



From **VISION** to **REALITY**  
Report 2009



Design elements of the cover and within the Annual Report 2009 are based on the Sun Art. The Sun Art is located at the entrance area of the Raiffeisen Lecture Hall on the IST Austria campus in Klosterneuburg. It was designed by the architect of the Lecture Hall, Heinz Tesar, in 2009.

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## IST AUSTRIA SCIENTISTS

### PROFESSORS (by last appointment before IST Austria)

- 1 Nick Barton, University of Edinburgh, UK
- 2 Jonathan Bollback, University of Edinburgh, UK
- 3 Krishnendu Chatterjee, University of California, Santa Cruz, USA
- 4 Sylvia Cremer, University of Regensburg, Germany
- 5 Herbert Edelsbrunner, Duke University, Durham, USA
- 6 Calin Guet, Harvard University, Cambridge, USA
- 7 Carl-Philipp Heisenberg, Max-Planck Institute, Dresden, Germany
- 8 Thomas Henzinger, EPFL, Lausanne, Switzerland
- 9 Peter Jonas, University of Freiburg, Germany
- 10 Christoph Lampert, Max-Planck Institute, Tübingen, Germany
- 11 Michael Sixt, Max-Planck Institute, Martinsried, Germany

### POSTDOCS (by institute of PhD degree)

- 12 Paul Bendich, Duke University, Durham, USA
- 13 Pavol Cerny, University of Pennsylvania, Philadelphia, USA
- 14 Michael Kerber, Max-Planck Institute, Saarbrücken, Germany
- 15 Dejan Nickovic, Verimag Laboratory, Grenoble, France
- 16 Ferran Palero, University of Barcelona, Spain
- 17 Amit Patel, Stanford University, Palo Alto, USA
- 18 Jitka Polechova, University of Prague, Czech Republic
- 19 Vasu Singh, EPFL, Lausanne, Switzerland
- 20 Harold Paul Vliadar, University of Groningen, Netherlands
- 21 Thomas Wies, University of Freiburg, Germany

### PHD STUDENTS (by nationality)

- 22 Simon Aeschbacher, Switzerland
- 23 Arjun Radhakrishna, India
- 24 Anmol Tomar, India
- 25 Bei Wang, China
- 26 Damien Zufferey, Switzerland

**BASIC RESEARCH** Curiosity Driven  
**INDEPENDENT** Board of Scientists  
**INTERNATIONAL** English Language  
**INTERDISCIPLINARY** No Boundaries  
**PHD GRANTING** Graduate School  
**SUPPORTING CAREERS** Tenure Track  
**DIVERSE FUNDING** Public and Private  
**EXPLOITING RESULTS** Intellectual Property



# An **AMBITIOUS** Experiment

Thomas A. Henzinger » President, IST Austria

In 2006 the Austrian parliament decided, with a broad majority, to found the Institute of Science and Technology Austria (IST Austria) as a contribution to strengthen Austria's role in international science.

I was at the time professor at the ETH Lausanne (EPFL) in Switzerland and reacted to the news – perhaps like other scientific expatriates from Austria – with a mixture of excitement and disbelief. Only later, when I visited the construction site and met the Executive Committee of the new Institute – including Haim Harari, the chair, as well as Claus Raidl and Anton Zeilinger – did I begin to fully comprehend that the venture was "for real" and followed exactly the steps I thought necessary to establish a world-class institute for basic research. My nagging suspicions turned into pride that such a bold project is possible in Austria and a desire to be part of it.

We are now humbly trying to implement the blueprint that was written by Haim Harari, Olaf Kübler, and Hubert Markl in order to attract some of the world's best scientists to Austria. We cannot compete with the storied history and certain future of an established European or American institution, and neither can we compete in resources with the upstart universities of Asia – so what can we offer to scientists that are sought after all over the world? I believe that the unique attraction of IST Austria is that it resembles a startup enterprise possessing three key indicators for success: an independent frontier spirit, high aspirations,

and experienced founders. This attraction worked for me, and I am trying to shape the growing Institute true to its vision so that the attraction can continue to work for others.

There has been much publicity about things that IST Austria is *not*: it is not a university, not in Vienna, and not going to solve any of the challenges that Austrian industry faces today. I hope that this first Annual Report presents a clear picture of what IST Austria *is*. Not yet at the end of our first year of operation, we cannot fill its pages with many scientific accomplishments, and instead we use this opportunity to explain the key elements that we believe will make the Institute a success.

With a short-term horizon, basic research is expensive and the outcome uncertain, but as with any wise long-term investment, the eventual payback will be significant and the alternative, to lose ground to others in basic research, is far more risky. At a rational level, this is easy to understand, yet it nonetheless requires courage to commit to a long-term strategy. The establishment of IST Austria is such a commitment and I thank the federal government, in particular BM Dr. Beatrix Karl, the government of Lower Austria, in particular LH Dr. Erwin Pröll, and the Federation of Austrian Industries, in particular President Dr. Veit Sorger, for their steadfast support.

Thomas A. Henzinger



On the occasion of the first Annual Report after our official campus opening in June 2009 I would like to recall the important and remarkable developments that have taken place in the previous years.

As with all truly revolutionary projects it needs a convincing idea (in our case by Anton Zeilinger), a bold transformation into reality, relentless and reliable support by the decision makers in politics and industry, and arduous work by the leadership of the Institute, the employees, and the boards and committees supporting them.

On September 1, 2009, Thomas Henzinger started his term as the first President of IST Austria and this marks the most important milestone since the foundation of this new institute. Tom Henzinger combines outstanding scientific abilities with an analytical and bold approach to the organization of a first-class research institute. I thank Tom for the enormous effort he puts into the development of the Institute. The recent appointments of professors as well as the administrative development already show the potential success that the leadership of Tom Henzinger will allow and I am personally convinced that this success is going to happen.

We owe much of the excellent progress of IST Austria so far to Haim Harari and I want to thank him for his continuing support as the Chair of the Executive Committee. His experience and prudent advice are invaluable for the development of the Institute. Between the Chair of the Scientific Board, Olaf Kübler, the Managing Director, Gerald Muraier, all employees, and all members of the boards and committees, an enormous amount of time, work, and attention has been devoted to the success of this seminal endeavor.

The advances at IST Austria would not have been possible without the help of the representatives of the federal government (foremost the federal ministers Elisabeth Gehrler, Dr. Johannes Hahn, and now Dr. Beatrix Karl), the government of Lower Austria (in particular Governor Dr. Erwin Pröll), and the Federation of Austrian Industries (above all President Dr. Veit Sorger). I thank all supporters and trust in their continuing efforts to help IST Austria become a beacon of science in Austria and Central Europe.

**Claus J. Raidl**

It needs a lot to build a **FIRST-CLASS SCIENTIFIC** research institute from scratch; The **WISE EXPERIENCE** of 'the old', the **ENERGY** and the **HARD WORK** of 'the young', and the **PATIENCE** of the politicians and the public.

**Claus J. Raidl » Chair, IST Austria Board of Trustees**

CEO, Böhler-Uddeholm





# VISION BECOMES REALITY

## A Brief History of IST

# Austria



### The Idea and Feasibility Study

In 2002, at the annual Technology Forum in Alpbach (Tyrol), the Austrian physicist Anton Zeilinger raised the idea of building a new scientific research institute in Austria. Zeilinger's vision of "a scientific flagship organization for research and postgraduate studies at the highest level" started the process that ultimately led to the official opening of IST Austria only seven years later.

In 2003, Zeilinger took his proposal to the City of Vienna, which agreed to finance a study about the possibility of setting up such a scientific flagship institute. On behalf of the City of Vienna, Michael Stampfer of the Vienna Science and Technology Fund (WWTF), Andrea Holzmann-Jenkins, and Alexandra Vogl conducted the feasibility study, which was published in 2004.

### The Panel Discussion and Working Group

In the fall of 2004, invited by Anton Zeilinger, a group of distinguished scientists met for a two-day panel, discussing the potential of building a new research institute and graduate school with international ambitions in Austria. The group of scientists included three Nobel laureates – Günter Blobel, Eric Kandel, and Jean-Marie Lehn – as well as several other prominent scientists from both inside and outside of Austria: Iwo Bialynicki-Birula, Peter Deufhard, Haim Harari, Cecilia Jarlskog, Olaf Kübler, Jürgen Mlynek, Peter Palese, Gottfried Schatz, Arnold Schmidt, and Peter Schuster.

The recommendations of the panel led to the formation of a working group in the Federal Ministry of Education and Science in 2005. At the same time, four provinces of Austria – Lower

Austria, Styria, Upper Austria, and Vienna – put in bids to host the new institute. At the end of 2005, the Council of Ministers, under the leadership of Federal Chancellor Wolfgang Schüssel and Minister of Education and Science Elisabeth Gehrler, decided to build the new institute in the city of Klosterneuburg in Lower Austria. Disappointed by the process that led to the choice of location, some of the driving forces – Arnold Schmidt, Peter Schuster, and Anton Zeilinger – withdrew from the project.

### The Harari-Kübler-Markl Report

At this stage, the Federation of Austrian Industries, led by its president Veit Sorger and with active contributions from Claus Raidl and Thomas Oliva, maintained its strong support for the project and reinvigorated it by inviting three distinguished international scientists with impeccable management credentials to advise it on the next steps towards the establishment of the institute. The so-called "International Committee" was chaired by Haim Harari, former President of the Weizmann Institute in Israel, and included Olaf Kübler, former President of ETH Zurich in Switzerland, and Hubert Markl, former President of the Max-Planck Society in Germany. Their report was published in June 2006 and became the foundation on which both the conceptual and physical frameworks of IST Austria are built.

The renewed effort enjoyed the strong support of the federal government, especially the Ministers of Science (first Elisabeth Gehrler, then Johannes Hahn, now Beatrix Karl) and their teams, the unwavering enthusiastic help by the Governor of Lower Austria, Erwin Pröll and his team, the continued participation of the Federation of Austrian Industries, and the blessing of

the city of Klosterneuburg. Arnold Schmidt and Anton Zeilinger rejoined the project as active members of its boards.

### The Law, the Boards, and the First Employees

Between May and July 2006, the federal law that established IST Austria and the related financial agreement between the federal government and the province of Lower Austria were enacted, with substantial contributions from the International Committee. These documents provide the legal framework for the governance of the Institute, its right to grant PhD degrees, its independence, its international orientation, and its financing.

From this point on, the creation of the Institute proceeded swiftly. The Board of Trustees, chaired by Claus Raidl, was appointed in the summer of 2006, and the Scientific Board, chaired by Olaf Kübler, and the Executive Committee of the Board of Trustees, chaired by Haim Harari, were formed shortly thereafter. The Executive Committee led the establishment of the Institute, and acted as interim president until the first president, Thomas Henzinger, took office in September 2009.

In March 2007 the first employee, Gerald Murauer, joined the Institute as interim manager, and the search for a president and the first professors began in the summer of 2007. In December 2007, the former tenant of the Klosterneuburg site, the Hospital for Neurology of Lower Austria, emptied the premises and renovations started, in order to adapt the buildings to the requirements of a scientific campus.

### The First Scientists, Campus Opening, and the First President

The first professor hired by IST Austria was Nick Barton, an evolutionary biologist from the University of Edinburgh (UK), who moved to the campus in the summer of 2008. In December 2008, Thomas Henzinger, a computer scientist from the EPFL (Switzerland), was appointed as the first President of IST Austria, and in September 2009 Gerald Murauer was confirmed as Managing Director.

On June 1, 2009, only 18 months after the beginning of the renovations, the campus was officially opened. At the end of 2009, there were four research groups, headed by Nick Barton, Herbert Edelsbrunner, Krishnendu Chatterjee, and Thomas Henzinger, with about 20 scientists active on campus. The admissions process for the Graduate School of IST Austria was opened in January 2010 and the first laboratory building is under construction, to be completed in the fall of 2010. By April 2010, eleven professors have signed their employment contracts with IST. They are all expected to be on campus with their research groups before the end of 2010. The recruitment of additional professors and other staff continues.

*IST Austria owes its creation to the enormous effort and untiring support of a large number of people and their respective organizations. While many of them were not named here, we want to warmly thank and express our gratitude to everybody involved in making this project a success.*

2002

2004

2008

2010

# THE KEYS to Success

In 2005, three internationally renowned scientists with extensive experience in science administration were selected to advise the government on the next steps towards the establishment of IST Austria. This team brought with it expertise from three of the most successful scientific research institutions and organizations in the world: Haim Harari, a theoretical physicist and former President of the Weizmann Institute of Science in Israel; Olaf Kübler, an engineer and former President of the Swiss Federal Institute of Technology (ETH) Zurich in Switzerland; and Hubert Markl, a biologist and former President of the Max-Planck Society for the Advancement of Science in Germany, and former President of the German Research Foundation (DFG).

This international committee looked at successful scientific institutions around the world and selected key elements that they believed would fit together and create a unique new institute in Austria. These key elements, which IST Austria is based on, include independent governance, a focus on basic research in the natural and mathematical sciences, a Graduate School for the education of doctoral students, a tenure track for structuring the careers of professors, incentives for acquiring third-party funds, intellectual property rules for exploiting scientific discoveries, and guidelines for the periodic external evaluation of the institute. All of these elements are carefully designed to allow the Institute to attract the best scientists in the world, and to do so on all levels, from doctoral students to post-doctoral fellows to Assistant Professors and Professors.

## Independence

IST Austria is headed by the President, who is a scientist, with the support of the Managing Director. The President is appointed by and reports to the Board of Trustees, which has a majority of scientific members, and is advised by the Scientific Board, which consists of distinguished international scientists. These

structures guarantee independence and freedom from political and commercial influences, and they permit the Institute to fully concentrate on scientific quality.

## Flat Internal Hierarchies

The scientists of IST Austria are organized into research groups. Every research group is led by a Professor or Assistant Professor and consists of several doctoral students and postdoctoral fellows, whose research is supervised by the group leader. While different groups are encouraged to collaborate with each other, even and especially across the boundaries of traditional disciplines, each group leader is independent and free to pursue any research direction. This independence is attractive to young scientists, who often reach the peak of their scientific creativity as Assistant Professors.

## Scientific Excellence

IST Austria does not search to hire scientists that fit previously defined positions or research topics, but the Institute is prepared to hire any excellent researcher. Scientific excellence is judged exclusively by international peer review, which means that every professorial appointment involves the consultation of several independent international experts. Of the more than 1'600 applications and nominations that have been screened for professorial positions so far, 24 candidates received offers, and as of April 2010, eleven offers have been accepted. These first 11 Professors and Assistant Professors broadly represent Computer Science and the Life Sciences, including evolutionary, cell, and neurobiology, but the future hiring will in no way be restricted to these areas.

## Diverse Sources of Funding

IST Austria is federally funded to three quarters, with the condition that the professors independently acquire the fourth quarter of the budget from third parties. This puts the Institute into

the position to offer generous funding to its research groups, and at the same time requires that all professors raise additional funds from external sources. The internal funding for each research group is partly performance based and provides incentives for the professors to obtain external research grants. This model combines features from both the European and American academic systems. It means that the Institute need not to rely primarily on third-party funding of research, which can be unpredictable and impinge upon scientific freedom, nor can it rely exclusively on funding from the government, which can impede motivation and lead to a loss of independence.



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## Intellectual Property Rights

While dedicated to the principle of curiosity-driven research, IST Austria owns the rights to all scientific discoveries and is committed to promote their use. All scientific output of the Institute is protected by intellectual property rules. The Institute will decide how to transfer inventions by its professors to commercial enterprises, and the inventors will receive part of the income that the Institute receives from licensing and patents. This model has proved to be highly successful at the Weizmann Institute in Israel.





# THE SPIRIT of a Scientific Environment



Establishing a new scientific institute involves not only the physical design and construction of laboratories and offices, but also the creation of the rules and conventions that will determine the spirit and scientific culture of the place. IST Austria derives its identity from an emphasis on basic research, and from the fostering of an international and interdisciplinary culture.

## Focus on Basic Research

In basic research the scientist is free to follow any line of scientific inquiry, unhampered by objectives or milestones, wherever that may lead. Such curiosity-driven science is different from project research, which is guided by the need to reach a specific goal by a specific time – such as the development of a new technology along a predefined roadmap. The very essence of basic research is that its results cannot be predicted. This uncertainty requires ingenuity and flexibility by the scientist to change the research direction or method at any time in order to pursue the unknown. Much of our understanding of nature and many of the greatest discoveries of mankind came from curiosity-driven research. However, this does not mean that basic research has no practical use. To the contrary, also most of the significant technological advances can be traced back to new insights gained through basic research. Sometimes it

takes years or even decades before applications of the knowledge derived from basic research are found, but without the basic research many inventions had never been made.

## Internationality

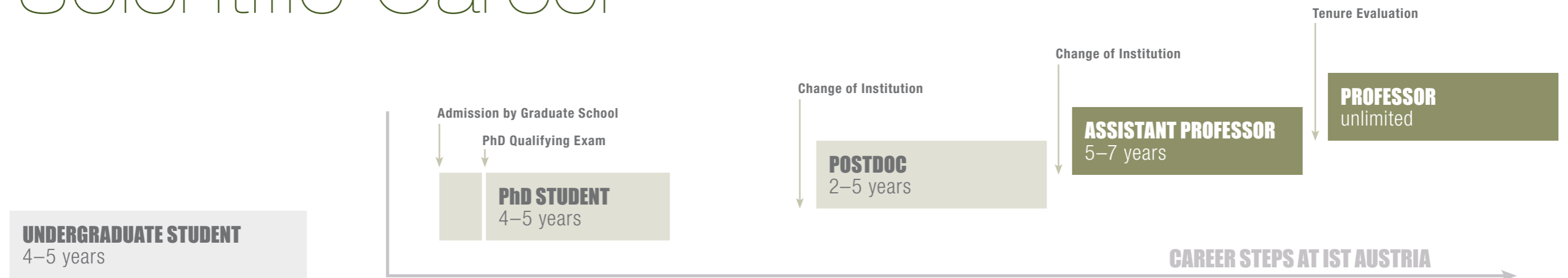
The international mobility of scientists during their years of training exposes them to different views and approaches, promotes the spread of knowledge and technical expertise, and pushes the boundaries of science around the world. In order to integrate seamlessly into the international community of science, the working language of IST Austria is English, with all symposia, courses, and seminars as well as the smaller group discussions being held in English. This generates an open environment and enables the free passage of information and ideas amongst all scientists and staff. There are no boundaries to participate in the campus life for non-German-speakers, although German courses are offered to facilitate their integration into the environment outside the campus. Recruitment for any position at the Institute knows no national boundaries, but requires a good working knowledge of the English language. The first call for admissions to the Graduate School attracted more than 100 applicants from 26 countries.

## Interdisciplinary Science

IST Austria is a scientifically interdisciplinary institution that aims to break down the traditional boundaries between disciplines. Not being restricted to a specific choice of scientific topics, and actively promoting cross-disciplinary collaborations, the Institute can expand its scientific orientation quickly into new directions. In this way the Institute hopes to capitalize on the fact that unexpected breakthroughs often happen at previously unexplored interfaces between different fields and approaches. While such an interdisciplinary emphasis is an early necessity, with only a few computer scientists and biologists being on campus in the last year, the Institute fully intends to maintain its open character through future growth. By not erecting internal boundaries, the Institute hopes to avoid the traditional obstacles to the free exchange of ideas. All physical spaces and organizational structures of the Institute will encourage interactions and sharing between scientists from different groups and disciplines. For example, every doctoral student is required to do rotations with multiple research groups, and students from different groups share offices. IST Austria considers its interactive and collaborative atmosphere to be one of its main assets.



# STEP BY STEP Climbing a Scientific Career



The steps of an international scientific career, from doctoral student to post-doctoral fellow to Assistant Professor to Professor, are very similar for young researchers all over the world. The career steps that can be taken at IST Austria are based on this model. Accordingly, scientists can enter the Institute at the following four stages of their careers:

- PhD student at the Graduate School
- Post-doctoral fellow
- Assistant Professor (tenure track)
- Professor

## Graduate School

The first step in the education of a research scientist is the PhD (Doctor of Philosophy) degree. IST Austria has the right to award PhD degrees through its Graduate School. However, being established as an institute for basic research rather than a university, IST does not offer Bachelor's or Master's studies. Prospective scientists can apply to the IST Graduate School only after having completed (or being close to the completion of) their undergraduate studies elsewhere, at a university.

Once a year, in January, the admissions process of the IST Graduate School is open to applicants from all over the world

who wish to begin their PhD studies at IST in the subsequent September. All aspiring students must apply to the Graduate School of IST Austria, rather than to a specific professor. The most promising candidates are invited for interviews with multiple professors, and the selected applicants are then offered PhD student positions, each with a full-time employment contract and a competitive salary. In the first 1 to 2 years on campus, every PhD student is expected to attend doctoral courses and do laboratory rotations with several research groups, so that every student gets exposed to a number of different groups and projects. This serves the broad education of young scientists and encourages interdisciplinary collaborations. It also gives the students time to find a supervisor (Professor or Assistant Professor) with whom they wish to perform their doctoral research, and to prepare for a Qualifying Exam. After passing the Qualifying Exam the focus is entirely on basic research, and the results of this research will eventually be collected in a PhD thesis (or "dissertation").

## Post-doctoral Fellow

The scientific career step that usually follows the completion of a PhD thesis is the application for a post-doctoral fellowship (or "postdoc", for short). Under normal circumstances, it is strongly advisable to accept a postdoc position at a different

institution, in order to learn about other scientific approaches and techniques. Conversely, the majority of postdocs at IST Austria have obtained their PhD degrees elsewhere. Working as a postdoc means to perform largely independent scientific research, but still under the supervision of a group leader (Professor or Assistant Professor).

After a few years of postdoc experience, the goal of a successful young scientist is to obtain a fully independent researcher position. This normally happens at a third institution, where the individual was neither a student nor a postdoc, in order to prevent scientific inbreeding. IST postdocs are almost never promoted to Assistant Professors at IST.

## Assistant Professor – Tenure Track

An Assistant Professor at IST is a completely independent researcher and group leader. Every Assistant Professor is free in choosing research projects, employing PhD students and postdocs, and spending the group budget.

"Tenure track" refers to a structured career progression from a temporary group leader position as Assistant Professor, to a permanent group leader position as Professor. By implementing the tenure track system, IST Austria promises every Assis-

tant Professor the opportunity to be promoted to Professor with a permanent contract. The decision to promote an Assistant Professor to Professor normally happens after 5 to 7 years and is always and entirely based on an evaluation by international experts of the Assistant Professor's scientific performance. If the evaluation is positive, then the Assistant Professor will be promoted, independent of financial or other considerations. Thus, the tenure track system offers both independence for young researchers and predictable career advancement. This allows the Institute to compete world-wide with the best institutions for the most brilliant scientists.

## Professor

Assistant Professors and Professors at IST Austria are expected to have research groups that consist of 5 to 15 doctoral students and postdocs, small enough so that all scientists in the group can receive individual attention by the group leader. In such a group, normally only the group leader (if s/he is a Professor) has a permanent position. This means that at any given time, the large majority of scientists are at the Institute for a temporary period.

# DIVERSE FUNDING – Public and Private

In the long term, the financial health of an institute dedicated to basic scientific research, such as IST Austria, depends on four types of income:

- Public funding
- Peer-reviewed research grants
- Licensing of technology
- Donations

## Public Funding by the Federal Government and Lower Austria

The federal government of Austria dedicated 290 million Euro to IST Austria for the time period of 2007 to 2016. However, only 195 million Euro are guaranteed, whereas the payment of the remaining 95 million Euro will depend on the Institute raising an equal amount of third-party funds, through scientific grants and donations. In other words, the amount of third-party funds that are obtained by the Institute will be matched by the government (up to a ceiling of 95 million Euro). In this way, it is ensured that IST Austria will receive public funding commensurate with its performance, and the professors of the Institute have a strong incentive to look for external funding.

In addition to the operating funds provided by the federal government of Austria, the province of Lower Austria supports the Institute financially with 140 million Euro that are earmarked for campus construction and maintenance.

## Peer-reviewed Research Grants

Scientists write proposals for research projects to acquire funding for personnel and equipment. The proposals are submitted to national and international funding agencies and programs that support basic research, such as the Austrian Science Fund (FWF), the European Research Council, or the Framework programs of the European Commission. Every proposal is reviewed by several independent international experts in the proposed area of research (this is called "peer review"), who recommend whether or not the proposal should be funded, usually in competition against other proposals. Professors and Assistant Professors at IST Austria regularly apply for such peer-reviewed funding.

## Nick Barton

*SelectionInformation:* Limits to Selection in Biology and in Evolutionary Computation (7/2010–6/2015)  
ERC Advanced Grant, European Research Council

## Thomas A. Henzinger

*Combest:* COMponent-Based Embedded Systems Design Techniques (1/2008–12/2010)  
FP7 European Commission

## Thomas A. Henzinger

*ArtistDesign:* Network of Excellence for Embedded Systems Design (1/2008–12/2011)  
FP7 European Commission

## Licensing of Technology

In basic research no one can predict what will be invented and when; sometimes it takes years or even decades to find out how the findings can be applied. Yet if one fosters basic research at a world-class level, it is highly likely that practical uses for some results will be discovered. Dedicated to the principle of curiosity-driven research, IST Austria wants its professors to do what they do best, to follow their creative instincts while investigating nature. However, the Institute owns the rights to all scientific discoveries and is firmly committed to promote their use. Licenses and patents are expected to become sources of income for the Institute in the future.

CATEGORY	DONORS
5 million € or more	<ul style="list-style-type: none"> <li>■ Invicta Foundation</li> </ul>
1'500'000–4'999'000 €	<ul style="list-style-type: none"> <li>■ Raiffeisen consortia (Agrana Beteiligungs-AG, Leipnik-Lundenburg Invest Beteiligungs-AG, Raiffeisen Holding Niederösterreich-Wien GmbH, Raiffeisen Zentralbank Österreich AG, STRABAG AG, UNIQA Versicherungen AG)</li> <li>■ voestalpine AG (voestalpine, Böhler-Uddeholm AG)</li> </ul>
500'000–1'499'000 €	<ul style="list-style-type: none"> <li>■ MONDI (Mondi Business Paper Services AG, Mondi Packaging AG)</li> <li>■ OMV AG</li> </ul>
250'000–499'000 €	<ul style="list-style-type: none"> <li>■ Miba AG</li> <li>■ Oberbank AG</li> </ul>
100'000–249'000 €	<ul style="list-style-type: none"> <li>■ Berndorf AG</li> <li>■ Prinzhorn Holding GmbH</li> <li>■ Schoeller Bleckmann Oilfield Equipment AG</li> <li>■ W. Hamburger GmbH</li> </ul>
10'000–99'000 €	<ul style="list-style-type: none"> <li>■ Alcatel-Lucent Austria AG</li> <li>■ Gebrüder Weiss GmbH</li> <li>■ Kapsch AG</li> </ul>

## Donations

While private donations are one of the regular sources of funding for universities and research institutions elsewhere, the private support of basic research does not have a strong tradition in Austria. IST Austria is therefore especially grateful that the idea and basic principles behind IST Austria have already convinced several donors to support the Institute generously. Including the recent 10 million Euro donation by the Invicta Foundation, IST Austria has collected donations of 17 million Euro. IST Austria expresses its deep gratitude to all donors and looks forward to having more supporters contribute to the Institute as an investment in the future through scientific research.



Innovation in Motion

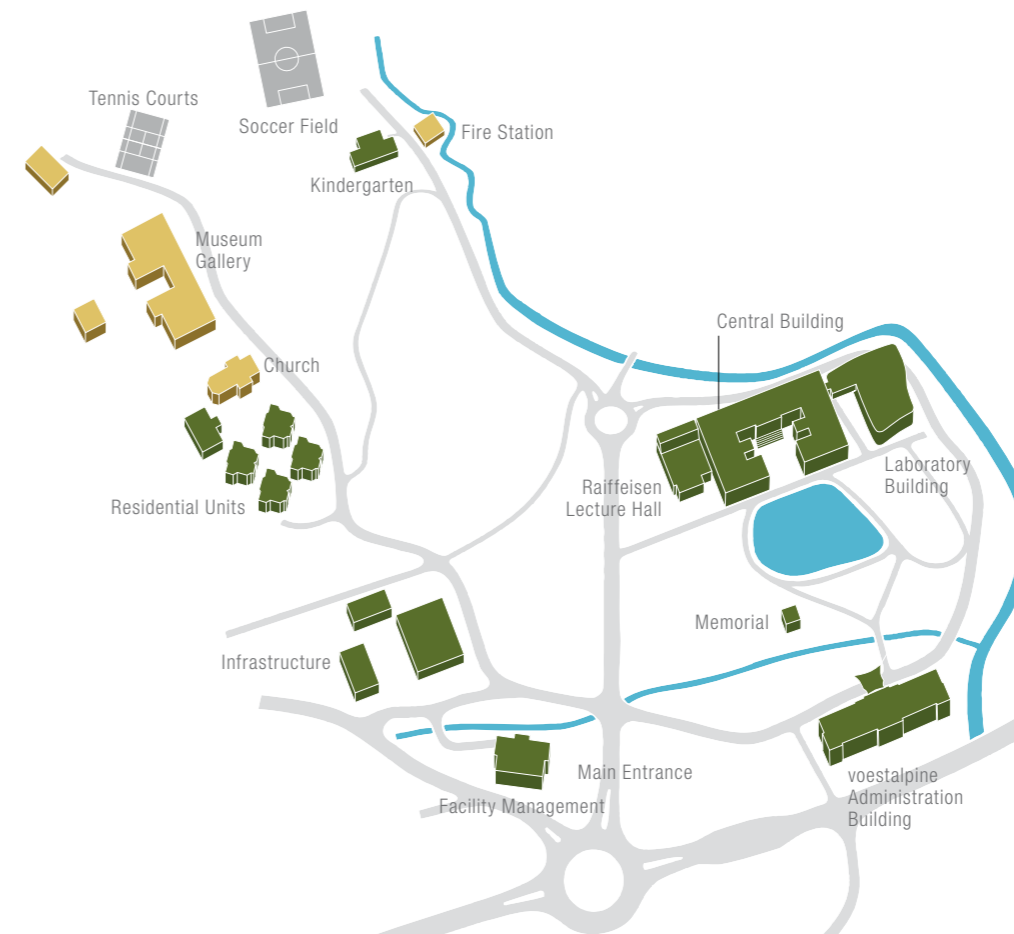


PRINZHORN HOLDING





# BUILDING a Campus for Science



The campus of IST Austria is located 18 km northwest of Vienna, within the historical town of Klosterneuburg. It is surrounded by the Vienna Woods and the estate itself is spread out over 180'000 m<sup>2</sup> of green area.

Situated on the site of a former hospital, the original buildings were designed in Art Nouveau style and finished around 1885. For IST Austria the historical buildings were carefully renovated and adapted to the needs of a modern scientific institution. The renovation, planned by the architects from Maurer-Neumann, started in December 2007, shortly after the hospital operations moved to their new location elsewhere. After only 18 months of construction, which included the erection of a modern lecture hall with 200 seats, designed by the architect Heinz Tesar, the official campus opening was celebrated on June 1, 2009.

In the fall of 2010, the first laboratory building will open its doors. The second laboratory building is already in the planning stage and will be completed in 2012. Further laboratory buildings are being planned to host 40 to 50 research groups with a total of about 500 scientists by 2016.

Essential for the functioning of the campus is also an infrastructure that serves all scientific needs. A new access road connects the campus with the roundabout at the main road. Underneath the ring road, which provides delivery access to all buildings, a collector houses all piping and wiring. Facility management, an energy supply unit fueled by wood chips, as well as mechanical and electronic workshops are located at the periphery of the campus.

The large expanses of green, including many trees around a central pond, have been preserved to maintain a peaceful, traffic-free atmosphere. Additional facilities to improve the quality of life for the employees include apartment buildings, a kindergarten, and sports facilities. The victims of Nazi medical crimes in the former hospital on the site are commemorated by a memorial that was designed by the German artist Dorothee Golz.



## CURRENT BUILDINGS

- The Central Building with approximately 8'500 m<sup>2</sup> provides office space for theoretical scientists, a seminar center with lecture rooms, a guest house for visiting scientists, and a restaurant.
- The Mondi seminar center in the Central Building is connected to the state-of-the-art Raiffeisen Lecture Hall with 200 seats.
- The other side of the Central Building is linked by a glass bridge to the Bertalanffy Foundation Building, which will be completed and named in the fall of 2010 and will provide 4'000 m<sup>2</sup> of laboratory space for experimental scientists. The bridge will facilitate the easy exchange of people and ideas.
- Opposite of the pond, the voestalpine Administration Building hosts the office of the president, the management, and the administrative staff.
- Residential units on the premises provide a welcome first home for many incoming scientists from abroad, giving them time for orientation and acclimatization during their first year in Austria.



**BASIC RESEARCH** is like **RAISING CHILDREN**: you provide care, love, devotion and resources, without knowing with certainty **WHAT WILL EMERGE**. In both cases there are **MARVELOUS SUCCESSES**, but also disappointments.

Every adult **STARTS AS A CHILD**, and every new technology or medical cure must **START AS BASIC RESEARCH**.

Haim Harari » Chair, IST Austria Executive Committee

Former President, Weizmann Institute of Science, Rehovot, Israel



# SHAPING the Future



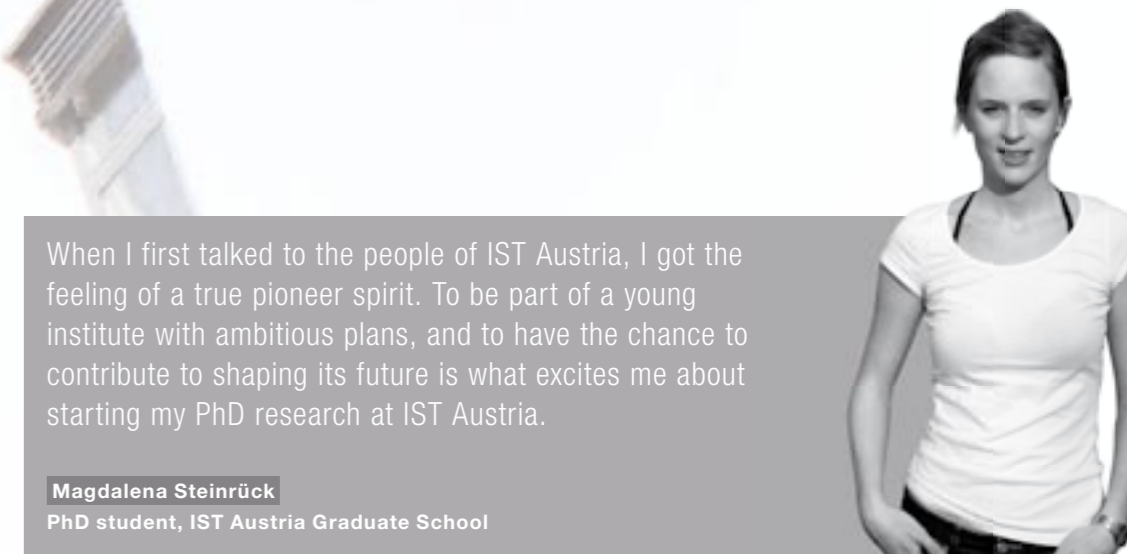
It was my personal conviction from the very beginning that the Federation of Austrian Industries and I must support IST Austria. Austria needs an institution for basic research that competes with the best such institutions worldwide. Internationally we can observe that top research institutes have a significant positive long-term influence on their surroundings and thus high relevance for industry and business.

**Veit Sorger**  
President, Federation of Austrian Industries



IST Austria sets a strong signal for Lower Austria on its way to an internationally recognized research location and thus for our way into the future. Where there is research, the future is being shaped.

**Erwin Pröll**  
Governor of Lower Austria



When I first talked to the people of IST Austria, I got the feeling of a true pioneer spirit. To be part of a young institute with ambitious plans, and to have the chance to contribute to shaping its future is what excites me about starting my PhD research at IST Austria.

**Magdalena Steinrück**  
PhD student, IST Austria Graduate School

IST Austria is helping to place Austrian science into a leadership position in Europe. Haim Harari and the Board have done a superb job in selecting Thomas Henzinger to head IST Austria and he has recruited an outstanding faculty. The future for the Institute is very bright!



**Eric Kandel**  
Member, IST Austria Board of Trustees;  
Professor, Columbia University, New York, USA

Convincing for my return to Austria was, that the institute is located in Austria, that it offers a perfect environment for high impact foundational research, and that the scientific areas it focuses on are close to my heart.



**Herbert Edelsbrunner**  
Professor, IST Austria



It is a great pleasure to watch the development of IST Austria, which gives a good reason to believe in the success of this ambitious project. By the wise and professional work of those responsible – Haim Harari first, now Thomas Henzinger, and their respective teams – a great idea is on the best way to become a great reality.

**Heinz Fischer**  
Federal President of Austria



It has been truly fascinating to oversee the growth of IST Austria, gone from a brilliant idea to a real institute, populated with an impressive set of talented researchers. But the future will be even more interesting...

**Catherine Cesarsky**  
High Commissioner for Atomic Energy,  
CEA-Saclay, Gif-sur-Yvette, France



I like the interdisciplinary and friendly environment – and, of course, being able to work with one of the leading scientists of my field.

**Jitka Polechová**  
Postdoc, IST Austria



IST Austria makes an essential contribution to the competitiveness and visibility of Austria as a location for international science. It also offers unique opportunities for young Austrians who want to pursue a career in research.

**Beatrix Karl**  
Federal Minister of Science  
and Research

IST Austria is making a significant impact in excellent science. Such investments are particularly significant for future economic development!

**Anton Zeilinger**  
Professor, University of Vienna and IQOQI,  
Austrian Academy of Sciences



IST Austria is an important endeavor to enforce Austria's international visibility as a research hot spot. Current Austrian research areas are strengthened with complementary but not doubling activities. The success of IST Austria is a "MUST"!

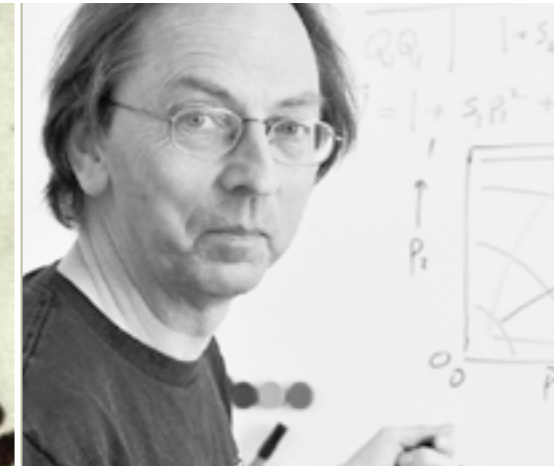
**Renée Schroeder**  
Professor, Max F. Perutz Laboratories, University of Vienna





# NICK BARTON

## Mathematical Models of Evolution



Nicholas Hamilton BARTON

### P

#### SELECTED PUBLICATIONS

1. Barton NH. 2009. Why sex and recombination? Cold Spring Harbor Symposia Quant. Biol. 74.
2. Barton NH, de Vladar HP. 2009. Statistical mechanics and the evolution of polygenic traits. Genetics 181: 997-1011.
3. Barton NH, Briggs DEG, Eisen JA, Goldstein DB, Patel NH. 2007. Evolution. Cold Spring Harbor Laboratory Press.

### T

#### TEAM

- Simon Aeschbacher, PhD student  
Ferran Palero, Postdoc  
Jitka Polechová, Postdoc  
Harold P. de Vladar, Postdoc

### CV

#### CAREER

- 2008 Professor, IST Austria  
1990– Fellow/Chair, University of Edinburgh, UK  
1982–1990 Lecturer/Reader, University College London, UK  
1980–1982 Demonstrator, Cambridge University, UK  
1979 PhD, University of East Anglia, Norwich, UK

#### SELECTED DISTINCTIONS

- ISI Highly Cited Researcher  
2009 Linnean Society Darwin-Wallace Medal  
2006 Royal Society Darwin Medal  
2001 President, Society for the Study of Evolution (on Council 2000–2002)  
1998 American Society of Naturalists President's Award  
1995 Fellow, Royal Society of Edinburgh  
1994 Fellow, Royal Society of London  
1994 David Starr Jordan Prize

We study diverse topics in evolutionary genetics, but focus on the evolution of populations that are distributed through space, and that experience natural selection on many genes. Understanding how species adapt, and how they split into new species, requires understanding of spatial subdivision, whilst interactions between genes are important in species formation, and in the response to selection. The recent flood of genomic data makes analysis of the interactions amongst large numbers of genes essential.

#### Current Projects

■ **Spatially Continuous Populations** Classical models assume that individuals reproduce and disperse independently, and so do not account for many features of real populations. Correlations across loci reveal their shared history, patterns may extend over very large spatial scales, and diversity is often lower than expected from census numbers. Jerome Kelleher (Edinburgh), Alison Etheridge (Oxford) and my group are working on a model of long-range extinction and recolonisation that includes these features.

■ **Evolution of Sex and Recombination** Why do almost all eukaryotes reproduce sexually? The most plausible is that recombination helps to bring together favorable alleles, thus

accelerating adaptation. The challenge is to find how recombination is favored, given that selection acts on a very large number of genes. We are analyzing a variety of stochastic models of selection on multiple recombining loci.

■ **Limits to Selection** How can the development of extraordinarily complex morphologies and behaviors be guided by a functional genome of  $\sim 10^8$  bases – much less information than is held in a personal computer? This issue is relevant not only to natural selection, but also to evolutionary computation, in which selection is used to evolve better algorithms. We are studying the relation between information, entropy, and fitness.

■ **Statistical Mechanics and the Evolution of Quantitative Traits** We have formalized an analogy between statistical mechanics and population genetics; the results are applied to study the evolution of quantitative traits, allowing for arbitrary interaction effects.

We also study several other topics in evolutionary genetics, including the genetics of hybrid zones, limits to a species' range, models of sympatric speciation, and methods for inferring population structure.



# KRISHNENDU CHATTERJEE

Computer-aided Verification, Game Theory



Krishnendu CHATTERJEE

## CV

### CAREER

- 2009 Assistant Professor, IST Austria
- 2008–2009 Postdoc, University of California, Santa Cruz, USA
- 2007 PhD, University of California, Berkeley, USA

### SELECTED DISTINCTIONS

- 2008 Ackerman Award, best thesis worldwide in Computer Science Logic
- 2007 David J. Sakrison Prize, best thesis in EECS, University of California, Berkeley, USA
- 2001 President of India Gold Medal, best IIT student of the year

## P

### SELECTED PUBLICATIONS

1. Chatterjee K. 2007. Concurrent games with tail objectives. *Theoretical Computer Science* 388:181-198.
2. Chatterjee K. 2005. Two-player non-zero sum omega-regular games. *Concurrency Theory* pp. 413-427.
3. Chatterjee K, Jurdzinski M, Henzinger TA. 2004. Quantitative stochastic parity games. *ACM-SIAM Symposium on Discrete Algorithms* pp. 121-130.

## T

### TEAM

Florian Horn, Postdoc

Our main research interest is in the theoretical foundations of formal verification and game theory. Our current research focuses on stochastic game theory, probabilistic model checking, logic and automata theory, and quantitative theories of verification. In addition, we are also interested in algorithms for developing robust reputation and trust management systems for Wikipedia.

### Current Projects

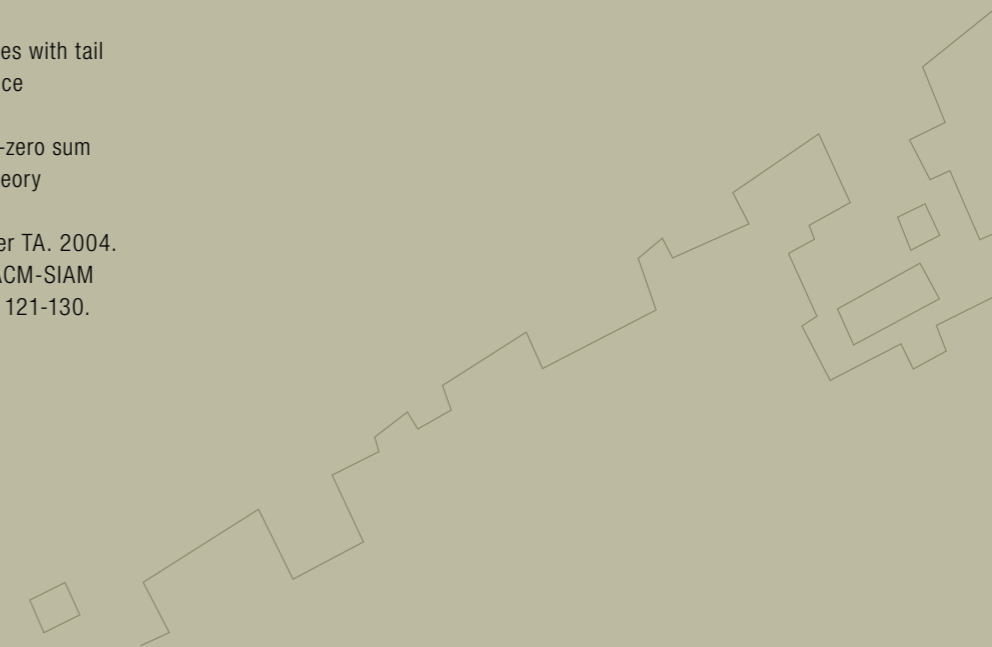
■ **Game Theory in Verification** This project involves the algorithmic analysis of various forms of games played on graphs. Systems for verification are modeled as a graph where vertices represent states, edges represent transitions, and paths represent behavior. Different components are modeled as players in a game on graphs where a controller represents one player and the reacting system another player. The central question of synthesis as well as many important questions in computer science can be analyzed effectively in the broad framework of games on graphs. In this project we work on theoretical aspects for the better understanding of games, developing new algorithms, as well as practical applications of game solving. The results present the theoretical foundations for the formal verification of systems. We also study other fundamental theoretical questions such as the existence and computation of Nash equilibria in stochastic games and their application in verification.

■ **Quantitative Verification** The classical Boolean theory of verification has a wide range of applications. However, there are a lot of applications where a more quantitative approach is necessary. For example in the case of embedded systems, along with the Boolean specification, a quantitative specification related to resource constraints must be satisfied. In this work we have been developing a framework to specify quantitative properties, answer the quantitative questions related to the classical Boolean theory of verification, and prove robustness results. The results of this project are useful for the design of correct and robust systems, and present a new theoretical framework for the formal verification of systems.

■ **Reputation and Trust Management Systems** In this work we study how to design robust algorithms for automatically computing the reputation of authors and the trust of text of an article in Wikipedia. Our algorithms are based on the content evolution of Wikipedia articles, and are completely automatic. We are also interested in extending the present robust algorithms for other application areas beyond Wikipedia.

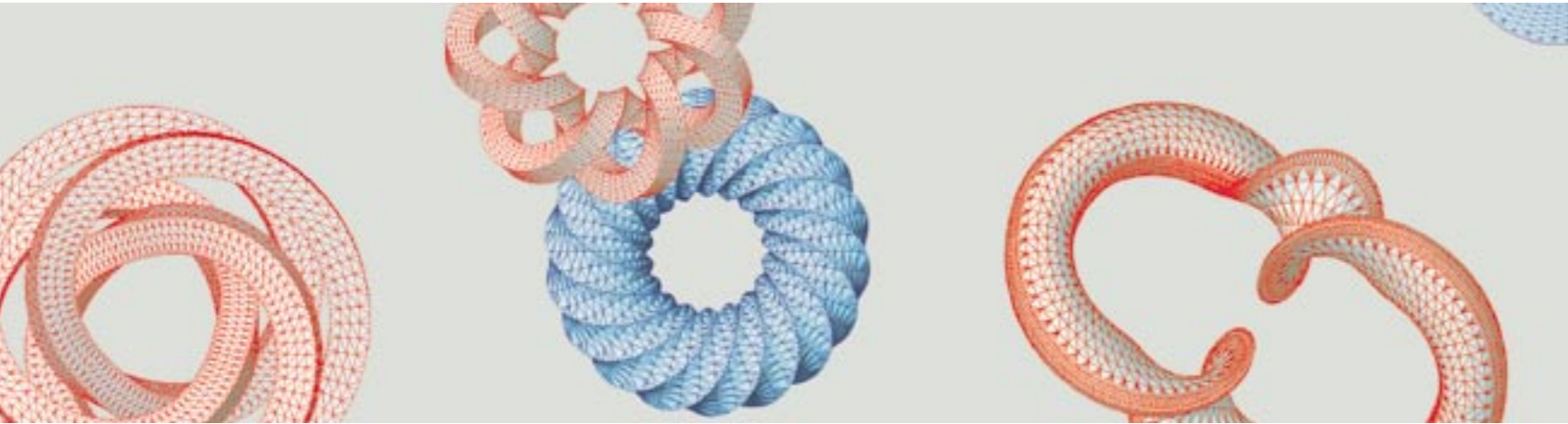
### Software

Several new efficient algorithms that we have developed have also been implemented by us to obtain research tools like ALPAGA and GIST for the study of graphs games.



# HERBERT EDELSBRUNNER

Algorithms, Computational Topology, and Computational Geometry



Herbert EDELSBRUNNER

## P

### SELECTED PUBLICATIONS

1. Edelsbrunner H, Harer JL. 2009. Computational Topology. An Introduction. American Mathematical Society, Providence, Rhode Island.
2. Edelsbrunner H. 2001. Geometry and Topology for Mesh Generation. Cambridge University Press, Cambridge, England.
3. Edelsbrunner H. 1987. Algorithms in Combinatorial Geometry. Springer-Verlag, Heidelberg, Germany.

## T

### TEAM

- Paul Bendich, Postdoc
- Chao Chen, Postdoc
- Brittany Fasy, PhD student
- Michael Kerber, Postdoc
- Amit Patel, Postdoc
- Bei Wang, PhD student
- Ying Zheng, PhD student

## CV

### CAREER

- 2009 Professor, IST Austria
- 2007–2008 Visiting Professor, Berlin Mathematical School, Germany
- 2007 Visiting Professor, Ecole Normale Supérieur, Paris, France
- 2006 Moore Distinguished Scholar, Caltech, Pasadena, USA
- 2004– Professor for Mathematics, Duke University, Durham, USA
- 2002 Visiting Professor, Lawrence Livermore National Laboratory, USA
- 1999– Professor for Computer Science, Duke University, Durham, USA
- 1996– Founder, Principal, and Director, Raindrop Geomagic
- 1994–1995 Visiting Professor, Hong Kong University of Science and Technology
- 1985–1999 Assistant, Associate, and Full Professor, University of Illinois, Urbana-Champaign, USA
- 1981–1985 Assistant, Graz University of Technology, Austria
- 1982 PhD, Graz University of Technology, Austria

### SELECTED DISTINCTIONS

- ISI Highly Cited Researcher
- 2009 Member, Academia Europaea
- 2008 Member, German Academy of Sciences Leopoldina
- 2006 Dean's Award for Excellence in Mentoring
- 2006 Honorary Doctorate, Graz University of Technology
- 2005 Member, American Academy of Arts and Sciences
- 1999 Sir Edward Youde Memorial Fund Visiting Professor, Hong Kong
- 1997 Beckman Fellow, Center of Advanced Study
- 1992 Burlington Northern Faculty Achievement Award
- 1991 Alan T. Waterman Award, National Science Foundation

Our research interests include areas in mathematics and computer science, with strong links to other fields: geometry and topology made computational through algorithms and data structures. Application areas include but are not limited to visualization, geometric modeling, mesh generation, structural molecular biology, and systems biology. Areas that benefit from this research are orthodontics, more generally dentistry, and even more generally the study of biological but also artificial shapes, including museum pieces that benefit from 3D records or new visualization methods. We believe in a broad approach to problems, including the development of new mathematics, the translation into new computational methods, and the application to frontiers of science. Candidate areas for fruitful collaborations include systems biology, neuroscience, materials science, and economics.

### Current Projects

■ **Funbio** The DARPA funded project Funbio, short for "microstates to macrodynamics: a new mathematics of biology" aims at deepening our understanding of broad biological questions through the use of novel mathematical methods. Data analysis with algebraic topology is one of the new methods.

■ **Roots** The NSF funded project, lead by Philip Benfey, aims at capturing phenotypes of root systems of agricultural plants, such as maize and rice, and to use this capability to drive genetic experiments. At the current stage, we employ mathematical and algorithmic techniques to reconstruct root systems as 3D structures from sequences of 2D photographs, and we compute topological descriptions of the root as well as the way it explores its 3D environment.

### Software

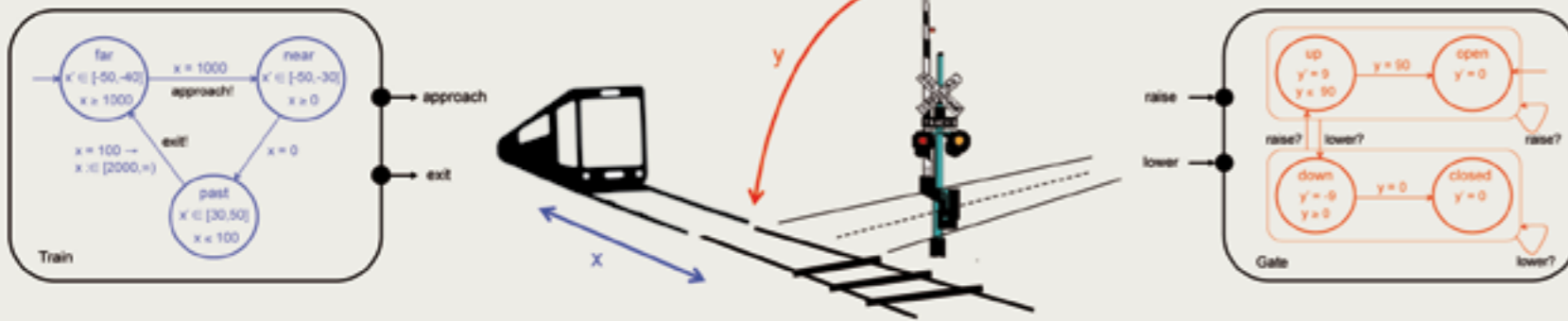
The Alpha Shapes software was developed some 20 years ago and prepared the path for many later developments. The software is designed to analyze point data in three dimensions and can be used for various applications. In our research, we focused on the analysis of molecular conformations, including proteins and nucleic acids.

The Geomagic Wrap software was motivated by the Alpha Shape software but needed a major new innovation, the use of a discrete geometric flow, to be useful for surface reconstruction. This is perhaps the most important application of geometric algorithms today, used in manufacturing, medical imaging, CAD design, tolerance control, and what have you.



# THOMAS A. HENZINGER

Design and Analysis of Concurrent and Embedded Systems



Thomas A. HENZINGER

## P

### SELECTED PUBLICATIONS

1. Henzinger TA. 2008. Two challenges in embedded systems design: Predictability and robustness. *Philosophical Transactions of the Royal Society A* 366:3727-3736.
2. Fisher J, Henzinger TA. 2007. Executable cell biology. *Nature Biotechnology* 25:1239-1249.
3. Alur R, Henzinger TA, Kupferman O. 2002. Alternating-time temporal logic. *Journal of the ACM* 49:672-713.

## T

### TEAM

- Pavol Cerny, Postdoc
- Dejan Nickovic, Postdoc
- Arjun Radhakrishna, PhD student
- Vasu Singh, Postdoc
- Anmol Tomar, PhD student
- Thomas Wies, Postdoc
- Damien Zufferey, PhD student

## CV

### CAREER

- 2009 Professor, IST Austria
- 2005– Adjunct Professor, University of California, Berkeley, USA
- 2004–2009 Professor, EPFL, Lausanne, Switzerland
- 1999–2000 Director, Max-Planck Institute, Saarbrücken, Germany
- 1998–2005 Professor, University of California, Berkeley, USA
- 1997–1998 Associate Professor, University of California, Berkeley, USA
- 1996–1997 Assistant Professor, University of California, Berkeley, USA
- 1992–1995 Assistant Professor, Cornell University, Ithaca, USA
- 1991 Postdoc, IMAG Laboratory, University of Grenoble, France
- 1991 PhD, Stanford University, Palo Alto, USA

### SELECTED DISTINCTIONS

- ISI Highly Cited Researcher
- 2009 Corresponding Member, Austrian Academy of Sciences
- 2006 ACM Fellow
- 2006 IEEE Fellow
- 2006 Member, Academia Europaea
- 2005 Member, German Academy of Sciences Leopoldina
- 1995 ONR Young Investigator Award
- 1995 NSF Faculty Early Career Development Award

My group is interested in mathematical methods for improving the quality of software. More and more things in our everyday lives are controlled by software and over 90% of the processing power is in places you wouldn't expect, such as kitchen appliances and pacemakers. Computer software has, at the same time, become one of the most complicated artifacts produced by man. It is therefore unavoidable that software contains bugs, and dealing with these bugs is a major technical challenge.

We focus on concurrent software and on embedded software. A concurrent system consists of many parallel processes that interact with each other, whether in a global network or on a single chip. Hardware manufacturers pack an ever increasing number of processors on one chip, generating a lot of parallelism/concurrency inside one computer – which is difficult to program, and one of the biggest challenges of computer science today. Concurrency is difficult because of the very large number of different interactions that are possible between parallel processes. They cannot be exhausted by testing the system, and concurrency bugs sometimes show up after years of flawless operation of the system.

An embedded system is a software system that interacts with the physical world, such as the electronic components in a car

or aircraft. For such embedded systems, the main technical challenge is to get the software react in real time. For a flight control system it is not only critical that the software computes the right results, but also that it does so sufficiently fast.

Our tools for building more reliable software are mathematical logic, automata theory, and models of computation. Some of these models can be used also to mimic certain biological systems, making the field inherently interdisciplinary. Computational models of, say, a living cell are different from mathematical equations as they can be executed on a computer and used to study the causal relationships between different events in the cell. This new field of research has been dubbed "Executable Biology".

### Current Projects

- **Interfaces and contracts**  
for component-based hardware and software design
- **Predictability and robustness**  
for real-time and embedded systems
- **Modern concurrency paradigms**  
such as software transactional memory and cloud computing
- **Model checking**  
biochemical reaction networks

# IST AUSTRIA PROFESSORS

## Starting in 2010



**Jonathan Bollback**

### Evolutionary Genetics and Experimental Evolution

Jonathan Bollback studied Biology at the University of Maryland and Evolutionary Genetics at the University of Rochester. After his doctoral studies at the University of Rochester he obtained his PhD in Evolutionary Genetics in 2005. He then spent three years as a postdoc at the University of Copenhagen. Since 2008 he has been a postdoc in the groups of Andrew Rambaut and Andy Leigh Brown at the University of Edinburgh. Jonathan Bollback is interested in the genetics of adaptation. To accomplish this he integrates empirical and theoretical approaches and uses experimental evolutionary, population genetic, phylogenetic, and computational methods. Jonathan developed sophisticated statistical methods for analyzing his own data and he published several papers on both methodology and data analysis.



**Sylvia Cremer**

### Evolutionary Immunology and Behavioral Ecology

Sylvia Cremer studied Biology at the Friedrich-Alexander-University of Erlangen-Nürnberg, and finished her doctoral studies at the University of Regensburg in 2002. After spending four years at the University of Copenhagen, she returned to Regensburg in 2006 where she established her own research group within the department of Jürgen Heinze. In 2006, she spent several months as a Junior Fellow at the Institute of Advanced Sciences in Berlin, where she was member of the "Evolutionary Immunology" group. Sylvia Cremer focuses on collective disease defense in insect societies (social immunity) using different ant species as a model. Her current projects investigate the effect of genetic diversity on social immunity and parasite detection abilities in ants, experimental and theoretical approaches of disease dynamics in socially and spatially heterogeneous groups, social vaccination and host-parasite co-evolution including experimental evolution studies. She is a member of the "Junge Akademie" of the

German Academy of Sciences Leopoldina and the Berlin-Brandenburg Academy.



**Calin Guet**

### Systems and Synthetic Biology

Calin Guet studied Physics and Molecular Biology at Princeton University. He did his doctoral work with Stanislas Leibler at Princeton and the Rockefeller University, and was awarded a PhD in Molecular Biology from Princeton in 2004. He then spent four years as a postdoc at the Institute for Biophysical Dynamics at the University of Chicago. Since 2008 he has been a postdoc at the FAS Center for Systems Biology at Harvard University. Calin is interested in understanding the rules that govern systems of interacting genes and proteins that form genetic and biochemical networks in living cells. He approaches this fundamental question by employing combinatorial libraries of synthetic transcriptional networks in living cells. To this end he has also developed minimally invasive biophysical techniques for quantifying RNA and mRNA levels in vivo at the level of single bacteria.



**Carl-Philipp Heisenberg**

### Cell and Developmental Biology, Biophysics

Carl-Philipp Heisenberg studied Biology at the Ludwig-Maximilians-Universität München and finished his PhD in 1996 at the MPI for Developmental Biology in Tübingen in the group of Nobel Laureate Christiane Nüsslein-Volhard. After performing postdoctoral studies at the King's College London/University College London he returned to Germany to the MPI of Molecular Cell Biology and Genetics in Dresden in 2000 as group leader and Emmy-Noether fellow. Carl-Philipp Heisenberg is interested in the molecular and cellular mechanisms underlying morphogenesis in vertebrate development using zebra fish embryos as a model system. Adapting the use of different biophysical tools such as high-resolution two-photon confocal imaging of single progenitor cells and atomic force microscopy in collaboration with

other groups, he provided important insights into more physical aspects of cell behavior. His approach to morphogenesis is mathematical and physical and therefore special in combining a highly quantitative and theoretical viewpoint of problems in cell and developmental biology.



**Peter Jonas**

### Neuroscience

Peter Jonas studied Human Medicine at the University of Gießen, where he finished his thesis in 1987. From 1988 to 1989 he performed post-doctoral studies at the Physiological Institute of the University Gießen. He then spent four years as a Research Assistant in the group of Bert Sakmann (Nobel Laureate Medicine 1991) at the MPI for Medical Research in Heidelberg. In 1994 he moved as an Associate Professor to the Physiological Institute at the Technical University of Munich. Since 1995 he has been Professor and Head of the Department at the Physiological Institute, University of Freiburg, Germany. Peter Jonas is best known for his contributions to the understanding of synaptic transmission in neuronal microcircuits. His work focuses on the characterization of ion channels, on high-resolution analysis of synaptic transmission, on the analysis of hippocampal microcircuits and inhibition, and on quantitative computational methods. The combination of molecular, electrophysiological, imaging and computer modeling methods mark the multidisciplinary approach in his current scientific questions. Among other awards and recognitions, he received the Leibniz Prize of the DFG and he is a member of the Editorial Board of Science Magazine.



**Christoph Lampert**

### Computer Science

Christoph Lampert studied Mathematics at the University of Bonn, where he finished his PhD in the field of Complex Analysis in 2003. Subsequently he changed his research area to work on computer vision and pattern recognition, in particular focusing on the development and application of methods

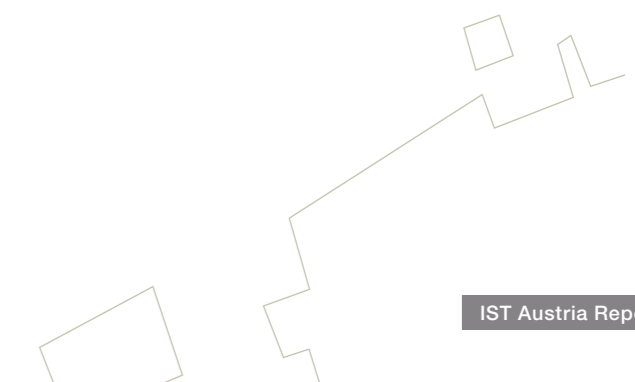
from machine learning to the problems of object category recognition in natural images. He held a postdoc position at the German Research Center for Artificial Intelligence (DKFI) in Kaiserslautern before becoming a Senior Research Scientist in the group of Bernhard Schölkopf in the MPI for Biological Cybernetics in Tübingen in 2007, where he led the Computer Vision group. As a computer scientist, Christoph Lampert is keen to interact with other disciplines that are already represented at IST Austria ranging from computational geometry to evolutionary genetics.



**Michael Sixt**

### Cell Biology

Michael Sixt studied Medicine at the Friedrich-Alexander-University of Erlangen-Nürnberg, where he performed the experimental work for his medical doctor (MD) at the Institute of Experimental Medicine until 2000. He then did internships in surgery, internal medicine (at Duke University), and dermatology and spent one and a half years as Junior Doctor at the Dermatological Clinic Erlangen. In 2002 he joined the laboratory of Lydia Sorokin at the Institute of Experimental Pathology in Lund, Sweden, as a postdoc. In 2004 he became a research group leader at the MPI for Biochemistry in Martinsried, where he is Endowed Professor of the Peter Hans Hofschneider Foundation for Experimental Biomedicine since 2008. Michael Sixt's ultimate goal is to understand molecular and mechanical principles of cell motility at cellular as well as tissue-level. His current research focuses on leukocyte migration. He further started to collaborate with physicists and mathematicians to model interstitial dendritic cell migration.







**SCIENCE** is an ingredient  
of our **GLOBAL CULTURE**  
and a pillar of **HUMAN**  
**CIVILIZATION**; it shares  
the responsibility of  
shaping the **FUTURE**  
of the world.

**Olaf Kübler » Chair, IST Austria Scientific Board**

Former President, ETH Zurich, Switzerland



# SERVICE AND SUPPORT for Scientists



## Employees with a Pioneer Spirit

Gerald Muraer » Managing Director, IST Austria

In March 2007 I started my appointment at IST Austria. At that time I was the first and only employee of IST Austria. At the end of 2007, the hospital operations moved away and the whole campus was more or less turned into a construction site, and recruitment processes were running full speed ahead. In summer 2008 the first professor started at IST Austria, and a year later we were able to celebrate the official campus opening and the welcome of the first president with a total faculty of four professors at that time. I am happy that I was able to accompany the developments on the campus from the very beginning and see IST Austria growing.

Building a scientific institute from scratch does not only mean hiring the best scientists. It also means setting up an administration and infrastructure from scratch. In addition to the

scientific structure we also wanted to build up an administrative structure that pursues only one goal: support of the scientists to let them do what they are here for – first-class basic research instead of bureaucracy. The best scientists in the world have offers from the best institutes in the world. We want that the administrative support that we offer is an added value for the scientists that helps them decide to move to IST Austria. To be able to achieve this we need very good and highly motivated administrative employees with a pioneer spirit.

With the growing number of tasks also the number of the administrative employees has increased. Guidelines for recruiting, intellectual property, and quality control were set up. Infrastructure like IT systems and networks, even a new energy supply for the campus and whole buildings were renovated and con-

structed, and further buildings are in the planning phase. Financial management, employment contracts, and salary schemes as well as communication channels were created. This would not have been possible without the remarkable effort of all the involved people and the good collaboration between our Board members and the administrative teams, and of course our President since his appointment.

As Managing Director I would like to thank all the administrative employees to run at full power the last years, not fearing long hours in the office and on the construction sites, being reachable in the evenings and on the weekends to make our shared goal come true: to support the scientists and impress them with our service.

### Service & Support

#### Academic Affairs

- 1: Laurenz Niel
- 2: Helga Materna

#### Grant Office

- 3: Barbara Abraham

#### Human Resources

- 4: Bettina Karnolz
- 5: Michaela Stöckel (maternity leave)

#### Finance

- 6: Leopold Kronlachner
- 7: Eva-Maria Strieck

#### Construction and Maintenance

- 8: Stefan Hipfinger
- 9: Michael Pletzer
- 10: Günther Reiterer
- 11: Martin Traxler

#### IT / Network

- 12: Franz Schäfer
- 13: Michael Adletzberger
- 14: Michael Brandstätter

#### Restaurant / Guest House

- 15: Martin Rinder

#### Office

- 16: Martina Doppler
- 17: Elisabeth Hacker
- 18: Barbara Kunes
- 19: Gerti Resch

#### Communications

- 20: Lisa Cichocki
- 21: Oliver Lehmann



# BOARDS of IST Austria

IST Austria is governed by a number of Boards, each of them responsible for precisely defined tasks. The members of the Boards are independent and selected according to their scientific or administrative competence.



- 01: Frank Allgöwer
- 02: Angelika Amon
- 03: Catherine Cesarsky
- 04: Alice Dautry
- 05: Peter Fratzl
- 06: Haim Harari
- 07: Alexander Hartig
- 08: Gisela Hopfmüller
- 09: Eric Kandel
- 10: Olaf Kübler
- 11: Kurt Mehlhorn
- 12: Hannah Monyer
- 13: Martin Nowak
- 14: Alfred Ötsch
- 15: Claus J. Raidl
- 16: Wolfgang Rutenstorfer
- 17: Arnold Schmidt
- 18: Elisabeth Stadler
- 19: Hansjörg Tengg
- 20: Ernst-Ludwig Winnacker
- 21: Anton Zeilinger

## The Board of Trustees

Among other tasks, the Board of Trustees is responsible for approving:

- the statutes of the organization and its strategic direction
- the appointment of the President, the Scientific Board, and the Managing Director
- the procedures for academic appointments and the promotion of scientists

The Board of Trustees consists of 15 members. Eight of them are distinguished international scientists, four are appointed by the federal government, and three are appointed by the government of Lower Austria.

### Claus J. Raidl

Chair; CEO, Böhler-Uddeholm AG, Vienna

### Anton Zeilinger

Vice-Chair; Professor, University of Vienna and IQOQI, Austrian Academy of Sciences

### Catherine Cesarsky

High Commissioner for Atomic Energy, CEA-Saclay, Gif-sur-Yvette, France

### Alice Dautry

President, Institut Pasteur, Paris, France

### Haim Harari

Former President, Weizmann Institute of Science, Rehovot, Israel

### Alexander Hartig

Member of the Management Board, Constantia Industries AG, Vienna

### Gisela Hopfmüller

Freelance journalist, Vienna

### Eric Kandel

Professor, Columbia University, New York, USA

### Olaf Kübler

Former President, ETH Zurich, Switzerland

### Kurt Mehlhorn

Max-Planck Institute, Saarbrücken, Germany

### Alfred Ötsch

Wiener Neustadt

### Wolfgang Rutenstorfer

CEO, OMV AG, Vienna

### Elisabeth Stadler

Chairperson, ERGO Austria International AG, Vienna

### Hansjörg Tengg

Manager, smart technologies, Vienna

### Ernst-Ludwig Winnacker

General Secretary, Human Frontiers Science Program, Strasbourg, France

## The Executive Committee

The Executive Committee is a sub-committee of the Board of Trustees. The Executive Committee has the following tasks, among others:

- act on behalf of the Board of Trustees in all matters between the meetings of the Board of Trustees
- hold preliminary discussions on matters to be brought for approval to the Board of Trustees, e.g., the annual budget

### Haim Harari

Chair

### Olaf Kübler

Vice-Chair

### Gisela Hopfmüller

Alfred Ötsch

### Claus J. Raidl

Anton Zeilinger

## The Scientific Board

The Scientific Board prepares recommendations on scientific directions and on ensuring a high degree of scientific productivity. The Scientific Board consists of 10 distinguished international scientists and one additional non-voting member with outstanding management experience. The members are appointed by the Board of Trustees for a term of 6 years.

### Olaf Kübler (until the end of 2009)

Chair; Former President, ETH Zurich, Switzerland

### Kurt Mehlhorn (from 2010 onwards)

Chair; Max-Planck Institute, Saarbrücken, Germany

### Arnold Schmidt

Vice-Chair; Professor, Photonics Institute, Vienna University of Technology

### Frank Allgöwer

Professor, University of Stuttgart, Germany

### Angelika Amon (from 2010 onwards)

Professor, MIT, Cambridge, USA

### Catherine Cesarsky

High Commissioner for Atomic Energy, CEA-Saclay, Gif-sur-Yvette, France

### Peter Fratzl

Max-Planck Institute, Potsdam, Germany

### Haim Harari (until the end of 2009)

Former President, Weizmann Institute of Science, Rehovot, Israel

### Hannah Monyer

Professor, University of Heidelberg, Germany

### Martin Nowak

Professor, Harvard University, Cambridge, USA

### Ernst-Ludwig Winnacker

General Secretary, Human Frontiers Science Program, Strasbourg, France

### Anton Zeilinger

Professor, University of Vienna and IQOQI, Austrian Academy of Sciences

Non-voting Member:

### Claus J. Raidl

CEO, Böhler-Uddeholm AG, Vienna





# EVENTS – Open Doors for an **OPEN FUTURE**



Scientists communicate their science. Gathering new knowledge through experiments and the development of new theories and applications is only one part of research. The other part, of not less importance, is to communicate these findings, discuss ideas and techniques with colleagues, publish results in scientific journals, exchange opinions at congresses and symposia – in short, to share and critique acquired knowledge and hypotheses. The communication of science stops neither at national boundaries nor at the borders of the scientific community. The importance of science and its impact on society must also be spread to the public. Therefore IST Austria, like other scientific institutions, organizes events and lectures for the general public in addition to symposia and seminar talks for scientists (please see the box on the opposite page). Additionally, the Institute is in contact with the media, donors, local schools, and the campus neighbors.

The **campus opening ceremony** in June 2009 was a three-day celebration of the official opening of the IST Austria campus in Klosterneuburg. On the first day, more than 2'500 people attended the **Open Campus 2009**, a party for the whole family, all friends and neighbors of IST Austria. The visitors were entertained by kids' lectures, a science cabaret, hands-on experiments for kids, guided campus tours, and they enjoyed music and BBQ. At the Open Campus 2009 also the winners of the school competition "Invent your Future" for local schools were announced. Five teenagers were selected by a jury to win

a special guided tour at the ORF. The second day included the scientific symposium "The Human Brain as the Most Powerful Computer" followed by a panel discussion on "Institutes of Basic Research: Is There One Formula for Success?" with Catherine Cesarsky (High Commissioner for Atomic Energy, CEA-Saclay), Barry Dickson (Director, Institute for Molecular Pathology), Peter Goddard (Director, Institute for Advanced Study, Princeton), Herbert Jäckle (Vice-President, Max-Planck Society), Hubert Markl (Former President, Max-Planck Society), and Daniel Zajfman (President, Weizmann Institute). This was followed by a panel titled "From Basic Research to Economic Value" with distinguished podium guests from science and industry. The opening ceremony was concluded with a second scientific symposium, called "Neurons and Machines".

In November 2009, a new series called **IST Lectures** was started with a presentation by Martin Nowak, Professor of Biology and of Mathematics at Harvard University. In his talk, Martin Nowak introduced the audience to Darwin's achievements and to his current research topic, the "Evolution of cooperation: from selfish genes to supercooperators". The IST Lectures present distinguished researchers and their work to a scientific audience and the general public.

For forthcoming events, please visit our website [www.ist.ac.at](http://www.ist.ac.at).

## SCIENTIFIC SYMPOSIA

**May 8, 2009**  
Symposium (hosted by IMP)  
"Frontiers of Quantitative Biology"

**June 3, 2009**  
Symposium  
"The Human Brain as the Most Powerful Computer"

**June 4, 2009**  
Symposium  
"Neurons and Machines"

**September 1, 2009**  
Workshop  
(organized by H.G. Feichtinger, University of Vienna)  
"Harmonic Analysis: from Foundation to the Real World"

**November 27, 2009**  
Symposium  
"Biology meets Physics"

## PUBLIC EVENTS

**June 1–4, 2009**  
Open Campus  
Campus opening celebrations with public and scientific events

**November 18, 2009**  
IST Lecture by Martin Nowak  
"Evolution of Cooperation: from Selfish Genes to Supercooperators"

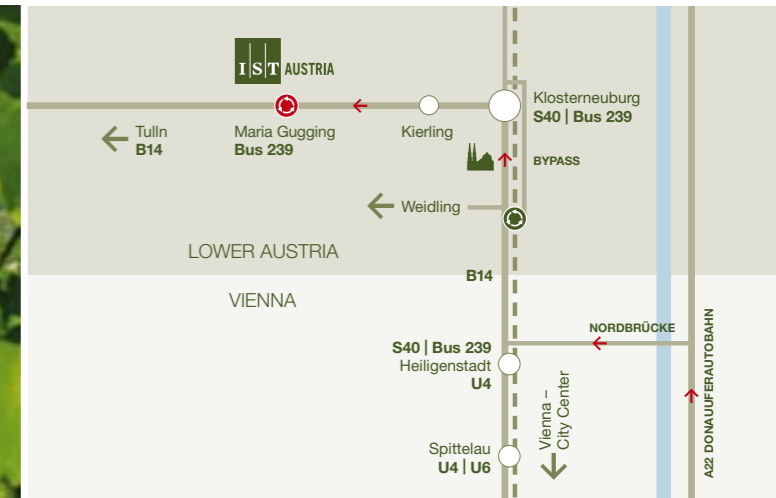


# LOCATION and Directions



The city of Klosterneuburg is known for its high quality of living. The location between the river Danube and the rolling hills of the Vienna Woods, with its vineyards, pastures, and forests, provides an exceptional environment that is both tranquil and stimulating for studying and recreation. The city offers educational, medical, social, and cultural facilities of the highest standard.

The historical center of Klosterneuburg is dominated by the enormous medieval monastery, which was redesigned in the early 18th century, in Baroque style, as residence for the Austrian emperor. Close to the monastery, the Essl Museum is world famous for its contemporary art. Our immediate neighbor on campus is the internationally renowned Art Brut Center Gugging.





## IMPRINT

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