the Prize for Innovative Researchers at ELTE. Every year on ELTE's Day of Innovation, this award is bestowed on the researcher who has contributed the most to producing knowledge for the benefit of the university. The first person to win the prize was András Lőrincz, a physicist and information technology specialist, for his work on human-computer interactions, such as facial expression recognition and monitoring of eye movement, which he designed to help children with special needs. In 2010, immunologist Imre Kacskovics received the award for developing a new procedure that significantly increases the quantity of antibodies and their effectiveness in genetically modified animals. Biophysicist Gábor Horváth and biologist György Kriska were recognized in 2011 for their research on polarisation patterns in nature. Their work has lead to the development of cloud detectors and horseflies traps.

INDUSTRY PARTNERSHIPS

ERICSSON SOFTWARE TECHNOLOGY LABORATORY AT THE FACULTY OF INFORMATICS

With the creation of this software laboratory, the university has become an international competency centre for Ericsson, where undergraduate and graduate students work together with the company's researchers on current software development problems. This partnership is an excellent opportunity for students to apply their skills to projects based on market needs. Furthermore, it allows them to contribute to world-class software development solutions with their creative work.

COOPERATION WITH MAGYAR TELECOM

In this partnership, Magyar Telecom and ELTE both play an active role in knowledge transfer, with actual business experience and practice-oriented instruction complementing theoretical knowledge. This partnership nurtures and develops the professional competencies needed for the business world.

STRATEGIC FRAMEWORK AGREEMENT WITH SANOFI-AVENTIS/CHINOIN

Experts from sanofi-aventis/Chinoin support the university's programmes in pharmaceutical production and research through meetings held with university personnel, professional consulting and special courses. In addition, they help university students by providing advice on how to prepare reports, theses and doctoral dissertations, and offering internship opportunities to young people during the summer and school year.

SPECIAL LANGUAGE LABORATORIES PROVIDED BY IBM

With financial support from IBM, ELTE has purchased special furniture, computers and peripherals, and equipment and software to assist the visually impaired, such as software for screen readers and screen magnifiers and refreshable Braille displays. Web cameras were set up for people who are hearing impaired. Students with dyslexia or dysgraphia can use programmes that help in reading and writing. Using such tools allows students with disabilities to study foreign languages independently. By acquiring such competencies, they will have an easier time finding employment.

JOINT PROGRAMMES WITH MOL

This cooperation serves to forecast the East-Central European oil company's needs for experts, to develop course materials, and to strengthen a practice-oriented course of study. ELTE and MOL are launching various joint professional training programmes and are elaborating research and development projects which are both innovative and results-oriented. With MOL's financial support, infrastructure is being upgraded, and educational and international master's programmes are being developed.

14 ELTE'S SPECIALISED SUPPLEMENTARY PROGRAMMES FOR TALENTED STUDENTS

ELTE is not just one of Hungary's largest universities, but it is also a citadel for training the best and the brightest. One of its primary missions is to nurture talent through specialised, supplementary programmes, called *kollégium* (i.e. college) in Hungarian, an academic institution steeped in tradition. The oldest of our institutions for fostering academic excellence is *Eötvös Collegium*. Using the École Normale Supérieure in Paris as his model, Loránd Eötvös founded the secondary school teacher training college in 1895. Though Eötvös Collegium now bears scant resemblance to its pre-war predecessor, its goal has remained unchanged: to train well-educated experts who have above average knowledge of their field, who are capable of independent research, and for whom the cultivation of knowledge is not just for one's profession but also for a teaching vocation. Two-thirds of the university students in Eötvös Collegium are in the Faculty of Humanities, with the rest in the Faculty of Science, the Faculty of Informatics, and the Faculty of Social Sciences.

Today ELTE has a network of *colleges* covering all areas of science taught at the university. Based on the English college system, ELTE's kollégium for students of law and political science was founded in 1983 and is now called the *ELTE Bibó István Kollégium*. In 1992, the institution for fostering excellence in natural sciences and informatics, Bolyai Kollégium, was founded. The *Social Sciences Kollégium*, founded in 2004, teaches its members to become well-prepared, educated, informed social science experts with a broad perspective in their field. For those interested in psychology, pedagogy, and health science, we offer the *Illyés Sándor Kollégium*, where students have been honing their scholarly and professional skills since 2007.

RESEARCH UNIVERSITY PROJECT ENTITLED

"FOR KNOWLEDGE ON A EUROPEAN SCALE, ELTE"

Our university succeeded in winning a tender of Hungary's National Development Agency which sought to raise the quality of higher education institutions through research and development, innovation and improvement of teaching. With funding of 3 billion forints from the European Union and the Hungarian government, the project runs from 1 June 2010 to 31 May 2012. Its goal is to build up ELTE's international competitiveness by improving the quality of teaching and research and by reinforcing the conditions necessary for personal and organisational excellence. ELTE's eight faculties are participating in the five sub-projects. The project will be completed under the direction of our internationally recognised researchers. These scholars come from very diverse areas of study—natural sciences, humanities, law, social sciences, education and psychology—and will work together through an interdisciplinary approach. Professional Director of the project: András Patkó, member of the Hungarian Academy of Sciences.

1. **LARGE SYSTEMS IN THE NATURAL SCIENCES AND COMPUTER SIMULATIONS (FACULTY OF SCIENCE, FACULTY OF SOCIAL SCIENCES)**
   Director: András Málnási-Csizmadia
   Professional Director: László Lovász

2. **SUBMICROSCOPIC RESEARCH IN MATERIALS SCIENCE AND LIFE SCIENCES (FACULTY OF SCIENCE)**
   Director: János Lendvai
   Deputy Director: Károly Havancsák

3. **SOFTWARE TECHNOLOGY QUESTIONS OF DISTRIBUTED AND MULTI-CORE SYSTEMS (FACULTY OF INFORMATICS)**
   Director: Tamás Kozsik
   Deputy Director: Zoltán Horváth

4. **CROSS-CULTURAL DIALOGUE (FACULTY OF HUMANITIES, FACULTY OF LAW)**
   Director: Ernő Kulcsár-Szabó
   Professional Director: Gábor Sonkoly

5. **SOCIAL PROCESSES OF LIFELONG LEARNING AND ITS BIOPSYCHOSOCIAL BACKGROUND (FACULTY OF EDUCATION AND PSYCHOLOGY, FACULTY OF PRIMARY AND PRE-SCHOOL TEACHER TRAINING, BÁRCZI GUSZTÁV FACULTY OF SPECIAL EDUCATION)**
   Director: György Bárdos
   Deputy Director: Mária Szokoly Kraiciné

E·L·T·E
RESEARCH UNIVERSITY

UNIVERSITAS BUDAPESTINENSIS DE ROLANDO EÖTVÖS NOMINATA

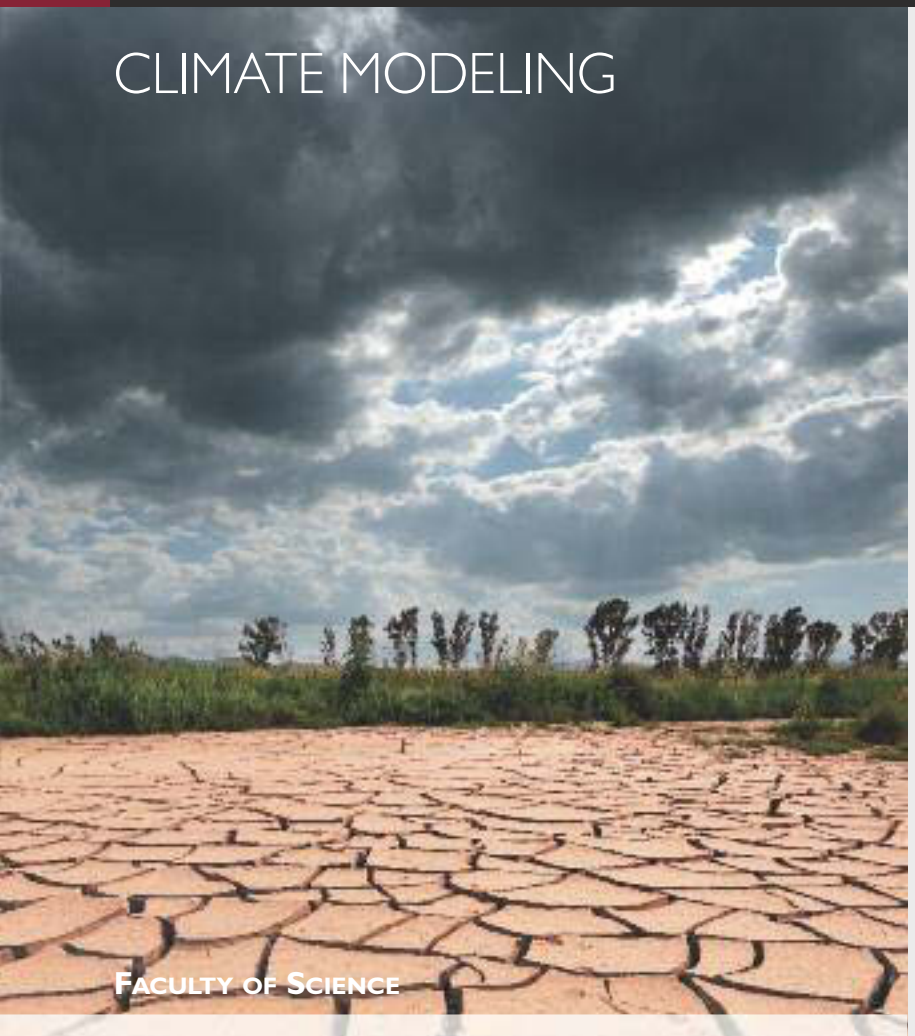
The project is being realised thanks to the support of the European Union and co-financing of the European Social Fund. TÁMOP 4.2.1/B-09/1/KMR-2010-0003).

NEW SZÉCHENYI PLAN

HUNGARY'S RENEWAL

The projects are supported by the European Union and co-financed by the European Regional Development Fund.

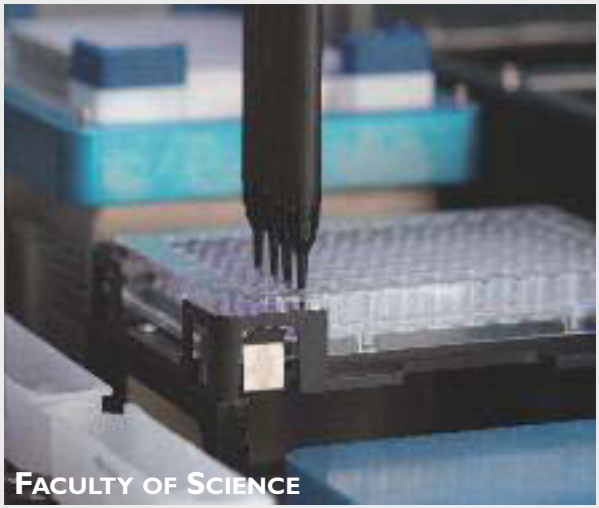
CLIMATE MODELING



Faculty of Science

Led by Judit Bartholy, this team performs regional weather simulations using ENSEMBLE-type climate models. The essence of this methodology is to run numerous simultaneous simulations differing only slightly from each other. In this manner, probability predictions can be given where uncertainty can be quantified. The models provide information on how Hungary's climate may change in the coming century. Such data are necessary in order to prepare for such changes and to formulate strategies allowing sub-regions to adapt. Naturally, this research has practical applications in government, society, business, agriculture and disaster management.

UNIVERSITY RESEARCH PROJECT I



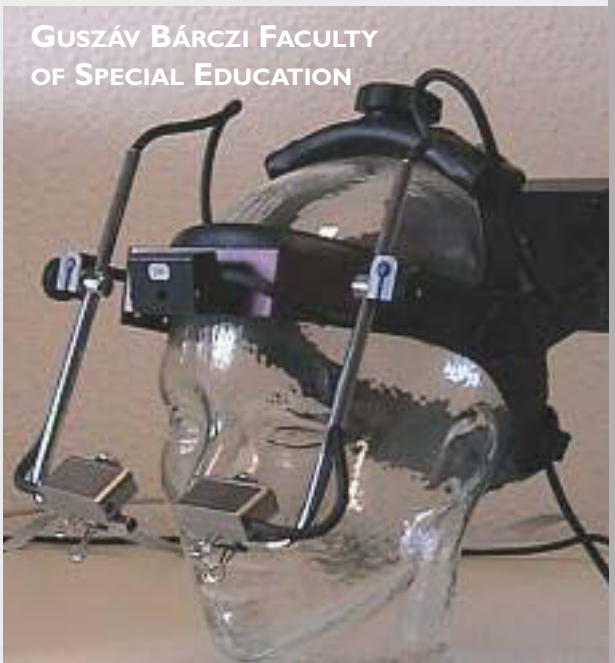
Faculty of Science

MOLECULAR INTERACTION FINGERPRINTING

András Málnási-Csizmádia's team of researchers has developed a bioinformatic method called the Molecular Interaction Fingerprint (MIF). This exciting tool offers new ways to systematically screen potential medications and to identify new effects of current ones. This approach works in a fundamentally different manner than earlier ones, whereby the effects and side effects of such molecules were predicted based on how they bound to target proteins. This method works instead by comparing docking poses of a given molecule along a sequence of proteins and comparing them to docking poses of drugs whose effects are already known. By defining profiles typical of drugs with a particular effect, researchers can in the long-run contribute to more effective development of drugs and to finding new uses of current ones. The results of the Málnási-Csizmádia team are verified by a robotised system.

RESEARCH IN ATYPICAL COGNITIVE DEVELOPMENT

Under the direction of Miklós Győri, the Workshop of Supporting Technology and Eye-Tracking was recently formed. This workshop, which is part of the Institute of Special Education and Psychology, primarily employs innovative eye-tracking. The main goals of its research and development efforts are to better understand the different phenomena of atypical cognitive development and to find new diagnostic and supportive solutions in the field of infocommunications. Its areas of investigation are autism spectrum disorder, a wide range of intellectual disabilities, and cortex-based visual perception disorders. Advances in infocommunications are being made by both Hungarian and international teams. The research team's most important partner in this area is the Neural Information Processing Group of ELTE's Faculty of Informatics.



NEW EEG LABORATORY

Thanks to the research university project, ELTE now boasts a new EEG laboratory outfitted with IT infrastructure and equipped with 128-channel EEG devices optimised for small children. The high-density recording net can be placed on the head of each subject easily and with great precision. The device is comfortable to wear and records surface signals of the subject's brain activity with great accuracy. This world-class system forms the basis for a long-term research programme led by Ildikó Király. Electrophysiological experiments take place at the famous behaviour analysis laboratory. In addition to examining the development of memory in newborn children, experiments focusing on speech development and categorisation are also conducted here. Experimental results and processes become immediately available for use in university instruction. Students have the opportunity to take part in the research process. Because direct evidence can only be obtained using such a device, this new EEG equipment marks a significant, qualitative advance in research.

UNIVERSITY RESEARCH PROJECT 5

FACULTY OF SCIENCE

UNIVERSITY RESEARCH PROJECT 2

The unique equipment of this centre, which is part of the research university project, will lead to significant advances in both teaching and networking with industry and international organisations. The Centre supports interdisciplinary research requiring use of its world-class equipment and cooperates with all university faculties.

The **dual beam scanning electron microscope** (SEM/FIB) uses both electron and ion beams to make high resolution images and is also suitable for working with samples. The number of detectors of this system open up new horizons in interdisciplinary research—nanotechnology-oriented materials physics, chemical and materials science, and biology—that could not be explored before.

One of the most important characteristics of the **transmission electron microscope** (TEM) is that in addition to providing high speed and contrast, it is also offers good resolution. The CCD camera in the system makes it possible to do automatic exposures and handle pictures electronically. In terms of the types of experiments it can perform, this transmission electron microscope represents a significant improvement in both quantity and quality.

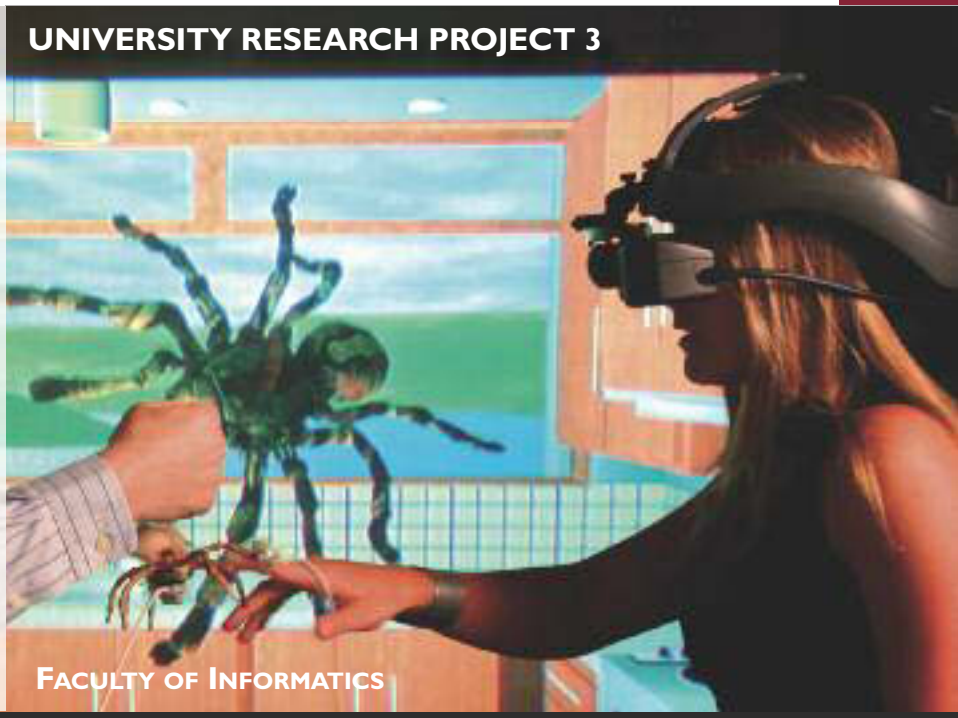
The **nuclear magnetic resonance spectrometer** (NMR) is a state-of-the-art, 700 MHz device using an electronic, superconducting magnet. It is used to analyse the shape of protein molecules and the chemical structure of active ingredients in drugs and of smaller molecules. The equipment is also suitable for research in materials science.

The **fluorescence-activated cell sorter** is currently the very latest equipment suitable for particle and cell analysis and sorting. The device is able to register individual cells according to 18 independent parameters, and this represents an enormous improvement for researchers in cell biology and immunology.

TEACHING IN THREE DIMENSIONS

Márta Turcsányi-Szabó is studying the topic of virtual reality in a project entitled "Adaptive Educational Technology: Co-operation Using Distributed Intelligent Systems." The goal of the project is to integrate virtual and real environments for educational purposes, to explore the possibilities of Augmented Reality (AR), and to develop "mashup" web applications based on locative activities connected to diverse, simple tools. The researchers are putting together a creative media studio for a new course of studies currently being designed in Media Informatics. Throughout this course of study, a wide range of models technologies will be available for the students to work with, spanning the gamut from interactive museum displays of outdated technology all the way to creative design. The focus of this project is not just on teaching, but instead, it highlights a virtual world that in the future may become part of the students' everyday lives.

UNIVERSITY RESEARCH PROJECT 3



Faculty of Informatics

TEACHING IN THE VIRTUAL WORLD

Faculty of Education and Psychology

Current research being conducted by János Ollé aims to integrate virtual and real worlds, and its primary goal is to develop a special teaching environment. So far nobody has studied the possibilities and limitations of merging real spaces with those created by computers. Within this subject, the team is examining how users in this virtual environment co-operate and work together in groups with three-dimensional beings under their control (avatars). They are looking for answers to how people cooperate when organising their studies in this environment, what skills are required of instructors, and what group dynamics play out. In addition, they are also investigating how the virtual world can help students requiring invidualized instruction.

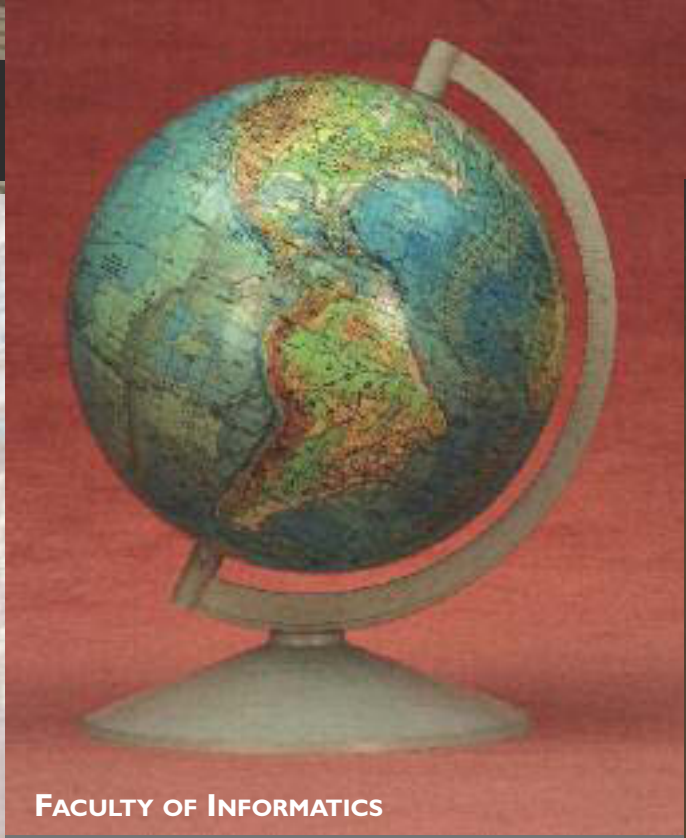
UNIVERSITY RESEARCH PROJECT 5

20 CROSS-CULTURAL DIALOGUE

During this project, wide-ranging research areas are mapped out based on the historical and spatial diversity of cultures in contact. The types of intercultural interactions covered differences in thinking patterns, simple translation and intercultural achievements. Financial support from the mobility programme allows the faculties involved (Faculty of Law, Faculty of Humanities) to take part in international research projects and the latest developments in this field. Our doctoral students can thus visit the best workshops in their field and learn from world-class scholars. One of the main goals of this project is the creation of a Centre for Excellence in Doctoral Studies. This centre is to contain offices for researchers and visiting professors, lecture halls and conference rooms, and to provide conditions necessary for visitors and doctoral students to complete their work. This centre has recently come to life: last spring it welcomed many foreign researchers and organised a number of conferences.

Faculty of Humanities, Faculty of Law

UNIVERSITY RESEARCH PROJECT 4



Faculty of Informatics

DIGITIZED GLOBES

UNIVERSITY RESEARCH PROJECT 3

The Virtual Globes Museum opened its doors in 2007. Its website allows the visitor to see three-dimensional, digital globes that can be enlarged and rotated. The purpose of this virtual gallery is to present different terrestrial and celestial globes created by Hungarians and foreigners. The models were created by photographing impressions of globes and original globes. Given the interactive nature of the exhibition, this excellent educational tool was presented in the National Széchényi Library. Its web page also contains an excellent interface in English and German. This project, entitled "Geoinformatics and Cartography," currently contains 99 different items, and researchers are constantly adding to it. They are developing a new technology to display globes with the most complicated structures.

NEVER TOO LATE TO LEARN

In the three pedagogy faculties, research is currently being conducted on how to maintain quality of life as one ages. While a longer life expectancy and a rise in the number of elderly people in the developed world are welcome developments, they pose new social, economic, and cultural challenges. According to Sándor Striker's team, which is working on the project entitled "Maintaining the quality of life as one ages; lifelong learning", the situation requires new approaches and solutions. The goal of this research is to collect examples from Hungary and other European countries and to focus on education among the elderly. Based on the information gathered, course materials will be developed to help elderly people learn better. Researchers acknowledge that it is important to encourage the elderly to actively participate in learning and help them strengthen their ability to care for themselves. In order to achieve this, specially designed teaching and learning processes must be created.

Faculty of InfoFaculty of Education and Psychology

Faculty of Primary and Pre-School Teacher Training

TRAINING THE TRAINERS

Judit Podráczky's project on "Training the Trainers" aims to change the approach of educators teaching at the bachelor's and continuing education level and to shape the culture of pedagogy. By using international experience gained from results-based teaching and school development in the area of learning research, the project leaders hope to make these innovative teaching methods and learning techniques an integral part of teacher training practice. These can later be instrumental in improving public education. The workshop and the project week served these goals in the department. During the project week, teachers and student teachers could experience for themselves how these project methodologies could be put to use in the classroom. During the day-long training session and workshop, they were acquainted with new methodologies for guiding studies.

UNIVERSITY RESEARCH PROJECT 5

VISITING PROFESSORS

ELTE is proud to welcome distinguished visiting professors from all over the world who belong to the frontline of international scientific research.

Recently, two Nobel laureate scientists have delivered exciting lectures at ELTE. At the Faculty of Social Sciences **Robert F. Engel** gave a presentation on the methods of risk analysis and management entitled "Global Financial Stability and Long Term Risks". **Ahmed Hassan Zewail** read a lecture on "Society and Science in the 21st Century"at the Faculty of Science. In 2010, ELTE awarded Zewail a degree honoris causa.

Robert F. Engel

Ahmed Hassan Zewail

Within the framework of the research university project several outstanding professors have visited our university: at the Faculty of Humanities **Prof. Lazar Fleishman** gave several lectures on Russian modernism and Russian futurist poetry. The lectures also covered an analysis of Russian art in the early 20th century. and the scandals related to the publication of Pasternak's Doctor Zhivago. **Hans Ulrich Gumbrecht**, a professor of Literary Studies at Stanford University gave a one-week long master class on historicity, aesthetics, and chronotopes entitled "What Are Humanities and Arts Today and What Can They Do?" at the Faculty of Humanities of ELTE. One of the most famous classical philologists, **Philip Hardie**, a Senior Research Fellow at Trinity College, Cambridge explicated the topic of "fama" i.e. fame in epic literature in his lecture at the university. The Faculty of Law hosted a lecture by **Xavier Philippe** (Paul Cézanne University Aix-Marseille) who spoke about the relatively new powers of the French Constitutional Council and the possibility of specific ex-post facto norm control. In 2011, **Prof. David L. Hamilton**, an international expert of the field of intergroup relations and an honorary doctor of ELTE since 2000, led an international workshop in which he explicated the problems of natural ambiguities.

Prof. Lazar Fleishman

Hans Ulrich Gumbrecht

Philip Hardie

Xavier Philippe

Prof. David L. Hamilton

Instructors at ELTE strive to engage students, Ph.D. candidates and newly minted post-doctoral researchers in research. Let's have a look at what some of them are doing.

MULTIDISCIPLINARY RESEARCH IN NANOTECHNOLOGY

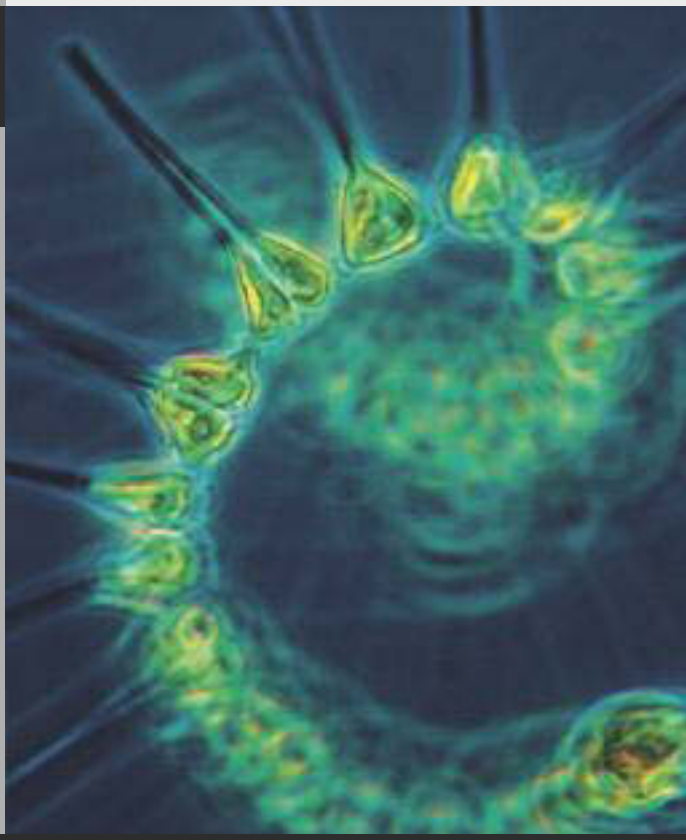
Kitti Ratter, currently a master's student in physics, operates one of the new tools of the Structural Research Centre for Materials and Life Sciences, a SEM/FIB scanning electron microscope. She works in close cooperation with researchers in specialised areas of physics. Based on her experience utilising this equipment, she is preparing to write her master's thesis. She is currently working on how to prepare a smooth surface with an ion beam suitable for experiments in electron diffraction. Developing technology to accomplish this could be useful in particle orientation, which could then be used to determine particle-size dispersion.

METALLURGICAL STUDY OF METAL OBJECTS FROM THE MIGRATION PERIOD

Péter Fodor is currently pursuing a master's degree in archaeology. Under his guidance, the Archaeology Students' Workshop on the Migration Period is studying iron objects from the time of the Avars. Using a scanning electron microscope, this project will analyse different metal objects found in burial sites covering the three Avar periods. The Faculty of Humanities and Faculty of Science are working together on this project, with the Faculty of Science providing the necessary equipment and expertise and the Archaeological Institute of the Hungarian Academy of Sciences and the Archaeology Institute of the Faculty of Humanities providing the objects to be studied. This type of research, which is still in the planning stage, is unique. To date, no studies so far have considered this many Avar funerary finds using the latest scientific methods. Moreover, this high-performance microscope has not yet been used for archaeological research. The results of these studies may shed some light on unresolved questions about the settlement of the Avars in the Carpathian Basin and their migration.

RAPID AND PRECISE DESCRIPTIONS OF LARGE CHEMICAL SYSTEMS

Planning in the field of environmental protection depends to a large extent on simulations. A given model may be able to predict the maximum efficiency of a chemical process. In this manner, fewer raw materials are required to make a given product, and the production of harmful substances can also be avoided. Tamás Varga, currently working on his bachelor's degree in [major], is writing different computer programmes for a research team focusing primarily on simulating chemical systems. Their specific area of investigation is "rapid and precise reaction-kinetic simulations using large-scale reaction mechanisms." He is working on a specific type of optimising programme that modifies the chemical model in such a way that it best describes the experiment's results. Such models also describe the spread of pollutants in the air and water and how they are transformed. It may be possible to use such chemical models instead of experiments. One model may show us what settings are required for achieving the best production and the least burden on the environment..

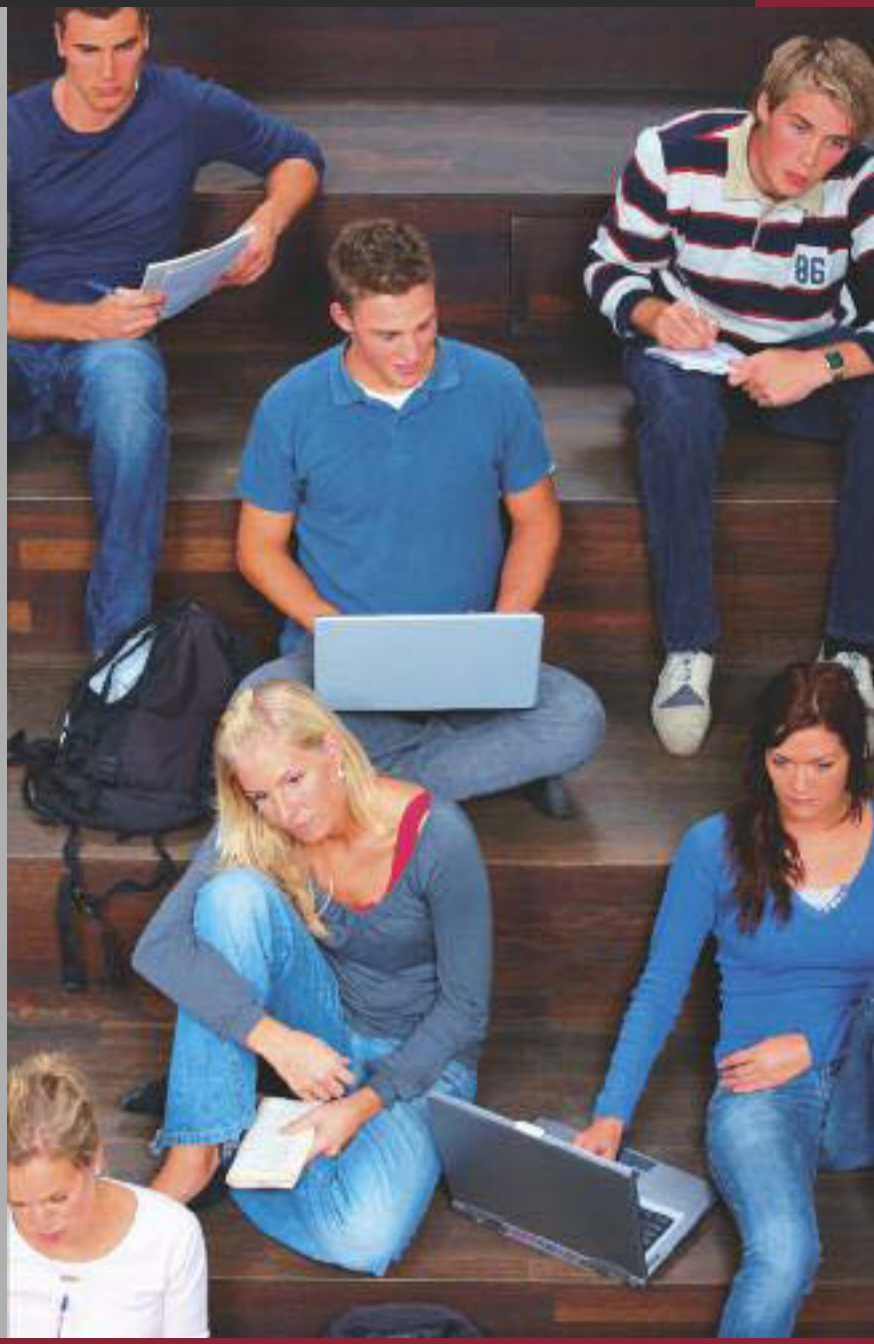


TRACKING MAMMOTHS

Attila Virág, a doctoral student at the Palaeontology Department of ELTE's Faculty of Science, is extracting samples of stable carbon and oxygen isotopes from mammoth teeth for analysis. In addition, he is also making copies of these teeth using dental moulding material and then examining microscopic abrasion patterns. The results of these studies may help us to determine what the animal's preferred food sources were. Studying the environment of these great beasts may also allow us to draw some conclusions about the climate at that time. This can be studied by looking at stable isotopes of oxygen dating from that time. The essence of this research approach is that fossils are not just mere objects from the past. Instead, these remnants may help us to answer questions about the environment. Mr. Virág's study focuses simultaneously on problems related to ecology and climatology. He has received wide acclaim for his work and recently received an award from the journal Central European Geology for the best study conducted by a young researcher.

Thanks to ELTE's Faculty of Informatics and Faculty of Humanities joining forces, course materials for eleven courses of studies have been created which are modern, digitized, and designed in a manner to foster learning. This programme has been made possible with funding which ELTE won from a government tender. It focuses on development of courses of study and course materials with special regard to new professions and to those professions for which there is a shortage of trained workers. There is a wide range of subjects related to this area. Among them are training in informatics, developing educational models that are interactive and self-paced, creating interdisciplinary courses to develop competencies needed in today's world, and providing instruction in conflict management. These interactive, digital course materials and new, continuing education programmes have expanded the range of ELTE's educational offerings.

Market participants have been instrumental in helping ELTE to design these materials in a way which responds to market needs, especially in areas of information technology. We believe that such advances will greatly contribute to providing a solid education for professionals and help to increase their chances of finding employment after graduation. At the same time, the new, professional course of study in informatics ("informatics professional with a specialisation in developing e-learning course tools") also helps e-learning to gain ground. Research in conflict management, its digital course materials, and its website aim to help governments, defence organisations, and service providers to prepare for and manage new, potential sources of conflict.



26 PUBLIC UNDERSTANDING OF SCIENCE

By hosting lectures in the humanities, the Faculty of Humanities is dedicated to promote a lively and dynamic cultural and scientific life at its campus. The monthly lecture series covers current issues in the humanities discussed by the most renowned Hungarian professors. Here is a sampling of the topics of the presentations: Antigone, a tragedy by Sophocles, "European roots and European identity", Culture and its Studies, Emigration to America;„ A Century of Progress: Changes in Civilisation in 19th Century Hungary.

As a modern research university, ELTE follows the tradition of Humboldt's ideas to encourage a wider cultivation of disciplines and their mutual fruitful cooperation. The professional image of a university cannot be shaped by arbitrary or short-sighted administrative decisions. On the contrary, they are formed by its traditions, by its history and by the interest of its excellent academics, researchers and students. This is what is able to convey real social, economic and cultural expectations. Therefore, ELTE Scientists' Club deals with various and fairly different topics including authority, relativity, visualization, sustainability, the Mars exploration programme, the measurability of numbers, and species and races.

The Faculty of Science organises two lecture series for secondary school students, which have set a goal to raise young people's interest in natural sciences. "From Atoms to the Stars" deals with the curiosities of physics, whereas "Alchemy Today" introduces new trends in chemistry. Researchers from the Institute of Physics touch upon niceties and new results belonging to the cutting edge of physics and present spectacular and exciting experiments afterwards. The chemistry lectures, accompanied by experiments, may be of interest to those curious about the new trends, the current challenges and problems in chemical research.

Every year Bárczi Gusztáv Faculty of Special Education organises an event called "Open Doors Festival", which help ordinary people better understand the world of people living with disabilities. The programmes are aimed at piquing attention since a tolerant and accepting society is a prerequisite for the integration of people with disabilities and the improvement of their quality of life. In order to have such a society, it is necessary "to open the doors" on both sides.

TRIAL RE-ENACTMENT CLUB

One of the greatest dilemmas of teaching is how to transmit the curriculum to students in a way that piques their interest. Using interactivity as a tool, Károly Kisteleki, legal historian, had his students perform parts of the Nuremberg trials, a topic of his course. This resulted in a documentary game involving creative, multimedia tools. The experiment was a huge success, and the decision was soon made to continue it. It was in this manner that the Trial Re-enactment Club was formed in 2005. In the years that followed, students selected and re-enacted on stage the trials of Joan of Arc, Georges Danton, Friar George (György Martinuzzi), Captain Alfred Dreyfus, Mary Stuart, Jean Calas, Tom Robinson, the Salem witch trials, the fictive trial of Oliver Cromwell, the Adolf Eichmann dossier and Al Capone's file. The Club also staged State Minister István Bibó's actions in 1956 and his political mire after the fall of the revolution.

The goal of the Trial Re-Enactment Club is not professional theatrics. Instead, it is to bring practical elements—so often absent from teaching—to life in a playful manner. During a given trial re-enactment, the actors obtain tangible experience of a courtroom situation by playing the role of plaintiff or defendant. In this manner, the students learn how to reason and resolutely express their viewpoints while standing in front of an audience. In other words, they are practising what they will later do as lawyers. Spectators also greatly enjoy seeing their classmates and friends perform in a trial re-enactment. This type of exercise provides students with valuable, personal experience in the roles they will later take on in the legal profession. Last but not least, by familiarising themselves with famous trials in legal history, they are also learning the cultural and historical background of milestones in legal history.

A 500-YEAR-OLD COLLECTION OF KNOWLEDGE

ELTE'S UNIVERSITY LIBRARY IS 450 YEARS OLD

The current University Library was founded in 1561 by Miklós Oláh, the archbishop of Esztergom as the library of the Jesuit college in Nagyszombat (today Trnava, Slovakia). In 1635, this became the University Library when Péter Pázmány, the archbishop of Esztergom, founded ELTE's predecessor in the very same place. It later moved to Buda, then Pest and became Hungary's first public library in 1876. The collection has grown continuously over 450 years, and the number of books and documents in the entire library network exceeds 3.6 million. The library's collection also contains a number of rare and old documents: 14 codices from the library of King Matthias of Hungary, 183 codices, 1,150 incunabula and a significant number—by European standards—of handwritten documents.

The University Library regularly organises exhibitions. The latest was an anniversary exhibition held in 2011 entitled „Cimelia", which displayed a representative selection of the most beautiful and most valuable handwritten manuscripts and printed works. In addition to organising scholarly and educational events, the University Library takes part in numerous international and national projects. One such initiative is to create a database for the Collection of Hungarian Scholarly Works, and another is to harmonise the library services for ELTE's different faculties. This latter endeavour is part of a larger, government-sponsored programme called "Knowledge Warehouse Express", which aims to build a common library database covering the entire university and including a multilingual service portal available around the clock.

THE "EÖTVÖS" ARTISTIC ENSEMBLE

Offering ELTE students opportunities for high-quality cultural entertainment and recreation, the Bartók Béla Choir and the University Concert Orchestra have been in existence for over fifty years have an excellent reputation among amateur Hungarian ensembles. The founder of the Ensemble was Gábor Baross, a recipient of the Liszt Ferenc Award and an excellent artist. He served as the Ensemble's artistic director from the very beginning until his death in 2009. The Ensemble's repertoire includes Hungarian works from the baroque, classical, and contemporary periods. Many Hungarian composers have penned works for and dedicated them to the choir and the orchestra, currently under the artistic direction of László Kovács, also a recipient of the Liszt Ferenc Award.

The Folk Dance Ensemble, also founded over fifty years ago, offers students the opportunity to become acquainted with and learning the traditions of Hungarian folk music and folk dance. The Ensemble's repertoire contains a vast selection from folk dance traditions of the Hungarians as well as other cultures living in the Carpathian Basin.

30 ELTE'S BOTANICAL GARDEN – A COMPLEX RENOVATION

The botanical garden, founded in Nagyszombat (Trnava, Slovakia) in 1771, moved to its today's location on land previously belonging to the Festetics family in 1847. It was immortalised in Ferenc Molnár's famous novel The Paul Street Boys. It was originally designed in the style of an English landscape park and features a lake fed by a natural spring, an island and a stunning view of artificial ruins. Because of the neighbouring clinic's expansion, the garden lost two-thirds of its area before World War I. The dismembered garden underwent various developments during the 20th century. New greenhouses were built; a rock garden was created; and a taxonomic collection was assembled. The park has been designated as a special protection area of national importance since 1960. In 2006, it was placed under the protection of the Office of Cultural Heritage. One of ELTE's unique teaching units, the Botanical Garden is has been renovated with European Union funding through Hungary's Operative Programme.

Three successful tenders for this project have led to the renovation of the unique Victoria and Collection Houses, the Propagation House, and the Acclimatisation house. In addition, new taxonomic groups of plants were planted. Certain parts of the garden related to particular themes and collections are being reorganised in order to protect biodiversity through ex situ conservation. The reconstruction of the Palm House, built in 1865 and classified as a protected monument, included renewing the tropical, subtropical, and Mediterranean collections.

FACULTIES OF ELTE UNIVERSITY

Faculty of Humanities
Founded in 1635.

Faculty of Law
Founded in 1667.

Faculty of Primary and Pre-School Teacher Training
Founded in 1869.
A faculty of ELTE since 2000.

Gusztáv Bárczi Faculty of Special Education
Founded in 1900.
A faculty of ELTE since 2000.

Faculty of Science
Founded in 1949.

Faculty of Informatics
Founded in 2003.

Faculty of Education and Psychology
Founded in 2003.

Faculty of Social Sciences
Founded in 2003.

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