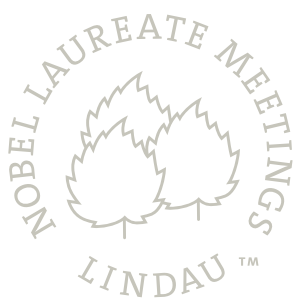

EDUCATE. INSPIRE. CONNECT.

DIALOGUE

EXCHANGE **OUTREACH**

DEBATES Impulses

63rd Lindau Nobel Laureate Meeting

COMMUNITY

ANNUAL REPORT 2013

DIALOGUE

63rd Lindau Nobel Laureate Meeting

Annual Report 2013

Council for the Lindau Nobel Laureate Meetings
Foundation Lindau Nobelprizewinners Meetings at Lake Constance

"With the Nobel Prize comes the opportunity to talk to people around the world. I am on a mission to talk to other scientists, to students, to decision makers, and to the population in general about the importance of education for all."

Dan Shechtman, ***Nobel Laureate in Chemistry 2011***

"*The best meeting you could ever attend—or at least it has been for me. It was not only how easy it was to approach our most admired Nobel Laureates, but the general openness of all participants and the relaxed atmosphere that prevailed during the entire event, which promoted a lot of discussion and interaction.*"

Mario Ulises Delgado Jaime, ***post-doc from Mexico***

"First and foremost we have to thank the Laureates, because they offer up something very precious: time. They devote a great deal of their valuable time to all the participants of the meeting."

Johanna Wanka, ***Federal Minister of Education and Research***

"It is wonderful to see what Laureates and young researchers exchange when they meet. This is not only about science, it is also about personal and cultural issues. This is what the young researchers do in Lindau: they learn from life for life."

Countess Bettina Bernadotte af Wisborg,
President of the Lindau Council

"*It has been great meeting with the Laureates and particularly with the young researchers from around the world. And it has been an experience of the United Nations but also an experience of the Nobel vision.*"

Gunnar Stålsett, ***Bishop emeritus of Oslo, Member of the Norwegian Nobel Committee***

"A common hope of young scientists attending the Nobel Laureate Meeting is inspiration—not only for their scientific career, but also for their personal life as a scientist. For some, even the choice of staying in academia will depend on it, as a PhD student said to me at a coffee table of the scientific breakfast.
Who if not Nobel Laureates can ignite a lasting fire of enthusiasm for scientific discovery!"

Hinnerk Feldwisch-Drentrup, ***science writer***

"The highlights definitely were the personal interactions and discussions with the Nobel Laureates. To see their enthusiasm for science, their fascination with their field of research, and (sometimes) their surprise that the discoveries they made were actually useful was very inspiring."

Bettina Keller, ***post-doc from Germany***

Contents

A Forum for Dialogue

The Lindau Nobel Laureate Meetings

Dialogue

Dialogue is not merely the title of this annual report. It is the guiding principle of the Lindau Nobel Laureate Meetings—as Countess Bettina Bernadotte and Wolfgang Schürer outline in their greetings.

COUNTESS BETTINA BERNADOTTE AF WISBORG
WOLFGANG SCHÜRER
President of the Council/
Chairman of the Board of the Foundation

"Many things would go much better if only people talked to each other. This is, one could argue, the experience of the 20th century. When the Lindau Nobel Laureate Meetings were founded in 1951, as a European initiative for reconciliation after World War II, a forum for dialogue was created. Tucked away on the shores of Lake Constance, distinguished scientists—Nobel Laureates—meet and interact with most promising young scholars from around the world, who are willing to learn and become inspired for their own careers in science.

Having played a central role in the evolution leading to modern societies, exchange has always benefitted mankind. Without it, innovative ideas and awareness cannot spread. And when bright minds interact, the result is more than any one of them can achieve on their own. History tells us many stories about how science develops across cultural and geographical borders.

Eminent scholars have always played a central role, as they stimulate students to acquire knowledge and then share that newly-acquired knowledge throughout the world. Today, hundreds of excellent young researchers come to Lindau every year to become informed, and to establish ties to their peers around the globe. Some of these ties last for a lifetime. In addition, these young people—and the Laureates—leave Lindau as ambassadors for the "Mission Education," thus advancing the Lindau spirit.

For one week every year an intensive dialogue takes place in Lindau. But there are many more ways to get inspired by the Nobel Laureates. The Lindau Mediatheque and all the other initiatives of our "Mission Education" are directed at pupils and teachers, students and lecturers, as well as at the general public interested in science.

Peter Badge's portraits reflect the personalities of the Laureates. For his project "Sketches of Science" Volker Steger has invited Laureates to draw a sketch of their award-winning discovery. The Nobel Labs 360° allow visitors to virtually join Laureates in their lab. Spectators are invited to enter an imaginary dialogue with the Laureates and their work. We hope that they receive inspiration and even join the scientific dialogue.

Science's potential for exchange is due to its universality. Scientific method provides a common ground to debate, without regard for one's religion, nationality, ethnicity or gender. But there is more to it than that. Ethos is the foundation on which the trust needed for a common endeavour can grow. Ethos and the responsibility of the scientist have been discussed at the Lindau Meetings ever since Albert Schweitzer introduced that link in 1954. This concept indeed has become a cornerstone of the Lindau dialogue."

At this year's Lindau Meeting, Countess Bettina Bernadotte and Wolfgang Schürer were bestowed with the Most Admirable Order of the Direkgunabhorn by HRH Princess Maha Chakri Sirindhorn (centre) of the Kingdom of Thailand—for their instrumental role in achieving a memorandum of understanding between the Lindau Nobel Laureate Meetings and the National Science and Technology Development Agency of Thailand. This MOU ensures the regular participation of young Thai researchers at the Lindau Meetings.

The Lindau Institutions

The Lindau Nobel Laureate Meetings are jointly organised, represented and promoted by two institutions, the council and the foundation. They act in concert to warrant the continuity of the meetings and further advance their on-going development.

THE COUNCIL

The Council for the Lindau Nobel Laureate Meetings was founded in 1954, three years after the first Lindau Meeting, to secure their existence and shape their future development. Count Lennart Bernadotte, the co-founder of the Lindau Meetings, became its first president.

The purpose of the council is to organise the annual meetings on the basis of an elaborate scientific programme. This includes the establishment and maintenance of close relations with academic partners worldwide.

The council will ensure that eligible and qualified young scientists get the chance to participate in the meetings—regardless of their ethnic or national origin, their religious belief or their gender. In this regard, the council also contributes to securing the financial conditions for the meetings in close collaboration with the foundation. The council maintains an executive secretariat in Lindau.

Honorary President
Count Lennart Bernadotte †

Board
Countess Bettina Bernadotte
President

Wolfgang Schürer
Vice-President

Burkhard Fricke
Vice-President

Nikolaus Turner
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Thomas Ellerbeck, *Spokesman*
Peter Englund
Astrid Gräslund
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Wolfgang Lubitz
Hartmut Michel

Corresponding Members
Lars Bergström
Hans Jörnvall
Stefan Kaufmann
Sten Orrenius
Dagmar Schipanski

Permanent Guests
Gabriela Dür
Gerhard Ecker

On behalf of both Lindau institutions, Countess Bettina Bernadotte and Wolfgang Schürer concluded new memoranda of understanding this year with academic partner institutions from Australia, Austria (left picture), France, Pakistan, and Thailand (right picture), to expand the global network that accounts for the internationality of the meetings.

THE FOUNDATION

The Foundation Lindau Nobelprizewinners Meetings at Lake Constance was established in the year 2000 by fifty Nobel Laureates, the Bernadotte family, and council members. Ever since, Wolfgang Schürer has been the chairman of the board. In general, the foundation's objective is to promote science, research, and related social activities.

In particular, its main purpose is to ensure the continuance and further development of the Lindau Meetings. This includes the support of projects and initiatives in the realm of the Mission Education. The foundation is registered on Mainau Island; in the interest of a close cooperation with the council, the foundation's office and its managing director are also based at Lindau.

Honorary Presidents
Count Lennart Bernadotte †
Roman Herzog

Board of Directors
Wolfgang Schürer
Chairman

Countess Bettina Bernadotte

Thomas Ellerbeck

Nikolaus Turner
Managing Director

The Lindau Foundation hosted a dinner at the Hotel Bad Schachen on the occasion of the opening of this year's meeting.

Mauro Dell'Ambrogio, Swiss State Secretary for Education and Research, signs the foundation's guestbook.

Founders Assembly of the Foundation

Through their membership in the Founders Assembly, 269 Nobel Laureates demonstrate their strong support of the guiding principles of the Lindau Nobel Laureate Meetings and entrust the foundation with the consistent further development of Lindau's intergenerational dialogue.

NOBEL LAUREATES

Alexei Abrikosov
Peter Agre
Martti Ahtisaari
George A. Akerlof
Zhores Alferov
Maurice Allais
Sidney Altman
Philip W. Anderson
Werner Arber
Kenneth J. Arrow
Robert J. Aumann
Richard Axel
Julius Axelrod
David Baltimore
Francoise Barré-Sinoussi
Gary S. Becker
Johannes Georg Bednorz
Baruj Benacerraf
Paul Berg
Hans A. Bethe
Bruce A. Beutler
J. Michael Bishop
Sir James Black
Elizabeth H. Blackburn
Günter Blobel
Nicolaas Bloembergen
Baruch S. Blumberg
Paul D. Boyer
James M. Buchanan
Linda Buck
Mario R. Capecchi
Jimmy Carter
Thomas R. Cech
Martin Chalfie
Georges Charpak
Yves Chauvin
Steven Chu
Aaron Ciechanover
Ronald H. Coase
Stanley Cohen
Claude Cohen-Tannoudji
Leon Cooper
Elias J. Corey
John Warcup Cornforth
Mairead Corrigan Maguire
James W. Cronin
Paul J. Crutzen
Robert F. Curl jr.
Hans G. Dehmelt
Johann Deisenhofer
Peter A. Diamond
Peter C. Doherty
Renato Dulbecco
Christian de Duve
Gerald Edelman
Manfred Eigen
Robert Engle
François Englert
Richard R. Ernst
Gerhard Ertl
Leo Esaki
Martin Evans
John B. Fenn
Albert Fert
Edmond Fischer
Ernst Otto Fischer
Robert W. Fogel
Jerome Friedman
Milton Friedman
Robert F. Furchgott
D. Caleton Gajdusek
Andre Geim
Murray Gell-Mann
Riccardo Giacconi
Ivar Giaever
Walter Gilbert
Alfred G. Gilman
Vitaly L. Ginzburg
Donald Glaser
Sheldon L. Glashow
Roy J. Glauber
Joseph L. Goldstein
Mikhail Gorbachev
Clive Granger
Paul Greengard
David J. Gross
Robert H. Grubbs
Peter Grünberg
Theodor W. Hänsch
John L. Hall
Serge Haroche
Lee Hartwell
Herbert A. Hauptman
Harald zur Hausen
Richard F. Heck
Alan C. Heeger
Dudley R. Herschbach
Avram Hershko
Antony Hewish
Jules A. Hoffmann
Roald Hoffmann
Gerardus 't Hooft
H. Robert Horvitz
David H. Hubel
Robert Huber
Russel Hulse
Timothy Hunt
Leonid Hurwicz
Andrew F. Huxley
Louis Ignarro
Brian Josephson
Eric R. Kandel
Charles K. Kao
Jerome Karle
Tawakkol Karman
Imre Kertész
Wolfgang Ketterle
Har Gobind Khorana
Lawrence R. Klein
Klaus von Klitzing
Aaron Klug
Makato Kobayashi
Brian K. Kobilka
Walter Kohn
Arthur Kornberg
Roger D. Kornberg
Masatoshi Koshiba
Edwin Krebs
Herbert Kroemer
Harold W. Kroto
Finn Kydland
Willis E. Lamb
Robert Laughlin
Paul C. Lauterbur
Leon M. Lederman
David M. Lee
Tsung-Dao Lee
Yuan Tseh Lee
Robert J. Lefkowitz
Jean-Marie Lehn
Rita Levi-Montalcini
Edward B. Lewis
William N. Lipscomb
Robert E. Lucas Jr.
Alan G. MacDiarmid
Roderick MacKinnon
Peter Mansfield
Rudolph A. Marcus
Harry M. Markowitz
Barry Marshall
Toshihide Maskawa
Eric S. Maskin
John C. Mather
Daniel L. McFadden
Simon van der Meer
Craig C. Mello
Bruce Merrifield
Robert C. Merton
Hartmut Michel
James A. Mirrlees
Rudolf Mößbauer
Mario Molina
Luc Montagnier
Dale T. Mortensen
Karl Alexander Müller
Kary B. Mullis
Robert A. Mundell
Ferid Murad
Joseph E. Murray
Roger B. Myerson
Yoichiro Nambu
John F. Nash jr.
Ei-ichi Negishi
Erwin Neher
Marshall Nirenberg
Douglass C. North
Konstantin Novoselov
Ryoji Noyori
Christiane Nüsslein-Volhard
Paul M. Nurse
George A. Olah
Douglas Osheroff
Arno Allen Penzias
Saul Perlmutter
Edmund S. Phelps
William D. Phillips
Christopher A. Pissarides
John Polanyi
John Pople
Lord George Porter
Edward C. Prescott
Ilja Prigogine
José Ramos-Horta
Norman F. Ramsey
Robert Richardson
Richard J. Roberts
Heinrich Rohrer
Joseph Rotblat
Alwin Roth
F. Sherwood Rowland
Carlo Rubbia
Bert Sakmann
Paul A. Samuelson
Bengt Samuelsson
Frederick Sanger
Thomas J. Sargent
Andrew V. Schally
Randy W. Schekman
Thomas C. Schelling
Brian Schmidt
Myron S. Scholes
Melvin Schwartz
John Robert Schrieffer
Richard R. Schrock
Reinhard Selten
Amartya Sen
William F. Sharpe
K. Barry Sharpless
Lloyd S. Shapley
Dan Shechtman
Osamu Shimomura
Kai M. Siegbahn
Christopher A. Sims
Ellen Johnson Sirleaf
Jens C. Skou
Richard Smalley
Hamilton O. Smith
Michael Smith
Oliver Smithies
George F. Smoot
Robert M. Solow
Jack Steinberger
Ralph M. Steinmann
Thomas A. Steitz
Joseph E. Stiglitz
Thomas C. Südhof
John Sulston
Akira Suzuki
Jack W. Szostak
Henry Taube
Joseph Taylor
Samuel C. C. Ting
Susumu Tonegawa
Charles H. Townes
Tomas Tranströmer
Roger Y. Tsien
Daniel C. Tsui
Harold E. Varmus
Martinus Veltman
John E. Walker
Robin Warren
Arieh Warshel
James D. Watson
Thomas H. Weller
Eric F. Wieschaus
Elie Wiesel
Torsten N. Wiesel
Frank Wilczek
Maurice H.F. Wilkens
Jody Williams
Robert Wilson
David J. Wineland
Kurt Wüthrich
Rosalyn Yalow
Chen Ning Yang
Ada Yonath
Muhammad Yunus
Ahmed Zewail
Rolf Zinkernagel

BERNADOTTE AF WISBORG FAMILY

Countess Bettina Bernadotte
Count Björn Bernadotte
Countess Catherina Bernadotte
Count Christian Bernadotte
Countess Diana Bernadotte
Countess Sonja Bernadotte

COUNCIL MEMBERS

Anders Bárány
Werner F. Ebke
Thomas Ellerbeck
Ludwig E. Feinendegen
Astrid Gräslund
Hans Jörnvall
Franz Knöpfle
Hubert Markl
Sten Orrenius
Wolfgang Schürer
Helmut Sies
Nikolaus Turner
Jürgen Uhlenbusch

Nobel Laureate in Literature Tomas Tranströmer being photographed by Peter Badge for the Lindau Foundation's project "NOBELS–Nobel Laureates photographed by Peter Badge".

New Members of the Honorary Senate

The members of the most prestigious body of the Lindau Foundation share the values and goals of the Mission Education and are dedicated to further advance it. They are valued advisers to the board and distinguished ambassadors for the cause of the Lindau Meetings.

At the 63rd Lindau Meeting, the foundation paid tribute to the social commitment and the dedication to education, science and research of three supporters and companions of the Lindau Meetings: Gunnar Stålsett, Bishop emeritus of Oslo and Member of the Norwegian Nobel Committee, the organisation responsible for awarding the Nobel Peace Prize; Marcus Storch, who chaired the Nobel Foundation for 17 years; and Klaus Tschira, co-founder of the software company SAP and founder of one of Europe's largest charitable foundations, were inducted into the Honorary Senate. Wolfgang Schürer described the three as outstanding personalities who have been role models, working selflessly in the service of society.

WOLFGANG SCHÜRER
Chairman of the Board of Directors, Lindau Foundation

"These leading personalities have each acted as catalysts for science and society. They have been responsible for many good causes, but without seeking the limelight. They share their belief in the values of the inter-generational dialogue, which they have fostered many times. For this, they deserve our profound gratitude."

GUNNAR STÅLSETT
Member of the Norwegian Nobel Committee

"I see at this gathering there is indeed a confluence of science and peace, which needs to be developed further in order to safeguard humanity against the destructive powers which are limited neither to individuals nor to groups."

KLAUS TSCHIRA
Founder of the Klaus Tschira Stiftung

"I believe that science has a duty to inform the public about its discoveries and its methods. For two main reasons: First, because in most countries scientific research is financed mainly by the state. And second, because it is important that public opinion be well disposed towards science if industry is to make good use of scientific discoveries."

MARCUS STORCH
Chairman of the Board of the Nobel Foundation 2005–2013

"What makes me so happy being here is youth. If we are able to inspire the youth as the Lindau Meetings are, the future will be much brighter. You represent a vital part of the potential for the future. All of this coincides with the opinion of the Nobel Foundation."

Honorary Senate

Josef Ackermann
Suleiman Jasir Al-Herbish
José Manuel Barroso
Christof Bosch
Ernesto Bertarelli
Martin Engstroem
William H. Gates III
Ulrich Grete
Roman Herzog
Klaus J. Jacobs †
Henning Kagermann
Malcolm D. Knight
Pamela Mars
Angela Merkel
Joachim Milberg
Ferdinand K. Piëch
Johannes Rau †
Annette Schavan
Shri Kapil Sibal
HRH Princess Maha Chakri Sirindhorn
Gunnar Stålsett
Edmund Stoiber
Marcus Storch
Tony Tan
Erwin Teufel
Klaus Tschira
Daniel Vasella
Ernst Ludwig Winnacker
Martin Winterkorn

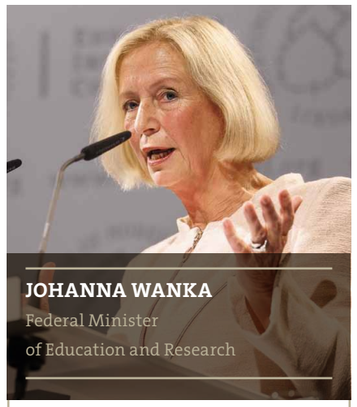
The Global Scientific Community as Guests in Germany and Bavaria

The experience of participating in the Lindau Meetings fosters lasting professional connections and personal friendships. The participants who have travelled to Lindau from all corners of the world carry on the scientific dialogue initiated here and return home as ambassadors for the spirit of Lindau.

GERMANY'S FEDERAL GOVERNMENT BACKS FURTHER DEVELOPMENT

As a principal benefactor, the Federal Ministry of Education and Research (BMBF) has funded and supported the Lindau Meetings throughout the years and has thereby enabled their continuous development into a truly international forum—a beacon for Germany's commitment to international collaboration in science and research.

Along with Federal Minister Johanna Wanka, more than 200 guests of honour from politics, business and science were present at the opening ceremony of the 63rd Lindau Nobel Laureate Meeting.



JOHANNA WANKA
Federal Minister
of Education and Research

"Science is international, excellent science transcends borders, this is common, but I think there are few places where the description of scientific reality is as tangible as here in Lindau."

Johanna Wanka invited participants and guests to a summer festival at Hotel Bad Schachen prior to the official opening of the 63rd Lindau Meeting.

Planned for 2017 the Inselhalle will just look like this winning design of an architectural competition.

FREE STATE OF BAVARIA ENSURES CONTINUANCE IN LINDAU

With an unambiguous commitment to significant financial support of the vitally needed fundamental modernisation and expansion of the Lindau conference venue "Inselhalle"—which has been the Lindau Meetings' venue since 1981—the Free State of Bavaria set a clear signal this year: the Lindau Nobel Laureate Meetings are deeply rooted in Bavaria and shall persist here as a stellar example of the openness and connectivity of the state and region.

The state government's decision to significantly promote this crucial project is in line with Bavaria's long-standing exceptional funding of the Lindau Meetings. Bavarias regular contribution to the social programme—which has been a tradition since the beginning of the meetings—testifies to the Free State's international reputation as a hub for excellent science and research.

HORST SEEHOFER
Minister-President
of the Free State of Bavaria

"The Bavarian State Government emphasises the goal that the Free State of Bavaria shall contribute to the modernisation of the Lindau Inselhalle venue in an appropriate and effective way."

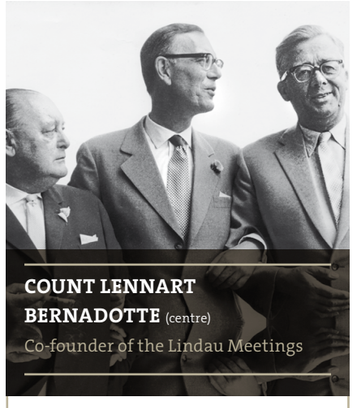
On the occasion of his visit to the newsroom of "Lindauer Zeitung"—the local edition of the region's largest newspaper "Schwäbische Zeitung"—in September 2013, Horst Seehofer (centre, together with, on the left, Hendrik Groth, Editor-in-Chief of Schwäbische Zeitung, and Deputy Editor-in-Chief Christoph Plate, on the right) reaffirmed his government's commitment to the financial support of the renovation of Lindau's conference venue.

Over 60 Years of Lindau Dialogue

Since their beginnings in 1951, the Lindau Nobel Laureate Meetings have evolved into a unique international discussion forum for scientific and societal issues and have given rise to a wide range of outreach initiatives to involve the broad public.

In 1951, the first "European Meeting of Nobel Laureates in Medicine" was held in Lindau on the initiative of the two local physicians Franz Karl Hein and Gustav Wilhelm Parade, and Count Lennart Bernadotte of nearby Mainau Island—a grandson of HM Gustaf V, King of Sweden.

Due to Count Bernadotte's efforts and networking in Stockholm, seven Nobel Laureates agreed to participate in this extraordinary meeting, which was conceived as a European initiative of post-war reconciliation among scientists.



COUNT LENNART BERNADOTTE (centre)
Co-founder of the Lindau Meetings

> *"And it was all to be so terribly solemn and so academic and so on, and I said, no, people, let's just relax and have a nice, friendly meeting."*

The picture shows Count Berndotte together with Franz Karl Hein (left) and Gustav Wilhelm Parade (right).

Count Lennart Bernadotte (third from left) welcomes the first Nobel Laureates in Lindau:

Adolf Butenandt (Germany, Chemistry 1939)
Carl Peter Henrik Dam (Denmark, Physiology/Medicine 1943)
Gerhard Domagk (Germany, Physiology/Medicine 1939)
Paul Müller (Switzerland, Physiology/Medicine 1948)
William Murphy (USA, Physiology/Medicine 1934)
Hans von Euler-Chelpin (Sweden, Chemistry 1929)
Otto Warburg (Germany, Physiology/Medicine 1931)

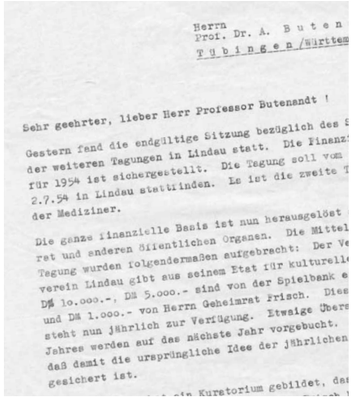
The initial success gave rise to the idea to establish periodic meetings of Nobel Laureates in Lindau, dedicated alternately to the Nobel Prize disciplines physiology or medicine, physics, and chemistry—and to have students, doctoral candidates, and post-doc researchers join the debates.

To institutionalise the overall organisation of the meetings, the Lindau Council was founded in 1954. Among its academic members were the deans of the medical faculties at the universities of Munich, Innsbruck, Freiburg and Tübingen.

Despite recurrent organisational and financial uncertainties, the meetings aquired a high reputation in the international scientific community. An exciting future and a long history of intergenerational exchange lay ahead.

A STUDENT FROM HAMBURG
One of the first young researchers who participated in the early meetings

> *"The distantly enthroned luminaries turned out to be human, wrestling with great diligence and luck, or in battle against repugnant prejudice, for their own self-discovery, as so many of us do. Our Nobel Laureates, however, have been crowned by success, for whom the path to further pioneering research work has been paved by a prize born of magnanimous resolution."*



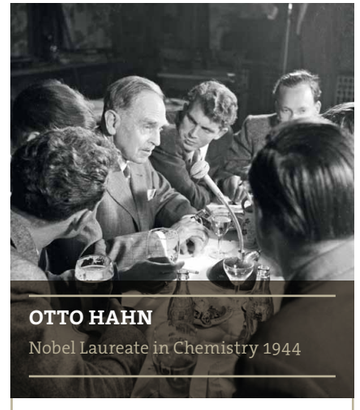
Herrn
Prof. Dr. A. Buten
Tübingen/Württe

Sehr geehrter, lieber Herr Professor Butenandt !

Gestern fand die endgültige Sitzung bezüglich des
der weiteren Tagungen in Lindau statt. Die Finanz
für 1954 ist sichergestellt. Die Tagung soll vom
2.7.54 in Lindau stattfinden. Es ist die zweite
der Medizine.

Die ganze finanzielle Basis ist nun herausgelöst
ret und anderen öffentlichen Organen. Die Mittel
Tagung wurden folgendermaßen aufgebracht: Der Ve
verein Lindau gibt aus seinem Etat für kulturelle
DM 10.000.-, DM 5.000.- sind von der Spielbank e
und DM 1.000.- von Herrn Geheimrat Frisch. Dies
steht nun jährlich zur Verfügung. Etwaige Übers
Jahres werden auf das nächste Jahr vorgebucht.
daß damit die ursprüngliche Idee der jährlichen
gesichert ist.

Letter by Franz Karl Hein to Nobel Laureate Adolf Butenandt of 28 January 1954 informing the latter that the continuance of the meetings had been secured by the recently founded Lindau Council



OTTO HAHN
Nobel Laureate in Chemistry 1944

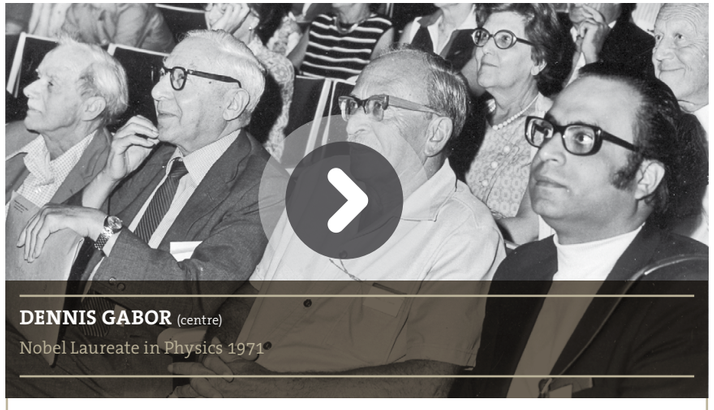
> *"I first came as a chemist, then disguised as a physicist and now again to the meeting of Laureates in medicine, because my work also has something to do with medicine, and should you ever invite those from literature, then you should know that in my youth I applied myself fervently to the art of poetry."*

1959: Werner Heisenberg (centre), Nobel Laureate in Physics 1932

Due to their informality, the Lindau Meetings became a role model for redefining the relationship between professors and students. They enabled up-and-coming young scientists to discuss openly and controversially with Nobel Laureates in an unconstrained atmosphere.

The issue of sustainability soon became a defining feature of the Lindau debates. In 1973, Dennis Gabor, founding member of the Club of Rome (1968), called for a responsible use of the world's scarce resources.

Participants of the 1967 Lindau Meeting surround Nobel Laureate Werner Forssmann (lower right) at a question and answer session.



DENNIS GABOR (centre)
Nobel Laureate in Physics 1971

> *"We must realise we are living on an earth which is now becoming too small for us. Applied scientists and technologists must radically reverse their priorities. The first priority is to get our civilisation going and not to continue with this irresponsible wasting of energy and material resources."*

"The Predicament of Mankind", lecture by Dennis Gabor at the 23rd Lindau Nobel Laureate Meeting (1973)—available in the Lindau Mediatheque

The 50th Lindau Meeting (2000) was the first to bring together Nobel Laureates of the three Nobel Prize disciplines physiology/medicine, chemistry and physics. On this occasion, the Lindau Foundation—a driving force for the continuous development—was established.

In addition, regular meetings of the Laureates of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel were enacted in 2004.

The basic principle of the Lindau Meetings was—and still is—to foster the exchange of knowledge, experience, ideas, and inspiration among scientists—across generations, cultures, and nationalities.

The second interdisciplinary meeting, held in 2005 according to the regular five-year interval, saw the record number of 44 Nobel Laureates participating (picture). This was only topped by the next interdisciplinary meeting in 2010, when 59 laureates took part. These numbers in mind, expectations are high regarding the up-coming fourth interdisciplinary meeting, to be held in 2015.

Muhammad Yunus (right), Nobel Peace Laureate of 2006, at his visit to the 2nd Lindau Meeting on Economic Sciences, in 2008.

DIANE WU
Graduate student from the USA

> *"The week of talking with those from older generations gave me a new appreciation for the long view. There is very little that you can guarantee through careful planning; perhaps a better-tested path to future success is to focus on what you love most in the present. Cheers to the elders who spoke with us, whose lives are testaments to the lessons they shared."*

Mentoring Young Scientists

In his address “Science—Walking a Tightrope”, given at a meeting on “Aspects of Trust and Confidence in Scientific Research” in Stockholm in February 2012, Nobel Laureate Heinrich Rohrer expressed the following five wishes directed at the next generation of leading scientists.

Along with Ernst Ruska and Gerd Binnig, Heinrich Rohrer—born in Buchs, a small municipality in the Swiss canton St. Gallen, on 6 June 1933—was awarded the 1986 Nobel Prize in Physics for designing the scanning tunnelling microscope. This invention ushered in a new era in microscopy, finally allowing researchers to produce topographical images of atomic surfaces, to visualise and analyse crystal surfaces, DNA molecules, and viruses.

Heinrich Rohrer participated in the Lindau Nobel Laureate Meetings of 1988 and 1991. For health reasons he had to decline the invitation to participate last summer, but he expressly declared his esteem and appreciation of the Lindau concept of offering young, budding scientists a platform for interchange and for unconstrained encounters with Nobel Laureates.
“A central point seems to me”, he stated, “that the young realise that Nobel Laureates are people like ‘You and I’ and not aloof inhabitants of Olympus, that there is no way around hard work, that life is all about shaping one’s fate rather than resigning oneself to it, that the Nobel Prize should be regarded as a reward for excellent work and not as an objective of one’s scientific efforts, and that having achieved something extraordinary does by no means make you someone special.”

Heinrich Rohrer wanted to share his “Five Wishes for Young Scientists” with the Lindau community.

He died on 16 May 2013 at the age of 79.

HEINRICH ROHRER †
Nobel Laureate in Physics 1986

“Young scientists are the ones who can mend what we old ones did wrong. But we have to help them and encourage them; we have to leave our kingdoms and become their mentors.

***My first wish** is that you keep an unbiased mind and that you control information and knowledge, not vice versa. Being impartial towards your own thoughts is often very tough but always indispensable. You do not create anything new except you venture into new and untouched lands beyond accepted knowledge, skills, abilities, and thinking. You aim at changes, not simply at continuations of what has been done already in one way or another. The first question, therefore, should always be: ‘What would change if I could do it?’ You do not always find a good answer, but without any questions there would be no answers at all. You will then approach the second question of ‘How can I do it?’ with a different state of mind. And only afterwards you turn to questions regarding sustainability, dangers, environmental aspects, ethics, finances, and so on. This is just the temporal sequence, not that of importance per se.*

***My second wish** is that you become proud and courageous scientists. Be proud that you are the key to the prosperity and to the wellbeing of society, more than ever. This is the most precious recognition of your ‘passion for science’ and for your scientific performance and brings you a noble satisfaction which makes broad stage-performer applause redundant. Be courageous to stand up for your convictions, for what you think is worthwhile doing. You have to be your own measure and standard, there are so many others who believe that they know better and can do better what should be done in science—and never do anything tangible.*

***My third wish** is that you have a lucky and skilful hand in selecting research collaborators and research topics. I know that luck is not part of the scientific vocabulary; intellectual mastery, bottomless knowledge, and scientific expertise rank much higher. Nevertheless, luck is a very crucial driver of scientific progress.*

***My fourth wish** is that you live in a relaxed and fruitful symbiosis with society. Society has to trust you as its member. Then it might also trust and appreciate deeper your scientific endeavours and intentions.*

***My final wish** is that you will belong to those scientists who are paid for what they are doing and not to those who do what they are paid for. Then you forge the future with your visions, passion, and devotion and the presence simply fades away.*

Let me leave you with these three beautiful lines from ‘Choruses from the Rock’ by T.S. Eliot:

‘Where is the Life we have lost in Living?
Where is the Wisdom we have lost in Knowledge?
Where is the Knowledge we have lost in Information?’

The five wishes above are simple enough to understand.
I refrain from preaching honesty, virtues, and alike. For those who do not have them, it would be in vain in any case.”

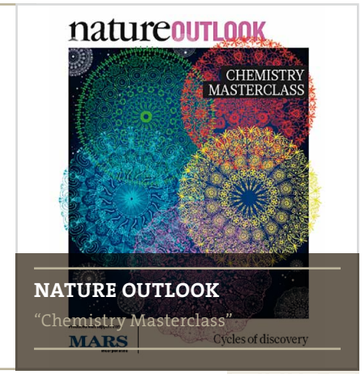
Great Minds Convened

The Participants of the 63rd Lindau Nobel Laureate Meeting

From Stockholm to Lindau

For three of the 34 Nobel Laureates convened in Lindau this year it was the first time to participate—because they had only just been awarded the Nobel Prize roughly half a year earlier.

> *"Brian Kobilka, with his medical background, said he felt like the 'the new kid in the chemistry club' at this summer's Lindau Meeting. But it's likely that every attendee was already familiar with his Nobel prizewinning work on the structure of the G-protein-coupled receptor (GPCR) for the hormone adrenaline. This research has 'revolutionised the hunt for new GPCR-ergic drugs', and has the potential to improve the treatment of many diseases, says Bryan Roth, a structural biologist and molecular pharmacologist at the University of North Carolina in Chapel Hill."*



Nature Outlook "Chemistry Masterclass"

While many of the 34 Nobel Laureates gathered at Lindau in 2013 were making their second, third or umpteenth visit to the annual meeting, Serge Haroche, Brian Kobilka, and David Wineland experienced a premiere: More than 600 young researchers were eagerly anticipating the rare chance to meet, learn from and debate with them, and to be inspired by their stories.

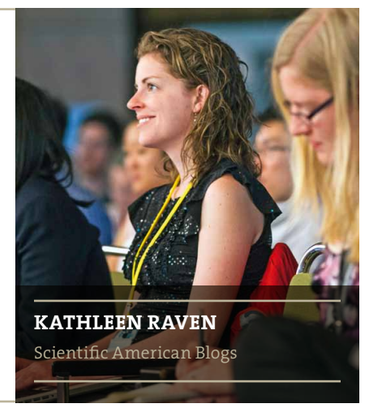
Brian Kobilka gave the opening lecture on G-protein-coupled receptors (GPCRs), which are the targets of around a third of all pharmaceuticals. His work in determining the first GPCR structures is considered to have big implications for future drug development. Understandably enough, Brian Kobilka was among the most sought-after speakers at the meeting—requested by fellow Laureates, young researchers, and journalists alike. But despite being physicists at a meeting dedicated predominantly to chemistry, Serge Haroche and David Wineland were similarly in demand.

Brian Kobilka hosting a discussion session

David Wineland and Serge Haroche as panellists at a science breakfast hosted by the Austrian Federal Ministry for Science and Research (BMWF)

> *"Kobilka is happiest when talking about his science. Unlike many other Laureates at the meeting, his status as the world's newest Nobel Prize winner means that he is still adjusting to the adulation and the publicity, a particularly challenging endeavour for a man who would rather spend his time at the bench looking at crystals."*
> *Lindau Nobel Online Community*

> *"'Quantum theory has opened to us the microscopic world of particles, atoms and photons,' explained Serge Haroche, who shared the 2012 Nobel Prize in Physics with David Wineland. In this sentence, Haroche answered why two physicists certainly belong onstage at a meeting dedicated to chemistry. Haroche's talk 'Controlling Photons in a Box and Exploring the Quantum to Classical Boundary' dovetailed with Wineland's lecture just before on 'Superposition, Entanglement, and Raising Schrödinger's Cat.' ('Though in half an hour, it's very difficult to give you details,' quipped Haroche.)"* *Lindau Nobel Online Community*



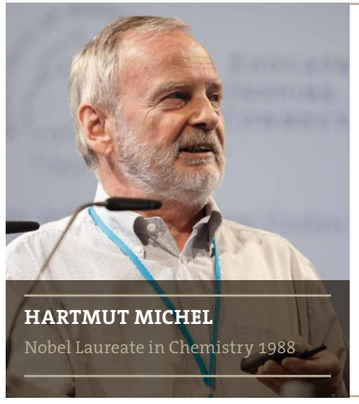
34 Nobel Laureates in Lindau 2013

34 Laureates devoted their precious time to give captivating lectures and engage in inspiring discussions. While the liveliness of the Lindau dialogue comes to the fore in the pictures throughout this report, the Laureates' personality is revealed congenially in Peter Badge's portraits.

During the annual encounters in Lindau the Nobel Laureates are naturally at the centre of attention. At the 63rd Lindau Nobel Laureate Meeting this attention was shared by 34 of the most esteemed scientists of our times who were invited to lecture on a topic of their choice and showcase the wide range of research fields.

The meeting was dedicated to chemistry and the lectures and the related discussions revolved mainly around green chemistry, chemical energy storage and conversion, as well as biochemical processes and structures. However, discussions also centered on chemistry's application in areas such as power supply, pharmaceutical research and sustainable resources. Consequently, the 63rd Lindau Nobel Laureate Meeting had an interdisciplinary character and included 23 Nobel Laureates in Chemistry, six physics Laureates, four Laureates in Physiology or Medicine, and José Ramos-Horta, a Nobel Peace Laureate.

Many Nobel Laureates have reported to consider it both their pleasure and their heartfelt responsibility to engage in the Lindau dialogue, and hence participate regularly in the meetings. Just to name one, Hartmut Michel has participated sixteen times.



HARTMUT MICHEL
Nobel Laureate in Chemistry 1988

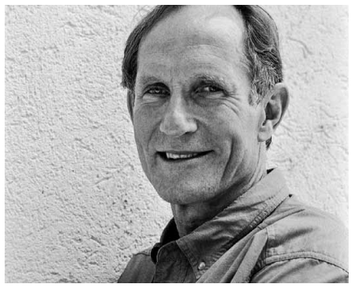
"It is a unique opportunity to meet old friends among the Nobel Laureates and to discuss items of mutual interest. It is the unconstrained atmosphere that distinguishes the Lindau Meetings from common scientific conferences and largely accounts for their appeal—not only to me but to an extensive community of Nobel Laureates who follow the invitation by the organisers year after year."

Official opening picture of the 63rd Lindau Meeting, depicting Countess Bettina Bernadotte together with 18 Nobel Laureates

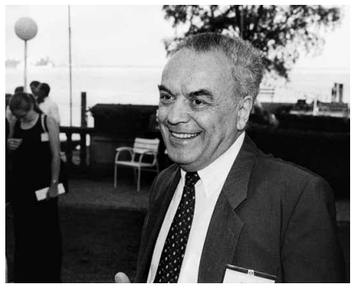
NOBEL LAUREATES IN PORTRAITS

As the following pages illustrate, the German photographer Peter Badge chose to specialise in the classic genre of portraiture for the photo series "NOBELS—Nobel Laureates photographed by Peter Badge". Peter Badge's ambition is to create a comprehensive gallery of unique personal portraits of each and every living Nobel Laureate. What began as a small collection in the year 2000 now encompasses over 350 portraits. His black-and-white portrait photos reveal the personality of the subject and generate recognition for their scientific, literary or humanitarian achievements. Many of the photos were taken at the Lindau Nobel Laureate Meetings, but the project has also taken Badge all around the globe.

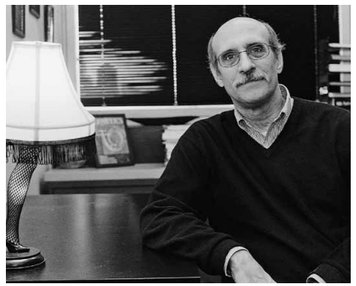
The majority of Badge's photos permanently embellish the foundation's as well as the executive secretariat's offices in Lindau. Badge pursues his project with support from the Lindau Foundation and the Klaus Tschira Stiftung.



Peter Agre
(Chemistry, 2003)

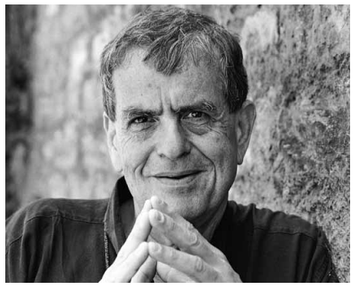


Werner Arber
(Physiology/Medicine, 1978)

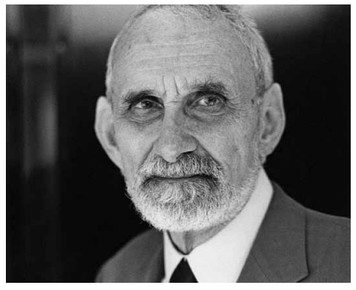


Martin Chalfie
(Chemistry, 2008)

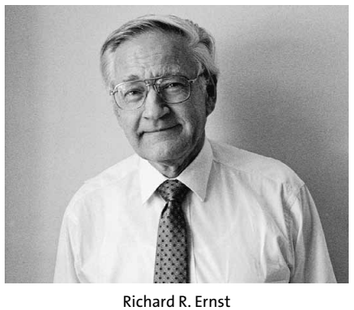
Steven Chu
(Physics, 1997)



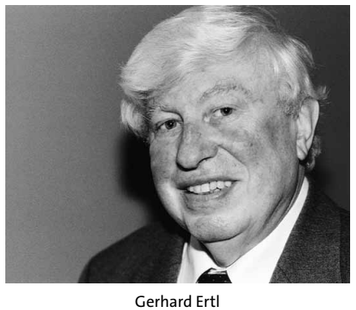
Aaron Ciechanover
(Chemistry, 2004)



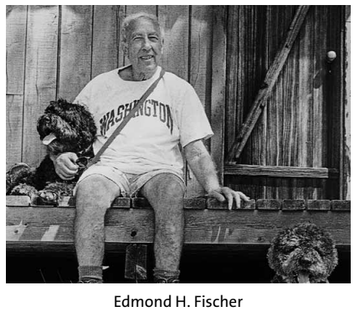
Robert F. Curl Jr.
(Chemistry, 1996)



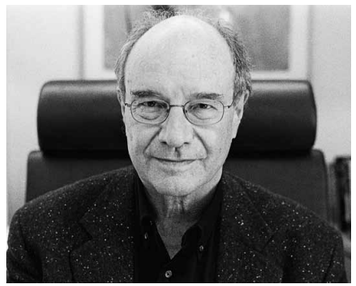
Richard R. Ernst
(Chemistry, 1991)



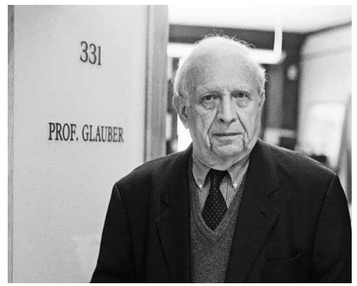
Gerhard Ertl
(Chemistry, 2007)



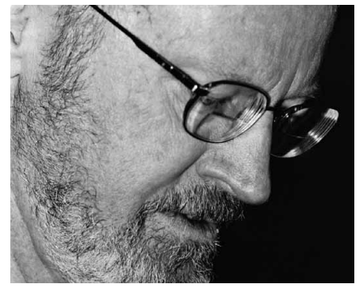
Edmond H. Fischer
(Physiology/Medicine, 1992)



Walter Gilbert
(Chemistry, 1980)

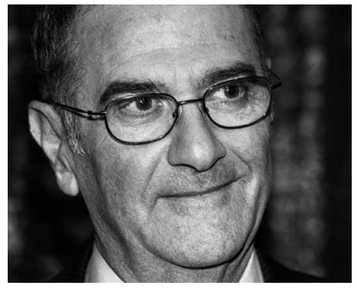


Roy J. Glauber
(Physics, 2005)



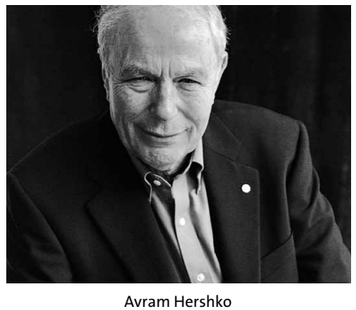
Robert H. Grubbs
(Chemistry, 2005)

Theodor W. Hänsch
(Physics, 2005)

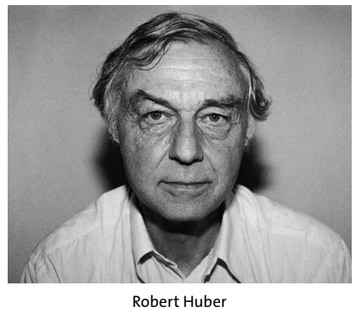


Serge Haroche
(Physics, 2012)

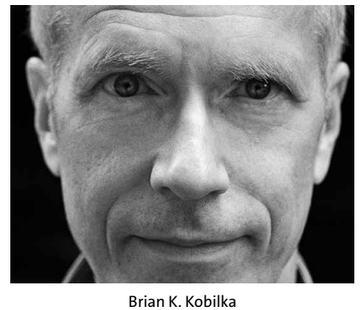
Harald zur Hausen
(Physiology/Medicine, 2008)



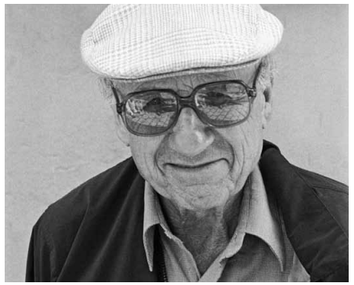
Avram Hershko
(Chemistry, 2004)



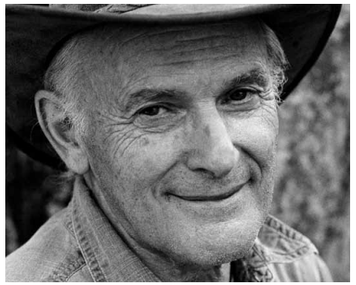
Robert Huber
(Chemistry, 1988)



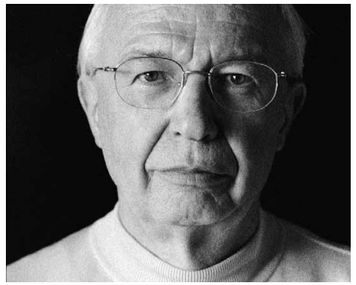
Brian K. Kobilka
(Chemistry, 2012)



Walter Kohn
(Chemistry, 1998)

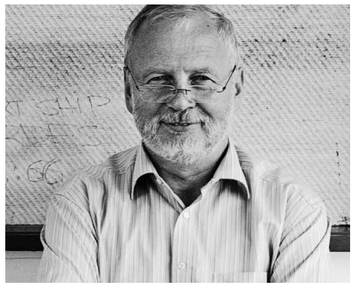


Sir Harold W. Kroto
(Chemistry, 1996)

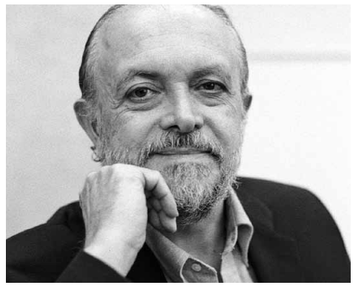


Jean-Marie Lehn
(Chemistry, 1987)

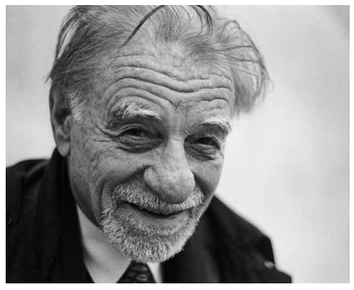
Rudolph A. Marcus
(Chemistry, 1992)



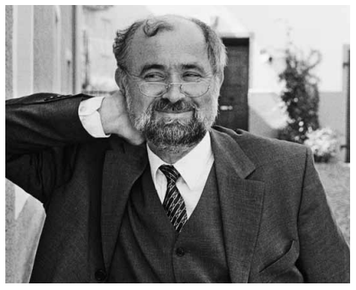
Hartmut Michel
(Chemistry, 1988)



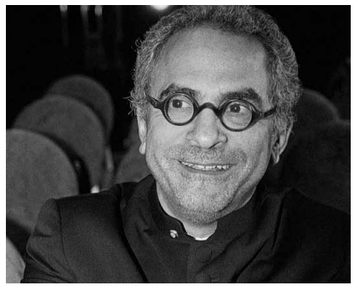
Mario J. Molina
(Chemistry, 1995)



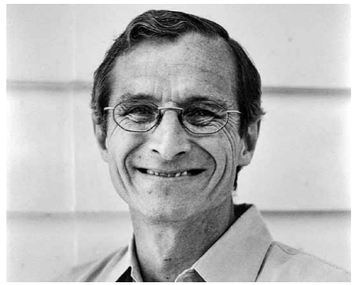
K. Alex Müller
(Physics, 1987)



Erwin Neher
(Physiology/Medicine, 1991)

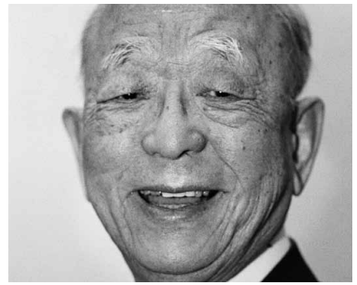


José Ramos-Horta
(Peace, 1996)

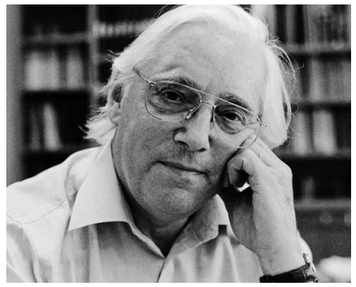


Richard R. Schrock
(Chemistry, 2005)

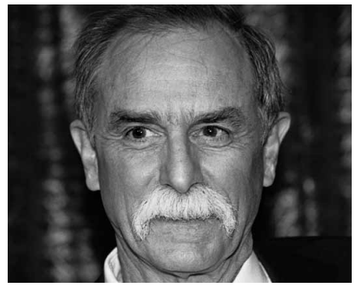
Dan Shechtman
(Chemistry, 2011)



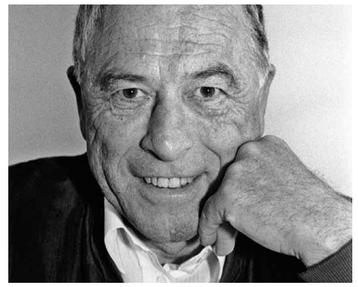
Akira Suzuki
(Chemistry, 2010)



Sir John E. Walker
(Chemistry, 1997)



David J. Wineland
(Physics, 2012)



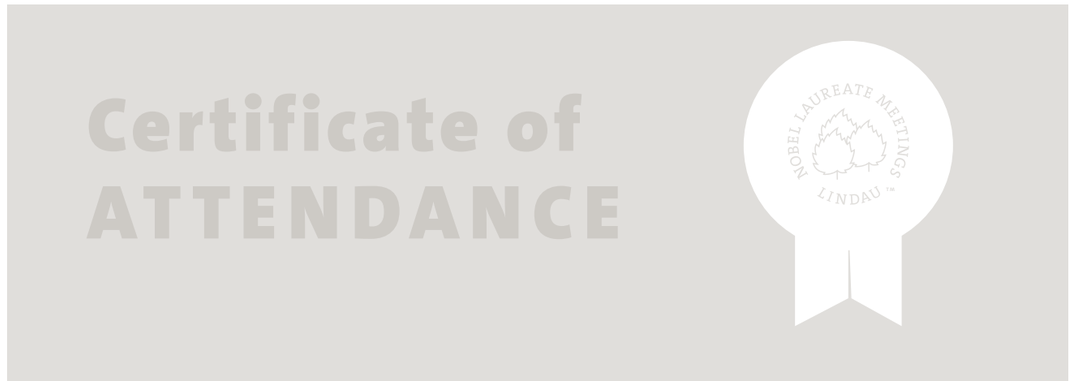
Kurt Wüthrich
(Chemistry, 2002)

Ada E. Yonath
(Chemistry, 2009)

Dialogue Across Borders

In total, 625 young researchers from 77 countries participated in the 63rd Lindau Nobel Laureate Meeting, making it one of the most international Lindau Meetings ever. The gender balance reached a remarkably high ratio of 42% female to 58% male.

Afghanistan • Argentina • Armenia • Australia
Austria • Bangladesh • Belarus • Belgium • Brazil
Bulgaria • Cameroon • Canada • China • Chile
Croatia • Cyprus • Czech Republic • Denmark
Egypt • Estonia • Finland • France • Gambia
Germany • Ghana • Greece • Hong Kong • Hungary
India • Indonesia • Iran • Ireland • Israel • Italy
Jamaica • Japan • Kazakhstan • Kenya
Korea • Latvia • Liechtenstein • Lithuania
Luxembourg • Malaysia • Malta • Mauritius
Mexico • Mongolia • Morocco • Nepal
Netherlands • New Zealand • Nigeria • Pakistan
Philippines • Poland • Portugal • Romania
Russian Federation • Singapore • Slovenia
South Africa • Spain • Swaziland • Sweden
Switzerland • Syria • Taiwan • Thailand
Timor-Leste • Turkey • Ukraine • United Kingdom
United States • Uruguay • Uzbekistan • Vietnam



The Next Generation of Leading Scientists

The 63rd Lindau Nobel Laureate Meeting was once again a hotspot for cross-generational dialogues between scientists—a forum where science serves as a common language for the discussion of issues of global significance beyond nationalities, gender, religions and cultures.

The 625 young researchers participating in the 63rd Lindau Meeting managed to pass the multi-step selection process, thus representing the budding scientific elite of tomorrow: enthusiastic men and women under the age of 35 and engaged in undergraduate, graduate or postgraduate studies or research at esteemed universities and top-ranking research institutions around the world.

The participants were initially nominated as eligible candidates by a global network of academic partners of the Lindau Meetings. As the first step, young researchers submitted their application to one of these partners. Based on the selection criteria formulated by the Lindau Council, the academic partners carried out a preliminary evaluation, which was then forwarded to the review panel of the council.

The evaluation process of all applications is based on marks or appraisals, scientific publications, tutorial experience, and recommendations by mentors. The chairmen of the Lindau Council's review panel for the 2013 Lindau Meeting were Professors Rainer Blatt, Burkhard Fricke, and Wolfgang Lubitz.

In the end, the selected participants stood out due to their strong motivation to join and engage in the Lindau dialogue and a credible interest in the scientific topics scheduled.

RAINER BLATT
Lindau Council

"Over the years, the scientific standard has increased significantly, an impression also reflected by the Nobel Laureates. However, the atmosphere has remained the same. When the participants arrive here, they are surprised because Lindau does not appear to be a city hosting an international conference at first sight. But, in fact, this is what we want: an informal atmosphere. Moreover, the Nobel Laureates are always around. They don't sit at separate tables at dinner but right among the young participants. Everybody can always approach them, be it for private or scientific conversations."

Interview with Deutsche Welle

MAX SCHWILK
PhD student from Germany

"I enjoyed the spirit of open-minded conversations and cultural diversity that was omnipresent. The speakers, as masters of their discipline, were great in transmitting the important concepts of their branch of science, and more importantly, gave insight into their personal life: how it is to be devoted to science, under which circumstances they had brilliant ideas or made ground-breaking observations, leading to great scientific achievements. A great motivation to continue to live my scientific passion, a lot of very inspiring and important conversations and certainly some contacts for collaborations in the future—this is what I took home from this meeting. All this made it a very special and unforgettable event for me."

Lindau Nobel Online Community

SABINE HAUERT
Post-doc from Switzerland

"Although the discipline of this year's Lindau Nobel Laureate Meeting was chemistry, the talks transcended boundaries. They featured quantum computing, personalised medicine, cell biology and even Tibetan art. The Laureates, who I imagined as super-specialists, urged us young researchers to expand our horizons, to work across disciplines to tackle challenges in climate change or medicine, and persevere against all odds. I'm not a chemist, and it doesn't seem to matter. Through listening and mingling at talks and dinners in Lindau, I've learned that many parallels exist across disciplines, and this untapped territory is making me tingle. Many seeds were planted this week, cross-disciplinary ideas that will require time and frontier funding to grow."

Lindau Nobel Online Community

A Diverse Community—Young Researchers in Focus

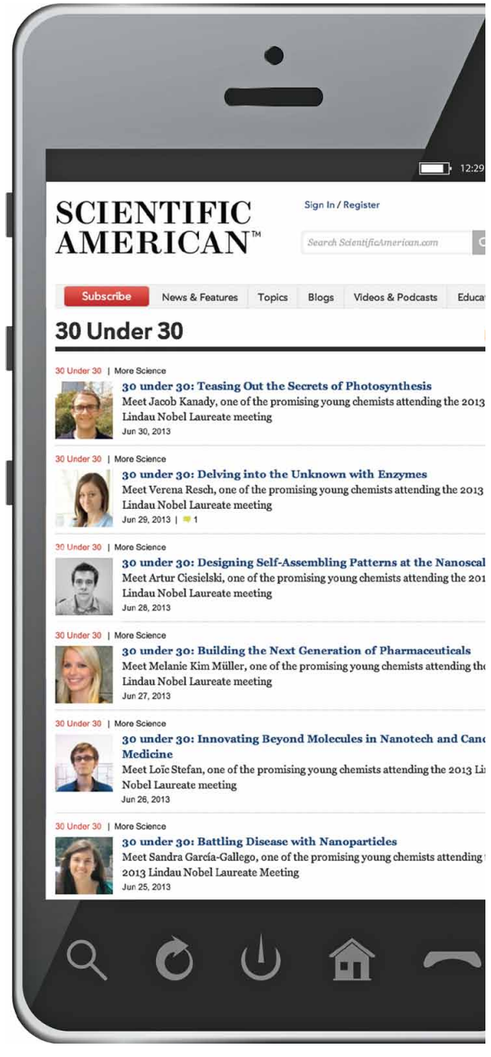
Two projects in the context of the 63rd Lindau Meeting exemplarily illustrate the diversity of the young participants: With its feature "30 under 30" Scientific American introduced the future generation of chemists, whereas video blogs allowed the participants to depict their meeting week.

"30 UNDER 30"

In anticipation of the 63rd Lindau Meeting, the prestigeous science magazine Scientific American prominently featured a group of 30 attendees under 30 years of age who represent the future of chemistry. They were each introduced with an individual profile that provides first-hand information on their research interests, their expectations, their role models and their view of chemistry, now and in the future. The first edition of "30 under 30" in 2012 had already been a vigorous account of the diversity of participants in the Lindau Meetings. With different public outreach programmes the magazine, as part of Nature Publishing Group, has made a vital contribution to Lindau's Mission Education for several years now.

In 2013, the participants were confronted with the following questions:

- What is your field of research?
- What drew you to chemistry, and to that research area in particular?
- Where do you see yourself in 10 years?
- What is your dream study or experiment? If you had unlimited resources, what kind of research would you conduct?
- What do you find most interesting in your field?
- Who are your scientific heroes?
- What activities outside of chemistry do you most enjoy?
- What do you hope to gain from this year's Lindau meeting?
- Are there any Nobelists whom you are particularly excited to meet?



CHRISTINE LE
PhD student from Canada

What is your dream study or experiment? If you had unlimited resources, what kind of research would you conduct?

"I would like to develop an efficient and site-selective method for the late-stage modification of a wide range of complex, druglike molecules. This would allow the facile (and potentially automated) synthesis of a library of molecules, which can be screened for biological activity in the hopes of discovering life-saving therapeutics."

"30 under 30", Scientific American

VIDEO BLOGGERS

During the Lindau Meeting week, four young researchers were equipped with cameras to each produce a short video for the official blog. They each focused on a different topic to share their personal impressions of the meeting. The resulting videos—available in the Lindau meetings' YouTube channel—are as diverse as the young researchers who volunteered for the project. Since the idea of featuring amateur videos in the meeting blog first came up in 2010, 52 videos by 24 young researchers have been produced.

Altogether, they have generated more than 21,000 hits on YouTube. As in previous years, the videos were designed, edited and produced by media consultant Eric May, together with media technician Matthias Schöbe, who both coached and accompanied the bloggers during the shooting.

The following five pieces were produced in 2013:

- "What do you expect from Lindau" (a short introduction to the four bloggers and a preview of the week ahead)
- "Facing Challenges and Inspiring Others" (Sarika Goel, India)
- "Spirit of Diversity" (Crystal Valdez, USA)
- "Connect!" (Edson Medeiros Filho, Brazil)
- "Learning from the Laureates" (Núria Sancho Oltra, Spain)

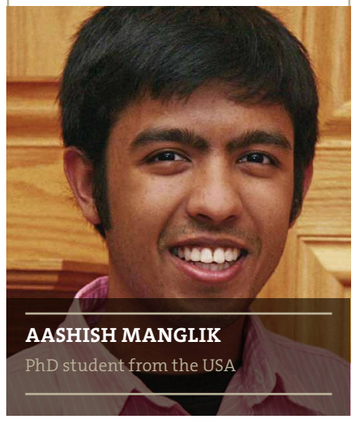
The 2013 video bloggers in the introductory video: Edson Filho, Núria Sancho Oltra, Sarika Goel, Crystal Valdez

"What do you expect from Lindau?"

What drew you to chemistry, and to that research area in particular?

"I am drawn to chemistry, and biochemistry in particular, in order to understand the complexity of biological processes in a reductionist manner. I was particularly attracted to the GPCR field because better biochemical understanding of these proteins has direct consequences for human health and disease."

"30 under 30", Scientific American



AASHISH MANGLIK
PhD student from the USA

NÚRIA SANCHO OLTRA
Post-doc from Spain

"Learning is everywhere here in Lindau. But what do we learn from each other? Do the Nobel Laureates also learn from us? How will this learning experience influence our scientific career in the future?"

The Right Chemistry

The Programme of the 63rd Lindau Nobel Laureate Meeting

The Scientific Programme

What is characteristic about the programme of the Lindau Meetings is the combination of didactic and discursive sessions, designed to activate the exchange of knowledge, ideas, thoughts, and experience throughout the meeting week.

LECTURES

Tuesday, 2 July, 11:00, Ada E. Yonath: *Curiosity and its Fruits: From Basic Science to Advanced Medicine*

The lectures held at the Lindau Meetings are not only educative, but highly inspirational, motivating, and memorable. No less than Nobel Laureates take centre stage to address current research findings, to elaborate on their own historical achievements, or to raise awareness of fundamentally important issues.

DISCUSSIONS

Tuesday, 2 July, 15:00, Robert H. Grubbs

At the Lindau Meetings, each speaker also chairs a discussion session—accessible exclusively to the young meeting participants. The intimacy, informality, and frankness that mould the atmosphere of these discussions allows for personal questionings, controversial reflections and in-depth specialist analyses.

MASTER CLASSES

Monday, 1 July, 17:00, Aaron Ciechanover: *New Frontiers in Deciphering Mechanisms of Diseases and in Drug Development*

The Lindau master classes are rooted on the principles of mentoring and mutual learning. At each meeting, a select group of participants is given the coveted opportunity to present their current research work to a Nobel Laureate in order to receive invaluable feedback and advice. The subsequent discussions, involving the audience, are marked by a high level of professionalism and specialisation.

PANEL DISCUSSIONS

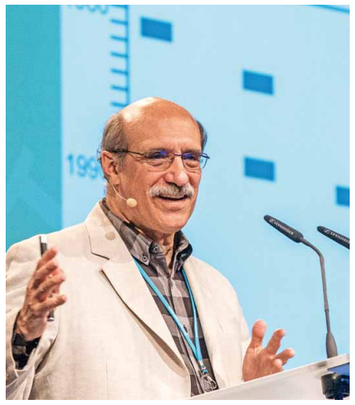
Wednesday, 3 July, 15:00, *Chemical Energy Conversion & Storage*

High-profile panel discussions embracing topical and meaningful issues are an integral component of the Lindau Meetings. With Nobel Prize-bestowed experts engaging actively in the debates, these panels provide the floor with a profound survey of the state of affairs in challenging fields of research.

SCIENCE BREAKFASTS

Tuesday, 2 July, 7:00, *How Can Science Drive Solutions That Better Use the Planet's Resources?*, upon invitation of Mars, Incorporated

Hosting a science breakfast is a splendid opportunity for partner institutions or supporters to complement the official programme of the Lindau Meetings. An inspiring topic, an animating presentation format, and of course a rich breakfast are particularly suited for an intellectually stimulating start into the day.



Lecture by Martin Chalfie

Peter Agre
Aquaporin Water Channels: From Atomic Structure to Malaria

Werner Arber
Cultural Values of Scientific Knowledge

Martin Chalfie
Tickling Worms: Surprises From Basic Research

Steven Chu
The Energy and Climate Change Challenges and Opportunities

Aaron Ciechanover
Drug Development in the 21st Century—Are We Going to Cure All Diseases?

Robert F. Curl Jr.
The Chemistry of Elemental Carbon

Richard R. Ernst
Widen Your Scope by Extracurricular Activities: My Example

Gerhard Ertl
Catalysis at Surfaces: From Atoms to Complexity

Robert H. Grubbs
Green Chemistry and Catalysis

Theodor W. Hänsch
What Can We Do With Laser Frequency Combs?

Serge Haroche
Controlling Photons in a Box and Exploring the Quantum to Classical Boundary

Avram Hershko
The Ubiquitin System

Robert Huber
Proteases and Their Control in Health and Disease

Brian K. Kobilka
G-Protein-Coupled Receptors: Challenges for Drug Discovery

Walter Kohn
Macular Distortion—Diagnosis and Correction

Harold W. Kroto
Four Horsemen of the 21st Century Apocalypse

Jean-Marie Lehn
Perspectives in Chemistry—Towards Adaptive Chemistry

Rudolph A. Marcus
Single Molecule Studies of Initial Steps in Dye Sensitized Solar Cells and of Quantum Dots—Examples of Electron Transfer and Relation to Ensemble Studies

Hartmut Michel
Structure and Mechanism of Otto Warburg's Respiratory Enzyme, the Cytochrome c Oxidase

Mario J. Molina
Communicating Climate Change Science

K. Alex Müller
Novel Synthesis for Ceramics: Superconductors, Magnets and Others

Erwin Neher
Chemistry Helps Biology: Fluorescent Labels and Caged Compounds

Richard R. Schrock
Advances in Olefin Metathesis Employing Molybdenum and Tungsten Catalysts

Dan Shechtman
Quasi-Periodic Materials—Crystal Redefined

Akira Suzuki
Cross-Coupling Reactions of Organoboranes: An Easy Way for Carbon-Carbon Bonding

John E. Walker
The Fuel of Life

David J. Wineland
Superposition, Entanglement, and Raising Schrödinger's Cat

Kurt Wüthrich
Conformational Plasticity of G-Protein-Coupled Receptors (GPCRs) Studied by NMR in Solutions

Ada E. Yonath
Curiosity and its Fruits: From Basic Science to Advanced Medicine

Master Class chaired by Kurt Wüthrich

New Frontiers in Deciphering Mechanisms of Diseases and in Drug Development
chaired by Aaron Ciechanover
Lecturers:
Nathalie Busschaert, *University of Southampton*

Mahmoud El-Sabahy, *Assiut University*

Francesca Re, *University of Milano-Bicocca*

Anke Roth, *Yale University*

Magnetic Resonance in Chemistry, Structural Biology and Medical Diagnosis
chaired by Kurt Wüthrich
Lecturers:
Axel Abelein, *Stockholm University*

Cristina Airoldi, *University of Milano-Bicocca*

Irene Marco-Rius, *University of Cambridge*

Mirco Zerbetto, *University of Padova*

The Power of Transmission Electron Microscopy (TEM)
chaired by Dan Shechtman
Lecturers:
Evelyn Auyeung, *Northwestern University*

Lindsay Baker, *Utrecht University*

Thomas Lunkenbein, *Fritz Haber Institute of the Max Planck Society*

Julia Mahamid, *Max Planck Institute of Biochemistry*

Mehtap Özaslan, *Paul Scherrer Institute*

Gunnar Stålsett and José Ramos-Horta

Challenges to Peace and Justice in the 21st Century
Panellists:
José Ramos-Horta, *Former President of the Republic of Timor-Leste, Nobel Laureate (Peace, 1996)*

Gunnar Stålsett, *Bishop emeritus of Oslo, Member of the Nobel Peace Prize Committee*

Moderator:
Fred Guterl, *Executive Editor, Scientific American*

Panel Discussion "Why Communicate?"

Science Breakfast "Quantum Information Processing"

Chemical Energy Conversion & Storage
Panellists:
Gerhard Ertl, *Department of Physical Chemistry, Fritz Haber Institute of the Max Planck Society*

Robert H. Grubbs, *Division of Chemistry and Chemical Engineering, California Institute of Technology*

Walter Kohn, *Department of Physics, University of California at Santa Barbara*

Hartmut Michel, *Department of Molecular Membrane Biology, Director Max Planck Institute of Biophysics*

Richard R. Schrock, *Department of Chemistry, Massachusetts Institute of Technology (MIT)*
Moderators:
Astrid Gräslund, *Professor of Biophysics, Department of Biochemistry and Biophysics, Stockholm University*

Wolfgang Lubitz, *Director, Max Planck Institute for Chemical Energy Conversion*

Green Chemistry
Panellists:
Michael Braungart, *Founder and Scientific Director, EPEA Internationale Umweltforschung GmbH*

Steven Chu, *Physics Department, Stanford University*

Mario J. Molina, *Centro Mario Molina para Estudios Estratégicos sobre Energía y Medio Ambiente A.C.*

Moderator:
Fred Guterl, *Executive Editor, Scientific American*

Why Communicate?
Panellists:
Simon Engelke, *Founder of Storage4, Maastricht University*

Brian K. Kobilka, *Department of Molecular and Cellular Physiology, Stanford University*

Harold W. Kroto, *Department of Chemistry and Biochemistry, The Florida State University*

Beatrice Lugger, *Deputy Scientific Director, National Institute for Science Communication*

Ada E. Yonath, *Department of Structural Biology, Weizmann Institute of Sciences*

Moderator:
Adam Smith, *Editorial Director, Nobel Media AB*

How Does Surface Science Contribute to Solve Global Energy and Environmental Issues?
upon invitation of the Republic of Korea
Panellists:
Gerhard Ertl, *Department of Physical Chemistry, Fritz Haber Institute of the Max Planck Society*

Kyungtae Kang, *Post-doc, Department of Chemistry, Korea Advanced Institute of Science and Technology (KAIST)*

Jeong Young Park, *Group Leader, Center for Nanomaterials and Chemical Reactions, Institute for Basic Science (IBS), Associate Professor, EEWS Graduate School, Korea Advanced Institute of Science and Technology (KAIST)*

Moderator:
Seung Bum Park, *Professor, Department of Chemistry, Seoul National University*

How Can Science Drive Solutions That Better Use the Planet's Resources?
upon invitation of Mars, Incorporated
Panellists:
Steven Chu, *Physics Department, Stanford University*

Howard-Yana Shapiro, *Chief Agricultural Officer, Mars, Incorporated; Senior Fellow in Plant Sciences, University of California, Davis*

Christina Heroven, *Free University Berlin*

Moderator:
Adam Smith, *Editorial Director, Nobel Media AB*

Quantum Information Processing—Where Do We Stand And Where Do We go?
upon invitation of the Austrian Federal Ministry of Science and Research
Panellists:
Serge Haroche, *Collège de France, Ecole Normale Supérieure*

David J. Wineland, *Physical Measurement Laboratory, The National Institute of Standards and Technology (NIST)*

Introduction & Moderator:
Rainer Blatt, *Institute of Experimental Physics, University of Innsbruck*

It Is All About Chemistry. How We Tackle the Energy Challenges of the Future!
upon invitation of BASF SE and Chemical Industry Fund
Panellists:
Hartmut Michel, *Department of Molecular Membrane Biology, Director Max Planck Institute of Biophysics*

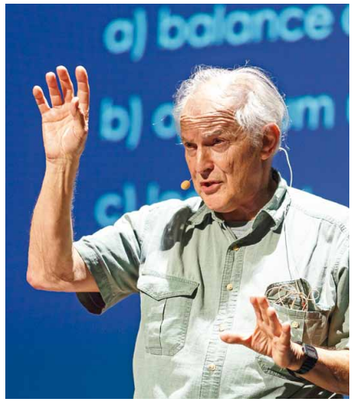
Mario J. Molina, *Centro Mario Molina para Estudios Estratégicos sobre Energía y Medio Ambiente A.C.*

Richard R. Schrock, *Department of Chemistry, Massachusetts Institute of Technology (MIT)*

Carla Seidel, *Vice President, E-Power-Management, BASF New Business GmbH*

Thomas Weber, *Senior Vice President, Science Relations and Innovation Management, BASF*

Moderator:
Julian Geuder, *bridging positions*



Harold W. Kroto
Presentation Skills

Opportunities for Research Excellence in Europe—the Pillar of Horizon 2020
Welcome Address:
Prof. Helga Nowotny, *President European Research Council*

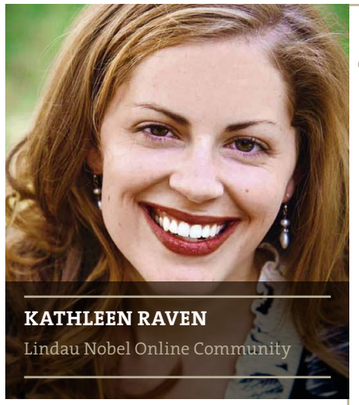
Moderator:
Mike W. Rogers, *DG Education & Culture, European Commission*

Focus of Interest

The concept of "Green Chemistry", biochemical processes and structures, and the generation, conversion and storage of chemical energy were the main topics on the agenda of the 63rd Lindau Nobel Laureate Meeting—and just what the majority of participants were keen to discuss.

FULL OF ENERGY

The 63rd Lindau Meeting could well have been called an energy summit of a very special kind because the generation, conversion and storage of chemical energy—one of the most important fields of research in chemistry—were addressed in great detail, especially at the same-titled panel discussion.



KATHLEEN RAVEN
Lindau Nobel Online Community

"The holy grail of energy storage may lie in chemical bonds, but a process for making this happen remains unknown. All of the Nobel Laureates who weighed in on the chemical energy conversion panel agreed on this much. 'The replacement of liquid fossil fuels is still in far reach,' said moderator Wolfgang Lubitz, director of the Max Planck Institute for Chemical Energy Conversion, and Co-Scientific Chair of the Lindau Meeting. From there, the panellists focused on the major questions relating to solar power, endothermic reactions, rare metals, the ever-controversial nuclear energy and another ice age.

Gerhard Ertl (Nobel Prize in Chemistry 2007) told the audience that nuclear fusion stood as the en vogue future energy source when he was studying in graduate school. 'We are still waiting for solutions,' he said. In a similar way, solar energy holds great promise, but the storage problem remains unsolved. Hartmut Michel (Nobel Prize in Chemistry 1988), the photosynthesis expert of the group, reminded that even nature struggled to get the most out of photosynthesis. 'In photosynthesis, only 40 percent of the sunlight—energy-wise—is absorbed by the plants,' he said. Therefore, the chemists onstage at the 63rd Lindau Nobel Laureate Meeting exhorted young researchers to search for a brand-new catalytic conversion process that could solve the sunshine enigma.

Richard Schrock (Nobel Prize in Chemistry 2005) reminded everyone that whatever the next energy source revolution is, it will most likely still rely on endothermic reactions. 'Nearly all conversion processes require energy,' he said. Even with ideas such as carbon dioxide conversion, 'it's a zero-sum game to talk about converting it catalytically or storing it.' He apologised for sounding pessimistic, but wanted to be sure the researchers in the audience felt the gravity of the situation.

A young researcher wanted the Nobel Laureates to answer this question: 'What happens when we run out of a rare metal like lithium used in batteries?' Schrock was quick to point out that 'we don't run out of elements, but we run out of concentrated forms of them—they are neither created nor destroyed.' Robert Grubbs (Nobel Prize in Chemistry 2005) pointed out that researchers have already begun looking at non-rare metals as potential energy sources, too. The consensus seemed to be that humans will use whatever source is most plentiful and easiest to extract before moving on to alternatives. 'Fortunately, a lot of these problems have to do with inorganic chemistry,' said Schrock, looking out over the audience. 'So, go to it!'

No open discussion of energy sources can completely avoid the nuclear question. So eventually the question sneaked into the dialogue. 'The problem is with nuclear waste—not the energy,' Ertl injected. Schrock acknowledged that while nuclear energy is no longer an option due to political forces in Germany, 'nearly 75 percent of France runs on nuclear energy, and I think that's a little-known fact.' As the discussion focused more on politics, Astrid Gräslund, professor of biophysics at Stockholm University and Co-Scientific Chair of the Lindau Meeting, picked up her microphone.

'One has to consider that this is the situation now,' she said. She explained that politics and public opinion are constantly in flux and that these changes should not influence science per se.

As the panel drew to a close, a young researcher in the first row stood up and gave a proposition. He offered, 'Won't this discussion seem a bit strange, if we think 1,000 years into the future, when we will most likely be depending exclusively on renewable energy?' The Laureates exchanged a few glances. Michel spoke first. He pointed out that some research has hinted that the next ice age on Earth may occur in the not-so-distant future. 'So Berlin may be covered with ice and we won't even be able to think about this because we'll be under ice,' he said, with a half-smile. 'How long will it last?' Schrock asked his colleague. 'About 80 to 90,000 years, maybe,' Michel answered. 'Oh, good, problem solved,' said Schrock."

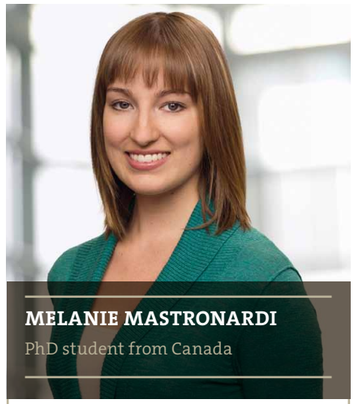
Panel Discussion "Chemical Energy Conversion & Storage"

GIVING GREEN CHEMISTRY A HAND

Sustainability is not just another buzzword for the research chemists of today. Indeed many make an effort to conduct their work with the desire in mind to make a contribution towards sustainable development. Hence, the meeting participants showed great interest in the lectures and discussions tackling the concept of "Green Chemistry".

In the early 1990s, American chemists Paul Anastas and John C. Warner began formulating a concept of "Green Chemistry". The twelve principles of their concept are geared toward making chemical production as resource-sparing, energy-efficient and environmentally-compatible as possible. The aim is to avoid harmful raw materials and end products, to reduce waste and to minimise accident risks. The use of catalysts is of immense importance here. They effectively hasten chemical reactions that would otherwise take much too long: reactions are accelerated and less energy is needed. That's why chemistry is all but inconceivable without catalysts in the modern era.

Panel Discussion "Green Chemistry"



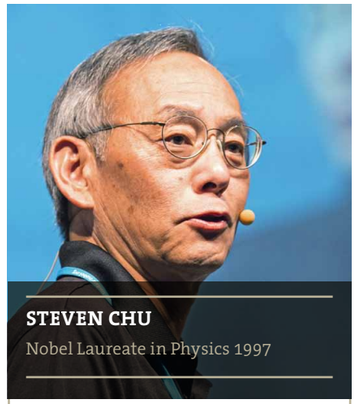
MELANIE MASTRONARDI
PhD student from Canada

"As a researcher, I have serious concerns about how chemical research affects the environment. While there have been significant advancements in incorporating the principles of green chemistry into many industries, resulting in the development of safer and more sustainable practices, such advancements seem to be progressing at a much slower rate in academia. I feel it is vitally important for the chemistry community to become more environmentally responsible, and along with trying to raise awareness about green chemistry practices, I strive to reflect this ideal in my own research."

Robert Grubbs gave a lecture on "Green Chemistry and Catalysis"

In his lecture on "Green Chemistry and Catalysis" at the 63rd Lindau Nobel Laureate Meeting, Robert Grubbs highlighted the significance of catalysts for the transition to a bio-based economy.

The panel discussion on "Green Chemistry" took place on Mainau Island, the very place where the "Green Charter of Mainau" was signed in 1961. This was one of the very first sustainability initiatives and came about at the instigation of Count Lennart Bernadotte, co-founder of the Lindau Meetings. The concept of sustainability has taken on increasing significance at the Lindau Meetings themselves, as debates on the influence and the responsibility of the scientific community extend beyond the circle of meeting participants and into society at large.



STEVEN CHU
Nobel Laureate in Physics 1997

"If 1.5 billion Indians and 1.5 billion Chinese wish to consume what America consumes, that would be unsustainable! But we do need to address issues of hunger and poverty, especially malnutrition among children. We need to change our agricultural practices; reduce carbon emissions and ocean acidification—and look to new ways of doing business. We need another green revolution but without the drawbacks of fertilisers and pesticides. High nutrition is important and to achieve that, we could explore safe GM food, both for human consumption and livestock feed. My dream is to make renewables more affordable." The Times of India, 9 July 2013

EVA PACIOK
PhD student from Germany

"With a rapidly growing world population, it is increasingly difficult to support our numbers. Therefore, the development of efficient & sustainable "green" processes and infrastructures becomes essential to the survival of nature and mankind. In chemistry, the advent of microfluidics has caused a paradigm shift by showing that efficiency & sustainability lie in scaling-down, not scaling-up. My work is aimed at revealing and understanding (sub-)microscopic processes to apply the lesson learned from microfluidics to other aspects of human life, and thus to pave the way into a greener tomorrow."

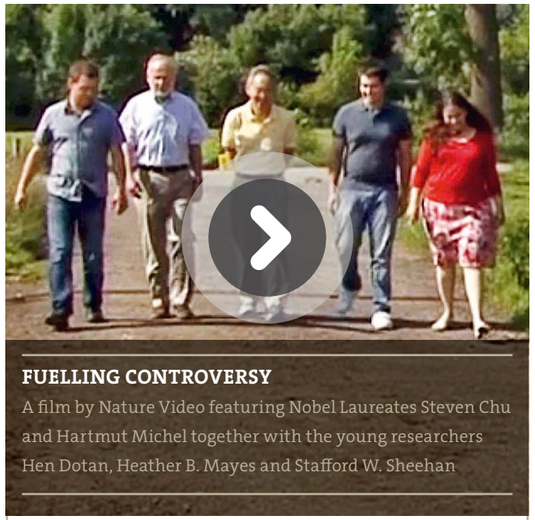
“Better Living Through Chemistry”

How can chemistry help us to solve the world’s pressing problems? Lively and controversial debates between young researchers and Nobel Laureates revolving around this question were filmed by Nature Video, reflecting the main topics of the 63rd Lindau Meeting.

Are biofuels a solution to the world’s energy thirst? What can we do when running out of rare metals? To what extent can nature help us develop new drugs? In the 2013 Nature Video series “Better living through chemistry” Laureates and students clash over the future of energy production, grapple with drug development and discuss dwindling supplies of metal catalysts. The viewer witnesses the eager researchers coming to the debates with big ideas and high hopes, while the Laureates bring a healthy dose of experience.

Since 2008, Nature Video has been dealing with the key debates of the Lindau Meetings by capturing the interaction between Nobel Laureates and young researchers. Thanks to the long-term support of Mars, Incorporated, this unique project now comprises more than 25 educational films covering a wide range of scientific issues. All films can be viewed online.

www.nature.com/lindau



FUELLING CONTROVERSY

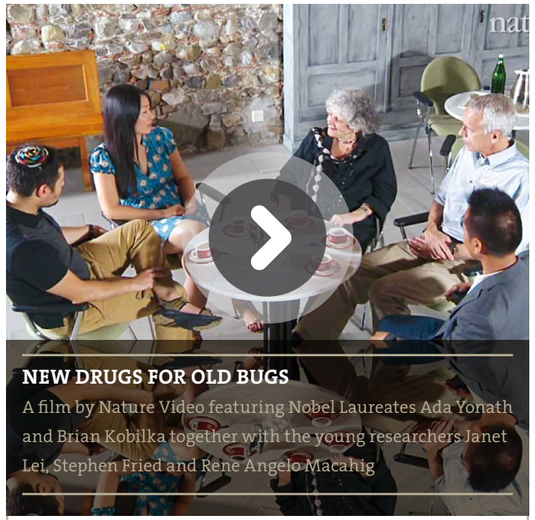
A film by Nature Video featuring Nobel Laureates Steven Chu and Hartmut Michel together with the young researchers Hen Dotan, Heather B. Mayes and Stafford W. Sheehan

“We are facing a global energy crisis, and scientists are charged with finding alternatives to fossil fuels. In this film, Nobel Laureates Steven Chu and Hartmut Michel visit a farm with three young researchers to consider our energy future. They ask whether biofuels can power the planet and, if not, what are the alternatives? The researchers are full of optimism but Chu, former US Secretary of Energy, brings them back down to earth with the harsh reality of economics, while Michel envisions a future powered by clean electricity.”

INDUSTRY’S RARE RESOURCES

A film by Nature Video featuring Nobel Laureates Gerhard Ertl and Robert Grubbs together with the young researchers Candy Hwang, Cameron Moore and Anna Schuppert

“Almost all industrial processes rely on catalysts, which increase the rate of chemical reactions. Many catalysts are made from rare metals—and the young researchers in this film are worried about them running out. They put the problem to Nobel Laureates Robert Grubbs and Gerhard Ertl. The group discusses how dwindling supplies of rare metals could affect industry, energy production and society. But the Laureates raise a more fundamental problem: in many cases, we don’t fully understand how catalysts actually work.”



NEW DRUGS FOR OLD BUGS

A film by Nature Video featuring Nobel Laureates Ada Yonath and Brian Kobilka together with the young researchers Janet Lei, Stephen Fried and Rene Angelo Macahig

“We should all be worried by the growing number of antibiotic-resistant bacteria and we urgently need to develop new drugs, says Ada Yonath. She and Brian Kobilka won Nobel Prizes for using x-ray crystallography to understand cell structures that are vital targets for drug development. In this film, three researchers challenge the structural approach and propose alternative ways to find drugs; some cutting edge, such as computation, and some ancient, such as searching for chemicals deep in the rain forest. What is the best way forward? Or is a combination of techniques the most promising approach?”

The Social Programme

In the Lindau leitmotif, “Educate” and “Inspire” are not without reason on a par with “Connect”. After all, the numerous opportunities for interpersonal encounters play a key role in the Lindau Meetings—and distinguish them from common scientific conferences aimed at mere knowledge transfer.

OPENING CEREMONY

Welcome Adresses

Countess Bettina Bernadotte
President of the Council

Johanna Wanka
Federal Minister of Education and Research (Germany)

Induction of New Members to the Honorary Senate of the Foundation

Wolfgang Schürer
Chairman of the Board of the Foundation

Gunnar Stålsett
Bishop emeritus of Oslo, Member of the Nobel Peace Prize Committee

Marcus Storch
Chairman of the Nobel Foundation 2005–2013

Klaus Tschira
Founder and Chairman, Klaus Tschira Stiftung gGmbH

RECEPTION & CONCERT

Karlheinz Töchterle

Upon invitation of
the Austrian Federal Ministry for Science and Research

Reception by
Minister Karlheinz Töchterle

Concert by an Ensemble of
the Vienna Philharmonic Orchestra

FOUNDATION DINNER

Wolfgang Schürer, Countess Bettina Bernadotte, Jean & Steven Chu

Upon invitation of the Foundation Lindau Nobelprizewinners Meetings at Lake Constance

Reception & Dinner at Hotel Bad Schachen

INTERNATIONAL DAY—GET-TOGETHER

Upon invitation by the Republic of Korea

Welcome Adresses

Countess Bettina Bernadotte
President of the Council

Jae-Shin Kim
Ambassador, Embassy of the Republic of Korea in Berlin

Hwang-Sik Kim
Former Prime Minister of the Republic of Korea (2010–2013)

Presentation:
“Save the Earth: Blue Beyond Green”
Dr. YoungJoo Ko
Director, Strategy & Cooperation Division, Korea Research Institute of Chemical Technology (KRICT)

Dinner

Cultural Performance & Dance

GRILL & CHILL

Barbecue upon invitation of the Lindau Nobel Laureate Meetings & the City of Lindau

ACADEMIC DINNERS

Upon invitation of:

Alexander S. Onassis Public Benefit Foundation

Alexander von Humboldt Foundation

Australian Academy of Science

Austrian Federal Ministry for Science and Research

Bayer AG

Centre National de la Recherche Scientifique

DAAD—German Academic Exchange Service

Oak Ridge Institute for Science and Education

Elite Network of Bavaria

Helmholtz Association

Human Frontier Science Program

Max Planck Society

Merck KGaA

Nobel Foundation

SAP AG

Sino-German Research Center for Research Promotion

BAVARIAN EVENING

Upon invitation of the Elite Network of Bavaria & the Free State of Bavaria

Welcome Adress

Wolfgang Heubisch
State Minister of Science, Research and the Arts

Presentations:

"Bavaria—Land of Science and Research"
Robert Huber
Nobel Laureate, Max Planck Institute of Biochemistry

"Current Research Projects in the Elite Network of Bavaria"
Nadja Bertleff,
University of Würzburg
Thomas Hopf,
Technische Universität München

BADEN-WÜRTTEMBERG BOAT TRIP

Presentation of the Elite Network Design Award
Victoria Raab

Bavarian Buffet Dinner

Folk Music & Dance

Boat trip on Lake Constance to Mainau Island
upon invitation of the State of Baden-Württemberg

Welcome Address
Theresia Bauer
Minister of Science, Research and the Arts

Wolfgang Heubisch and Victoria Raab

Fostering the International Dialogue

Partners and Supporters of the 63rd Lindau Nobel Laureate Meeting

Science Breakfast at the 63rd Lindau Meeting hosted by Mars, Incorporated

A Global Network of Academic Partners

Some of the most renowned international research institutions operate as academic partners of the Lindau Meetings. Their profound commitment paved the way for the participation of 625 young researchers from nearly 80 countries in the 63rd Lindau Nobel Laureate Meeting.

The Lindau Nobel Laureate Meetings interact closely with their academic partners to identify highly-talented young researchers and to nominate them for participation. Partners include leading universities, academies of science, research institutions, foundations and innovative enterprises. Additionally, the central banks of over 50 countries are involved as academic partners with regard to the meetings on economic sciences. The Lindau Nobel Laureate Meetings continue to build on the cooperation, support and assistance of about 200 academic partners worldwide, representing more than 70 countries so far.

These institutions organise the first stage of the selection process for young researchers. Promising young scientists can submit their applications to the academic partners. Based on the specified selection criteria of the Lindau Council, the partners then carry out a preliminary evaluation which is forwarded to the review panel of the council.

The international network of academic partners is continuously expanding. With their commitment the partners disseminate Lindau's Mission Education worldwide. The participants of the 63rd Lindau Nobel Laureate Meeting were initially nominated by 143 partner institutions from 33 countries—and by 16 Nobel Laureates.

PARTNER INSTITUTIONS

Academia Nacional de Ciencias del Uruguay
Academy of Finland
Academy of Sciences Malaysia (ASM)
Academy of Sciences of the Czech Republic
acatech—National Academy of Science and Engineering
Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC), Spain
Alexander S. Onassis Public Benefit Foundation
Alexander von Humboldt Foundation, Germany
Australian Academy of Science
Austrian Federal Ministry of Science and Research
Bangladesh Academy of Sciences
Bavarian Academy of Sciences and Humanities
Bavarian State Ministry of Education, Science and the Arts, Elite Network of Bavaria
Bielefeld University
Boehringer Ingelheim GmbH
Brazilian Academy of Sciences
CERN European Organization for Nuclear Research
Chilean Academy of Science
Christian-Albrechts-University Kiel
Clausthal University of Technology
CNRS—National Center for Scientific Research, France
Croucher Foundation
Department of Science and Technology (Government of India)
Department of Science and Technology South Africa
Deutsche Forschungsgemeinschaft (DFG)
Deutsche Telekom Stiftung
Eberhard Karls Universität Tübingen
Embassy of Timor-Leste
EMBO
Estonian Academy of Sciences
European Commission
European Molecular Biology Laboratory (EMBL)
European Research Council
European Science Foundation (ESF)
Fondazione Cariplo
Foundation for Polish Science
Freie Universität Berlin
Friedrich-Alexander Universität Erlangen-Nürnberg
Friedrich-Schiller-University Jena
Gerhard C. Starck Stiftung
German Academic Exchange Service (DAAD)
German Aerospace Center (DLR)
German Chemical Industry Fund
German Environmental Foundation
German National Academy of Sciences Leopoldina
Global Young Academy (GYA)
Goethe-University Frankfurt am Main
Gottfried Wilhelm Leibniz Universität Hannover
Göttingen Graduate School for Neurosciences, Biophysics, and Molecular Biosciences (GGNB)
Heinrich Heine University Düsseldorf
Helmholtz Association
Human Frontier Science Program Organization
Humboldt-Universität zu Berlin
Industrie-Club e.V. Düsseldorf
International University of Lake Constance
Irish Research Council
Jacobs University Bremen
Japan Society for the Promotion of Science
Johannes Gutenberg University Mainz

NIKOLAUS TURNER
Managing Director and Member of the Board of the Lindau Foundation

"The cooperation between the Lindau Meetings and their academic partners in 50 countries is a cornerstone of the on-going internationalisation process of the meetings. Both sides benefit mutually from the commitment to connect and promote scientists worldwide. A global scientific exchange heightens the perspective for universal sciences, and Lindau tries its best to provide this very dialogue."

ORLA FEELY
Chair of the Irish Research Council

"We want to ensure that researchers within Ireland are connected with the international community and set their ambition at the highest international level. And there is no better way to do this by introducing them to the community of Nobel Laureates and other leading researchers who meet in Lindau."

Jordan University of Science and Technology/JUST
Justus-Liebig-University Gießen
King Abdullah University of Science and Technology
KIT (Karlsruhe Institute of Technology)
Körber Foundation
Leibniz Association
Leipzig University
LMU Munich
Lomonosov Moscow State University
Mars, Incorporated
Max Planck Institute for Biophysical Chemistry
Max Planck Society
McKinsey & Company, Inc.
Mexican Academy of Sciences
Microsoft Corporation
Ministry of State for Higher Education and Scientific Research
Ministry of Tertiary Education, Science, Research and Technology of the Republic of Mauritius
National Fund for Scientific Research
National Research Foundation Prime Minister's Office Singapore
National Research Fund Luxembourg
National Science and Technology Development Agency, Thailand
National Science Council Taiwan
Natural Sciences and Engineering Research Council of Canada
Oak Ridge Associated Universities
Organization of Islamic Cooperation (OIC)
Ministerial Standing Committee on Scientific and Technological Cooperation (COMSTECH)
Otto-von-Guericke-University Magdeburg
Pakistan Institute of Engineering and Applied Sciences
Philipps-University Marburg
Robert Bosch Stiftung GmbH
Royal Netherlands Academy of Arts and Sciences
Ruhr-Universität Bochum
Ruprecht-Karls-Universität Heidelberg
RWE AG
RWTH Aachen University
Saarland University
Saint-Petersburg State University
Siemens AG
Sino-German Center for Research Promotion
Slovenian Academy of Sciences and Arts
Suedwestmetall—The Baden-Wuerttemberg Employers' Association of the Metal and Electrical Industry
Swiss Re
Technische Universität Berlin
Technische Universität Braunschweig
Technische Universität Chemnitz
Technische Universität Darmstadt

The National Research Foundation (NRF), Singapore joins the network of academic partners: Wolfgang Schürer, Chairman of the Lindau Foundation, Low Teck Seng, Chief Executive Officer NRF, Karen Tan, Deputy Director NRF, Nikolaus Turner, Managing Director and Member of the Board of the Lindau Foundation (from right to left) in Berlin on 27 May 2013

Nikolaus Turner and the newly-appointed Lindau fellows of the Irish Research Council were received by Michael D. Higgins, President of Ireland. The President was presented with a copy of "NOBELS—Nobel Laureates photographed by Peter Badge".

Technische Universität München
The Association of German Engineers
The Danish Council for Independent Research
The Korean Academy of Science and Technology
The Lithuanian Academy of Sciences
The Mongolian Academy of Sciences
The Nobel Foundation
The Royal Society
The Scientific and Technological Research Council of Turkey (TÜBİTAK)
The Weizmann Institute of Science
TU Dortmund University
TWAS, The World Academy of Sciences—for the advancement of science in developing countries
Ulm University
Universität Duisburg-Essen
Universität Hamburg
University of Bayreuth
University of Bonn
University of Bremen
University of Freiburg
University of Göttingen
University of Kaiserslautern
University of Kassel
University of Koblenz-Landau
University of Konstanz
University of Lagos
University of Latvia
University of Liechtenstein
University of Malta
University of Oldenburg
University of Osnabrueck
University of Paderborn
University of Potsdam
University of Regensburg
University of Rostock
University of Stuttgart
University of Würzburg
Volkswagen Foundation
Volkswagen Group
Westfalian-Wilhelms University of Münster

NOBEL LAUREATES

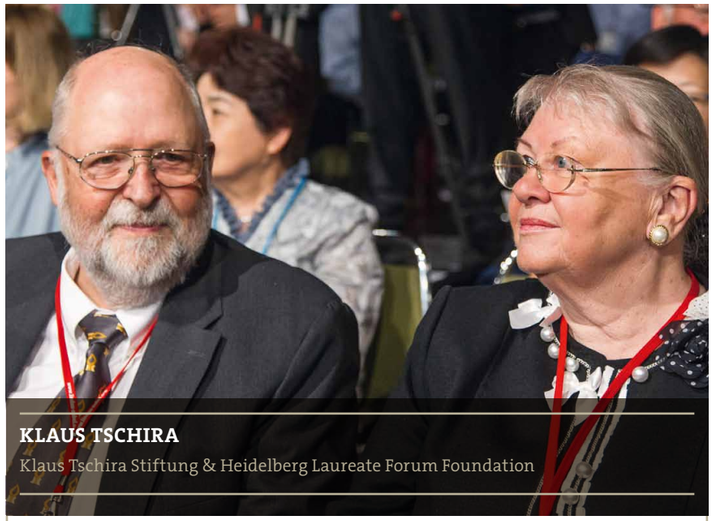
Peter Agre
Martin Chalfie
Aaron Ciechanover
Paul Crutzen
Harald zur Hausen
Brian Kobilka
Harold Kroto
Yuan Tseh Lee
Rudolph Marcus
Hartmut Michel
K. Alex Müller
Erwin Neher
George A. Olah
Thomas Steitz
Roger Tsien
Ada Yonath

The Memorandum of Understanding between the Lindau Meetings and the Pakistan Institute of Engineering and Applied Sciences was among several MOU being signed during the 63rd Lindau Nobel Laureate Meeting.

Committed to Support

It is only due to the commitment of a multitude of generous supporters and patrons that hundreds of the best young scientists from around the world get the chance to participate in the Lindau Meetings year after year—and that the meetings further develop splendidly.

Ever since the Lindau Meetings were established more than 60 years ago, they have acted as a catalyst for intergenerational, intercultural and interdisciplinary dialogue among scientists. The basic principle of the Mission Education, to enhance the transfer of knowledge for the benefit of our societies, is shared by its many supporters.



KLAUS TSCHIRA
Klaus Tschira Stiftung & Heidelberg Laureate Forum Foundation

“For several years now, I have regularly visited the Lindau Nobel Laureate Meetings dedicated to the natural sciences. It is—for me personally—an honour to participate.
Here, I have been able to experience first-hand what a great source of inspiration the contact with the Laureates can be for young researchers. In an informal atmosphere, both groups are provided with the opportunity for interchanging and exchanging experiences and ideas.

The Klaus Tschira Stiftung is a German foundation which supports natural sciences, mathematics and informatics in the fields of education, research and science communication. Therefore, it was a pleasure for the foundation to support the Lindau Meetings. On a personal note: Who knows how my own career would have developed, if I had had the opportunity to attend the Lindau Meetings myself as a young physicist? Perhaps my career would have taken the originally planned path—but then I would certainly not have been able to become one of the financial supporters of the meetings.”

Edmond Fischer (with sunglasses) at his ninth Lindau Meeting—having lunch with the Vallee Foundation fellows, Ernst-Ludwig Winnacker (top right, Member of the Board of Directors of the Vallee Foundation & Member of the Honorary Senate of the Lindau Foundation), and the Nobel Laureates Ada Yonath and Rudolph A. Marcus.

EDMOND H. FISCHER
Nobel Laureate in Physiology or Medicine 1992
Member of the Board of Directors of the Bert L. and N. Kuggie Vallee Foundation

“The mission of the Bert and Kuggie Vallee Foundation is to contribute to the advancement of biomedical sciences by promoting the development of interdisciplinary scientific subjects related to human health. One of its goals is to foster interactions among scientists both in the US and abroad. What better way to fulfil this goal than to help gifted, motivated and productive young scientists attend the Lindau Nobel Laureate Meetings whose mission is precisely to educate, inspire and connect young researchers with the most respected scientists in their fields? To this effect, the Vallee Foundation, as an academic partner of Lindau, is happy to provide four fellowships for each of the Lindau Meetings of 2013 (chemistry), 2014 (physiology/medicine) and 2015 (interdisciplinary).”

Supporting the Mission Education

Uncertainty was the key factor for the global financial and investment environment in 2013. The most severe effects of the euro crisis seem to have been contained, but not without serious impact to affected economies and societies. On a broader scale, especially the US economic situation has continued to increase uncertainty.

With these perspectives, the acquisition of project funding as well as endowment investment has again proven to be challenging, in particular with historically low interest rates.

Yet, the Lindau Nobel Laureate Meetings have again been successful in maintaining the level of support and thus organisational and scientific quality.

Neither the 63rd Lindau Nobel Laureate Meeting nor the outreach projects of our Mission Education could have been accomplished without the substantial and extensive support of public authorities, private enterprises and science-promoting institutions and foundations. Generous contributions to the endowment of the Lindau Foundation as well as project-related funding, grants and donations-in-kind have enabled and secured sustainable enhancements in all areas.

FOUNDATION ENDOWMENT

Since 2000, significant contributions to the foundation's endowment have enabled a wide range of activities within Lindau's Mission Education. The foundation would like to thank all endowment contributors for their trust and long-lasting engagement.

In 2013 the endowment capital has again been significantly enhanced:

Long-term Lindau supporters such as Mars, Incorporated, Volkswagen Group (Audi AG/ Dr. Ing. h.c. F. Porsche AG), Bayer AG and the OPEC Fund for International Development (OFID) have continued their strong support with additional contributions to the foundation's endowment.

Singapore's National Research Foundation, who also partnered with the Lindau Meetings in organising the International Day at the 2012 meeting, joined as principal patron.

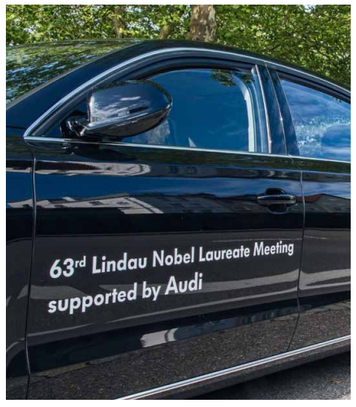
Alcoa Inc., Cabot Corporation, DSM Nutritional Products Ltd., Fresenius SE & Co. KGaA , and Linde AG joined as donors with a contribution to the endowment, supporting the participation of young researchers.

Lindau citizen Maja Dornier supported the Lindau Meetings personally as a donor.

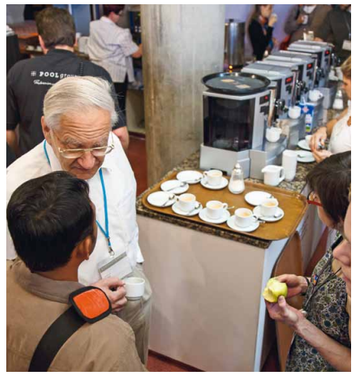
The Foundation would also like to thank the following supporters for their continued contributions:

Alexander S. Onassis Public Benefit Foundation, Boehringer Ingelheim GmbH, Deutsche Bank AG, EnBW Energie Baden-Württemberg AG, Jacobs Foundation, Jornvall Foundation, Leopoldina Nationale Akademie der Wissenschaften, McKinsey & Company, Inc. , Merck KGaA, Ruth Schilling, SAP AG, and Vacheron Constantin.

The board and the founders' assembly of the foundation look forward to a stimulating cooperation with all our partners around the world to enhance Lindau's Mission Education.



Volkswagen Group provided a VIP car shuttle service.



The coffee facilities were presented by Jura, bottled water was provided by EnBW.

BENEFACTORS

The 63rd Lindau Nobel Laureate Meeting has received financial support from a multitude of funders, among them long-term supporters such as the German Ministry of Education and Research, the European Commission, the Free State of Bavaria, and the International Lake Constance Conference, as well as Microsoft Corporation.
Furthermore, many foundations like the AKB-Stiftung, Bayer Science Foundation, Deutsche Telekom Stiftung, Eduard-Rhein-Stiftung, Klaus Tschira Stiftung, Peter-Dornier-Stiftung, Robert-Bosch-Stiftung, Stiftung van Meeteren, as well as the Stifterverband für die deutsche Wissenschaft have supported the meetings.
A substantial fellowship programme for chemistry students studying in Germany was realised with aid from the Chemical Industry Fund (VCI).

DONATIONS-IN-KIND

Donations-in-kind are equally indispensable as funding means to ensure a high-standard scientific meeting. Thus, we are grateful for the invaluable services provided for example by the Volkswagen Group, Deutsche Lufthansa AG, Microsoft Corporation, EnBW Energie Baden-Württemberg AG, JonesDay, Stadtwerke Lindau, American Chemical Society, Jura Elektroapparate AG, and others.

CO-HOSTS OF MEETING EVENTS

Involving partners is another successful strategy to organise an eventful and varied meeting week every year. In 2013, the Republic of Korea hosted the International Day at the 63rd Lindau Nobel Laureate Meeting by financing and co-organising a science breakfast, a lunch, and a memorable evening get-together with presentations, performances, dinner and dance.

As in many past years, the Free State of Bavaria generously hosted the equally well-established Bavarian Evening with presentations, folk dance and music performances, a traditional buffet dinner and local beer.

Three additional science breakfasts during the meeting week were hosted, financed and co-organised by Mars, Incorporated, the Austrian Federal Ministry for Science and Research, and BASF SE together with the Chemical Industry Fund (VCI).

Telekommunikation Lindau provided fully equipped computer working places and facilitated the wireless internet access throughout the meeting week.

ACADEMIC PARTNERS

Lindau's academic partners have enabled the participation of many young researchers by supporting the application and selection process and covering travel and lodging expenses.

JOINT FORCES IN OUTREACH

The two major projects at the core of the outreach programme were continued in 2013. Our comprehensive multimedia mediatheque is funded by the German Ministry of Education and Research and the Carl Zeiss Stiftung. The exhibition "Sketches of Science", curated jointly with the Stockholm Nobel Museum, is currently touring the world with venues in Singapore and Malaysia, and is generously funded by the Klaus Tschira Stiftung.

Supporters

Science breakfast presented by BASF SE in the format “World Café”

The European Commission and the European Research Council informed young scientists about Europe’s research opportunities. Top picture: Robert-Jan Smits, Director-General for Research and Innovation of the European Commission, and Helga Nowotny, President of the European Research Council

Academic dinner presented by the Bayer Foundation; in the picture: Countess Bettina Bernadotte, Wolfgang Plischke, Member of the Board of Bayer AG, and Wolfgang Schürer

“Lindau is a valuable platform for Mars to reach out to the young researchers, these great scientists of the future, and put them in touch with the Nobel Laureates, the leading scientific minds of our generation.
At Mars, we want to do everything that we can through the Lindau relationship to connect Laureates, young researchers and Mars scientists in this unique melting pot and catalyze a commitment to do great things in science and tackle societal challenges that we share as a business.”

RICHARD WARE
Vice President, Supply, Research & Development and Procurement, Mars, Incorporated

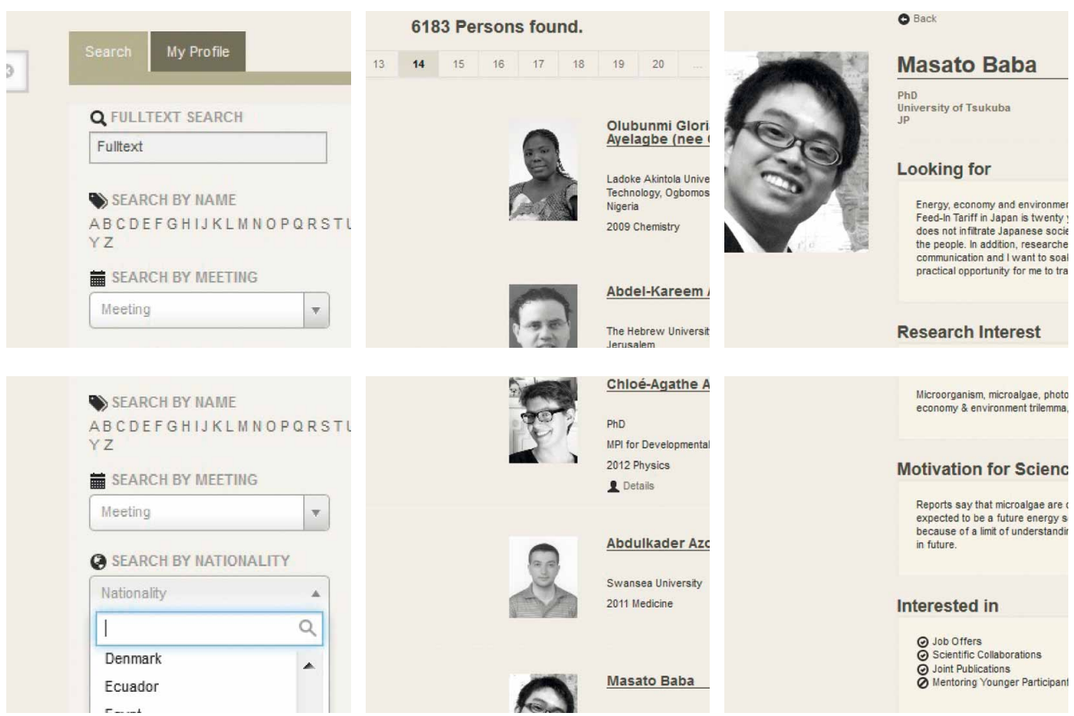
Baden-Württemberg presented the boat trip to Mainau Island; in the picture: Minister Theresia Bauer, framed by Nobel Laureate Steven Chu (left), and Philipp Haug

The Republic of Korea hosted the International Day; in the picture: the Korean delegation with Jae-Shin Kim, Ambassador to Germany (right)

Staying Connected—
The Lindau Alumni Network

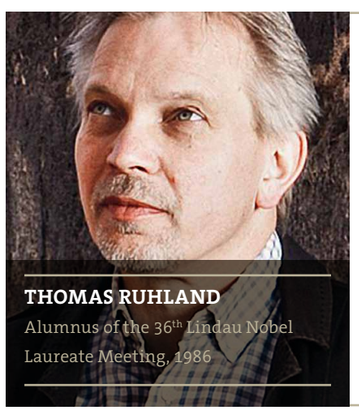
Approximately 25,000 students have participated in the Lindau Meetings since their beginnings in 1951. Many of them made friends in Lindau or found new collaborators and conveyed the spirit of Lindau. The Lindau Alumni directory aims to cultivate this community.

alumni.lindau-nobel.org



Spending an intense week full of scientific input and social encounters, and sharing the common experience in Lindau, fosters connections and even lasting friendships. Many of the participants stay connected with some of their peers via social networks or other communication tools. But the ability to find a complete list of participants, to search systematically for somebody with whom there was only a brief encounter without sharing any contact details, to learn who else from the same institution or country has participated or who works on similar projects—all this can only be provided by the Lindau alumni directory.

Currently, data and names from the last couple of years are completely available, but the Lindau Meetings continue to approach alumni from earlier years asking them to become part of the community. In that way, every user will be given the opportunity to build up an intergenerational network with Lindau alumni so that the directory will become a connecting platform for scientists from around the world.



THOMAS RUHLAND
Alumnus of the 36th Lindau Nobel Laureate Meeting, 1986

"I usually do not have strong memories of conferences, so there must be a reason that I am still full of fond memories of the Lindau Meeting in 1986. For me as a student (I had just graduated from university) meeting Nobel Laureates in person was incredibly impressive. I was particularly surprised that we were taken seriously in the conversations and that Nobel Laureates can be open-minded and gentle (as a student I had imagined something quite different).

Not to mention my fascination about the lectures and presentations held by the Laureates. For sure I sat there open-mouthed when Max Perutz explained the complex 3D structure of haemoglobin by using computer simulations (which was something quite extraordinary back in 1986). Currently I am a professor at the Roskilde University, Denmark.
I would like to call on you to stay motivated in continuing the meetings."

MAX G. HUBER
Former Vice-President of the German Academic Exchange Service (DAAD)

"Several decades ago, I had been invited to participate in one of the Lindau Meetings—as a young physics student. "My" Lindau Meeting would become a decisive event in my professional career: for the first time I met Werner Heisenberg, Paul Dirac, Max Born and others—distinct pillars of physics during the first half of the 20th century. They left a deep impact on my life.

The Lindau alumni are united in their common perception of the chances of science and of the challenges of our modern world. It seems to me that such a global network of the Lindau alumni could actively and efficiently promote science, and at the same time help to counterbalance the manmade impact on our natural resources. It is our duty to shape the community of Lindau alumni into a sustainable network of responsible scientists, across all national borders."

Broadening the Dialogue

Publicity, Debates and Impulses

Valuing Peace

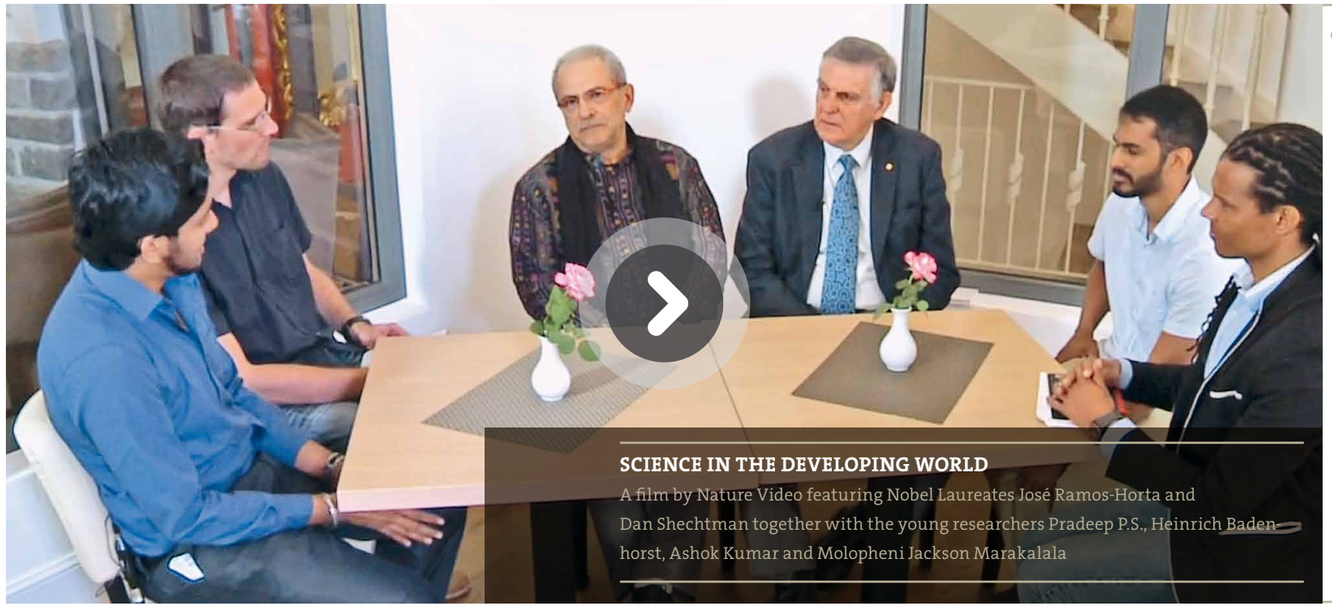
Dialogue on the challenges to peace and justice brought the 63rd Lindau Meeting to a solemn close. Peace and the contribution of science and research to humanity has been becoming an ever more important issue at Lindau, but this debate marks the beginning of a regular occupation with the topic.

THE PEACE DIALOGUE IN LINDAU

During a visit to Lindau in 2012, Nobel Peace Laureate José Ramos-Horta urged the organisers of the Lindau Nobel Laureate Meetings to provide a regular forum for peace. In 1996, he was co-awarded the Nobel Peace Prize for his efforts in finding a peaceful solution to the conflict in East Timor.

In a debate on the challenges to peace and justice in the 21st century, moderated by Fred Guterl, Executive Director of Scientific American, the panellists José Ramos-Horta and Gunnar Stålsett, Bishop emeritus of Oslo and Member of the Norwegian Nobel Committee, insisted on the implementation of a regular peace dialogue. Both emphasised the important role and the great responsibility of scientists in the quest for solutions to global problems such as environmental destruction or climate change.

The following Nobel Peace Laureates have participated in Lindau Meetings within the more than 60 years of history: Albert Schweitzer, Willy Brandt, Linus Pauling, Muhammad Yunus, Rajendra Pachauri, chairman of the award-winning Intergovernmental Panel on Climate Change (IPCC), and Unni Karunakara, president of the award-winning organisation Médecins Sans Frontières. Additionally, quite a few Nobel Peace Laureates have become members of Lindau's Founders Assembly, among them Martti Ahtisaari, Jimmy Carter, Mikhail Gorbachev, and Elie Wiesel.



SCIENCE IN THE DEVELOPING WORLD
A film by Nature Video featuring Nobel Laureates José Ramos-Horta and Dan Shechtman together with the young researchers Pradeep P.S., Heinrich Badenhorst, Ashok Kumar and Molopheni Jackson Marakalala

"What role can science play in the developing world? In this film, Nobel Peace Laureate José Ramos-Horta and Israeli Nobel Laureate Dan Shechtman discuss the issue with young researchers from South Africa, India and the US. Science and politics collide as the group grapple with funding problems, social responsibility and culture. The Laureates emphasise that science alone is not enough; researchers must work with industry and government to solve the problems of the developing world."

GUNNAR STÅLSETT
Bishop emeritus of Oslo, Member of the Norwegian Nobel Committee

"Two Norwegians at the UN were talking about the world situation and the need for peace. One said, 'For that we need to speak the same language.' And the other turned around and asked, 'How on earth are we going to teach them all Norwegian?!' Jokes apart, speaking the same language is also a challenge between science and the humanities; between politics and religion, between generations—it is a question of communication, of inspiration, of connection. You need to be careful about not limiting old capacities to express and connect by using only activist or scientific language but inclusive language. At a hotel in Geneva, a notice at the front desk said 'Please leave your values here'. Of course, they meant 'valuables'! There is a difference between values and valuables but there is also a deep connection, for the question of values is one of the fundamental challenges to peace work today."

"If you look at human history and development of science: thanks to science we live longer, we don't need to die young. But at the same time, sometimes I visit Hiroshima and every time I go through the museum, regardless of their rationale for dropping the bomb and regardless of who started the war—the fact is that tens of thousands of Japanese were innocent victims of a terrible manmade weapon. I am horrified how some scientists become very powerful in perfecting weapons systems. How can they fight with ammunition, and add more and more sophisticated weapons to kill ourselves? When you design torture equipment and then market them, you cannot be disassociated with the potential harm."

JOSÉ RAMOS-HORTA
Nobel Peace Laureate 1996

Impulses for the Next Generation

Reaching out to younger people and getting them interested in science is an integral part of Lindau's Mission Education. At the 63rd Lindau Meeting two initiatives addressed school children and teachers: Harry Kroto's Buckyball Workshop and the programme "Teaching Spirit".

THE BUCKYBALL EXPERIENCE

For some years now Nobel Laureate Sir Harry Kroto has given "Buckyball Workshops" around the world to get children enthusiastic about science. At Lindau he showed local schoolchildren aged ten to eleven how to build a buckyball, a model of the C60 Fullerene molecule (or Buckminsterfullerene, "Buckyball"), that Kroto co-discovered and for which he was awarded the 1996 Nobel Prize in Chemistry. After giving an introduction to algebra and to the composition of stars in the universe, he helped the children build their own football-shaped buckyball and thus provided them with a basic idea of structures and geometry.

TEACHING SPIRIT

The interest in natural sciences and hence the foundation for future generations of scientists is laid at an early age—be it in family or at school. Since teachers can play a key role in arousing fascination for natural phenonema, the Lindau Meetings decided to recognise the role and work of excellent teachers and launched the initiative "Teaching Spirit" in 2011.

In recognition of their outstanding efforts and achievements in teaching natural sciences in class and in extra-curricular projects, 21 teachers from Germany were invited to attend two days of the 63rd Lindau Nobel Laureate Meeting. Over lunch they had the opportunity for a direct conversation with Nobel Laureates Richard Ernst, Gerhard Ertl and Kurt Wüthrich. After hearing an introduction to the Lindau Mediatheque, the teachers participated in a workshop prepared by the Leibniz Institute for Science and Mathematics Education (IPN), in which they discussed and tested innovative educational strategies and talked about chances to identify and promote scientific talents from very early on.

HAROLD KROTO
Nobel Laureate in Chemistry 1996

"As a kid I didn't want to be a scientist. I wanted to be Superman."

Participants of Teaching Spirit 2013

Achim Baumann, Tuttlingen; Tanja Eickholt, Wesel; Thomas Fieber, Ingolstadt; Carmen Heinemann, Stade; Bernhard Horlacher, Ludwigsburg; Ruben Keuchel, Koblenz; Stephan Kienast, Werl; Axel Kisters, Gauting; Andrea Koestler, Schondorf am Ammersee; Petra Kring, Pfaffenhofen a.d. Ilm; Markus Lenk, Bayreuth; Claudia Lindau, Naumburg; Heike Birgit Maier, Plochingen; Cäcilia Sauer, Bergheim; Silke Schreiber, Neustadt; Martin Schwab, Kitzingen; Bernhard Sturm, Oldenburg; Sabine Venke, Berlin; Christian Vetrovsky, Pullach; Jens Viehweg, Meißen; Jochen Wahr, Konstanz

Workshop organised in collaboration with the Leibniz Institute for Science and Mathematics Education (IPN)

Supporters and Partners of Teaching Spirit 2013

Deutsche Telekom Stiftung
Deutscher Verein zur Förderung des mathematischen und naturwissenschaftlichen Unterrichts (MNU)
Esther und Silvius Dornier Stiftung
EWE Stiftung
Internationale Bodensee Konferenz (IBK)
Leibniz Institute for Science and Mathematics Education (IPN)
Prof. Dr. Manfred Prenzel, TU Munich
Robert Bosch Stiftung
Stiftung Haus der Kleinen Forscher
Stiftung Jugend forscht
Verband der Chemischen Industrie (VCI)

"Meeting a Nobel Laureate is something quite amazing—I will definitely tell my pupils about it! I took along a newspaper from 2007 with an article about Professor Ertl being awarded the Nobel Prize. His research achievements are part of the curriculum for high school chemistry. Thus, I used the opportunity to have him sign the article."

BERNHARD STURM
Chemistry Teacher,
Neues Gymnasium Oldenburg

MOSCOW SCIENCE FESTIVAL

For the first time, the Lindau Nobel Laureate Meetings engaged in the widely popular Moscow Science Festival at Lomonosov University—a long-standing academic partner of the Lindau network. From 11–13 October 2013, students, teachers, schoolchildren, and anyone interested in science had the opportunity to discover the diverse projects of the Mission Education, such as "Nobel Labs 360°" or the Lindau Mediatheque.

Since 2006, the festival has been organised annually by the Ministry of Education and Science of the Russian Federation, the City of Moscow, and Lomonosov University. It is part of the All Russia Science Festival initiative, which attracted more than 800,000 people in 2013.

Innovation Forum

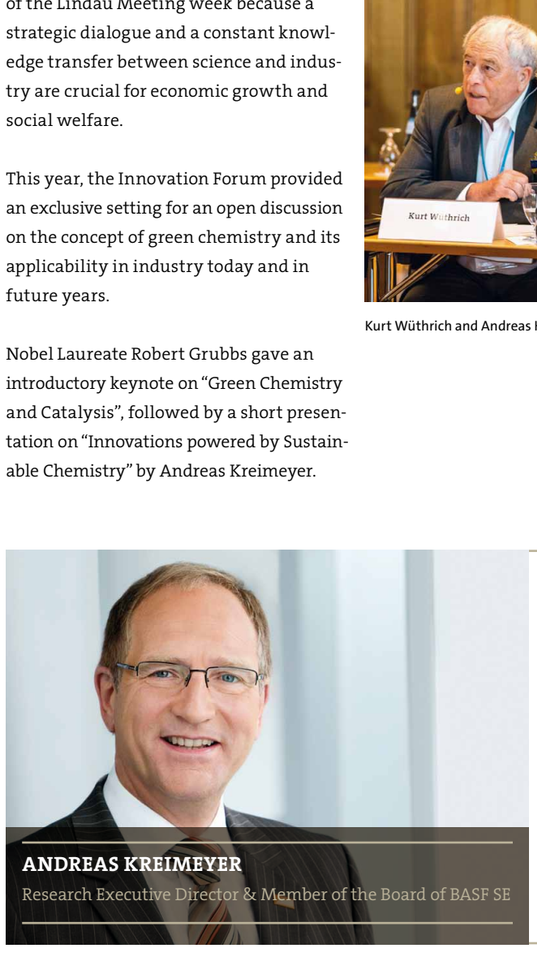
As Nobel Laureates and business executives meet to discuss how to advance innovations at the interface of science, industry and society, they make a vital contribution to foster the modern knowledge society.

Since its establishment in 2010 upon the initiative of Nobel Laureates, the Innovation Forum has become an integral part of the Lindau Meeting week because a strategic dialogue and a constant knowledge transfer between science and industry are crucial for economic growth and social welfare.

This year, the Innovation Forum provided an exclusive setting for an open discussion on the concept of green chemistry and its applicability in industry today and in future years.

Nobel Laureate Robert Grubbs gave an introductory keynote on "Green Chemistry and Catalysis", followed by a short presentation on "Innovations powered by Sustainable Chemistry" by Andreas Kreimeyer.

Kurt Wüthrich and Andreas Kreimeyer chaired and moderated the Innovation Forum.

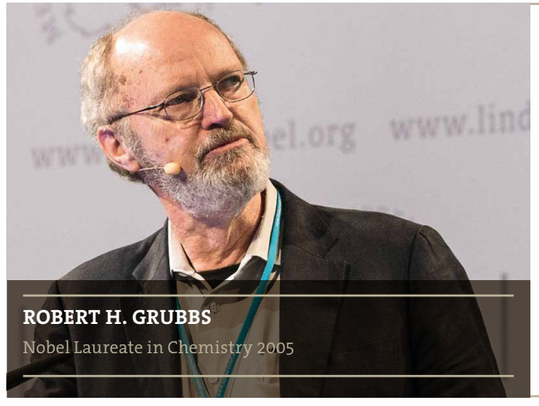


ANDREAS KREIMEYER
Research Executive Director & Member of the Board of BASF SE

"The Lindau Innovation Forum ideally combines scientific excellence, economic expertise and creativity. It is therefore predestined to deal with the greatest challenges of our times.
One of them—often neglected—is to ensure that society keeps pace with what the scientific community comes up with. This is a prerequisite for turning ideas into innovations and economic value."

Yakov Kutsovsky, Senior Vice President of Research & Development and Chief Technology Officer of Cabot Corporation, and Dan Shechtman, Nobel Laureate in Chemistry

Andreas Kreimeyer, Wolfgang Schürer, and Gerd Romanowski, Director, Science, Technical and Environmental Affairs, Verband der Chemischen Industrie (VCI)



ROBERT H. GRUBBS
Nobel Laureate in Chemistry 2005

"Much of the chemical industry is based on processes that were developed decades ago. The change in the cost of petroleum carbon and energy sources and the need to control emissions of carbon dioxide and other pollutants will change the rules of the industry. As the rules change new processes will be required. Catalytic processes provide green routes to many old and new chemicals and open new sources of carbon. We will use examples from our work on olefin metathesis to give examples of how catalysis can be used to meet the challenges imposed by the changing conditions."

Science Communication

Substantial science communication is of utmost relevance—not only within the scientist community, but also within society as a whole. In this regard, the Lindau Meetings have made it an integral part of their programme and the guiding principle of their communications and outreach work.

PANEL DISCUSSION "WHY COMMUNICATE?"

These days, with so much emphasis placed on the need for public engagement with science, the question "Why communicate?" might appear almost redundant. Isn't it obvious that scientists need to tell the world what they are doing and that the more energy they put into doing so the better? Perhaps, but this panel sought to take stock of the current science communication scene and reflect on what all this effort is for.

The panellists spun the range from those who take obvious joy in communicating science to those who, as a rule, prefer not to step into the limelight. Their discussion can be reviewed online as a video in the Lindau Mediatheque.

Panellists:

Simon Engelke
Maastricht University

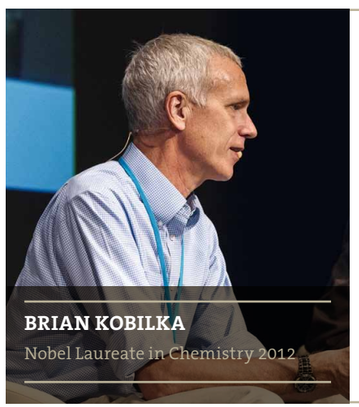
Brian Kobilka
Nobel Laureate in Chemistry 2012

Sir Harold W. Kroto
Nobel Laureate in Chemistry 1996

Beatrice Lugger
National Institute for Science Communication

Ada Yonath
Nobel Laureate in Chemistry 2009

Moderator:
Adam Smith, *Nobel Media*



BRIAN KOBILKA
Nobel Laureate in Chemistry 2012

"The process of communication might be distracting for some people. It is definitely an advantage to see what is going on in other fields, and I think it helps everybody to some extent to improve or develop new approaches to their own research. However, it can also prevent you from focusing on what you really need to do to accomplish your own research."

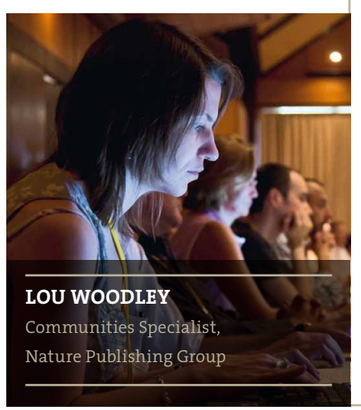
BEATRICE LUGGER
Coordinator of the Lindau Nobel Online Community

"Science communication has totally changed over the last 10 years. If you want to reach the youth today to engage their attention and interest for science and research, then you have to use social media because that's what they consume."

THE LINDAU NOBEL ONLINE COMMUNITY

The several quotes throughout this annual report testify to the vibrant activity of the Lindau Nobel Online Community in the meeting week—and beyond. Expert science communicators were joined by young researchers in giving a comprehensive account of their Lindau experience.

A close alliance with Spektrum der Wissenschaft, Scientific American, and Nature enabled a wide dissemination of the various contents throughout Twitter, Facebook, YouTube, and popular science blogs.



LOU WOODLEY
Communities Specialist, Nature Publishing Group

"I've been thinking a lot about community recently—no big surprise given 'Communities' is what I do for a job. It's a word that's become increasingly popular online, with many groups now underlining their community focus as an indicator of a more connected, open and participative attitude. Reading Jono Bacon's excellent book, 'The Art of Community' has helped me to ponder it some more. While the book is essentially something of a bible for community management, it starts right from the basics—defining communities and the qualities that make them a success.

A community is a 'group of people having common interests' and the beating heart of any community, the thing which keeps the interactions flowing, is a sense of belonging. A sense of opportunity can then often grow from this very social infrastructure, based on ingredients such as trust and clear communication.

Writing of the possibilities that communities can create, Bacon states that 'Imagination offers the mind a vision of how things could be. If there is a viable path toward this future, we build a sense of opportunity.'

For me, one of the strongest indicators of a possible path is the sharing of the knowledge gained by others who have gone before you, or those who are prepared to walk alongside you for a while. That seems to me exactly what meetings such as Lindau are all about—get like-minded people with different experiences, but common interests, in the same place and watch the magic happen as they swap notes and encourage each other in their scientific ambitions.

Lindau also has personal significance because of its community-based nature. Attending the meeting in 2010 was my first 'business trip' and one that, without exaggeration, changed my life. It was there that I met for the first time a handful of people who were to become some of my best friends, and from which various projects have arisen or expanded. It was also the first time I'd really blogged anything for public consumption and where I began to experience the importance of in-person interactions to supplement online ones. In short, it's where I really connected with one of the communities of most importance to me—and one of the places where I feel like I belong.

If a network is an extended group of people who interact, perhaps a community is a sub-group of a network, people held together by stronger ties. At Lindau, those sub-groups might be the young scientists from the same country, those working in the same fields or the satellite communities of the press, video and blogging teams—and you can belong to more than one community at a time. I'd like to think that at least some of the ties that form each year result in lasting friendships. But even if we all just retreat back to our own corner of the world at the end of the week, we're also all part of the global scientific community, and right now that's a place of tremendous opportunity."

Media Exposure

DEUTSCHE WELLE TV
Wolf Gebhardt

MOSCOVSKAYA PRAVDA
Viola Egikova

BAYERISCHER RUNDFUNK
Annette Kolb

LE MONDE
Martine Jacot

SÜDDEUTSCHE ZEITUNG
Patrick Illinger

MIDDLE EAST BROADCASTING CENTER
Dima Tayeh

MUNHWA BROADCASTING CORP. KOREA
Seung Jae Lee

EL MERCURIO
Lorena Guzmán

Media Exposure

Renowned print media, TV and radio broadcasters, as well as online news providers based in 35 countries have covered the 63rd Lindau Nobel Laureate Meeting. More than 150 journalists were accredited to attend the meeting.

As public attention to topics and people in science and research is growing perceptively, more and more science journalists join in the Lindau dialogue—not only as observers but also as discussants valued for broadening the debates by contributing their views.

A close cooperation with the European Union of Science Journalists Associations (EUSJA), the Arab Science Journalist Association (ASJA), the US National Association of Science Writers (NASW) and other influential journalistic networks has contributed significantly to the worldwide media coverage of the meeting.

Argentina • Australia • Austria
Brazil • Canada • Chile • Denmark • Egypt
Finland • France • Germany • Ghana
Hungary • India • Ireland • Israel • Italy
Korea • Liechtenstein • Mauritius • Mexico
Nepal • Netherlands • New Zealand
Pakistan • Philippines • Poland • Russia
Singapore • South Africa • Spain
Switzerland • United Arab Emirates
United Kingdom • United States of America

ETTAY NEVO
Science Reporter,
Israeli Public Radio/Kol Israel

"Kol Israel aired a special one-hour live broadcast from the meeting. The programme featured interviews with the three Israeli Nobel Laureates Ada Yonath, Avram Hershko, and Dan Shechtman, with Wolfgang Schürer, Chairman of the Board of Directors of the Lindau Foundation, as well as with ten of the twelve young Israeli meeting participants.

This broadcast enabled us to give a live presentation of the significance and importance of Israeli science in the international context. It also gave us a chance to expose some of the most cutting-edge research done by students, in radio prime time. It was a unique radio programme!"

Página12 • RTE • Geelong Advertiser • Radio Canada • Deutsche Welle
Süddeutsche Zeitung • Africa Time • El Mercurio • El Sol de Mexico
Al Ahram • Indagando TV • Le Monde • Moscovskaya Pravda • BILD
Bayerischer Rundfunk • Le Bien Public • Scientific American • Die ZEIT
The Times of India • The Economic Times • St. Galler Tagblatt • ORF
Irish Independent • Evening Echo • Le Scienze • Nature • Kol Israel
Corriere della Sera • El Economísta • Ciência Hoje • Otago Daily
Schwäbische Zeitung • Nederlands Tijdschrift voor Natuurkunde
The Straits Times • Science • TIME for Kids • Novosci • PBS Newshour
Südwestrundfunk • El Mundo • Sunday Telegraph • Chemistry World
Science and Technology Daily • Chemical and Engineering News
Der Spiegel • Times • TIME for Kids • Frankfurter Allgemeine Zeitung

Beyond Lindau

Public Outreach Projects

Nobel Laureate George F. Smoot's lab and working place featured in "Nobel Labs 360°"

The Lindau Mediatheque Enters the Next Level

It is the ultimate online archive, mapping the rich history of scientific dialogue at the meetings, and it provides a comprehensive picture of the major baselines and developments in science and research. In spring 2014, a completely optimised version of the Lindau Mediatheque will be launched.

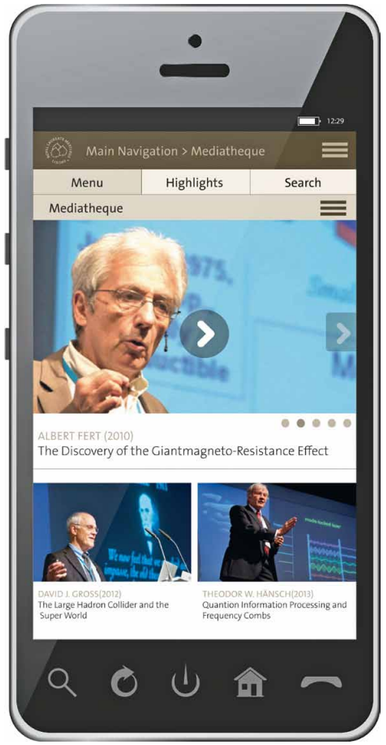
THE LINDAU MEDIATHEQUE 2.0

The Lindau Mediatheque—accessible online, free of any charges—contains video and audio recordings of the numerous lectures and panel discussions of the past 62 years, as well as profiles with short CVs and portraits of all Nobel Laureates who have participated in the Lindau Meetings. Furthermore, the programmes of past meetings, abstracts of lectures, and background information have been diligently compiled to complement this multimedia treasure trove.

Improving the convenience of the Lindau Mediatheque is an on-going project. In fact, this demands the continuous work and dedication of a team of editors headed by a long-standing friend and companion of the Lindau Nobel Laureate Meetings, Anders Bárány, formerly professor of physics at Stockholm University and Deputy Director of the Nobel Museum. As people increasingly use mobile internet, especially to access multimedia content, the first and most pressing challenge for the further development of the Lindau Mediatheque was obvious: to create a completely responsive version optimised for both desktop and mobile use, touch-ready, to improve its usability, and to add new features and contents.

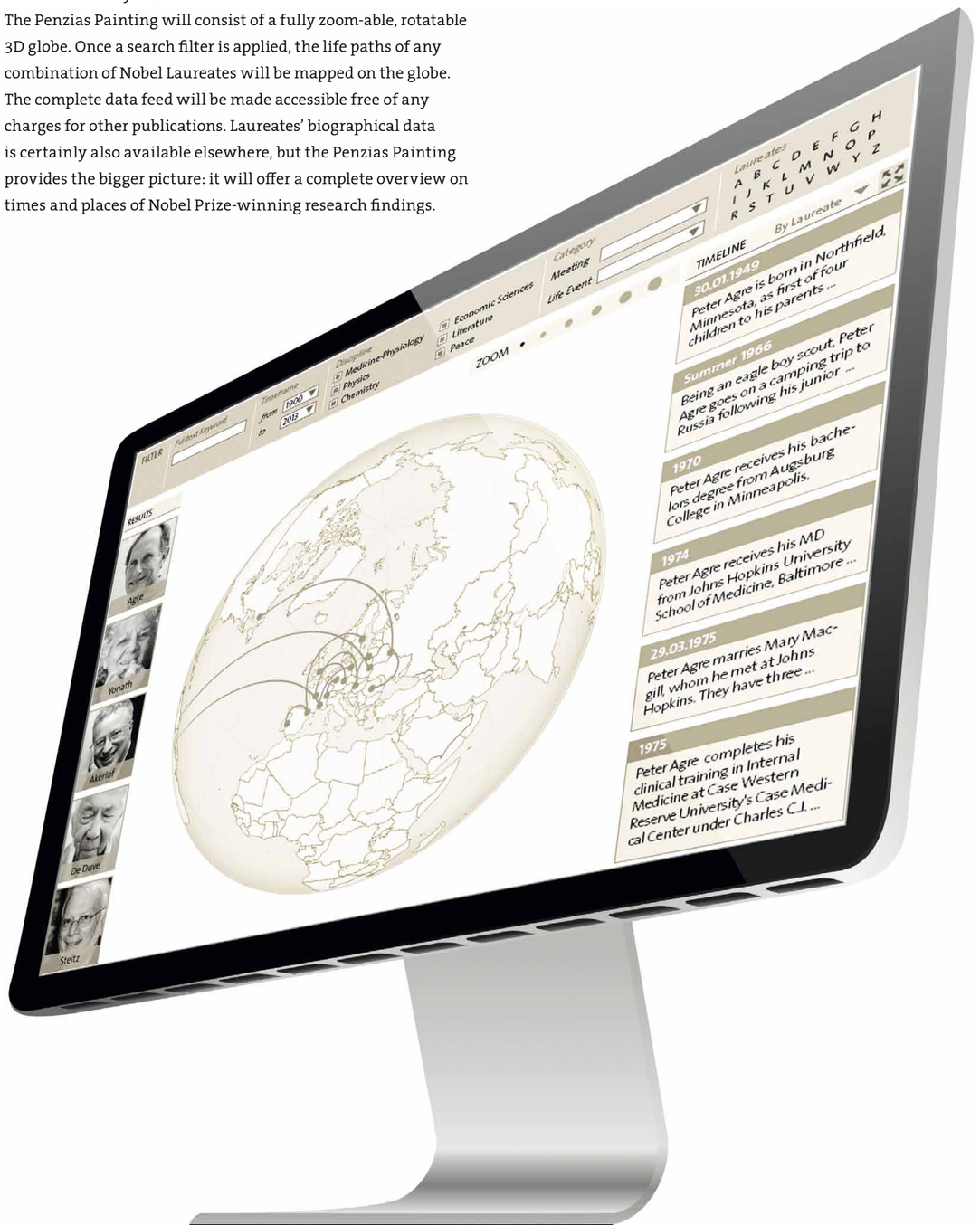
RESPONSIVE DESIGN FOR MOBILE MULTIMEDIA

The new mediatheque can be explored anywhere—on home desktop computers or any mobile devices. It is a fully mobile-enabled website that does not require any app or plug-in. With full HTML5 compatibility, the mediatheque is as future-proof as possible, and it works with iOS, Android, Windows 8, and any modern browser. Its responsive design adapts to almost all mobile devices and has also been optimised for touch displays.



THE PENZIAS PAINTING

The 2014 release of the mediatheque will feature a completely new component: the “Penzias Painting” initiated by and named after Nobel Laureate Arno Penzias. He suggested that a map of the life paths of all Laureates would be a spectacular painting of science history—and indeed it will be!
The Penzias Painting will consist of a fully zoom-able, rotatable 3D globe. Once a search filter is applied, the life paths of any combination of Nobel Laureates will be mapped on the globe. The complete data feed will be made accessible free of any charges for other publications. Laureates’ biographical data is certainly also available elsewhere, but the Penzias Painting provides the bigger picture: it will offer a complete overview on times and places of Nobel Prize-winning research findings.



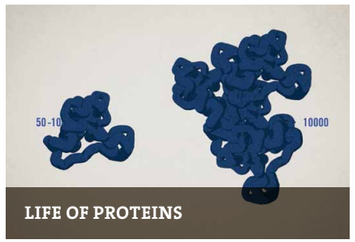
MINI LECTURES, TOPIC CLUSTERS & RESEARCH PROFILES

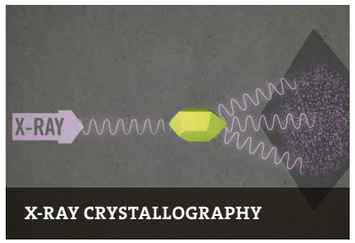
Mini lectures are compact presentations of the most relevant facts and figures in select research fields, basically “all there is to know”. Watching the mini lecture videos—each about ten minutes in length—constitutes an alternative to watching hours of lecture videos contained in the mediatheque. The videos are of high didactic quality, making them perfectly suited for use in school education.

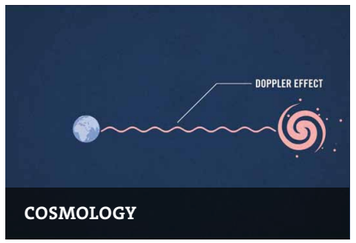
For each mini lecture there is a corresponding topic cluster in the mediatheque. Topic clusters are compilations of select mediatheque contents put into context. They provide continuing and additional information on the chosen field of interest, extending the elementary contents of the mini lectures. Until now, the following topic clusters are already available, but there are more to come:

CARBON · COSMOLOGY · ENVIRONMENTAL PROTECTION
GLOBAL FINANCIAL CRISIS · LIFE OF PROTEINS
(SMALL) MOLECULES OF LIFE · SUBATOMIC PARTICLES
TROUBLES IN SCIENCE · X-RAY CRYSTALLOGRAPHY

To round out this set of new mediatheque features, the editors have introduced research profiles of Nobel Laureates. These profiles provide reliable, reviewed and quality-checked information on select Laureates‘ research work.







A 2.0 MAKEOVER

The remastered mediatheque—scheduled to be launched in spring 2014—will come up with a fresh look and an enhanced usability at the same time. Moreover, several new features will be introduced, among them a content level rating system that will help users judge the level of complexity of contents—whether they are destined for advanced scientists or whether they are also appropriate for teachers and school kids.

Another novelty is that the virtual Nobel Labs 360° will be fully integrated in the mediatheque to facilitate a seamless, immersive user experience.

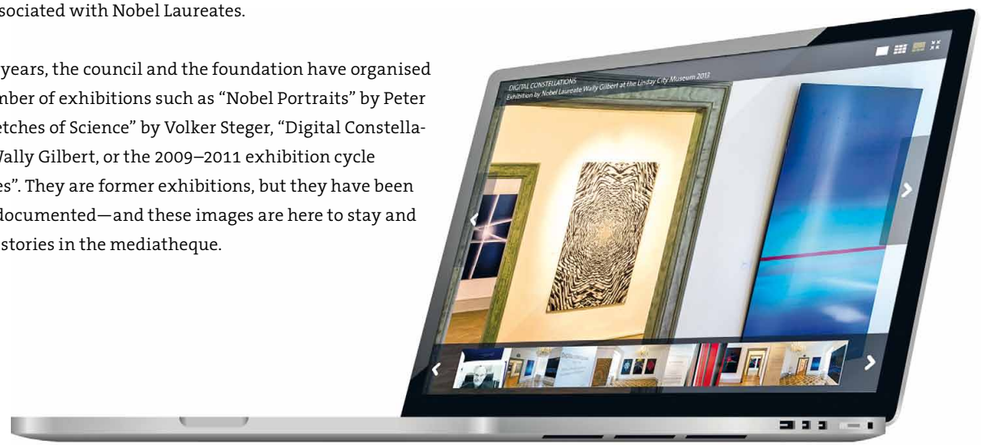
All video subtitles, transcripts, and text contents can also be accessed in other languages, and a new download option will make selected contents available as podcasts.

Altogether, the Lindau Mediatheque will be the most complete hub of multimedia contents on Nobel Laureates available on the internet.

ONLINE GALLERIES

Virtual exhibition tours—easy to navigate, yet stylish in their appearance—are another new feature of the re-edited mediatheque. Users will have access to online galleries featuring artwork associated with Nobel Laureates.

In the past years, the council and the foundation have organised quite a number of exhibitions such as “Nobel Portraits” by Peter Badge, “Sketches of Science” by Volker Steger, “Digital Constellations” by Wally Gilbert, or the 2009–2011 exhibition cycle “Discoveries”. They are former exhibitions, but they have been diligently documented—and these images are here to stay and retell their stories in the mediatheque.



Sketches of Science

By looking at pictures of Nobel Laureates presenting their scientific achievements with simple sketches, communication is instantaneously stirred. The project "Sketches of Science" playfully functions as a catalyst for exchange on both science and art.

"Sketches of Science—Photo Sessions with Nobel Laureates" is an art project of the German photographer Volker Steger. In his pictures, Steger captures the spontaneity and creativity of Nobel Laureates. When they meet for a photo session—mostly during the Lindau Nobel Laureate Meetings—Steger lays a blank sheet of paper and a box of crayons in front of the laureates challenging them to draw a colourful sketch of their award-winning scientific achievements and to present it in front of his camera. Some of the depicted scientists used this opportunity to abstract from formulas and chemical reactions and show their creative side. Others have proven the ability to break down quite a few years of research into one central code. In the photographs, the creativity and the enthusiasm of scientists and researchers are expressed, showing the beauty of intellectual performance.

"Sketches of Science" is a joint project of the Lindau Foundation and the Nobel Museum, funded mainly by the Klaus Tschira Stiftung. It was launched at the Stockholm Nobel Museum in 2012. The exhibition consists of around 50 portraits and a selection of the original drawings, complemented by multi-media information. The "Sketches" will soon be on display at Kuala Lumpur, Malaysia, the exhibition's second Asian venue. Thereafter, the exhibition will travel on to be shown in the USA, Japan and Korea.

Stockholm, Nobel Museum
8 June–30 September 2012

Frankfurt, Airport
5 December 2012–9 January 2013

Berlin, Baden-Württemberg Representation Offices
18 January–5 February 2013

Heidelberg, Carl-Bosch-Museum
22 February–2 June 2013

Mainau Island, Mainau Castle
24 June–31 August 2013

Singapore, Science Centre Singapore
16 September–22 November 2013

Kuala Lumpur, Galeri Petronas
6 December 2013–30 January 2014

Serge Haroche, Nobel Laureate in Physics 2012, drew his sketch during the 63rd Lindau Meeting.

TONY TAN KENG YAM
President of the Republic of Singapore

> *"I hope that this exhibition will be viewed by many people, particularly young scientists, school children, who will come here, look at the exhibition, find out why science is so interesting, why research is a worthwhile activity, because it is important for us to nurture this culture of discovery in Singapore."*

Photographer Volker Steger with Nobel Laureate Martin Chalfie

Countess Bettina Bernadotte, Nobel Laureate Edmund H. Fischer and Olov Amelin at the opening of "Sketches of Science" on Mainau Island on 5 July 2013

OLOV AMELIN
Director of the
Nobel Museum Stockholm

> *"Throughout history, playfulness has often been closely linked to creativity. Could it even be the case that children learn creativity through play? Testing an idea; allowing associations to flow freely and in unlikely directions; rejecting one path and switching to another until you find a direction—an idea that is so promising that you choose to focus on it for an extended period of time, delving ever deeper into a specific question. Volker Steger's portraits show a group of playful people. His idea—to let Laureates illustrate their discoveries through simple sketches—created wonderful opportunities to take personal portraits in which playfulness and creativity are central themes."*

"Sketches of Science" on display at the Science Centre Singapore

Introducing Nobel Laureates

Meeting Nobel Laureates in person, learning more about their ground-breaking achievements and possibly even looking at their art must not remain an exclusive privilege of those who get the opportunity to participate in the Lindau Meetings.

The Council for the Lindau Nobel Laureate Meetings feels committed to share the enthusiasm that characterises the annual encounters between Nobel Laureates and young scientists with the general public in and around Lindau. It is an integral part of the Mission Education to reach out beyond the meetings and involve society in the dialogue on the importance of education, science and research.

With exhibitions in the City Museum Lindau—displaying portraits of Nobel Laureates by Peter Badge in 2012 and works by Nobel Laureate Wally Gilbert in 2013—as well as with public explanations of the Nobel Prizes in the old town hall of Lindau, the council manifests the deep rootedness of the meetings with its hometown.

"DIGITAL CONSTELLATIONS"

In the beautiful premises of the City Museum Lindau the Lindau Nobel Laureate Meetings presented visual-artistic works by Nobel Laureate and artist Wally Gilbert. His exhibition "Digital Constellations"—large-scale computer-generated abstractions from the "Geometric Series"—was on display from April to October 2013.

Wally Gilbert, born 1932 in Boston, USA, had a long international career as a molecular biologist and geneticist. Gilbert and the Englishman Fred Sanger were jointly awarded the 1980 Nobel Prize in Chemistry "for their contributions concerning the determination of base sequences in nucleic acids".

Since 2000, Wally Gilbert has been working in digital art. Focusing on form, texture, and colour, he initially produced large images of fragments of things, often machines or architecture, photographed with a digital camera. He then created more abstract pictures based on photographs. The Geometric Series consists of digital images made with the use of a computer. They depict highly complex patterns of superimposed shrinking squares and triangles as well as single lines, strongly coloured or in black and white.

WALLY GILBERT
Artist and Nobel Laureate

"These images exemplify my delight in colour and form, and my search for a three-dimensional effect on a two-dimensional surface. I make them by hand on the computer. The computer simply holds the intermediate forms as I superimpose the many layers that I create to build up the image. The images begin in black and white, and then I colour them in the computer. I generate these colours either simply, by accessing the colours available, or in a complicated fashion by using the ability to change the global input-output functions for each colour and intensity separately. When the layers containing the coloured images interact with each other, still more colour patterns appear. The computer is a digital workspace, driven by my hand and eye."

"Digital Constellations" on display at the City Museum Lindau

Wally Gilbert (left) presenting his work to Countess Bettina Bernadotte and Gerhard Ecker, Lord Mayor of the City of Lindau

EXPLAINING THE NOBEL PRIZES

What are G-protein-coupled receptors? What benefit has the reprogramming of mature cells into pluripotent cells? How can market design be beneficial for human society? It has become a tradition that the Lindau Council starts a new year by hosting a public presentation dedicated to the recent Nobel Prizes in the old town hall of Lindau. Reputable scientists give lectures to explain the research findings of the recently bestowed Nobel Laureates.

The overall positive feedback to these events proves that the general interest in science and research is very notable. And it once again brings out the appeal and esteem of the Nobel Prize and its Laureates.

"The Nobel Prizes 2012"
Lindau, January 2013
Supported by Schwäbische Zeitung

Moderator:
Christoph Plate, *Deputy Editor-in-Chief*

Presentations

Physiology or Medicine:
Marcel Leist, *University of Konstanz*

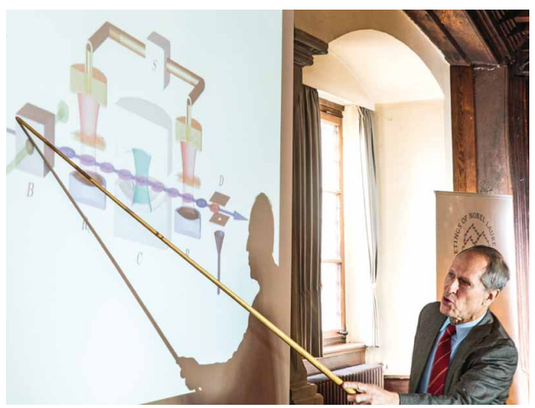
Physics:
Burkhard Fricke, *Lindau Nobel Laureate Meetings*

Chemistry:
Rüdiger Faust, *University of Kassel*

Economic Sciences:
Wolfgang Schürer, *Lindau Nobel Laureate Meetings*

Moderator Christoph Plate (left), Deputy Editor-in-Chief of Schwäbische Zeitung, following Marcel Leist's presentation on the Nobel Prizes in Physiology or Medicine

Burkhard Fricke, Vice-President of the Lindau Council, explains the achievements of the 2012 Nobel Laureates in Physics, Serge Haroche and David Wineland



Seeing Behind the Curtain—Nobel Labs 360°

Nobel Labs 360° is a unique and unprecedented science communication project. Users of the online application can virtually move around in the labs and offices of Nobel Laureates and explore them in detail. Research becomes vivid in an innovative and entertaining way.

nobel-labs.
lindau-nobel.org

The Lindau Nobel Laureate Meetings initiated the Nobel Labs 360° as one of its outreach projects, together with German photographer Volker Steger, to explain science in a new way. Steger was invited by several Nobel Laureates to visit their labs or offices, take 360° photographs and record short videos of characteristic workplaces. Laureates gave interviews to present their labs, they elaborated on their research projects, and each granted Volker Steger very personal insights into their life as a researcher. State of the art technology was applied to combine 360° spherical panoramic photos with embeded videos, audio files, images and text elements. The project closes the gap between photography and film in a multimedia context and merges portraiture, explanatory science journalism and 3D-like interactivity into a single experience—both educational and entertaining. The playful interaction with the contents is almost casually highly educative, and with all the multimedia information combined the people behind the research come to the fore.
The Nobel Labs 360° can be displayed in web applications, on personal tablet computers, or on large touch screens in museums or exhibitions. Currently, users can take "panoramic lab tours" in ten Nobel Labs—now with Elizabeth Blackburn as the first female researcher and Alvin Roth as the first economist featured.

"Aaron Ciechanover's office is full of odd objects. A picture of Nobel Peace Laureate Elie Wiesel stands next to an advertisement for a sushi place in Tokyo. There are models of a VW Beetle, a double-decker London bus and even a Vespa. The music playing in the background is soothing and his voice, when he speaks to me, is crisp. He also gave me a tour of his lab at the Technion University in Haifa, Israel. The building is right by the coast and provides picturesque views of the Mediterranean Sea.

Between doing experiments, students in his lab also introduced themselves and gave a hint about what they are working on. Standing by the coast, Ciechanover who was awarded the 2004 Nobel Prize in Chemistry says,

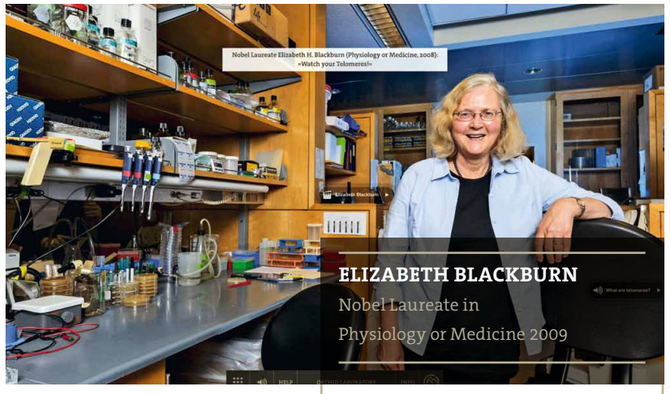
AKSHAT RATHI
Science Writer

"Without my science, I'm a dead man. My curiosity to understand the world is oxygen to me."

All this I know not because I visited Ciechanover in Haifa, but because I have just spent the last hour exploring Nobel Labs 360°. An excellent place to meet Nobel Laureates on their home ground. You can visit John Mather (Physics 2011) at NASA's Goddard Space Flight Centre, Brian Schmidt (Physics 2011) in his vineyard in Canberra (or hooting in a burnt telescope), Danny Shechtman (Chemistry 2011) in the Bahai Gardens, or Oliver Smithies (Medicine 2007) making gold nanoparticles.

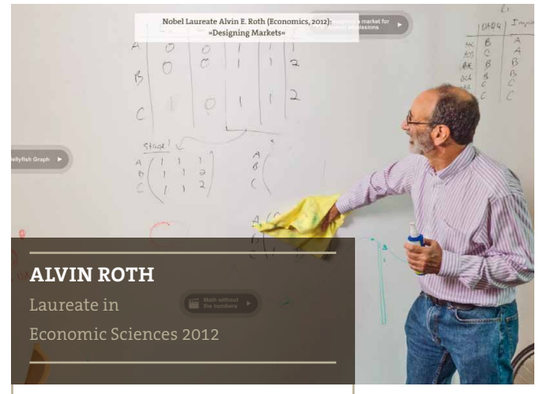
*Google's Street View has made 360° images a common feature these days, but the Nobel Labs 360° takes it further by embedding video and audio.
The ambient sounds add to your experience and it definitely feels like you are present where all the action is happening.*

I don't want to give away any more. Go to Nobel Labs 360° now."
Lindau Nobel Online Community



ELIZABETH BLACKBURN
Nobel Laureate in
Physiology or Medicine 2009

"I'm Elizabeth Blackburn and I'm in the lab here at San Francisco, where we study the ends of chromosomes and how they talk to cells and how they are replenished. We study yeast cells and we study human cells; sometimes normal human cells, such as the cells in our blood, and sometimes cancer cells, where telomerase, the enzyme that makes telomeres, often goes very seriously awry. We need a telomere maintenance to get through a long and healthy life, and so the more we understand them at the most basic level and how they work is going to give us more power to be able to do things that we help people's health and also to understand something very exciting in nature: How do our cells work."
Nobel Labs 360°

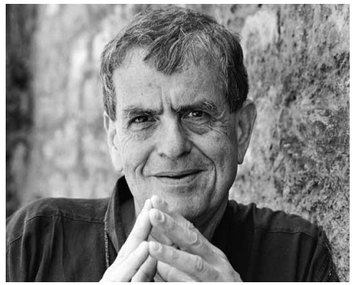


ALVIN ROTH
Laureate in
Economic Sciences 2012

*"One of the luxuries of being a college professor is that you can think about problems as long as you like to.
In business you are confronted with lots of interesting problems also, but they need fast solutions, you have to give the best solution you can in a short time. But here in academia we can think about problems until we think we are ready to talk to people about them. And that's a comforting thought because if you are a market designer sometimes people take our advice and it is good to be able to wait until we have good advices to give."* *Nobel Labs 360°*

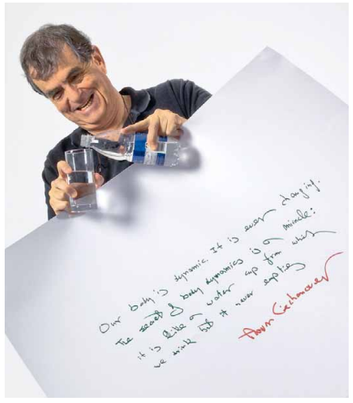
The Interplay of the Lindau Projects

The outreach initiatives of the Lindau Nobel Laureate Meetings aim to combine several components into the big picture. Only their elaborate interplay enables the Mission Education to effectively reach a broad audience on every level of society.

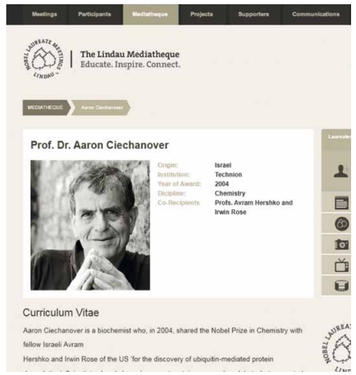


A first approach towards science in the Lindau context might be looking at a portrait of a Nobel Laureate photographed by Peter Badge. In his picture Aaron Ciechanover, who shared the Nobel Prize in Chemistry "for the discovery of ubiquitin-mediated protein degradation" in 2004, appears as a canny, gentle and energetic man, who still has grand plans in life. By all means, this picture arouses interest.

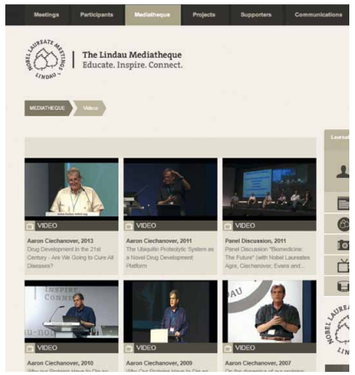
It is all about the dynamics of organisms accompanied by the ongoing destruction of proteins. This is the message revealed by Ciechanover when visiting him in his laboratory. "Nature is complex. Nature doesn't have limits. But we want to understand how each piece is working. Synthesising one single protein and one ubiquitin is essential. We put it in the system and learn how it behaves. It is fun to crack nature's secrets." How the scientist applies his own system to unravel these secrets, under which conditions he works at the Technion in Haifa, what he needs to stay motivated at work—all these questions are answered by Ciechanover himself at "Nobel Labs 360°"—and can even be examined by every user.



To learn more about Ciechanover and his work the next step could lead to another portrait. Here, photographer Volker Steger challenged Ciechanover to sketch his discovery; however, on the provided sheet of paper the Laureate rather gives a witty remark of his outlook rather than an in-depth look into his research. Superficially the observer does not become acquainted with the secrets of proteins although Ciechanover's lines reveal more of his work than it seems.

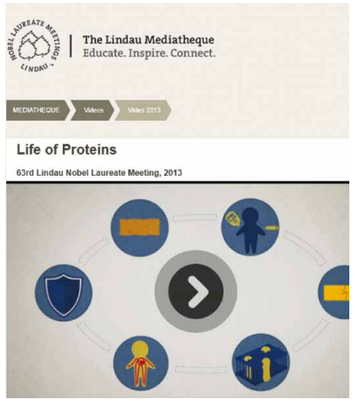


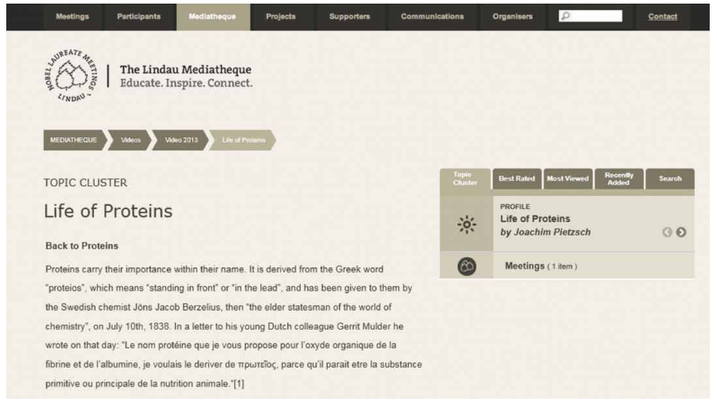
The Mediatheque not only contains the elaborate abstracts of all lectures given by Aaron Ciechanover, additionally he again speaks for himself. As of 2013, five recordings of his lectures and one video of a panel discussion he participated in are available online. Be it a profound introduction in "The Dynamics of our Proteins: From Basic Mechanisms and Onto the Patient Bed" (lecture at the 57th Lindau Meeting, 2007) or a lecture on "The Ubiquitin Proteolytic System as a Novel Drug Development Platform" (61st Lindau Meeting, 2011)—with these inspiring presentations the interested lay person as well as the graduated chemist get a condensed round-up.



When virtually moving around in his lab and workplace visitors gain a valuable insight into Aaron Ciechanover's personality and his field of research, but there is a lack of plain biographical data and of background information regarding his Nobel Prize. Read Ciechanover's curriculum vitae, get detailed information about his work on redundant proteins, find out in which Lindau Meetings he participated and follow the links to his co-recipients' CVs in the Lindau Mediatheque. The mediatheque reveals as many of the hidden treasures as possible and illuminates cross-links. Consequently the Laureate's profiles are also connected to all lectures held in Lindau.

In case Ciechanover's lectures come across as too complex, the mediatheque helps to acquire basic knowledge and understanding of natural history phenomena in general and of proteins in particular. The most interesting parts from different lectures are condensed into educational video pieces, enriched with didactic narration and vivid animations. These videos provide the most relevant and essential information on selected scientific topics in a compact format. With "Life of Proteins" yet another path of an (easy) entry into the world of proteins is enabled by the mini lectures.





As the mediatheque contains countless connecting points to the major baselines and developments of contemporary science and research, so-called topic clusters were designed to complement the mini lectures. These detailed descriptions of scientific theories and discoveries are suited for use in schools. In "The Life of Proteins" a fundamental introduction is again freely available to anyone.

Enabling the Mission Education

Organisation & Account

Organisation

The Council for the Lindau Nobel Laureate Meetings and the Foundation Lindau Nobelprizewinners Meetings at Lake Constance maintain offices at Lindau that are responsible for the organisation and processing of the annual meetings and the diverse projects and activities in the realm of the Mission Education. This includes general management tasks and finances, organisational planning and processing, conception and coordination of infrastructure and logistics, participant and partner liaison and support, communications and public relations, as well as administration and secretarial services.

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Melinda Dioszegi *(until July 2013)*
Gabriela Schneider *(since August 2013)*

Account 2013

Expenditures (in Euro)

TRAVEL, BOARDING & LODGING	
Nobel Laureates	193,938.07
Young Researchers	396,214.26
Media	37,966.97
Other	136,485.80
SCIENTIFIC PROGRAMME & YR SELECTION	20,616.11
VENUES, EQUIPMENT & STAFF	
Locations (Rental Fees, Tents)	78,915.65
Technical Equipment	212,889.54
Other Equipment	13,314.38
Utilities, Signage, Services	37,971.36
External Onsite Staff	65,418.86
SOCIAL PROGRAMME	26,068.02
PRINTED MATTERS	103,005.86
AV PRODUCTIONS & COMMUNICATIONS	
AV Productions	117,143.89
Online Communication	22,186.20
External Services	16,281.52
Distribution & Monitoring	13,041.69
Mediatheque & Website	674,646.25
OTHER MEETING COSTS	44,796.44
EXHIBITIONS (Sketches of Science, Nobel Laureates in Portraits)	328,246.29
PUBLICATIONS (Nobel Chemists)	22,903.44
ADDITIONAL EVENTS & PROGRAMMES (Teaching Spirit, Innovation Forum, Public Lectures, etc.)	78,674.59
EXECUTIVE SECRETARIAT	
Staffing, Wages and Salaries	644,796.14
Operating Costs (Rent, Utilities, Maintenance)	43,850.52
Accounting, Legal Services, Bank Services	16,967.49
Hardware, Software, IT Services	88,307.60
Communication	16,106.03
Office Supplies	12,442.72
Insurances	6,452.89
Other Costs	31,550.39
TOTAL	**€ 3,501,198.97**
Total Meeting incl. Executive Secretariat	2,399,259.61
Total Outreach	1,101,939.36

This budget includes estimated expenses for the period October–December 2013 with a total amount of € 624,401.26. This amount may vary for the final accounts.

Account 2013

Revenues

Grants, donations, funds and donations in kind (in alphabetical order) from the public sector (Bavarian State Ministry of Education, Science and the Arts; Bundesministerium für Bildung und Forschung (BMBF) (Germany); Bundesministerium für Wissenschaft und Forschung (BMW_F) (Austria); European Commission; International Lake Constance Conference (IBK); Land Baden-Württemberg, Ministerium für Wissenschaft, Forschung und Kunst; Ministry of Science, ICT and Future Planning of Korea; Stadt Lindau (B); U.S. Department of Energy), **from institutions aiding the advancement of science** (Deutsche Forschungsgemeinschaft (DFG); Deutscher Akademischer Austauschdienst (DAAD); Elitenetzwerk Bayern; Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.; Helmholtz Association of German Research Centres; Korea Institute of Basic Science (IBS); Korea Institute of S&T Evaluation and Planning (KISTEP); Korea Research Institute of Chemical Technology (KRICT); Max-Planck-Gesellschaft; National Research Foundation of Korea (NRF); Oak Ridge Associated Universities ORAU; Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz e.V.), **from the private sector** (Alcoa Inc.; Audi AG; BASF SE; Boehringer Ingelheim GmbH; Cabot Corporation; Chemical Abstracts Service; Deutsche Bank AG; Deutsche Lufthansa AG; EnBW Energie Baden-Württemberg AG; FREIBERGER Lebensmittel GmbH & Co. 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TOTAL REVENUES	**€ 3,501,198.97**

Note: The calculated revenues refer only to the meeting and outreach projects included in the expense budget for the fiscal year 2013. Deficits have been covered by the Foundation Lindau Nobelprizewinners Meetings as guaranteed to the Council for the Lindau Nobel Laureate Meetings.

Lasting Impressions

> *"It's rare that a researcher gets to question a Nobel Laureate, and I am honoured that I was one of those offered the opportunity to listen to Laureates' personal stories as well as to ask them questions about their research careers and about the environments and contexts that turned them into pioneers."*

BANOTHILE MAKHUBELA
Post-doc from South Africa

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"We want science to be conveyed to society, and we want to motivate young people to make an effort. We are very proud that the meeting has part of its roots in Baden-Württemberg."

Theresia Bauer, *Minister of Science, Research and the Arts, Baden-Württemberg*

"*The wisdom garnered from the connection with numerous cultures and viewpoints, the formation of long-term, worldwide relationships with top scientists, and the inspiration from Nobel Laureates will expand the way I see my research and show me my place in international scientific pursuits.*"

Jacob Kanady, *PhD student from the USA*

"Inspiration normally comes from an external source, from somewhere unexpected. Without this kind of inspiration you can become very narrow-minded. If you have a passion outside of science you should be proud of it—it makes life more enjoyable. Too many scientists lose their humanity, in the sense that they only have one focus: their research. Science is not the only aspect to life, there are other exciting aspects too and you have to give them a chance."

Richard Ernst, *Nobel Laureate in Chemistry 1991*

"Sustainability is one of the key words which describe the biggest challenges that mankind has to tackle nowadays. Scientific research is probably the only possibility to overcome the lack of resources and the increasing pollution faced by our world: from this point of view science is our hope. Working in the development of new environmentally friendly processes makes me feel to contribute towards a greener and safer planet."

Mattia Riccardo Monaco, *PhD student from Italy*

"Lindau is a microcosm of scientific teaching. There's the formal talks of course, but there's also scores of dinner discussions, breakfasts, outdoor events and master classes. Students don't just get to listen to Nobel Laureates but they actually get to talk to them one-on-one, pepper them with informal questions about how they actually made their discoveries rather than how it all appeared in the official journal articles and even get to sample their signature styles of thinking on topics ranging from culinary preferences to politics."

Ashutosh Jogalekar, *Scientific American Blogs*

"*Each year when I am fortunate to attend a Lindau Nobel Laureate Meeting, I am impressed and carried away by the competence, curiosity and energy of the young participants—networking, discussing, asking the right questions. This makes me think confidently about the perspectives of a global scientific community.*"

Hartmut Michel, *Nobel Laureate in Chemistry 1988*

Imprint

Dialogue | 63rd Lindau Nobel Laureate Meeting | Annual Report 2013

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Council for the Lindau Nobel Laureate Meetings &
Foundation Lindau Nobelprizewinners Meetings at Lake Constance

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UPCOMING LINDAU MEETINGS

2014 **64th LINDAU NOBEL LAUREATE MEETING**
Physiology or Medicine, 29 June–4 July 2014

5th LINDAU MEETING ON ECONOMIC SCIENCES
Lindau Meeting of the Laureates of
the Sveriges Riksbank Prize in Economic Sciences in
Memory of Alfred Nobel, 19–23 August 2014

2015 **65th LINDAU NOBEL LAUREATE MEETING**
4th Interdisciplinary Meeting: Physics, Physiology/
Medicine and Chemistry, 28 June–3 July 2015

2016 **66th LINDAU NOBEL LAUREATE MEETING**
Physics, 26 June–1 July 2016

2017 **67th LINDAU NOBEL LAUREATE MEETING**
Chemistry, 25 June–30 June 2017

6th LINDAU MEETING ON ECONOMIC SCIENCES
Lindau Meeting of the Laureates of
the Sveriges Riksbank Prize in Economic Sciences in
Memory of Alfred Nobel, 22–26 August 2017


LABORATORIES Elements
Molecules Catalysis
ENERGY RESOURCES
CELLS EXPERIMENTS
SUSTAINABILITY
Materials Organisms
REACTIONS Enzymes ATOMS