

67th Lindau Nobel Laureate Meeting
6th Lindau Meeting on Economic Sciences
Annual Report 2017



LINDAU
NOBEL LAUREATE
MEETINGS





The Lindau Nobel Laureate Meetings

Over the last 67 years, more than 450 Nobel Laureates have come to Lindau to meet the next generation of leading scientists. The laureates shape the scientific programme with their topical preferences. In various session types, they teach and discuss scientific and societal issues and provide invaluable feedback to the participating young scientists.

Outstanding scientists and economists up to the age of 35 are invited to take part in the Lindau Meetings. The participants include undergraduates, PhD students as well as post-doctoral researchers. In order to participate in a meeting, they have to pass a multi-step application and selection process.

67th Lindau Nobel Laureate Meeting (Chemistry)
25–30 June 2017
#LiNo17

Scientific Chairpersons

- Astrid Gräslund, Professor of Biophysics, Department of Biochemistry and Biophysics, Stockholm University, Sweden
- Wolfgang Lubitz, Director, Max Planck Institute for Chemical Energy Conversion, Germany

6th Lindau Meeting on Economic Sciences
22–26 August 2017
#LiNoEcon

Scientific Chairpersons

- Martin F. Hellwig, Director, Max Planck Institute for Research on Collective Goods, Germany
- Torsten Persson, Institute for International Economic Studies, Stockholm University, Sweden
- Klaus M. Schmidt, Department of Economics, Economic Theory, Ludwig-Maximilians-Universität München, Germany



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No Such Thing as Splendid Isolation

Greeting from Countess Bettina Bernadotte and Jürgen Kluge



Jürgen Kluge, Chairman of the Board of Directors of the Foundation, and Countess Bettina Bernadotte of Wisborg, President of the Council

This year was defined by a climate of intense debate in society and science. National political decisions and their international consequences are signs of a global volatility. Radical ideologies and re-emerging separatist or nationalist sentiments add to a growing sense of insecurity and isolation. Further uncertainty is created by the trend of post-factual statements and science denial in public discourse. This atmosphere of doubt and disillusionment reminds us of the importance of global dialogue. Scientific dialogue is particularly decisive as it can easily transcend barriers and connect cultures. The scientific principle is based on empirical facts instead of beliefs and ideologies. This focus on scientific dialogue is the connecting element of the 67th Lindau Nobel Laureate Meeting, the 6th Lindau Meeting on Economic Sciences and the Lindau Meeting community at large.

In 1951, the first Lindau Meeting was realised by Franz-Karl Hein, Gustav Wilhelm Parade and Count Lennart Bernadotte. Their vision was to re-establish the scientific dialogue between Germany and the rest of the world after World War II and to build bridges between people using the language of science. The three founders intended to gather a community of international scientists in order to work towards a better, prosperous future defined by peace and progress. In today's tense global situation, this vision is as important as ever.

Modern digital communication tools enable collaboration between scientists in previously unimaginable ways and across ever-greater distances, making science a truly global endeavour. Nevertheless, the Lindau Meetings and the extraordinary Lindau Spirit are proof of the value of face-to-face encounters. This year, Lindau was the stage for two international meetings. During the 67th Lindau Nobel Laureate Meeting dedicated to chemistry, 28 Nobel Laureates met with 420 international young scientists. At the 6th Lindau Meeting on Economic Sciences, 17 laureates encountered 350 young economists. The two Lindau Meetings differed in their scientific subjects, yet were connected by enthusiastic approaches to difficult and complex questions. Two weeks of intergenerational, cross-cultural encounters affirmed the fact-oriented power of science.

This year's 67th Lindau Nobel Laureate Meeting was by rota devoted to chemistry, and a special emphasis was placed on big data, green chemistry and molecular machines. These key topics were discussed in lectures, panel discussions, master classes and science breakfasts. Nobel Laureate Steven Chu wrote an impassioned keynote, in which he encouraged young scientists to use their talents in the fight against climate change. Poster sessions gave young scientists and Nobel Laureates a forum to receive and give direct feedback on current research projects. Short presentations in the form of poster flashes gave selected young scientists another opportunity to present their work to the laureates. By consciously also discussing the work of a new generation of scientists, we continue to pursue the goals inscribed in our leitmotif: 'Educate. Inspire. Connect.'

The 6th Lindau Meeting on Economic Sciences was a truly global meeting, manifested not only in the international participants but also in the topics of discussion. Mario Draghi, President of the European Central Bank, delivered a keynote address in which he stressed the importance of economic research for monetary policy and commented on protectionism. Aspects of monetary and fiscal policy, contract and incentive theory or global inequality were discussed from varied economic perspectives in lectures, panel discussions and science breakfasts. A new opportunity for dialogue between laureates and young economists was created by the addition of seminars to the meeting programme: selected young economists had the opportunity to present their work to a group of laureates. The laureates' willingness to share their life experience in interactions with the young scientists is at the core of both meetings and a central element of the extraordinary Lindau Spirit.

For the young scientists, the Lindau Meeting is a once-in-a-lifetime experience that hopefully has a lifelong impact. The days in Lindau intend to give birth to new ideas, personal connections and professional networks. Over the last 67 years, about 32,000 young scientists have taken part in the meetings. We have embraced the appeal of our late friend Nobel Laureate Sir Harry Kroto that all participants should consider themselves as alumni.

Our alumni initiative aims to identify this intergenerational, international community and to engage the Lindau Alumni as ambassadors of Lindau's 'Mission Education'. Launched in time for the 67th Lindau Nobel Laureate Meeting, the Lindau Alumni Network offers a new digital space where brilliant scientists of all backgrounds can connect, collaborate, exchange and jointly work towards their ideas and visions. A first series of events has brought together a number of Lindau Alumni, and we look forward to more reunions in the future.

Beyond the meetings, our leitmotif pervades our diverse outreach projects, in the local and the digital spheres. A new addition to our outreach efforts is the Lindau Science Trail, a public exhibition project that integrates science into the Lindau city space. At prominent locations across Lindau and Mainau Island, passers-by can learn about Nobel Prize-awarded discoveries. The key element of our digital offering is our mediatheque, a collection of more than 500 videos of lectures by Nobel Laureates and other educational content. A new filter makes this unique treasure trove easily accessible to educators and interested people across the world.

There is no such thing as splendid isolation in today's world: The problems ahead of us cannot be solved alone, and they cannot be solved by remaining silent. Through dialogue and discovery, science can offer solutions to the problems of today. In the spirit of Alfred Nobel, science can champion the well-being of humanity. This is the unique spirit of Lindau.

67th Lindau Nobel Laureate Meeting
Chemistry
25–30 June 2017



67

Science as an Insurance Policy Against the Risks of Climate Change

Nobel Laureate and former US Secretary of Energy (2009–13) Steven Chu dedicated his keynote at #LiNo17 to the devastating consequences of climate change, and stressed the importance of evidence-based research. As Chu had to cancel his attendance at short notice, the speech was read during the opening ceremony by William E. Moerner.

Steven Chu signed the 'Mainau Declaration 2015 on Climate Change' during the 65th Lindau Meeting.



Alfred Nobel wished to award the Nobel Prize to those that “conferred the greatest benefit to mankind.” In the past several hundred years, scientific discoveries have led to revolutions in agriculture, medicine, communications and energy.

We live in magical times. With the flick of a finger, the power of five horses flow out of a wire in our homes to clean our floors. We go to the local market under the pull of hundreds of horses and fly across continents with the power of a hundred thousand horses. Our homes are warm in the winter, cool in the summer and lit at night.

Fritz Haber and Carl Bosch were first to discover how to synthesise ammonia from nitrogen and hydrogen. With this discovery nitrogen-based fertilizers prevented mass starvation, and a world of two billion people could be fed. The Green Revolution pioneered by Norman Borlaug led to a 5-fold increase in grain production per acre in many parts of the developing world. His contributions made it possible to feed a world population that has grown from three billion people in 1960 to 7.5 billion today. Fritz Haber, Carl Bosch and Norman Borlaug were all awarded Nobel Prizes for their enormous scientific contributions for the benefit of mankind.

These miracles have been made possible by our ability to find and exploit abundant sources of energy with ever-increasing dexterity. Sadly, we have discovered that these benefits have come with unintended consequences. The discovery of those collateral effects is also an extraordinary scientific discovery. For the first time in human history, science is showing that human greenhouse gas (GHG) emissions are changing the Earth's climate. We are also predicting how future emissions will affect the world one hundred years from today.

Climate change is not new. The Earth went through six ice ages in the past 600,000 years. However, recent measurements show that the levels of CO₂ and other greenhouse gases have risen dramatically in the last century. Carbon dioxide levels and equivalent GHGs are now 45% higher than they were a century ago. Taking all GHGs into account, we are currently at 490 parts per million CO₂ equivalents. 550 parts per million of CO₂ is a 100% increase in atmospheric CO₂.

By examining the ratio of the carbon isotope ¹⁴C to ¹²C, we know that the increase in carbon dioxide and methane has diluted the ¹⁴C/¹²C ratio. Since ¹⁴C has a half-life of 5,700 years, that means the added atmospheric carbon had to have been sequestered from the biosphere for many ¹⁴C decay times. The decline in the ¹⁴C/¹²C ratio is in agreement with an accounting of human GHG emissions minus the known absorption of CO₂ from land and the oceans. This finding is considered the ‘gold standard’ confirmation that the increase in CO₂ we are now observing is due to the burning of fossil fuels.

Three quarters of human greenhouse gas emissions have occurred since 1950, and since that time, the Earth has warmed up by one degree Celsius. The Arctic and Antarctic polar ice caps and the glaciers in Greenland and Antarctica are melting much faster than was predicted ten years ago. [...]

From the geological record of the last warm period (129,000–116,000 years ago), the Earth was only one degree Celsius warmer than today. During that time, the sea level was 6–9 meters higher.

This is a matter of history, not a computer simulation. We used to believe that it would take millennia for the sea to rise to these heights, but recent satellite data suggest that a greater than one-meter sea level rise is possible by the end of this century, and a 4–5 meter rise by 2200.


A changing climate does not respect national boundaries. There is a real danger that rising seas or collapsing agriculture due to heat and drought will lead to massive climate-induced migrations. History has repeatedly shown that the inability of people to feed themselves can lead to unrest and civil wars. The 4.5 million Syrian refugees and additional millions of Africans pouring out of their home countries are an early warning of what may happen in the coming decades and centuries. 800 million people live within ten meters of sea level.

We also face the spectre of non-linear ‘tipping points’ that may cause more severe changes. An example of a tipping point is the thawing of the permafrost. The permafrost contains immense amounts of frozen organic matter that have been accumulating for millennia. If the soil melts, microbes will spring to life and cause this debris to rot. The difference in biological activity below freezing and above freezing is something we are very familiar with. Frozen food remains edible for a very long time in the freezer, but once thawed, spoils quickly. How much methane and carbon dioxide might be released from the rotting permafrost? Even if only a small fraction of the carbon is released, it could be greater than all the greenhouse gases we have released to date. Once started, a runaway effect could begin.

There are numerous people and politicians who enjoy the benefits of scientific discovery, but do not accept the compelling scientific evidence and overwhelming scientific consensus that humans are changing our climate. There are others who admit the climate is changing, but maintain that the change is due to natural causes. Hence, they conclude there is nothing we can do about these changes. Others argue that governments should not spend money until we are certain of the predicted consequences of climate change.

 @JoelBHeim

Absolutely inspiring speech by Steven Chu (given by William Moerner) on climate change and policy #LiNo17 #youngscientists
Joel Benjamin Heim, University of Oslo

 @moonfant

“Nonlinear tipping points” are probably the scariest words from Steven Chu’s talk on the risks of climate change #LiNo17
Marija Liutkute, Uni Göttingen

The Earth’s climate system is extremely complex and there are considerable uncertainties in predicting future risks. However, the uncertainty does not lie in whether we are causing climate change, but in predicting with precision the consequences of our actions. With each passing year, measurements tell us that the climate system is far more sensitive than we thought only a decade ago. Given these findings, it is prudent risk management to take significant steps to mitigate the worst risks of climate change. [...]

We also need to confront a moral issue. Deeply rooted in all cultures is the notion of generational responsibility. Parents work hard so that their children will have a better life, but are we willing to invest our money to protect the grandchildren of people we will never know? One of the cruellest ironies of climate change is that the ones who will be hurt the most are the most innocent: the world’s poorest and those yet to be born. [...]

What can science and technology do to help us mitigate and adapt to climate change? We need abundant, clean and inexpensive energy sources to power and feed the world. The world’s population is projected by the U.N. to grow to 9.8 billion by 2050 and 11.2 billion by 2100. In short, we will need another industrial revolution, another agricultural revolution and a water resource revolution.

Tremendous progress has been made in developing carbon-free energy sources such as wind and solar energy. Today, long-term power purchase agreements of solar energy have decreased to one third of the price in 2012. The cost of on-shore wind power has also declined and is approaching parity with fossil energy. Great progress is being made in reducing the cost of off-shore wind energy. Despite this progress, we need additional technical advances. [...]

We also need to de-carbonise our transportation system. The adoption of electric vehicles (EVs) for personal transportation has begun. However, before EVs become the mainstream consumer choice, the cost must become competitive with internal

combustion automobiles. The speed of recharging EVs is also essential for wide-scale adoption. Today’s fast-charging stations can add 140 miles in 20 minutes, but we need to decrease the charging time to around five minutes. I not only believe this is possible, I am working with a colleague at Stanford University to turn the dream into a reality. We are also developing a method of economically extracting lithium from sea water, thereby increasing the world supply of lithium 10,000-fold. With lithium-sulphur batteries that we and others are working towards, we hope to revolutionise personal transportation. [...]

There are numerous other technological developments needed before clean energy becomes the low-cost option for all our energy needs. Science is part of the solution, but we also need stable, long-term policies to fund visionary research and development. [...]

I close my remarks by asking the young students gathering this week at the Lindau Nobel Laureate Meeting to consider joining the effort to combat climate change. Now more than ever, we need talented young scientists and engineers to create the innovations needed for a prosperous and sustainable future. We also need young economists and political scientists to work with the technologists to create better policy options, and future business leaders that will make sustainability an integral part of their business. [...]

There is an iconic image taken by Voyager 1 in 1990. As the spacecraft began to leave our solar system, the astronomer Carl Sagan convinced the NASA engineers to turn Voyager for one last, homeward look. In this picture, Earth appears as a pale blue dot of light, one tenth of the area of a single pixel, and embedded in a rainbow of scattered light.

Here is a condensed version of what Sagan said about this picture:

“Look again at that dot. That’s here. That’s home. That’s us. On it, everyone you love, everyone you know, everyone you ever

“A changing climate does not respect national boundaries.”

Steven Chu

heard of, every human being who ever was, lived out their lives... on a mote of dust suspended in a sunbeam.

“Our planet is a lonely speck... in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves. The Earth is the only world known so far to harbour life. There is nowhere else, at least soon, to which our species could migrate... Like it or not, for the moment the Earth is where we make our stand.

“...there is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal kindly with one another, and to preserve and cherish the pale blue dot, the only home we’ve ever known.”

To this message, I add an ancient Native American saying about how we should care for our planet: “Treat the Earth well: it was not given to you by your parents, it was loaned to you by your children.”

I hope you, the young Lindau scientists, will be moved to use your considerable talents to help enrich and save the world.

 A video of Steven Chu’s full speech read by William E. Moerner is available in the mediatheque.

 The original document of the Mainau Declaration 2015 is on display in the Bundeskunsthalle in Bonn until 4 March 2018.

The heartfelt speech of Steven Chu, delivered by William E. Moerner, was met with a standing ovation.

W. E. Moerner delivered the keynote on behalf of Steven Chu.



67 Opening Ceremony

Welcome

Countess Bettina Bernadotte, President of the Council for the Lindau Nobel Laureate Meetings

Greetings From Stockholm

Astrid Gräslund, Official Representative of the Nobel Foundation and Former Secretary of the Nobel Committee for Chemistry, Sweden

Address

Johanna Wanka, Federal Minister of Education and Research, Germany

Keynote

SCIENCE AS AN INSURANCE POLICY AGAINST THE RISKS OF CLIMATE CHANGE

Written by Steven Chu, Nobel Laureate in Physics 1997, Stanford University, USA

Delivered by William E. Moerner, Nobel Laureate in Chemistry 2014, Stanford University, USA

Master of Ceremonies

Ingolf Baur, Germany

Musical Accompaniment

Ensemble of the Vienna Philharmonic Orchestra

» The text of the keynote by Steven Chu can be found on p. 10 of this annual report.



Astrid Gräslund



Ensemble of the Vienna Philharmonic Orchestra

Countess Bettina Bernadotte



Ingolf Baur



Johanna Wanka



67

New Friends Across Borders

Astrid Gräslund and Wolfgang Lubitz, scientific chairpersons of the 67th Lindau Nobel Laureate Meeting, reflect on the programme and themes of #LiNo17.

Astrid Gräslund with young scientists during the boat trip to Mainau Island



It was a pleasure to chair this inspiring meeting once again, to see the sparks in the eyes of the young scientists and get the positive feedback from the Nobel Laureates.

Most of the laureates attending the 67th Lindau Meeting were awarded the Nobel Prize in Chemistry, but the participants also included a few Nobel Laureates in Physiology or Medicine and in Physics. This led to an event that was at once interdisciplinary in character, while also supporting the central position of chemistry in the sciences. The meeting was attended by about 420 young scientists from 78 nations, who were nominated by their home countries or institutions and finally selected and admitted by the Lindau review panel. As has been the tradition in the past, the programme mainly consisted of plenary lectures by Nobel Laureates in the mornings, followed by more private discussions in small groups between laureates and young scientists in the afternoons. Further elements of the programme such as panel discussions, master classes, science breakfasts, posters and brief oral poster flashes filled the week with interesting scientific activities.

On Saturday, 24 June, the 9th Innovation Forum took place with the participation of Nobel Laureates, invited scientists and business executives. The chosen topic was 'Imaging on a Molecular Level'; new and future technologies for making molecular images and models were discussed. This also included a lecture on cryo-electron microscopy, a revolutionary technique for which, later this year, the Nobel Prize in Chemistry was awarded.

During the opening ceremony on Sunday, a keynote lecture from Nobel Laureate Steven Chu titled 'Science as an Insurance Policy Against the Risks of Climate Change' was read by his colleague and fellow laureate William E. Moerner, because Chu was unable to attend the meeting for personal reasons. The speech was very well received by the audience and was honoured with a standing ovation. The topic is a serious one and led to lively discussions among all participants, young and old, in the true tradition of the Lindau Meetings. The overall conclusion was rather optimistic, suggesting that future scientific considerations and activities may provide solutions to manage the consequences of earlier mistakes for the benefit of the world's climate.

Wolfgang Lubitz in discussion with young scientists during the science breakfast hosted by BASF SE



The regular scientific programme started on Monday when 2016 Nobel Laureate in Chemistry Ben Feringa gave a lecture on 'The Joy of Discovery', an appropriate beginning of the Lindau week. The continuation was a series of lectures with wide-ranging topics, from regulating and observing details of reactions in chemistry and biochemistry to the invention of new technologies enabling such studies. Based on recent Nobel Prizes in Chemistry, methods to study single molecules were discussed but also societal and timely questions about the scientific background of climate change or the use of antibiotics were among the topics. The young scientists were enthusiastic listeners at the plenary lectures, but they were maybe even more eager to discuss science in more detail with the Nobel Laureates and talk to them about the conditions of scientific work now and in the future. We have heard that the Nobel Laureates were very happy to meet so many excellent young scientists from many countries and backgrounds, to engage in discussions with them, to share their experiences and to give advice to the younger generation.

The final day of the Lindau Meeting was devoted to the boat trip to Mainau Island hosted by the federal state of Baden-Württemberg, where the participants were welcomed by Countess Bettina Bernadotte, President of the Council, and her brother Count Björn Bernadotte. The programme on Mainau Island included a panel discussion about 'Ethics in Science'. For this event, Ahmet Üzümcü, Director-General of the Organization for the Prohibition of Chemical Weapons, whose institution received the Nobel Peace Prize in 2013, was invited. The serious panel topic generated many follow-up questions and discussions. This was followed by a pleasant science picnic on the green arboretum lawn on beautiful Mainau Island. The return trip by boat to Lindau gave rise to lively dancing and reveling among the young participants – an important component of a week rich in scientific interactions and in opportunities to make new friends across borders.

67 Nobel Laureates



Peter Agre
Nationality: USA
Nobel Prize: Chemistry
Year: 2003
Prize Motivation: “for discoveries concerning channels in cell membranes”



Martin Chalfie
Nationality: USA
Nobel Prize: Chemistry
Year: 2008
Prize Motivation: “for the discovery and development of the green fluorescent protein, GFP”



Aaron Ciechanover
Nationality: Israel
Nobel Prize: Chemistry
Year: 2004
Prize Motivation: “for the discovery of ubiquitin-mediated protein degradation”



Paul J. Crutzen
Nationality: Netherlands
Nobel Prize: Chemistry
Year: 1995
Prize Motivation: “for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone”



Tomas Lindahl
Nationality: Sweden
Nobel Prize: Chemistry
Year: 2015
Prize Motivation: “for mechanistic studies of DNA repair”



Rudolph A. Marcus
Nationality: Canada
Nobel Prize: Chemistry
Year: 1992
Prize Motivation: “for contributions to the theory of electron transfer reactions in chemical systems”



Hartmut Michel
Nationality: Germany
Nobel Prize: Chemistry
Year: 1988
Prize Motivation: “for the determination of the three-dimensional structure of a photosynthetic reaction centre”



William E. Moerner
Nationality: USA
Nobel Prize: Chemistry
Year: 2014
Prize Motivation: “for the development of super-resolved fluorescence microscopy”



Johann Deisenhofer
Nationality: Germany
Nobel Prize: Chemistry
Year: 1988
Prize Motivation: “for the determination of the three-dimensional structure of a photosynthetic reaction centre”



Bernard L. Feringa
Nationality: Netherlands
Nobel Prize: Chemistry
Year: 2016
Prize Motivation: “for the design and synthesis of molecular machines”



Harald zur Hausen
Nationality: Germany
Nobel Prize: Physiology or Medicine
Year: 2008
Prize Motivation: “for the discovery of human papilloma viruses causing cervical cancer”



Stefan Hell
Nationality: Germany
Nobel Prize: Chemistry
Year: 2014
Prize Motivation: “for the development of super-resolved fluorescence microscopy”



Mario J. Molina
Nationality: Mexico
Nobel Prize: Chemistry
Year: 1995
Prize Motivation: “for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone”



Ferid Murad
Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 1998
Prize Motivation: “for discoveries concerning nitric oxide as a signalling molecule in the cardiovascular system”



Ei-ichi Negishi
Nationality: Japan
Nobel Prize: Chemistry
Year: 2010
Prize Motivation: “for palladium-catalysed cross couplings in organic synthesis”



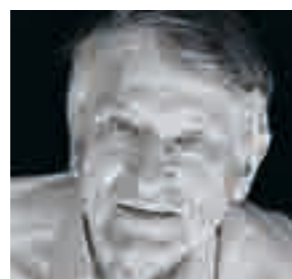
Erwin Neher
Nationality: Germany
Nobel Prize: Physiology or Medicine
Year: 1991
Prize Motivation: “for discoveries concerning the function of single ion channels in cells”



Avram Hershko
Nationality: Israel
Nobel Prize: Chemistry
Year: 2004
Prize Motivation: “for the discovery of ubiquitin-mediated protein degradation”



Robert Huber
Nationality: Germany
Nobel Prize: Chemistry
Year: 1988
Prize Motivation: “for the determination of the three-dimensional structure of a photosynthetic reaction centre”



Klaus von Klitzing
Nationality: Germany
Nobel Prize: Physics
Year: 1985
Prize Motivation: “for the discovery of the quantised Hall effect”



Jean-Marie Lehn
Nationality: France
Nobel Prize: Chemistry
Year: 1987
Prize Motivation: “for the development and use of molecules with structure-specific interactions of high selectivity”



Jean-Pierre Sauvage
Nationality: France
Nobel Prize: Chemistry
Year: 2016
Prize Motivation: “for the design and synthesis of molecular machines”



Richard R. Schrock
Nationality: USA
Nobel Prize: Chemistry
Year: 2005
Prize Motivation: “for the development of the metathesis method in organic synthesis”



Dan Shechtman
Nationality: Israel
Nobel Prize: Chemistry
Year: 2011
Prize Motivation: “for the discovery of quasicrystals”



George F. Smoot
Nationality: USA
Nobel Prize: Physics
Year: 2006
Prize Motivation: “for the discovery of the blackbody form and anisotropy of the cosmic microwave background radiation”



Thomas A. Steitz
Nationality: USA
Nobel Prize: Chemistry
Year: 2009
Prize Motivation: “for studies of the structure and function of the ribosome”



Sir John E. Walker
Nationality: United Kingdom
Nobel Prize: Chemistry
Year: 1997
Prize Motivation: “for their elucidation of the enzymatic mechanism underlying the synthesis of adenosine triphosphate (ATP)”



Kurt Wüthrich
Nationality: Switzerland
Nobel Prize: Chemistry
Year: 2002
Prize Motivation: “for his development of nuclear magnetic resonance spectroscopy for determining the three-dimensional structure of biological macromolecules in solution”



Ada E. Yonath
Nationality: Israel
Nobel Prize: Chemistry
Year: 2009
Prize Motivation: “for studies of the structure and function of the ribosome”



Organisation for the Prohibition of Chemical Weapons (OPCW)
Nobel Prize: Peace
Year: 2013
Prize Motivation: “for its extensive efforts to eliminate chemical weapons”
Represented by: Ahmet Üzümcü



Joseph Sifakis
Nationality: Greece
Award: ACM A.M. Turing Award
Year: 2007
Prize Motivation: “for their role in developing Model-Checking into a highly effective verification technology that is widely adopted in the hardware and software industries”

» All portraits can be found in Peter Badge's new book 'Nobel Heroes' (see p. 69).

» The mediatheque contains profiles of more than 400 Nobel Laureates.

Laureates at #LiNo17

29 LAUREATES



23
Chemistry



3
Physiology/
Medicine



2
Physics

+



1
ACM A.M.
Turing Award

NATIONALITIES

12



RECORDS

Most Participations
 Robert Huber (21)
 Hartmut Michel (20)
 Klaus von Klitzing (16)

First Participations
 Ben Feringa
 Tomas Lindahl
 Jean-Pierre Sauvage

Earliest Award
 Klaus von Klitzing (1985)

AGE

Youngest: Stefan Hell (53)
Oldest: Rudolph A. Marcus (93)

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Nominating Institutions

» Academic Partners With Accepted Candidates at #LiNo17

- Academia Nacional de Ciencias del Uruguay (ANCIU)
- Académie Nationale des S & T du Sénégal
- Academy of Science of South Africa (ASSAf)
- Academy of Sciences Malaysia
- acatech – National Academy of Science and Engineering, Germany
- African Academy of Sciences (AAS)
- Alexander S. Onassis Public Benefit Foundation
- Alexander von Humboldt-Stiftung
- American University of Beirut, Lebanon
- Australian Academy of Science
- Bangladesh Academy of Sciences
- Bavarian Academy of Sciences and Humanities, Germany
- Brazilian Academy of Sciences
- Bulgarian Academy of Sciences

- Canadian Institutes of Health Research (CIHR)/ Institut de recherche en santé du Canada (IRSC)
- Centre National de la Recherche Scientifique (CNRS), France
- Chilean Academy of Sciences
- Clausthal University of Technology, Germany
- Columbus Association
- Croucher Foundation
- Danish Council for Independent Research
- Department of Science & Technology, Government of India
- Deutsche Bundesstiftung Umwelt
- Deutsches Krebsforschungszentrum (DKFZ)

» List continues on p. 24

Academic partner representatives during the 67th Lindau Meeting



Young Scientists at #LiNo17

419
from
78 countries

MOST REPRESENTED NATIONS



GENDER BALANCE

♂ 55% ♀ 45%

AGE

Oldest 35 years Youngest 20 years Average 28 years

ACADEMIC DEGREES



10% Undergraduate 33% Master/Diploma 58% PhD

» Academic Partners With Accepted Candidates at #LiNo17

Eberhard Karls Universität Tübingen, Germany

Eidgenössische Technische Hochschule Zürich, Switzerland

Elite Network of Bavaria

Else Kröner-Fresenius-Stiftung (EKFS)

EMBO – excellence in life sciences

Estonian Academy of Sciences

European Commission

European Molecular Biology Laboratory (EMBL)

Federation of European Biochemical Societies (FEBS)

Fonds Wetenschappelijk Onderzoek – Vlaanderen (FWO), Belgium

Foundation for Polish Science

Friedrich Schiller University Jena, Germany

German Academic Exchange Service (DAAD)

German National Academy of Sciences Leopoldina

Göttingen Graduate School for Neurosciences, Biophysics, and Molecular Biosciences (GGNB), Germany

Helmholtz Association of German Research Centres

Human Frontier Science Program

Humboldt-Universität zu Berlin, Germany

Hungarian Academy of Sciences

Internationale Bodensee-Hochschule

Irish Research Council

Jacobs Foundation

Jacobs University Bremen, Germany

Japan Society for Promotion of Science (JSPS)

Julius-Maximilians-Universität Würzburg, Germany

Kiel University, Germany

King Abdullah University of Science and Technology, Saudi Arabia

Körber Foundation

Leibniz-Gemeinschaft

Leipzig University, Germany

Linde AG

Lomonosov Moscow State University, Russia

Ludwig-Maximilians-Universität München, Germany

Luxembourg National Research Fund (FNR)

Max Planck Institute for Biophysical Chemistry, Germany

Max-Planck-Gesellschaft

McKinsey & Company, Inc.

Mexican Academy of Sciences

Ministry of Education and Human Resources, Tertiary Education and Scientific Research of the Republic of Mauritius

Ministry of Science & Technology (MOST), Taiwan

Mongolian Academy of Sciences

Myanmar Book Centre Co., Ltd.

National Academy of Sciences of the Republic of Armenia (NAS RA)

National Research Foundation Singapore

National Science and Technology Development Agency, Thailand

Novartis

OIC Standing Committee on Scientific and Technological Cooperation (COMSTECH)

ORAU, USA

Österreichische Akademie der Wissenschaften, Austria

Pakistan Institute of Engineering and Applied Sciences

Philipps-Universität Marburg, Germany

Robert Bosch Stiftung

Royal Netherlands Academy of Arts and Sciences

Ruhr-Universität Bochum, Germany

Saint-Petersburg State University, Russia

Sharif University of Technology, Iran

Sino-German Center for Research Promotion, China

Slovenian Academy of Sciences and Arts

Spanish National Research Council (CSIC)

Studienstiftung des deutschen Volkes

Technische Universität Braunschweig, Germany

Technische Universität Dresden, Germany

Technische Universität Kaiserslautern, Germany

The Czech Academy of Sciences (CAS)

The Korean Academy of Science and Technology (KAST)

The Lithuanian Academy of Sciences

The Nobel Foundation

The Norwegian Academy of Science and Letters

The Research Council, Oman

The Royal Society

TU Bergakademie Freiberg, Germany

TU Dortmund, Germany

TUBITAK, Turkey

TWAS – The World Academy of Sciences

Universität Bayreuth, Germany

Universität Bielefeld, Germany

Universität Hamburg, Germany

Universität Paderborn, Germany

University of Bonn, Germany

University of Kassel, Germany

University of Liechtenstein

University of Regensburg, Germany

Verband der Chemischen Industrie e.V. (VCI)

Verein Deutscher Ingenieure e.V. (VDI)

Volkswagen Aktiengesellschaft

Weizmann Institute of Science, Israel

Westfälische Wilhelms-Universität Münster, Germany

» The nomination process in Germany was conducted in cooperation with the Mathematisch-Naturwissenschaftlicher Fakultätentag (MNFT).

Wolfgang Lubitz, scientific chair of the 67th Lindau Meeting, and Ayaka Sasagawa, Head of the Research Cooperation Division, JSPS



Academic partner luncheon

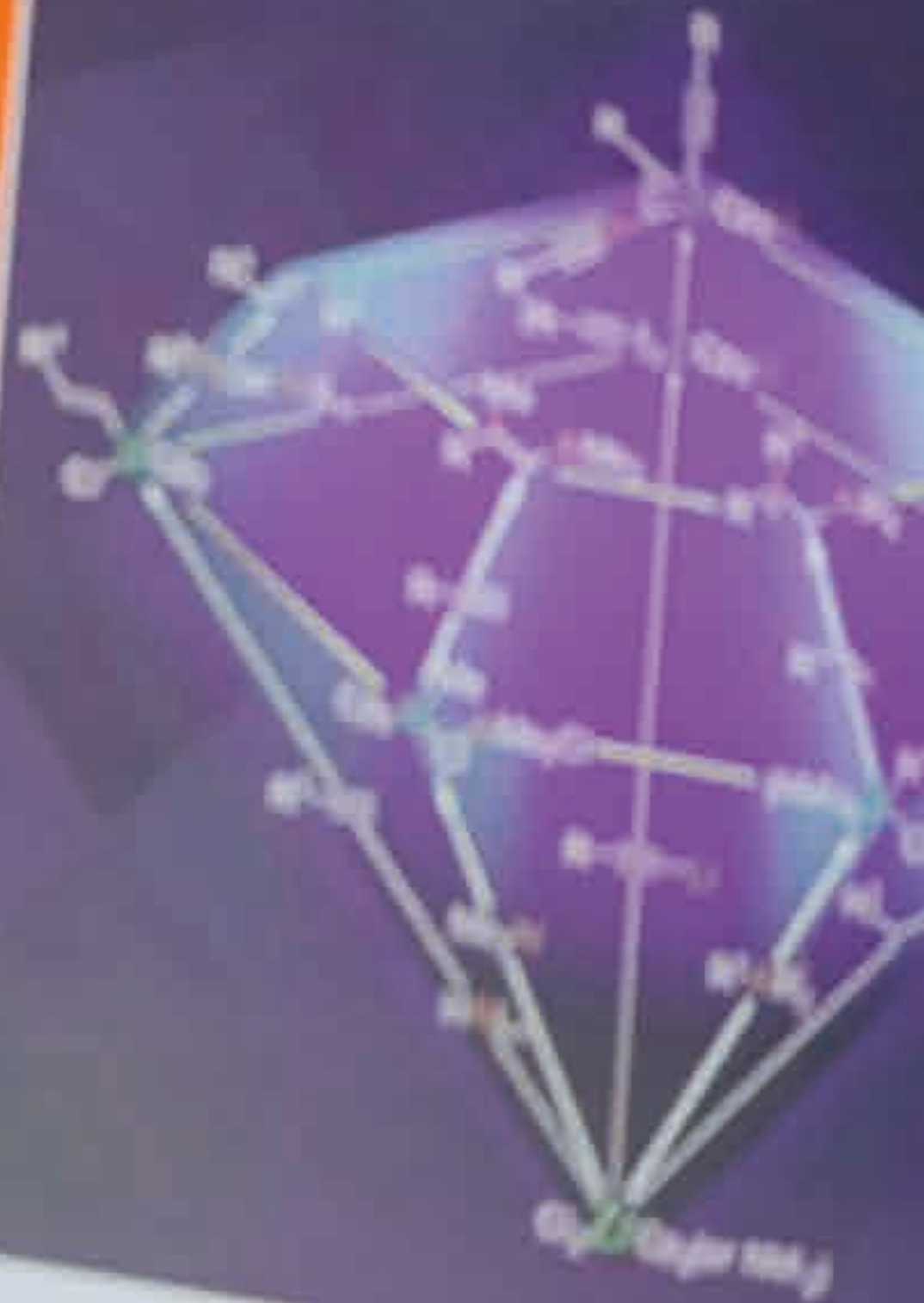


Countess Bettina Bernadotte with Helmut Schwarz, President of the Alexander von Humboldt-Stiftung



'The Magical Power of Transition Metals'

Lecture by Ei-ichi Negishi, Nobel Laureate in Chemistry 2010



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Scientific Programme

» Lectures

Peter Agre	Aquaporin Water Channels: From Atomic Structure to Malaria
Aaron Ciechanover	The Revolution of Personalised Medicine: Are We Going to Cure All Diseases and at What Price?
Martin Chalfie	Robustness in Cell Development
Johann Deisenhofer	On the Structural Biology of Photosynthetic Light Reactions
Ben Feringa	The Joy of Discovery
Harald zur Hausen	Pathogenicity of Bovine Bacterial Plasmid-Derived Virus-Like Infections
Stefan W. Hell	Nanoscopy With Focused Light
Avram Hershko	Lessons From the Discovery of the Ubiquitin System
Robert Huber	New Ways of Vision: Protein Structures in Translational Medicine and Business Development, My Experience
Klaus von Klitzing	A New International System of Units: From a New Mole to a New Kilogram
Tomas Lindahl	DNA Instability and the Role of TREX1
Jean-Marie Lehn	Toward Adaptive Chemistry
Rudolph A. Marcus	What Can Be Learned About the Enzyme ATPase From Single Molecule Studies of Its Subunit F1 and What Not?
Hartmut Michel	Oxygen Reduction and Energy Conservation by Membrane-Integrated Terminal Oxidases



Jean-Pierre Sauvage

Sessions of the Scientific Programme of #LiNo17

6 BREAKFAST SESSIONS
Early Morning Panel Discussions
Presented by Partners & Supporters

28 LECTURES
By Nobel Laureates
Free Choice of Topics

PANEL DISCUSSIONS
Topical and Relevant Issues
Discussions Involving the Audience

3

DISCUSSIONS 27
Time for Q&A
Informal Atmosphere

MASTER CLASSES
Young Scientists Showcase Their Research
Nobel Laureates Give Advice

3

30 POSTER FLASHES
2-Minute Presentations
One Session

3 POSTER SESSIONS
Young Scientists Present Posters
Nobel Laureates and Young Scientists Vote for the Winners

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» Lectures

- William E. Moerner What Can You Learn From Watching Single Molecules?
- Mario J. Molina Climate Change: Science, Policy and Risks
- Ferid Murad Role of Nitric Oxide and Cyclic GMP in Cell Signaling and Drug Development
- Ei-ichi Negishi Magical Power of d-Block Transition Metals as Exemplified by Catalytic Highly Asymmetric C-C Bond Formation
- Erwin Neher In-Situ Ca⁺⁺-Imaging and Fluorescent Proteins: Using the Tools of Roger Tsien
- Jean-Pierre Sauvage From Chemical Topology to Molecular Machines
- Richard R. Schrock Catalytic Reduction of Dinitrogen to Ammonia
- Dan Shechtman The Science and Beauty of Crystals
- Joseph Sifakis On the Nature of Computing (Heidelberg Lecture)
- George F. Smoot Cosmic Connections
- Thomas A. Steitz How Protein Factors Facilitate Protein Synthesis by the Ribosome
- Sir John E. Walker The ATP Synthase in Cellular Life and Death
- Kurt Wüthrich Aromatic Ring Flips in Protein Dynamics
- Ada E. Yonath Next-Generation Environmentally Friendly Antibiotics

Erwin Neher



All lectures from #LiNo17 can be watched in the mediatheque, which contains more than 750 videos.



Stefan W. Hell

Kurt Wüthrich



Tomas Lindahl



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» Panel Discussions

CURRENT AND FUTURE GAME CHANGERS IN CHEMISTRY

Panellists

- Stefan W. Hell, Max Planck Institute for Biophysical Chemistry, Germany
- Jörg Huslage, Research Manager, Volkswagen Group, Germany
- Richard R. Schrock, MIT Massachusetts Institute of Technology, USA
- Siddulu Talapaneni, Future Industries Institute, University of South Australia (UniSA), Australia

Moderator

Geoffrey Carr, Science Editor, The Economist, United Kingdom

SCIENCE CAREERS

Panellists

- Thomas L. Gianetti, Department of Chemistry and Applied Bioscience, ETH Zurich, Switzerland
- May Shana'a, Head of Research & Development, Beiersdorf AG, Germany
- Dan Shechtman, Department of Materials Science and Engineering, Technion – Israel Institute of Technology, Israel
- Wiltrud Treffenfeldt, Chief Technology Officer Europe, Middle East, Africa & India, Dow Europe GmbH, Switzerland
- Sir John E. Walker, Emeritus Director, Medical Research Council, Mitochondrial Biology Unit, United Kingdom

Moderator

Alaina G. Levine, science journalist and science career consultant, Quantum Success Solutions, USA

Alaina G. Levine



ETHICS IN SCIENCE

Panellists

- Jeffrey D. Kovac, Department of Chemistry, University of Tennessee, USA
- Michael Lerch, Faculty of Mathematics and Natural Sciences, University of Groningen, Netherlands
- Karen Stroobants, Department of Chemistry, University of Cambridge, United Kingdom
- Ahmet Üzümcü, Director-General, Organisation for the Prohibition of Chemical Weapons (Nobel Peace Prize 2013), Netherlands

Moderator

Geoffrey Carr, Science Editor, The Economist, United Kingdom



Panel discussion on Ethics in Science: Karen Stroobants, Michael Lerch and Ahmet Üzümcü, OPCW (Nobel Peace Prize 2013)



Jörg Huslage



Geoffrey Carr and Jeffrey Kovac

Panel discussion on Science Careers: Wiltrud Treffenfeldt, Dan Shechtman and May Shana'a



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» Poster Presentations

In addition to the poster sessions, for the first time ever, poster flashes were held during #LiNo17. During these 2-minute presentations, young scientists explained their research in a concise way to an audience of Nobel Laureates and other meeting participants.

In total, 287 young scientists applied to present posters during #LiNo17; 30 of them made it to the final selection and were offered the opportunity to present their work both during the poster sessions and poster flashes. The winners were then determined by a public vote among the participating Nobel Laureates and young scientists.

Topic Areas

- Catalysis – Photocatalysis
- Metal Organic Frameworks
- Perovskite Photovoltaics
- Nanoparticles
- Supramolecular Chemistry, Photoswitching, Polymers
- Methods and Method Development for Studying/ Building Biological Systems
- Surfaces – Biofilms
- DNA, RNA, Ribosome

Amita Ummadisingu from École Polytechnique Fédérale de Lausanne during her poster flash



Frank Biedermann from the Karlsruhe Institute of Technology presenting his poster to Nobel Laureate Erwin Neher



Chenjie Zeng in front of her prizewinning poster



Thomas Gianetti from ETH Zurich during his poster flash



The Winners

1st Place

Chenjie Zeng
Carnegie Mellon University, USA
for her poster
PRECISION AT THE NANOSCALE: ON THE STRUCTURE AND PROPERTY EVOLUTION OF GOLD NANOCCLUSERS

2nd Place

Chenge Li
École Normale Supérieure, France
for her poster
DYNAMIC MULTI-COLOR PROTEIN LABELING IN LIVING CELLS

3rd Place

Michael M. Lerch
University of Groningen, Netherlands
for his poster
UNDERSTANDING DONOR-ACCEPTOR STENHOUSE ADDUCTS



Victor Pui-Yan Ma from Emory University during his poster flash



A programme booklet with abstracts of all 30 posters is available for download in the mediatheque.

Wolfgang Lubitz, Chenjie Zeng, Chenge Li, Michael M. Lerch and Astrid Gräslund during the presentation of the winners' certificates



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» Master Classes

PROTEINS AND THEIR MODIFICATIONS IN HEALTH AND DISEASE
chaired by Aaron Ciechanover

Speakers

- Franziska Doll, University of Konstanz and Konstanz Research School Chemical Biology, Germany
- Nancy Fang, Harvard Medical School, USA
- Florian Meier, Max Planck Institute of Biochemistry, Germany
- Karen Stroobants, University of Cambridge, United Kingdom
- Annika Weber, Max-Delbrück-Center for Molecular Medicine, Germany

OLEFIN METATHESIS IN ORGANIC AND POLYMER CHEMISTRY
chaired by Richard R. Schrock

Speakers

- Jeffrey Bruffaerts, Technion – Israel Institute of Technology, Israel
- Rebecca Musgrave, School of Chemistry, University of Bristol, United Kingdom
- Oleksandra Trofymchuk, Universidad de Talca, Chile

STUDIES OF RATE PROCESSES IN CHEMICAL AND BIOLOGICAL SYSTEMS BY NMR AND/OR EPR
chaired by Kurt Wüthrich

Speakers

- Jean-Philippe Demers, Center for Cancer Research, National Cancer Institute, USA
- Thibault Viennet, Institute of Complex Systems, Forschungszentrum Jülich, Germany
- Cecilia Wallin, Stockholm University, Sweden

Florian Meier presenting at the master class chaired by Aaron Ciechanover



Jeffrey Bruffaerts and Richard Schrock



Cecilia Wallin at the master class chaired by Kurt Wüthrich

» Science & Partner Breakfasts

SCIENCE AND PUBLIC POLICY
hosted by Mexico

Panellists

- José Franco, Former President, Mexican Academy of Sciences, Mexico
- Mario Molina, Centro Mario Molina para Estudios Estratégicos sobre Energía y Medio Ambiente A.C., Mexico
- José Octavio Saucedo Lucero, Department of Processes and Technology, Universidad Autónoma Metropolitana (UAM), Mexico
- Ana Elizabeth Torres-Hernández, Department of Chemical Engineering, Texas A&M University, USA

Moderator

Arturo Borja Tamayo, Director of International Cooperation, Consejo Nacional de Ciencia y Tecnología (CONACYT), Mexico

Ana Elizabeth Torres-Hernández and José Franco



EXCELLENCE IN SCIENCE AND EXPLORATION
hosted by Rolex SA

Panellists

- Martin Chalfie, Department of Biological Sciences, Columbia University, USA
- Francesco Sauro, Scuola di Scienze, Università di Bologna, and La Venta Esplorazioni Geografiche, Italy
- Hosam Zowawi, King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia and The University of Queensland, Australia

Moderator

Mary O'Mahony, Rolex SA, Switzerland

Mary O'Mahony



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» Science & Partner Breakfasts

CARBON DIOXIDE RECYCLING TO USEFUL CHEMICAL PRODUCTS AND SYNTHETIC FUELS?

hosted by the Austrian Federal Ministry of Science, Research and Economy

Panellists

- Anna Eibel, Institute of Physical and Theoretical Chemistry, Graz University of Technology, Austria
- Ben Feringa, Faculty of Science and Engineering, University of Groningen, Netherlands

Moderator

Niyazi Serdar Sarıçiftçi, Head of Linz Institute for Organic Solar Cells (LIOS), Institute of Physical Chemistry, Johannes Kepler University Linz, Austria

Niyazi Serdar Sarıçiftçi, Ben Feringa and Anna Eibel



THE CHEMISTRY OF FOOD: FLAVOUR AND BEYOND

hosted by Mars, Incorporated

Panellists

- Aaron Ciechanover, Tumor and Vascular Biology Research Center, Technion – Israel, Institute of Technology, Israel
- Thomas Hofmann, Food Chemistry and Molecular Sensory Science, Technische Universität München (TUM), Germany
- Hira Khalid, Forman Christian College, Pakistan

Moderator

Adam Smith, Chief Scientific Officer, Nobel Media AB

Thomas Hofmann, Aaron Ciechanover, Hira Khalid



CIRCULAR ECONOMY – HOW DO WE MAKE IT HAPPEN

hosted by BASF SE

Table Hosts

- Robert Huber, Max Planck Institute of Biochemistry, Germany
- Jean-Marie Lehn, Université de Strasbourg, France
- Ei-ichi Negishi, H.C. Brown Laboratories of Chemistry, Purdue University, USA
- Wolfgang Lubitz, Max Planck Institute for Chemical Energy Conversion, Germany, Scientific Chairperson of the 67th Lindau Meeting

Host

Thomas Weber, Senior Vice President Innovation Management, BASF SE, Germany

Moderator

Anja Feldmann, Senior Manager Research Communications, BASF Personal Care and Nutrition GmbH, Germany

Ei-ichi Negishi chairing a world café table at the BASF science breakfast



STRONGER SCIENCE LEADERSHIP AS BASIS FOR INNOVATION IN A DISRUPTIVE WORLD

hosted by McKinsey & Company, Inc.

Panellists

- Florian Budde, Senior Partner, McKinsey & Company, Inc., Germany
- Hartmut Michel, Max Planck Institute of Biophysics, Germany
- David Lunn, University of Oxford, United Kingdom

Moderator

Matthias Evers, Senior Partner, McKinsey & Company, Inc., Germany

Hartmut Michel



67 Innovation Forum

» Imaging on a Molecular Level

The Innovation Forums were established in 2010 upon an initiative of Nobel Laureate Martin Chalfie. Their aim is to bring together top-level scientists and business executives for an informal exchange on current problems and solutions for tomorrow.

The first Innovation Forum 2017 – which took place at the 67th Lindau Meeting – zoomed in on the topic of ‘Imaging on a Molecular Level’. Observing molecules in action in their native environments, with atomic resolution and in real time has long been a dream of biologists, physicists and chemists alike. As well as unravelling some of the key mysteries of life, such abilities would provide fundamental insights into molecular mechanisms of disease and enable the design of precise medical treatments.

In his opening presentation, Stefan Hell introduced the audience to his new, ground-breaking technology called MINIFLUX. After receiving the Nobel Prize for STED microscopy, which effectively overcame Abbe’s resolution limit, he went on to combine the approaches of STED technology with the competing PALM technique, resulting in an increase of the resolution factor by 100X.

Nobel Laureate Kurt Wüthrich has long been a pioneer in NMR spectroscopy, which allows for analysis of biomolecules in solution as well as non-invasive imaging of whole organisms. In his talk, he presented recent advances that allow imaging molecules in the human body.

Cryo-electron microscopy (cryo-EM) has enabled scientists to reveal the structures of isolated macromolecules at near-atomic resolutions, and the newest methods generate three-dimensional images of biomolecules in their native environments, providing unique snapshots of cellular landscapes. This technology was explained by one of its pioneers, Wolfgang Baumeister of the Max Planck Institute of Biochemistry, Martinsried. The topic selection was especially timely, as the Nobel Prize in Chemistry 2017 was awarded to cryo-EM research.

As the Innovation Forum is dedicated to the exchange between fundamental research and applied science, the audience also followed Astra Zeneca’s Stefan Geschwindner with great interest. He presented an exploration of total internal reflection

fluorescence microscopy, which is used in pharmaceutical development to analyse molecular structures or, more specifically, ‘drugs in action’.

Discussing what lies ahead in terms of research frontiers is one of the most exciting parts of the Innovation Forum. Plenary discussions as well as coffee break talks were inspired by an analytical overview of research trends emerging from big data publication analytics, provided by Joshua Schnell from Clarivate Analytics.

Presentations
NEW CONCEPTS AND INNOVATIONS IN SUPERRESOLUTION MICROSCOPY
 Stefan Hell, Max Planck Institute for Biophysical Chemistry, Germany

NMR-BASED IMAGES OF MOLECULES AND HUMAN BODIES
 Kurt Wüthrich, The Scripps Research Institute, USA

SEEING DRUGS IN ACTION: FROM MOLECULAR ENSEMBLES TO SINGLE MOLECULES WITH TIRF MICROSCOPY
 Stefan Geschwindner, AstraZeneca, Sweden

CRYO-ELECTRON TOMOGRAPHY OR THE CHALLENGE OF DOING STRUCTURAL BIOLOGY IN SITU
 Wolfgang Baumeister, Max Planck Institute of Biochemistry, Germany

MINING SCHOLARLY LITERATURE FOR INSIGHTS INTO MOLECULAR AND NEAR-MOLECULAR IMAGING RESEARCH AND APPLICATIONS
 Joshua Schnell, Clarivate Analytics, USA

Stefan Geschwindner



Kurt Wüthrich



Joshua Schnell



Stefan Hell



Wolfgang Baumeister

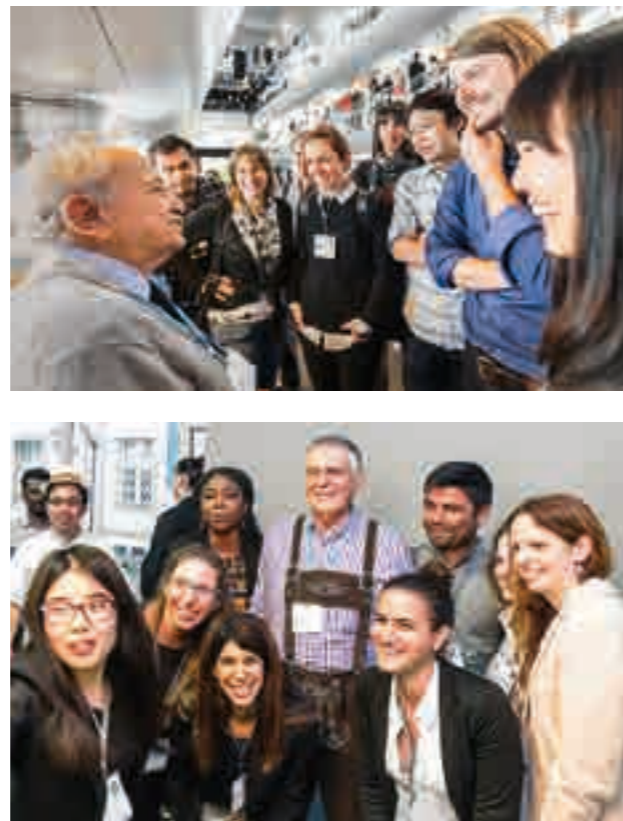


Impressions

Peter Agre



Rudolph A. Marcus in discussion with young scientists



Young scientists posing with Klaus von Klitzing and his Nobel medal



Marian Nkansah from the Kwame Nkrumah University of Science and Technology, Ghana



Dan Shechtman and young scientists during the Bavarian Evening



Aaron Ciechanover in discussion with young scientists over lunch

67 Social Programme

» Summer Festival of Science

hosted by the German Federal Minister of Education and Research Johanna Wanka

Boat Trip to Langenargen

Reception at Montfort Castle, Langenargen

Welcome Addresses

Johanna Wanka, Federal Minister of Education and Research
Countess Bettina Bernadotte

Dinner at Montfort Castle

Fireworks

Johanna Wanka welcoming young scientists



» Bavarian Evening

hosted by the Elite Network of Bavaria and the Free State of Bavaria

Welcome Addresses

Countess Bettina Bernadotte
Ludwig Spaenle, Bavarian State Minister of Education,
Science and the Arts

Presentations

BAVARIA – LAND OF SCIENCE AND RESEARCH
Hartmut Michel, Max Planck Institute of Biophysics, Germany

CURRENT RESEARCH PROJECTS WITHIN THE ELITE NETWORK OF BAVARIA

Jennie Pottbäcker and Rebecca Grünbauer, Fellows of the Elite Network of Bavaria

Traditional Bavarian Music & Parade

Die Neisamer Musikanten

Young scientists Stephan Hess, Clara C. Eisebraun, Rebecca Grünbauer, Jennie Pottbäcker and Tobias Klein together with Ludwig Spaenle



» International Day

hosted by Mexico

Science Breakfast

SCIENCE AND PUBLIC POLICY

hosted by Mexico (see p. 37)

International Get-Together

hosted by Mexico at the Dornier Museum Friedrichshafen

Welcome

Countess Bettina Bernadotte

Welcome Address

Aurelio Nuño Mayer, Secretary of Public Education, Mexico

Aurelio Nuño Mayer



Presentation

SCIENCE IN MEXICO: RESEARCH AND POLICIES

Enrique Cabrero Mendoza, Director, Consejo Nacional de Ciencia y Tecnología (CONACYT)

Master of Ceremonies

Christian González Laporte, Representative for Europe,
Consejo Nacional de Ciencia y Tecnología (CONACYT)

Music

Mariachi El Dorado

Enrique Cabrero Mendoza, Sergio Hernandez, Elias Micha, Mario Molina and José-Luis Morán



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» Grill & Chill

hosted by the Council and the Foundation in cooperation with the City of Lindau

Welcome Address

Gerhard Ecker, Lord Mayor of Lindau
Countess Bettina Bernadotte, President of the Council for the Lindau Nobel Laureate Meetings

Donations

The proceeds and donations were divided among three different Lindau institutions: the local branch of 'Grünes Klassenzimmer' (Green Classroom), the 'Kinderakademie Bodensee' (Children's Academy of Lake Constance) and the association for the conservation of the historical Cavazzen building.

Support

Continental AG
Stadtwerke Lindau

Gerhard Ecker, Countess Bettina Bernadotte, Uwe Grau, Continental AG, and Thomas Gläßer, Stadtwerke Lindau



» Academic Dinners

Hosts

- Alexander von Humboldt Stiftung
- Australian Academy of Science
- Federal Ministry of Science, Research and Economy (BMWFV), Austria
- German Academic Exchange Service (DAAD)
- Elite Network of Bavaria
- Helmholtz-Stiftung
- Human Frontier Science Program
- Max-Planck-Gesellschaft
- Mexican Academy of Sciences
- Nobel Foundation
- ORAU (Oak Ridge Associated Universities)

Dinner with the US delegation hosted by ORAU with Nobel Laureates Avram Hershko, William Moerner, Richard Schrock and Dan Shechtman



Nobel Laureates George Smoot and Mario Molina in discussion with Syrian refugees at the Grill & Chill

» Baden-Württemberg Boat Trip

hosted by the State of Baden-Württemberg

Welcome Address

Ulrich Steinbach, Deputy Minister, Ministry of Science, Research and the Arts, Baden-Württemberg, Germany

Exhibition

Presentations by selected research institutions from Baden-Württemberg

Announcement

Winners of the #LiNo17 Poster Sessions

Science Picnic

Nobel Laureate Richard Schrock giving his farewell speech in front of Mainau Castle



Ulrich Steinbach

Nobel Laureate Martin Chalfie at the science picnic





“The most important part of the meeting for me is the chance to meet and talk with the student participants.”

Martin Chalfie, Nobel Laureate in Chemistry 2008

The Joy of Discovery

Ben Feringa, Nobel Laureate in Chemistry 2016, provides some personal impressions from the 67th Lindau Nobel Laureate Meeting.



Few events in the career of a scientist make such a lasting impression as the Lindau Nobel Laureate Meeting. In the beautiful setting of Lake Constance, Countess Bettina Bernadotte and the staff of the executive secretariat of the Lindau Meetings welcome hundreds of young talents from all over the world to discuss with several Nobel Laureates. Far beyond my daily joy of discovery in the molecular world, I experienced the excitement and stimulating atmosphere created by the discussions with so many bright young minds. The lectures of distinguished Nobel Laureates, covering various aspects of our discipline and far beyond, were equally stimulating, providing ample opportunities to open new windows to our common

future. This memorable event, characterised by superb organisation and royal treatment, makes even the youngest participant feel proud to be a scientist. The numerous discussions with the students reminded me vividly of my own early days as a young scientist – the wonder and passion for chemistry but also the struggle with choices. Which are the most challenging topics or areas for the future, which directions to take, how to deal with the winding and unpaved roads to discovery, the balance in one's personal life? How do you translate the advice of one of your heroes in the field and find the balance with your own knowledge and intuition? It was indeed a great joy to rediscover how the journey of a scientist starts as well as sharing my personal experiences with these daring and ambitious young men and women.

The opportunity to advocate the values of science in general – our responsibilities for humanity and the important role of 'quality of thought' in academic training, through extensive discussions with participants from around the world – reflects to me one of the major assets of the Lindau Meetings. This extends to the many opportunities to engage with the press to emphasise the beauty and power of chemistry as the central science and the key role of all the young talents gathered in Lindau in making major contributions to invent our future. The considerable efforts of the Lindau organisation in reaching out to the community at large are to be applauded. The inspiring lectures and high-level social events, including an enchanting 'Mexican Evening', provided the proper 'wings' to make us all feel as though we were flying during this magnificent week.

For me, the absolute highlight of the event was the discussion forum, which lasted nearly two hours, with a large group of students. The topics ranged from personal highlights to decisive moments in my career, the challenging questions by the audience on the future of our discipline and the experiences shared by students from different continents, made this particular meeting a steep mutual learning curve for all of us. It was a fine example of the essence of science, asking questions and entering academic debate. It gave me much pleasure to share with the

“Few events in the career of a scientist make such a lasting impression as the Lindau Nobel Laureate Meeting.”

Ben Feringa



Ben Feringa with young scientists

students my views on “how to discover your talent” being a scientist: “Be confident in following your dreams, as it allows you to discover what will give you lots of energy and to experience your limits in this adventure in the unknown beyond your current horizon.”

The joy of discovery by the students, both scientifically and personally, experienced in all its facets during the Lindau week, will make a long-lasting contribution to the careers of these young chemists. The Lindau Nobel Laureate Meeting offers a magnificent 'laboratory' for young talents who are going to shape our future.

Breaking the Shyness Barrier

Laureate Sir Christopher Pissarides reflects on the 6th Lindau Meeting on Economic Sciences.

“Lindau succeeds in breaking the shyness barrier between young people still struggling with degree studies and silver-coloured gentlemen.”

Christopher Pissarides



When I was growing up as an economist, first at Essex University and then at the London School of Economics, I was hearing about the Nobel Prize and all the gossip around it and I thought those winning it must be some kind of superhumans, that every word that came out of them is a word of wisdom. I guess in economics in my formative years, there were indeed some superhumans around: Samuelson, Hicks, Arrow, Friedman, to name a few who made the subject what it is. But it is still puzzling to me why, as human beings, we attach so much importance to the few who have the medal in their hand. And it's not new: in Classical Greece, a city would destroy part of its city walls when one of its young men got the Olympic wreath because

with men like him it did not need walls to protect it. What would I not have given in those days to be in the company of the Nobel Laureates (or the Olympic athletes, for that matter) for a few days? Lindau does just that for a few hundred lucky young people.

Of course, today, being on the other side of the fence, I also count myself lucky to be in the company of so many bright young people and so many of my fellow laureates. In Lindau, I enjoy most the quiet discussions around the dinner table or talking with a cup of coffee in hand until the coffee gets cold and undrinkable (please, next time hire an Italian barista!). Lindau succeeds in breaking the shyness barrier between young people

still struggling with degree studies and silver-coloured gentlemen who have forgotten what it is like to study for a degree (regrettably, there are no living women laureates in economics), to the extent that the organisers feel they should set aside certain times where the laureates can be on their own. Credit should go to the organisers, Countess Bettina Bernadotte and the staff of the executive secretariat.

I decided to lecture about my more recent interests rather than the work that won me the prize: the future of work in the age of automation and robots. It is a fascinating topic, which has attracted a lot of attention on both sides of the argument – the doom and gloom scenario that there will be no meaningful work left for humans and all the profits from the robots will go to a few wealthy individuals and the optimists who claim that society as a whole will be better off and the sooner the robots take over the work the better off we will all be. I belong to the second category but not unconditionally. A lot of jobs will no doubt be taken over by robots but many more will be created, ranging from software engineers who will develop and feed the robots with data and instructions to carers who will look after the children and ageing parents of men and women engaged in the new economy. But inequality and the question of who will get the rewards from the robots' work is a big unresolved issue; governments need to work hard to come up with credible policies for how to reduce poverty and achieve more equality if the optimistic scenario is to materialise. These last topics were hotly debated both at the side gatherings and in the final panel session of the meeting, of which I was fortunate enough to be a member, on a beautiful day in the lush gardens of Mainau Island.

Lindau has been going on for a long time but it is an evolving organisation. This year, we had several 5-minute presentations by graduate students, which are much better than poster sessions where you wander around a room with posters hanging on its walls and students standing by them in the hope that someone will pay attention. The 5-minute presentations put laureates and student participants into the picture, enabled the students to say what their research objectives were and generated lively



Christopher Pissarides with young economists during #LINOecon

discussions afterwards in the gardens and coffee rooms of the island. If I have a grievance, it is that despite the length of the meeting (arrived Tuesday and left Sunday) there was still no time to visit the other attractions of Lindau Island, including, from what I am told, a wonderful old library. A free afternoon would have been welcome! This year, there were also more journalists with requests on one's time for interviews, which interfered with participation in other laureates' presentations, which is a shame given how much you learn from them. Journalists can reach many more people than can be present in Lindau so their presence should be welcome, but where one strikes the balance between time taken up in interviews with them and attendance at the scheduled events is something not easy to resolve.

Overall, this was an excellent meeting; regretfully, we have to wait three whole years for the next one.

We Need Diversity in Science

Hlamulo Makelane is a postdoctoral researcher at the University of the Western Cape, South Africa. Her research focuses on the development of sensitive methods for determination of organic pollutants in wastewater. Physicist and science writer Ulrike Böhm talked with Hlamulo about her career, her advice for other women in research and her experience at #LiNo17.

Ulrike Böhm: What inspired you to pursue a career in chemistry?

Hlamulo Makelane: The most interesting aspect of science that has inspired me is the generation of evidence-based solutions to national and global challenges, because knowledge gained from research is the gateway to making a positive difference for humankind. I developed a passion for chemistry and decided to pursue this career path after a school visit to one of the mines around Phalaborwa, where I met a female analytical chemist. I realised that I could make a difference in the world through chemistry. The stereotype that science isn't for girls and constant reminders that it is difficult, especially for women, never stopped me from pursuing my career.

UB: What are you seeking to accomplish in your career?

HM: Firstly, I would like to continue with the development of selective and sensitive sensor techniques for the determination of organic pollutants in wastewater, because there are many exciting wastewater questions for environmental management that need to be answered. Secondly, I would like to focus on developing methods to assess environmental impacts.

UB: Do you have advice for women interested in science?

HM: The stereotype that science is challenging for women should not prevent anyone from following her career path. Challenge yourself to go beyond your first degree and to even obtain the highest degree, because I believe that if I made it, you can also make it. We need diversity in science. If you are interested in increasing the number of women in science, it will also empower you to think differently about the global challenges, and your creativity will contribute to good solutions.

UB: What do you think will be the next breakthrough in chemistry?

HM: Many breakthroughs are to be anticipated in meeting the environmental challenges that we face, but ultra-sensitive sensor systems with high selectivity for the detection of organ-

ic pollutants at femto- to atto-molar detection limits are envisaged to be one of the next ones. Such devices will be cost-effective, reliable and consist of easy-to-use technologies suitable for accurate determination of organic pollutants in effluents, collecting the requisite data necessary in setting environmental standards and ensuring compliance with regulations on emission limits.

UB: What should be done to increase the number of female scientists and female professors?

HM: One of the challenges associated with the low number of female scientists is the lack of support from their departments or institutions. There is a need for governments to address this issue by implementing and monitoring policies that encourage female scientists. If more women were attracted to stay in science and enhance their careers, they could become role models for the next generation of female scientists.

UB: What were your highlights of the #LiNo17?

HM: The Lindau Meeting was a great opportunity that I will treasure forever. The Nobel Laureates' talks, discussion sessions and panels were very informative, interesting, inspiring, and motivated me to continue with my research. Meeting young scientists from around the world working in different areas of chemistry was amazing. It has broadened my knowledge and made me think about how we can integrate our research through collaboration and explore ways to build something together that can be applicable to societal issues. I was not only inspired by the research of young scientists, I also found it exciting to meet people from different countries and cultural backgrounds, and I had the pleasure to talk about life itself, not only science. I felt like I was surrounded by people who see greatness in one another that we didn't even see in ourselves. I was impressed by the fact that as many women participated in the meeting as men, and I strongly encourage other young scientists, especially women, to consider this career- and life-changing meeting and apply to participate.

"I was surrounded by people who see greatness in one another."

Hlamulo Makelane

The speakers of the farewell addresses at the 67th Lindau Meeting: Richard Schrock, Hlamulo Makelane, Ulrich Steinbach, Deputy Minister of Science, Research and the Arts, Baden-Württemberg, and Countess Bettina Bernadotte



» This interview is part of a series from the Women in Research Blog by physicist Ulrike Böhm. The aim of the blog is to increase the visibility of women in science.

» A video with all the farewell addresses can be viewed in the mediatheque.



Ulrike Böhm

Science Should Prepare for a Marathon

The year 2017 has shown that scientists cannot insulate themselves from political and societal trends. We talked to Helga Nowotny, Vice-President of the Council, about the worldwide March for Science and asked her why thousands of people took to the streets to show their support for science and for fact-based politics.



Around 2,000 people participated in the Vienna March for Science. In total, an estimated 1.1 million people worldwide took to the streets in support of science on 22 April 2017.

Science can no longer be complacent about its role in society in 2017. Global inequality and dissatisfaction with the global financial system that is perceived to perpetuate this inequality has led many into the arms of populists. In a highly polarised environment, it is not only political and financial mechanisms that are being called into question, but also scientific facts. A 'post-truth era' has arrived in which scientific evidence is no longer necessarily perceived as the gold standard. It wasn't only the scientific enterprise in general that was beleaguered this year, though: the institutions of science and learning and scientists themselves also came under attack in numerous places around the globe, from Hungary to Turkey.

These tempests have acted as a jolt that has awakened the scientific community and supporters of science into action. Many scientists now acknowledge that they must invest more

time and effort in communicating not only scientific results but also the nature of scientific investigation to the public. Huge numbers, provoked in particular by the politics of US president Donald Trump, also felt moved to take a visible stance in support of science. A worldwide March for Science took place on 22 April 2017, in which people from more than 600 cities around the world took to the streets. A prominent supporter of this initiative is Helga Nowotny, Vice-President of the Council for the Lindau Nobel Laureate Meetings and former President of the European Research Council. Nowotny was the first signatory of the Vienna March for Science, and gave the closing speech at the event.

Why have you given your support to the March for Science?

Helga Nowotny: For a long time it has been said that science has facts and society deals with values. It is finally time to abolish this separation – it no longer applies! Because science is also based on values. One of these values is the freedom to ask questions and to step into the unknown. At the same time, facts don't fall from the sky, but are the result of a long process of scientific investigation. As scientists, we need to better convey how we arrive at facts. We should have more confidence in people's power of judgement, whilst also helping them to acquire this power. This is necessary if we want to transform information into knowledge.

Do scientists then need to communicate more? Has their reticence contributed to the current situation?

HN: Of course, one can always communicate more. However, I would like to stress that science cannot be isolated from what is happening in society, and when politicians push science to the side or try to instrumentalise it, then this creates space for populists of all kinds. The scientific community needs to understand that it cannot fully insulate itself from political events, because it is part of society. It is important to realise that science is not the primary target of 'alternative facts'. However, it is confronted with considerable collateral damage.

The initiative for a March for Science came about as a direct reaction to the politics of US President Trump. Why have people now in parallel also taken to the streets in Vienna or Munich?

HN: It is important to stress that this was a march FOR science, and was not a march against something. Of course, the current political situation in the USA played a subliminal role, but the march cannot be reduced to an anti-Trump demonstration. Rather, the intention was to raise the profile of science.

A post-truth mentality appears to be characteristic of these troubled times. What dangers does it pose?

HN: Above all, through the constantly changing positions of US president Trump, we can see how unstable and volatile the geopolitical situation has become. This has effects worldwide. One element of the post-truth mentality is the irresponsible handling of solid findings. Such an attitude is particularly dangerous at present due to the enormous problems that we face, not least climate change.

Is the current situation unique in history?

HN: What is unique is the strong entanglement with economic processes. The pursuit of economic growth is, as before, a driving force in society, and from the point of view of politicians, science and technology are the engines of this growth. The great progress that has been made, for example, in smart technologies, is quite remarkable, but we need to address the problem of the jobs that are being lost in this way.

Where do things go from here after the March for Science? Are you optimistic this current movement will change anything?

HN: This is the beginning of a process. I think all who took part in the March for Science agreed on that point. As the Vienna City Marathon took place the day after the march, I would like to use it as a metaphor. One march won't do it: Science should prepare for a marathon!



Helga Nowotny

The original version of the interview in full length and in German can be found on the blog: blog.lindau-nobel.org

An Opportunity Not to Waste

Australian young economist David Smerdon reflects on his exciting days at the 6th Lindau Meeting on Economic Sciences.

David Smerdon (right) with Countess Bettina Bernadotte and laureate Jean Tirole



I must admit to being incredibly intimidated about attending the 6th Lindau Meeting on Economic Sciences. About twenty of history's greatest minds coupled with hundreds of the world's most talented young scholars on one island – I felt like a stowaway on a celebrity cruise, and I wondered how on earth I'd participate in their conversations without being discovered for the imposter I was.

But in hindsight, my fears were ill-founded. From the very first interaction at the airport arrivals, everyone I met was enthusiastic, approachable and, above all, friendly. I discussed how to best measure teacher quality and swapped job-market war stories with Chicago-based Nathan in the taxi ride from the airport

and was amazed by the developments in climate finance after meeting Veronika, a Russian physicist, in the hotel lobby. Rushing off to dinner, I sat opposite Banji, who educated me about the consequences of Nigeria's trade policy on its energy markets, and Eleni, who detailed the early results of a cash transfer pilot study in Ethiopia. On the bus, Roxana from Romania taught me a form of econometrics I didn't even know existed. By the time I fell asleep that night, my notebook already had pages full of scribbles about the people I'd met and the conversations I'd had – and the official programme hadn't even begun.

“I didn't anticipate such positivism in a room full of economists, but on reflection I guess that's what the Lindau Meetings are all about.”

David Smerdon

But it was the interactions with the laureates themselves that really surprised me. I had expected these esteemed statesmen to be cordial and pleasant – which they were – but I had not expected them to go so far beyond their official obligations (for lack of a better word). The laureates were not only tirelessly willing to acquiesce to our floundering flattery and sycophantic selfies, but were eager to interact with us on an intellectual level, engaging in stimulating conversation with different groups of scholars at every possible break in the programme. They actively encouraged us to ask the big questions, whether it was about their work, our own careers or the state of the science itself. They listened to our views, not dismissively or with well-crafted rebuttals but with real consideration. And while it was hard to ignore their obvious intellectual aura, on several occasions the laureates showed us their human sides and let their hair down (who knew they could dance like that?). One common thread of advice I picked up from the laureates was their earnest desire that young economists take up relevant, welfare-improving research topics, rather than just playing the classic publishing game. Coming from a policy background and thus a 'late-starter' to the world of academia, I very much appreciated hearing this admonishment – though one could imagine it is easier to dish out, let alone follow, with a Nobel Prize hanging in one's office... Having said that, I found that this idealism was echoed by my fellow scholars, and it was a delight to listen to their presentations and the laureates' comments in the parallel sessions – not to mention the many animated conversations we had over dinners, coffees and even swims in the lake. Judging by these short snapshots of research, it was even possible to imagine a few of them standing in front of the Swedish monarch at some point in the future.

I particularly enjoyed chatting with people from vastly different streams of research to mine – including, mind you, other attendees such as the laureates' and scholars' partners, members of the Lindau Council and its executive secretariat and industry partners. In the cut-throat world of academia, it's so easy to lose one's self in the narrow silos into which we now specialise, so it was an unexpected pleasure to have such stimulating

debates that combined all branches of economics and policy, joined by a common focus on real-world issues (I'd forgotten that macroeconomics can actually be fun). More importantly, there appeared to exist a collective motivation among the scholars that our careers should matter in some tangible way to the 'outside world' and that the investment made by ourselves and others in our education deserved to be returned with real contributions to improving welfare. To be honest, I didn't anticipate such positivism in a room full of economists, but on reflection I guess that's what the Lindau Meetings are all about.

It was surprisingly sad to leave Lindau after such a brief but hectic event. Sure, I'd been running on caffeine and naps for a week, visited the first-aid tent twice and had run out of clean socks, but attending the Lindau Meeting was, pardon the cliché, an unforgettable experience. I landed home with a folder overflowing with lecture notes, research ideas scribbled on napkins and crumpled business cards of the scholars and other attendees, all thanks to the wonderful opportunity that the Foundation and the Council for the Lindau Nobel Laureate Meetings provided. It's an opportunity I'm not going to waste.

David Smerdon gave the farewell address of #LiNoEcon alongside Jean Tirole, which can be watched in the mediatheque.

Impressions

The Lindau City Theatre



Johann Deisenhofer talking to young scientists at the International Get-Together



McKinsey science breakfast at the 67th Lindau Meeting

Boat trip to Mainau Island



#LiNoEcon farewell ceremony at Mainau Castle



Waving Goodbye to Nobel Laureates



Brian Schmidt: Live long and prosper.

A Taste of Mexico

The Mexican Academy of Sciences, long-standing academic partner of the Lindau Nobel Laureate Meetings, hosted the #LiNo17 International Day. Jaime Urrutia-Fucugauchi, then president of the Mexican Academy of Sciences, and his predecessor José Franco reflect on the programme and the role of science in public policy.



Mexico has been participating in the Lindau Nobel Laureate Meetings for about a decade now. The selection process for young scientists has become more and more competitive, and the number of applicants has also increased year by year. During the week of the meeting, the successful applicants attend conferences, master classes, poster sessions, round table discussions and social events. They also get the opportunity to discuss with the laureates as well as with the other members of this unique international network of talented researchers.

This is an extraordinary and crucial experience for their academic careers. We at the Mexican Academy of Sciences feel very proud to be one of the academic partners for the meeting, and we are very excited to see our young scientists engage in provocative discussions with both Nobel Laureates and young scientists from other countries.

This year, Mexico hosted the International Day, and eleven young scientists from Mexican institutions took part in the 67th Lindau Meeting. As part of the activities, the Mexican Academy of Sciences organised the academic partner dinner for our young

scientists with Nobel Laureates and special guests, which offered the opportunity for closer interactions. The International Day was a very special event for all of us, as we were able to provide a glimpse of our culture. It was wonderful to share our food, our music and our science with all participants. The attendance of Nobel Laureate Mario Molina as an ambassador of Mexican science and technology, as well as that of Aurelio Nuño, Minister of Education of Mexico and Enrique Cabrero, General Director of CONACYT, our funding agency for science and technology, were immensely gratifying for us.

A key topic that was discussed was the urgent need, all around the world, to base policy making on scientific evidence. The role that academies and technology assessment institutions should play in providing advice to the public and to private decision makers was discussed. This important issue needs to be addressed to improve government and parliamentary work in every country.

Indeed, science and technology are essential for our daily lives and are the sources of many benefits for our society. Thus, in Mexico we strongly believe that the academies of science, medicine

“We strongly believe that the academies of science, medicine and engineering should have a significant role in government decision-making.”

José Franco

and engineering should have a significant role in government decision-making as well as in the design of public policy. We also believe that it is the responsibility of scientists and technology experts to get closer to policy makers and advise them on complex topics.

This is particularly true in fields related to climate change, sustainable energy, public and mental health, water management, synthetic biology, food production, disasters and resilience, artificial intelligence, new materials, genome editing, biobanks, etc. The list is already long, and will likely grow further in the near future. The involvement of scientists from all fields in public communication and policy-making is critical, especially now that we are facing the absurdities of ‘alternative facts’ and the ‘post-truth era’.

Today, in many countries, the national academies have programmes focused on basic education for children, and some of them are providing advice to governments. There are already two important international networks that should be mentioned here. One is the network of European Parliamentary Technology Assessment (EPTA) institutions, which boasts more than 20 members including associate members from countries outside Europe, like Chile, Japan, Mexico, Poland, Russia and the USA. These institutions explore the relationships between science, technology and society. Their common goal is to explore how current technological developments affect our world. The EPTA partners advise parliaments on the possible social, economic and environmental impacts of new developments in science and technology. The second network, which is even larger, is the global network of academies, the InterAcademy Partnership (IAP), with more than 130 members from all five continents. It is the scientific equivalent of the United Nations. These two networks have been operating for several years now, and they have published papers on many of the issues mentioned.

These networks represent great steps forward, but one must be aware that there are still many challenges ahead, and they need to be addressed on a country-by-country basis. Firstly,

policy and politics are not the same thing, and the making of public policy is a very complex process that requires a deep understanding of the relevant issues as well as social sensitivity. Secondly, a large fraction of policy makers does not have a science background and is not really interested in science per se. Thus, the communication channels between researchers and policy makers are poor, and often there is even mutual mistrust. Both groups must be aware that policy and science operate with different values and on different timescales, and effort has to be expended on both sides: policymakers should learn from scientists, and scientists from policymakers. Not a simple task, but highly needed...

We would like to conclude by saying that the 67th Lindau Nobel Laureate Meeting not only gave us the opportunity to meet again brilliant minds from all over the world, but also gave us a chance to share a taste of our culture with them and to discuss the links between science and society. The reports of the young participants reflect their passion and enthusiasm for this event, and their comments highlight the motto and objectives of the Lindau Meetings: educate, inspire and connect.

The Mexican delegation



Lindau Forever

Lindau Alumna Renata Gomes is the Head of Research and Innovation at Blind Veterans UK and a Senior Lecturer in Haematology and Cardiovascular Medicine. Here, she tells the story of her Lindau experience as an alumna of the 64th Lindau Nobel Laureate Meeting in 2014.



Renata Gomes in 2014, with her meeting bag signed by Nobel Laureates

Einstein once said, what makes a great scientist is character not intellect. I recall clearly – as if it were yesterday – receiving the email that read “Congratulations (...) you have been selected (...) Lindau Nobel Laureate Meeting.” My initial thought was one of disbelief. Was it a prank, or did I maybe just get lucky? I was having one of the most difficult times of my life. I despaired; I felt I had no more strength to continue; my character had gone; I was surrounded only by intellect. My research was progressing, perhaps not as fast as I hoped, yet progress was there.

However, I was being targeted by animal activists. I have been a fervent researcher and proud scientist for over ten years. My area of focus is regenerative medicine, namely cardiovascular regeneration. This obviously implies that I work with all systems from molecules to in vivo models. Our in vivo work has always been impeccably ethical and in accordance with the strictest regulations, yet in my opinion some activists ignore this and act blindly. I was advised to consider becoming invisible, to reconsider my position in research. I shamefully admit that I had started to reconsider my career in science; but if nothing else, I had one more trip to make: I had to go to Lindau.

“I’d never been in a place where scientists were so welcomed and where our nerdiness was something to be proud of.”

Renata Gomes

As I arrived in Lindau, I felt I didn’t belong there. Although I had been very successful for my age and also received the honour of a Valley Foundation Fellowship to attend Lindau, I thought that this was no place for people with existential doubts. However, within minutes my mind was changed completely. I was surrounded by young scientists from all over the world. We were all unique, we all had problems, yet we had a common passion for science and knowledge. I’d never been in a place where scientists were so welcomed and where our nerdiness was something to be proud of. I felt so honoured to be part of such a unique community.

In all honesty, I didn’t learn a great deal of new science whilst in Lindau. I learned more about challenging the status quo, not feeling guilty about continuously breaking barriers and about thinking outside every single box. I also learned how to better myself as a scientist and as a human. I learned that everything is a journey, that we will eternally face difficulties, some greater than others, yet it’s all about how we deal with them.

I was in a place surrounded by Nobel Laureates who had travelled from every corner of the world to share their science and experiences with us. We thrilled them, we were the main attraction! Nobel Laureates treated us as equals. They never told us what to do, and they stimulated us to think for ourselves even more, to smash the imposter syndromes, to forget luck. We deserve it, and yes, we are intelligent! We worked hard together, we also played hard. For one whole week I hardly slept, because there was so much amazing science to discuss, so many experiences to share, so much excitement. I didn’t want to miss out on anything or anyone.


My hat goes off to Nobel Laureate Peter Agre with whom I had one of the best dinner parties ever. He was so much fun and totally engaged with us, his young scientists. His humanity and humility is awe-inspiring. While on the dance floor with Professor Agre, Countess Bettina Bernadotte walked by, joined us and thanked each one of us for coming. I want to thank the Countess and all involved for having us and for making such

a unique event happen. I believe our lives, at least mine, were deeply transformed by visiting Lindau. I made friends for life, I’m still in contact with alumni from every corner of the world.

Science for the benefit of mankind was the topic of the meeting. Professor Oliver Smithies, whom I had the honour to meet and have many discussions with, once said in an interview that “Renata can solve any problem, really any problem.” I had more conversations with his wife, Professor Noyubo Maeda. I started thinking, started looking into how to best use knowledge for the benefit of mankind, how to use my ability to solve problems. I decided to do something, and in collaboration with others I started a task force which aims to use knowledge for the benefit of mankind by attempting to tackle extremism.

I also found that – regardless of adversity – I was and always will be a scientist! Through good and bad health, through peace or war.

Suddenly, I felt like one of Beethoven’s symphonies, as described by Daniel Barenboim: “Music which tends to move from chaos to order, as if order were an imperative of human existence.” Lindau helped me find the order and changed my life forever. Lindau is not just a place or a meeting, it is a stairway!

 The digital space of the Lindau Alumni Network: alumni.lindau-nobel.org

Reunited After Six Years – Elom Aglago and His Lindau Host Family

Young scientists have the option of staying with local host families throughout the week of the Lindau Meeting. We interviewed Brigitte Trojan and Hans Schweickert from Lindau, who have welcomed young scientists as a host family since 2011, and their first guest, Elom Aglago, who returned to Lindau in 2017 to reunite with his hosts.



Brigitte Trojan and Hans Schweickert have served as a host family since 2011. They have already welcomed seven young scientists from all over the world (Egypt, Japan, Georgia, Chile, Iran, Lebanon and Togo). In 2011, young scientist Elom Aglago from Togo was their first guest, and they have kept in touch during the past six years. This year, Elom came back to Lindau to see his host family again, and we met them to talk about their experiences as hosts and guest.

How did you decide to become a host family?

Brigitte Trojan: We had just moved here to Lindau into a new house with a garden, when we thought that we might welcome a young scientist from abroad. We love being at home, we love living here in Lindau, but we are also open to new cultures and perspectives. In addition, we are very enthusiastic about the Lindau Nobel Laureate Meetings. So, for us, it was a perfect opportunity to meet people from all over the world. It is also a great way for us to improve our English.

How do you remember Elom's first stay here in Lindau?

Hans Schweickert: We felt really happy and privileged to host Elom here in 2011. We had breakfast together every morning and talked about the daily programme. And every evening, he gave us a briefing about the day at the Lindau Meeting. We got lots of inspiration from him. He always liked to discuss things with us, and we truly appreciate that.

How did you stay in contact over the past six years?

Trojan: We occasionally exchanged emails. For example, we wished each other a Merry Christmas every year. We sent him the news from Lindau, told him about the new young scientists, and in return received news from Togo, Morocco or France,

Lindau Alumnus Elom Aglago and his host family reunited in Lindau in 2017

depending on where he lived at the time. He shared the progress of his scientific career with us, the papers he published and his most important findings. Two years ago, we had the idea that he could visit us again. Last December, we planned his visit for this summer – and now here he is again.

How was it to be reunited?

Trojan: We met at the railway station and were happy to see each other again. Immediately, there was the familiar warmth and the same spark. We right away started again to discuss differences in our philosophies and to talk about the various roles of family and parents in our different cultures and so on. We missed him, and our cat missed him as well (laughs).

Is he the same as you remember him?

Trojan: Yes and no. He is as young and as lively as he was then – but also a little bit more serious; it seems as if he has arrived where he wants to be.

Elom Aglago: I have become wiser, I'm not as childlike as I was then. I think that my host family contributed in some way to that; they helped me to understand differences in cultures, to respect other cultures and learn from them. I think it all started with the Lindau Nobel Laureate Meeting. I experienced for the first time that we are all different but unique and special. We have to take that into account.

Are you closer to getting the Nobel Prize now than you were back in 2012?

Aglago: Getting the Nobel Prize is not on my agenda at the moment (laughs). I would like to take on an administrative position from which I can improve the transfer of knowledge, technology and responsibility to Africa. Many Africans get lost in their ambitions, not aware of the correct procedures. I plan to do this and continue with my research at the same time.



Elom Aglago at the 61st Lindau Meeting together with Nobel Laureate Werner Arber

Did you have such good experiences with every young scientist you welcomed?

Schweickert: It is always a great opportunity to meet people who are able to bring the world forward. All young scientists were very polite and got along well in our home. They were always very thankful, eager to engage in dialogue and to take in all information.

» Since 2008, host families from Lindau and the surrounding area have welcomed young scientists from all over the world who are participating in the Lindau Nobel Laureate Meetings. Through the host families' engagement, the young scientists avail of the unique opportunity to get to know Lindau and its people on a personal level and learn more about their lives and culture first-hand.

A Symphony of Science, Peace and Education

In his speech at the presentation of Peter Badge's 'Nobel Heroes' on 22 September 2017 at the Nobel Peace Center in Oslo, Bishop emeritus Gunnar Stålsett stressed the importance of science in times of global tensions. The former Vice Chair of the Nobel Peace Prize Committee was appointed a member of the Honorary Senate of the Foundation in 2013.

The Nobel Peace Center is like the eye of the storm. Irma, Maria, Kim Jong-un and Donald Trump: in diverse ways they all wreak havoc for millions of people, and threaten disaster for our entire human habitat. To stem these destructive tides of extreme weather and human folly, we need the wisdom of science and the calm of common sense. Against hatred and intolerance we need education and civil courage. This is what Nobel science and Nobel peace is about. This is what we celebrate today: a confluence of academic knowledge and moral conviction. This is wisdom. This makes peace great again.

Every day, we are reminded of great threats to the human family and to our entire habitat. We are on the brink of a nuclear war. Hundreds of millions of lives are threatened by starvation and climatic catastrophes causing mass migration. National, ethnic and cultural extremism affect every region of the world. Violent religious extremism is seen in every religion. Hatred defeats the love of neighbours.

The will of Alfred Nobel emphasised fraternity, not enmity, between nations, the reduction of standing armies, not an escalation in the development of weapons of mass destruction, peace congresses, not unilateralism. His are practical steps even in the 21st century. The concerted efforts of people of good will across social, ethnic, cultural and religious divides, from one generation to the next, are what will bring about a better tomorrow. In a vulnerable world, there are victims and there are heroes. Sometimes heroes sadly fail. Sometimes victims win the day.

In the eye of the storm, it is still but not silent. Peace is dissent, expressed in loud protest. I believe we are all grieved by the tragic onslaught on the Rohingya Muslim population of Myanmar, not forgetting the tragedies of Syria and Yemen – to name but a few of the places where death and destruction reign.

Alfred Nobel wanted to strengthen those who conferred the greatest benefit to mankind. That is his legacy. That is our privilege. Here, in this centre, in the spirit of Nobel, we humbly

affirm a foundation of shared human values on which to build the future. Peace is personal. The great Swedish humanist, Dag Hammarskjöld, the General Secretary of the United Nations who died in the pursuit of peace, speaks in words of prayer of the inner challenge we all face: "If only I may grow: firmer, simpler, quieter, warmer."

Thank you, Countess Bettina Bernadotte, for inviting me to offer a few remarks on this special occasion. I have been greatly inspired by your leadership of the Council for the Lindau Nobel Laureate Meetings. You have continued the wise direction of your predecessors, your father Lennart and your mother Sonja. With eminent supporters and co-workers, such as Professor Wolfgang Schürer and Nikolaus Turner, the Lindau Nobel Laureate Meetings and its institutions have become the most significant academic encounter worldwide between Nobel Laureates and the new generations of scientists.

The occasion here today, the launching of Peter Badge's 'Nobel Heroes', connects Lindau, Stockholm and Oslo as different members in one Nobel family, all dedicated to promoting the will of Alfred Nobel, through a symphony of science, peace and education. Peter has used his personal and professional skills to promote the Nobel legacy. No one has met more laureates literally, face-to-face, than he has. Through his photographic genius, we are brought closer to personalities who have contributed to fulfil the vision of Alfred Nobel. Life itself makes it impossible to isolate academic, scientific dedication from the challenges of responsible citizenship. I share the wish of Nobel Laureate in Physics Steven Chu when he says "I hope you, the young Lindau scientists, will be moved to use your considerable talents to help enrich and save the world." In a nutshell, this is what science is about. This is what peace is about. This is the highest aspiration of the human intellect and the shared yearning of humanity. Whether Lindau or Stockholm or Oslo, we are united at the crossroads of human endeavour for peace and justice.

Let one example suffice: in the history of the Nobel Peace Prize, the abolition of weapons of mass destruction has most frequently

"Whether Lindau or Stockholm or Oslo, we are united at the crossroads of human endeavour for peace and justice."

Gunnar Stålsett

been highlighted by the Prize Committee. The Lindau Nobel Laureate Meetings in 1955 issued the Mainau Declaration against the use of nuclear weapons. In 2015, Nobel Laureates initiated the Mainau Declaration on Climate Change. Both were signed by many laureates from all sciences. And both issues are shaping the agenda of heads of states this week at the United Nations.

The presence here today of one of the Nobel Laureates of 2011, Tawakkol Karman, reminds us of the importance of women for peace and in the struggle for freedom of thought, freedom of expression, freedom of faith and freedom from fear caused by oppression and war. Again, by bringing all laureates together, Peter Badge's work helps us to transcend the categories of sciences, literature and peace and to see ourselves as one mankind in one global community with one mission.

Through the images of Nobel Laureates of all prizes, Peter Badge conveys a message without words. Through his lens we sense the greatness of the human mind and the depth of the human heart. I see his work, in the words of St. Francis of Assisi, as an instrument for peace.

Congratulations on your message of hope, your testimony of perseverance and not least, your trust in the human genius for good. Your interpretation of the past offers healing for the future.

» In summer 2017, renowned German publisher Gerhard Steidl released the coffee table book 'Nobel Heroes'. It compiles 400 portraits of Nobel Laureates by German photographer Peter Badge. The project, commissioned by the Lindau Nobel Laureate Meetings, is supported by the Klaus Tschira Foundation.

Gunnar Stålsett at the Lindau Meeting in 2016



Peter Badge: Nobel Heroes
400 black-and-white photographs
Quadrotono, two clothbound
hardcover books housed in a slipcase
ISBN 978-3-95829-192-8

Impressions

International Get-Together at the Dornier Museum



Wolfgang Schürer, Honorary Chairman of the Foundation, and Harold Schmitz, Chief Science Officer, Mars, Incorporated



Tawakkol Karman, Nobel Peace Laureate 2011, at the presentation of Peter Badge's 'Nobel Heroes' at the Nobel Peace Center in Oslo



The Lindau Science Trail: Daniel McFadden at the pylon featuring his research



Aaron Ciechanover giving the Lindau Lecture at the 5th Heidelberg Laureate Forum



Jürgen Kluge, Countess Bettina Bernadotte, Suleiman Al-Herbish, Director-General, OPEC Fund for International Development (OFID)



Stefan Hell at the book presentation of Peter Badge's 'Nobel Heroes' at the publisher Steidl, Göttingen

We Will Eventually Deal with the Problem Through Education

Mario J. Molina shared the 1995 Nobel Prize in Chemistry for his work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone. During #LiNo17, Molina spoke to Richard Hodson from Nature magazine about climate change.

Nobel Laureate Mario J. Molina during his lecture at #LiNo17



“Especially for climate change, there are many big questions we have to answer, and it’s important to join forces.”

Maximiliane Sievert, participant of the 6th Lindau Meeting on Economic Sciences, RWI – Leibniz Institute for Economic Research, Germany

Nature: How do you feel about the current state of climate policy in the United States?

Mario Molina: It is extraordinarily worrisome. Science tells us very clearly that we are putting millions of people at very high risk if we continue to function in a business-as-usual manner. We don’t accept risk for people flying, or living in tall buildings in earthquake zones. But here we’re risking gigantic disasters for humanity. It is extremely irresponsible and unethical to neglect the welfare of future generations.

N: Why has action on global warming been much harder to achieve than on ozone depletion?

MM: Ozone depletion and climate change have some important differences. For one thing, there were a relatively small number of very large chemical companies involved in producing the ozone-depleting compounds. Those companies were, of course, initially opposed to any regulation, but they were able to make alternative compounds that allowed us to continue using refrigeration and aerosols without affecting the ozone layer. By contrast, climate change is tied to the use of fossil fuels. They’re pervasive and they’re crucial to the functioning of society – and therefore much harder to control.

The other thing that happened is that the climate issue became politicised. Skepticism has become a mantra of the Republican party in the United States, which currently holds the presidency, both houses of Congress and a majority of state legislatures. That unwillingness by a large part of the country’s political leadership to accept the reality of climate change makes the problem much more difficult to deal with. It’s become a matter of belief, however irrational.

N: What can scientists do about it?

MM: We normally think that the first step is to go to the people in power – after all, they’re the ones who can implement the changes we need, so we should make sure they’re well informed.

But this approach can backfire if you don’t do it in the proper way, and right now it is hard to see how the people in power in the United States can be convinced through rational argument. There are indications that rational thinking is taking a back seat in other parts of the world as well, and that’s extremely worrying.

If scientists learned to communicate more effectively we might be able to affect government functions, but probably not in the near future. That doesn’t mean we should give up – there are many organisations, such as city councils and industrial companies, that are continuing to behave rationally in spite of what is going on in the federal government – but we do need to think about longer-term solutions. My expectation is that we will eventually deal with the problem through education, by communicating the enormous importance that science has and how it benefits society and our standard of living.

Nature, Vol. 550, S63 (12 October 2017)

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» Since 2010, the Lindau Nobel Laureate Meetings have been featured in Nature Outlook. With their mix of full-length features, articles and interviews, these Nature supplements serve as enduring records of the vivid exchange among laureates and young scientists. The supplements could be produced thanks to the support of Mars, Incorporated.



Why Finance Ministers Prefer Carbon Taxes

Young economist Max Franks explains how protecting the environment and investing in infrastructure can go hand in hand.



“In Germany, there is massive under-investment in infrastructure,” warns Joachim Käppner of the *Süddeutsche Zeitung*, one of the country’s most read daily newspapers. He continues: “[schools], streets and bridges are crumbling. In Germany, investments of more than 100 billion euros are needed.” Economists Pedro Bom and Jenny Lighthart confirm Käppner’s warning in a study showing that there is a shortage of investment in infrastructure almost everywhere.

Why is there such an under-supply? One reason is that finance ministers throughout the world are constrained by tight budgets. Next to the need to repay debt, governments are under pressure to lower corporate tax rates to prevent private capital – and with it jobs – from leaving the country.

With the growing integration of world markets, this has become an increasingly harmful ‘race-to-the-bottom’. The problem of crumbling roads, schools and bridges is thus compounded by the problem of finding sources of public revenue to finance

maintenance of existing infrastructure as well as investments in new infrastructure.

A solution can be found off the beaten track in a study of mine that makes a strong case for green tax reform for the sake of the national budget. My co-authors and I analyse how governments should reform their tax system when they find themselves competing for mobile capital and are constrained by tight budgets, but have to finance productive public investments.

Our results show that it is best to lower corporate taxes and instead put a price on the carbon content of fossil resources. In that way, the tax system distorts the economy less while raising higher revenues. If the additional revenues are then invested to increase productivity – for example, in education and infrastructure – everyone is better off.

In short: It’s better to tax ‘bads’ instead of ‘goods’. Protecting the environment and stimulating the economy can go hand in hand.

What explains this result? At first glance, both kinds of tax seem to harm the economy in a similar fashion. Both increase the costs for businesses, potentially encouraging the private sector to react by moving part of its activities abroad.

But a carbon price has the decisive advantage of shifting part of the tax burden away from businesses that produce goods and services, and towards the owners of fossil resources. Thus, the carbon price captures the ‘resource rent’ – that portion of a resource owner’s total revenue that is in excess of the costs needed to supply the resource.

When the resource owner’s rent is thus reduced via a carbon tax, resource extraction decisions do not change and there is no adverse impact on the real economy. (The Economist explains rent income using the example of a soccer star’s income.)

Unless a corporate tax is paid by a monopolist, it cannot capture as much rent as a carbon tax would. This is because businesses in a competitive market have comparably little revenue in excess of their production costs, when we include payments on interest, insurance against risk and managerial activities. Otherwise, high excess revenues would be competed away. Even if carbon taxes are implemented only for fiscal reasons, they will help to mitigate dangerous climate change.

Now let’s suppose that finance ministers actually implement our suggested tax reform and succeed in balancing their budgets. Is there not a danger that resource owners will anticipate higher carbon taxes in the future and accelerate extraction? Might carbon taxes then actually harm the environment due to an increase in emissions?

The answer is a clear no: when carbon taxes are used to finance productive public investments, this will affect both the demand for and supply of fossil resources. With supply, the rate of extraction will not increase because rent taxation has no effect on extraction decisions. Therefore, the demand side will fully determine when and how much of a resource is extracted.

For buyers of resources, the price of carbon increases, which lowers demand, postpones extraction and reduces emissions.

This is not to say that we don’t need a global agreement on climate change. A unilateral fiscal reform that includes a carbon tax will not by itself solve the climate problem. But when politicians, and finance ministers in particular, understand that green fiscal reforms benefit the whole economy, fiscal considerations can be an entry point for more stringent climate policy.

» This article is based on research reported in ‘Why Finance Ministers Favor Carbon Taxes, Even If They Do Not Take Climate Change into Account’ by #LiNoEcon participant Max Franks, Ottmar Edenhofer and Kai Lessmann, published in *Environmental and Resource Economics* in 2015. The study was recognised as the ‘best overall paper’ at the third annual conference of the Green Growth Knowledge Platform, hosted in partnership with the United Nations Environment Programme (UNEP), the OECD and the World Bank.

Max Franks



The Future According to Nobel Laureates

Times Higher Education in collaboration with the Lindau Nobel Laureate Meetings have conducted a survey among Nobel Laureates on the biggest issues facing science, education and society. Here, they give a brief overview of the survey's outcome.



Panel discussion at the THE World Academic Summit 2017 at King's College London: Prabha Kotiswaran, Peter Agre, Rivka Isaacson and John Gill

In 2017, the Lindau Nobel Laureate Meetings agreed to work with Times Higher Education, the world's leading provider of higher education analysis, data and news, to pursue a lofty ambition. The shared aim was to conduct a survey of Nobel Laureates, to seek their wisdom on vital issues such as the state of global higher education funding, gender balance in the academy, the public appetite for investing in fundamental research, the perspectives of universities and, indeed, the future of the human race.

The response was impressive, with 50 laureates in the fields of physics, chemistry, economics, physiology and medicine responding to the survey and offering a wealth of well-founded insight. Among the starker findings were that today's researchers are not given the same freedom of those a generation ago and

only a little over a third of them (37%) feel that they would definitely be able to produce their prize-winning work given the current funding system.

Some of the laureates surveyed expressed a fear that too much time is spent on writing grant-funding applications, which are too often rejected, thanks to today's risk-averse culture. A large majority (81%) of those surveyed said international mobility is crucial or very important to research – and yet some voiced a fear that geopolitical forces are working against this, citing the election of an 'America First' president of the USA and the UK's decision to exit the EU.

The majority of laureates also identified political polarisation and populism as twin sources of angst, with over two thirds (70%) believing that these twin threats are grave or serious and only five per cent believing them not to present a concern.

Anti-scientific claims, such as that climate change is a 'hoax', which are symptomatic of a 'post-truth' era and the growth of 'fake news' and 'alternative facts' were also cited by Nobel Laureates as major threats to society and the perceived value of scientific research. These threats became some of the central themes of the Times Higher Education World Academic Summit 2017, hosted by King's College London. At this prestigious summit, against the backdrop of diminished public admiration for experts and the spread of false information, the ongoing vitality of evidence-based policy-making and the paths to research breakthroughs were discussed at length by Nobel Laureates Peter Agre, Director of the Johns Hopkins Malaria Institute at the Baltimore University's Bloomberg School of Public Health and Sir Paul Nurse, Chief Executive and Director of the Francis Crick Institute, who took to the stage alongside distinguished university leaders such as Louise Richardson, Vice Chancellor of the University of Oxford, Andrew Hamilton, President of New York University and Sabine Kunst, President of Humboldt University of Berlin. The themes of the THE/Lindau Nobel Laureate Meetings' survey permeated many of the sessions across that summit.

Yet, the greatest public interest in the survey – perhaps not surprisingly – was attracted by the views of the Nobel Laureates on the biggest threats facing mankind. Threats to humanity cited by those surveyed included environmental concerns and drug-resistant pathogens, nuclear war, the ignorance of political leaders, artificial intelligence, terrorism and even Facebook. However, environmental concerns and the combined threats of ignorant political leaders with access to nuclear weapons were deemed the gravest threats of all.

The news of the THE/Lindau Nobel Laureate Meetings' survey spread worldwide, both before and during the World Academic Summit, with articles appearing in The Times, Daily Mail, The Independent and The Sun in the UK, Salon, the Daily Kos, the Atlanta Journal-Constitution and the New York Post in the USA as well as a range of newspaper and television channels around the world, including the Middle East, Russia and China. Times Higher Education ran the survey story on its front cover, considering it one of the most important stories of the year.

In total, the survey and the World Academic Summit drove a huge volume of media and social media interest, with 645 news articles and more than 3,800 social media posts recorded over the course of the week of the story.



» The Nobel Laureate survey was published in Times Higher Education on 31 August 2017.

Public Outreach and Societal Dialogue – A Survey Among Young Scientists

In addition to the exchange between laureates and young researchers, societal dialogue about science is highly valued at the Lindau Meetings. But what do the young researchers themselves think about external science communication – and how do they personally engage in public outreach activities?

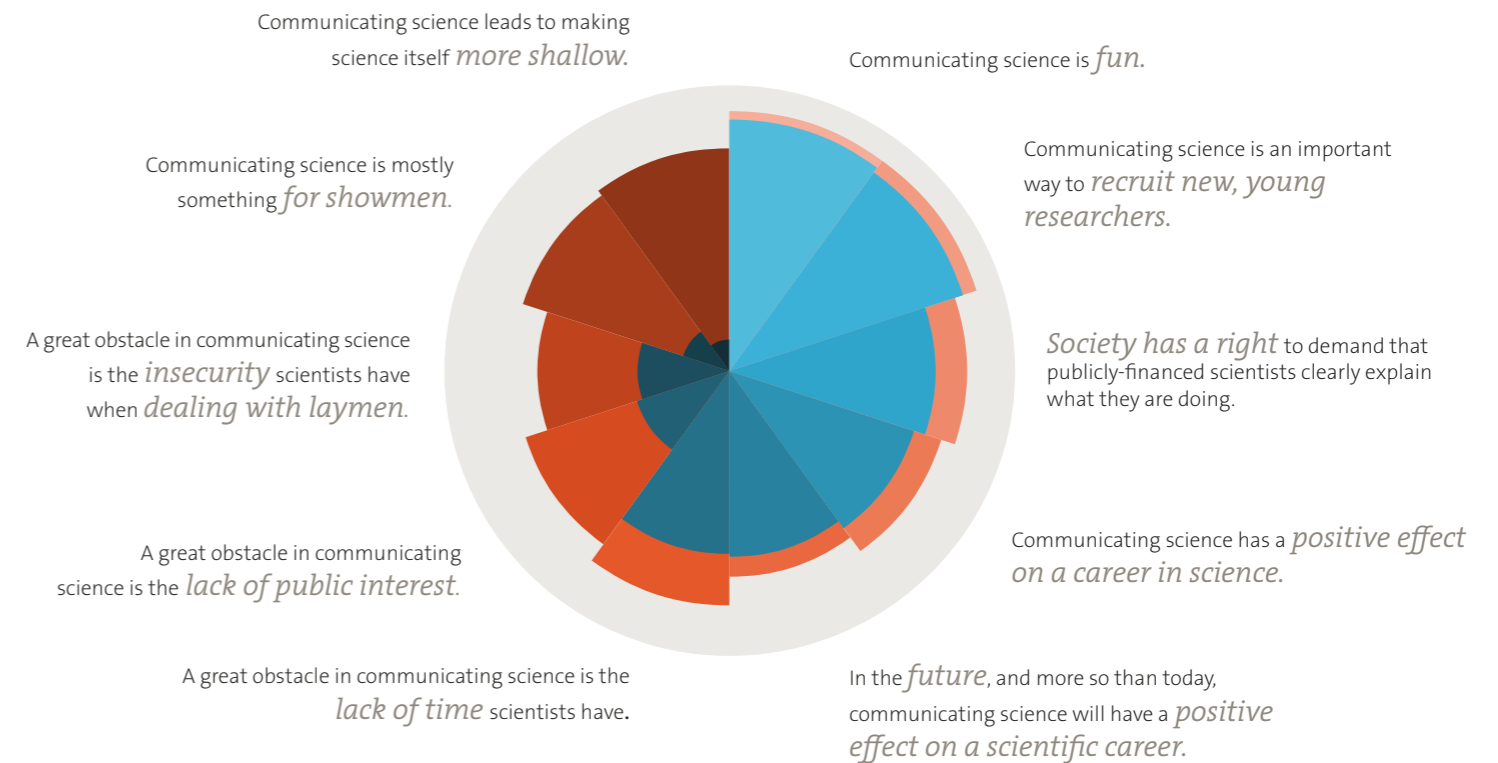
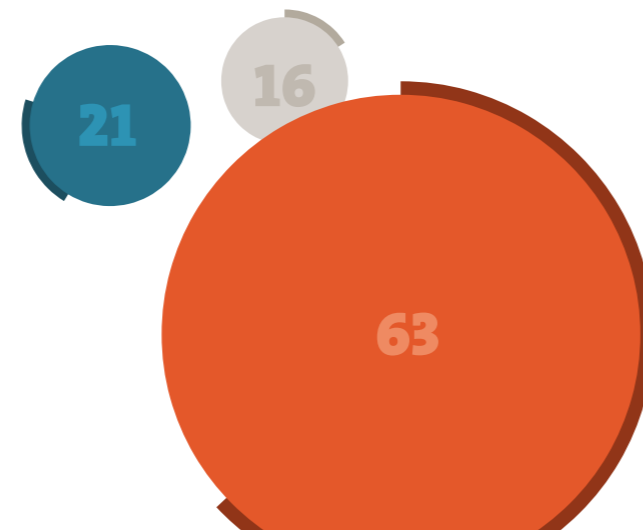
In a way, the dialogue between science and the public is currently flourishing. There have never been so many formats for the direct exchange between researchers and citizens. In addition to traditional formats such as the public lecture, the popular science book or the lab tour, numerous new formats have been introduced in the past years. Scientists can now communicate offline, e.g., in cafés scientifiques, childrens' universities or science slams. In the digital world, opportunities may be even greater, as dialogues are easily possible across spatial and temporal boundaries. In principle, every researcher can now explain her or his science via weblog or online video or make her or his own expertise useful to others in discussions in social networks. But to what extent does the next generation of professors make use of it? Which attitudes towards the communication of their research beyond the narrow circle of their scientific community – what we call external science communication – do they reveal? And do young researchers who are socialised in the digital world particularly use the digital formats for scientific communication?

Answers to these questions are provided by a survey study that we conducted 2014–2016 with the participants of the Lindau Nobel Laureate Meetings and the Heidelberg Laureate Forum (HLF). The HLF, held annually since 2013, is a conference for mathematics and computational sciences complementary to the Lindau Meetings. The survey was evaluated specifically for young researchers born in 1981 or later, following a common concept of 'digital natives' by John Palfrey and Urs Gasser. In total, 856 participants fully completed our survey and met the inclusion criteria. The mean age within the sample was 28.8 years, 57% of the participants were males and 42% females. Researchers from physical sciences – including mathematics and computational sciences – were predominant (52%), followed by researchers in chemistry (16%) and the life sciences (15%). The current position of the researchers was mostly either doctoral student (36%) or research associate (33%, with doctorate). The majority of them primarily worked in Europe.

How could the personal engagement of excellent young researchers in public outreach and dialogue be stimulated even further? Time is undoubtedly a limiting factor – and this may not change in the near future. However, there may be a starting point: More than 60% of the survey participants retrospectively assessed the possibilities to acquire skills in external science communication at their universities as poor or very poor. Interestingly, this complaint was more often formulated by participants from Europe than by those from North America and Asia. Thus, training programmes on a graduate and post-doctoral level could encourage young scientists, and especially those in Europe, to engage even more in public dialogue than they do today – a development that would be beneficial for society at large.

Carsten Könneker, Philipp Niemann, Christoph Böhmert
(Karlsruhe Institute of Technology)

Some higher education institutions provide practice-oriented training for students in how to communicate science topics to non-scientists. If you think back on your own time as a student, what were the possibilities for acquiring such skills?
very poor & poor | average | very good & good

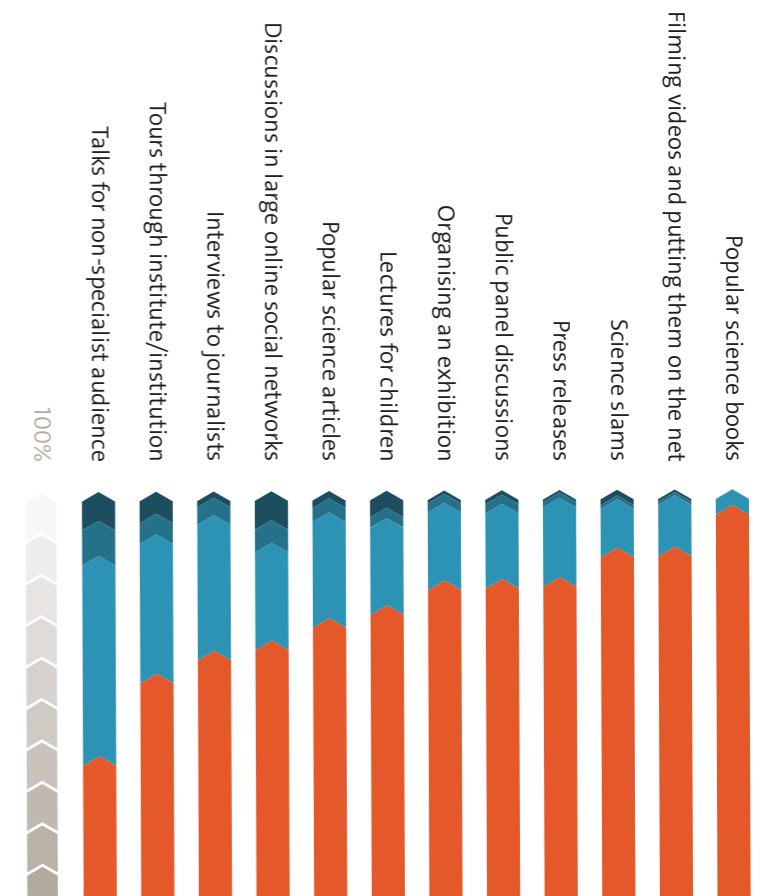


Young researchers' agreement with different statements regarding external science communication
● 100% | completely or mostly agree | completely or mostly disagree | neither nor unable to answer

The data indicate that the young researchers mostly have clearly positive attitudes regarding the value of external science communication. More than two out of three mostly or completely agree that external science communication has a positive effect on a scientific career. Lack of time – rather than lack of public interest in science – is regarded as a problem for external science communication.

Usage of different formats of external science communication among digital native Lindau and HLF participants
more than 6 times | 4-6 times | 1-3 times | never

Nine out of ten participants had used at least one format of external science communication at least once within the preceding 24 months; on average 3.6 formats were used within this period of time. With talks for non-specialist audiences, tours through their institutes/institutions and interviews to journalists, three traditional outreach formats were used most often, followed by discussions in large online social networks. This indicates that even among digital native high-profile scientists, digital formats of external science communication are not predominant: in contrast, only 36% of the participants took part in discussions in large online social networks like Facebook or Twitter. 15% operate their own weblog; however, the vast majority of weblog owners does not post on a regular basis. 14% have already filmed videos of their research and put them onto the web. Video- and audiocasts play only a very subordinate role, with only 2% and 1% operating them, respectively.





6th Lindau Meeting on Economic Sciences
22–26 August 2017

6 The Interdependence of Research and Policymaking

In his keynote speech at the 6th Lindau Meeting on Economic Sciences, Mario Draghi, President of the European Central Bank, emphasised the interaction of economic research, monetary policy and financial regulation.



I am especially thankful to Professor Hellwig for inviting me to address this conference. All of you Nobel Laureates share the extraordinary ability to explain parts of our everyday reality that have not been understood before, or were previously seen from a different, and less informative, perspective. You are the builders of a science that is also a guide to policymaking. Your discoveries have contributed to the way we think, the way we do policy, the way we affect the welfare of millions of individuals.

This year marks the 200th anniversary of David Ricardo's Theory of Comparative Advantage – in the words of Paul Samuelson, one of the few counter-intuitive fundamental ideas in economics, which moved the world away from mercantilism. And when we look at other giants in the history of economic thought, Adam Smith, who laid down the foundations of capitalism; Keynes, who drove us into policy activism and away from *laissez-faire*; until the founders of econometric model building in post-war time, we cannot but conclude that there is little in economics that does not have policy implications and that the interaction between research and its policy application is continuously evolving in an ever-expanding universe. [...]

It is hard to overestimate the enormous impact that the Lucas critique and the problem of time inconsistency have had on the conduct of monetary policy over the past 40 years. In the 1970s, most central banks were under political control and obliged to follow more or less short-term oriented policies. During the 1990s and 2000s, the importance of credibility was increasingly appreciated and evidence mounted that operationally independent central banks with a clear mandate to maintain price stability delivered much better economic outcomes than those under direct government control.

The result was a revolution in central banking. Today, most countries' central banks are independent, but subject to a mandate drawn up by the legislators, who in turn hold the central bank to account. As a result of independence and of greater accountability, communication of monetary policy has become much more transparent. [...]

The pre-crisis paradigm in macroeconomics predicted neither the onset nor the severity of the crisis in any meaningful fashion for the conduct of policy. Unconditional trust in the self-repairing capacities of financial markets, or simple neglect, had led to deregulation and lax supervision in the years preceding the crisis. Low quality capital with little loss-absorbing capacity, underestimation of asset risk, excessive and overlooked leverage, ignorance of the interconnections, disregard for the liquidity buffers, low resilience of the funding markets, and pervasive fraud, especially in the sub-prime sector were just a few of the factors that produced the most severe financial crisis since the Great Depression. [...]

Up until that point, sovereign debt had been considered as effectively risk free, regardless of the rating of the sovereign. The Greek crisis destroyed that illusion, and induced a general repricing of risk in the EU. The banking crisis morphed into a sovereign debt crisis. In these countries credit contracted even further, aggravating the ongoing recession and further weakening the banking system in a vicious circle.

The interest rates faced by businesses and households – and indeed sovereigns – became increasingly divorced from movements in short-term central bank rates. The crisis that had started as a global crisis was now becoming the crisis of the euro.

The financial sector played a significant role in not only propagating but also originating negative shocks to the economy. Financial frictions – largely absent from both the pre-crisis experience of developed economies and the canonical macroeconomic models – had become major drivers of the recession. The resulting crisis prompted academics to reassess existing economic paradigms and policymakers to adjust their frameworks. The rediscovery of the notion that policy may have a role in coordinating private expectations at times of severe uncertainty played a major part in the transition to today's post-crisis world. [...]


Research in both academia and in central banks has re-examined alternative monetary policy tools, including so-called quantitative easing (QE) policies. Here the newly developed models with financial frictions have been useful. Earlier studies based on the assumption of frictionless financial markets had concluded that QE is completely ineffective. The renewed focus on financial frictions clarified that this conclusion is unwarranted, once it is recognised that financial intermediaries are subject to leverage constraints. Large-scale asset purchases can ease these constraints and increase investors' risk-bearing capacity, leading to a portfolio rebalancing towards risky assets and to strengthened lending activity for banks.

All in all, research has confirmed that central banks are not powerless at the effective lower bound. Provided they are willing to explore non-standard policy avenues, they can continue pursuing their price stability mandates even in the most adverse circumstances.

The policy response by central banks and governments has evolved along the two main lines suggested by research. As short-term interest rates approached the effective lower bound, central banks on both sides of the Atlantic undertook a number of unconventional measures aimed at influencing the whole constellation of rates that are important for the financial decisions taken by households and businesses.

But central bank policy moves extended beyond just measures to counteract the impairment of the transmission mechanism caused by financial frictions. The ECB also acted in various ways to prevent self-fulfilling expectations from delivering socially undesirable outcomes by co-ordinating expectations onto 'good' outcomes. [...]

The pricing of redenomination risk led to a breakdown of money markets, a fragmentation of banking systems along national lines and threatened the unity of monetary policy transmission across the euro area. Moreover, expectations fuelled a vicious cycle. Tightening monetary conditions in countries affected by

 @MrJurgenWillems
Economics is there to improve social-wellbeing“
by Mario Draghi. @lindaunobel #LiNoEcon
Jurgen Willems, Universität Hamburg

 @AnjaEttel
Draghi: Wld be mistake to look back at macroecon theories
with today’s disenchanted, post-crisis eyes. #LiNoEcon
Anja Ettel, Journalist, Welt N24, Germany

perceptions of redenomination risk put downward pressure on economic activity, exacerbating the perceived risk. Such moves are a classic example of expectations leading towards an outcome that is non-optimal for social welfare.

This is why we announced Outright Monetary Transactions (OMTs) as an instrument that can support our monetary policy. The idea was for the ECB to purchase the sovereign bonds of countries affected by panic-based redenomination risk. By breaking the link between perceptions and downward pressure on economic activity, OMTs would aid in restoring the proper transmission of monetary policy across the whole euro area and support the recovery.

That the ECB had the tool at its disposal was sufficient to anchor expectations at the ‘good’ outcome. This played a vital role in fostering the euro area recovery that is currently under way. [...]

This account of how policymakers and researchers have interacted in the past ten years shows how indebted the former are to the latter. From my point of view, one can draw five lessons for policymakers.

First, sudden shocks often make visible the flaws in our policy frameworks and challenge the explanatory power of existing theories in ways that have been previously overlooked. But analysis conducted by researchers and embraced by policymakers remains essential in designing the policy response.

Second, a policy response that has its foundation in rigorous research is less prone to being impaired by political compromise and easier to explain to the general public.

Third, Keynes is often quoted as saying, “When the facts change, I change my mind. What do you do, sir?” Well, for policymakers, it is not that simple, and research helps us to decide whether a change in the facts deserves a policy response or, as we say, we should look through it.

Fourth, when the world changes as it did ten years ago, policies, especially monetary policy, need to be adjusted. Such an adjustment, never easy, requires unprejudiced, honest assessment of the new realities with clear eyes, unencumbered by the defence of previously held paradigms that have lost any explanatory power.

Fifth, we must be aware of the gaps that still remain in our knowledge. Our mainstream macroeconomic models still have little to say, for instance, about the non-linear propagation of shocks, the distributional impacts of policies, or how endogenous firm entry and exit can affect economic performance. Policy actions undertaken in the last ten years in monetary policy and in regulation and supervision have made the world more resilient. But we should continue preparing for new challenges.

The changes that we have discussed, profound as they are, often hinge on one fundamental idea. A natural question to ask is whether such an idea sprang out as a response to a specific policy problem or was rather conceived previously in an entirely different, unrelated intellectual environment, perhaps addressing a different set of problems. It is a question that is especially relevant in economics, when previously held consensus views change. But it is a question that is unlikely to have a precise answer. Let me rather use the 1939 words of Abraham Flexner, the first director of the Princeton Institute for Advanced Study: “Almost every discovery has a long precarious history. Someone finds a bit here, another a bit there. A third step succeeds later, and thus onward till a genius pieces the bits together and makes the decisive contribution.”

Today, I have had the privilege of addressing such people – geniuses who have pieced the bits together and made decisive contributions.

» The text of the speech is available in full length on the website of the European Central Bank: www.ecb.europa.eu

“Today, I have had the privilege of addressing such people – geniuses who have pieced the bits together and made decisive contributions.”

Mario Draghi

Mario Draghi in discussion with young scientists



6 Opening Ceremony

Welcome

Countess Bettina Bernadotte, President of the Council for the Lindau Nobel Laureate Meetings

Greetings from Stockholm

Torsten Persson, Secretary, The Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, Sweden

Introduction of Mario Draghi

Martin F. Hellwig, Max Planck Institute for Research on Collective Goods, Germany

Keynote

Mario Draghi, President of the European Central Bank



Countess Bettina Bernadotte



Torsten Persson

» The text of the keynote by Mario Draghi can be found on p. 82 of this annual report.

The laureates rise to greet the audience



Martin Hellwig



Nobel Laureate in Physics Brian Schmidt following the opening ceremony

6 An Inspiring Hothouse of Intergenerational and Cross-Cultural Exchange

Torsten Persson and Klaus Schmidt, who served as scientific co-chairmen of the 6th Lindau Meeting on Economic Sciences together with Martin Hellwig, reflect on the highlights of #LiNoEcon.

Klaus Schmidt



The 6th Lindau Meeting on Economic Sciences was an inspiring hothouse of intergenerational and cross-cultural exchange – and this was not just because of the sunny Lindau weather. In mid-August, 17 laureates met 350 young economists from 66 different countries, all of them carefully selected and highly qualified undergraduates, PhD students and postdoctoral researchers. The young economists were eager to use this once-in-a-lifetime opportunity to interact with the scientific leaders of their discipline and to connect with each other. The result was four intense days of engaged discussions, deep reflections and new insights on core issues of economics.

An early highlight of the meeting was the opening address by Mario Draghi, President of the European Central Bank. He reflected on the interaction of economic research and economic policy after the financial crisis. As a former PhD student of laureates Franco Modigliani and Robert Solow, and as a former economics professor, Draghi knows the academic side as well as the political side of this interaction. He also enjoyed the interaction with the young economists and stayed for another few

hours after his presentation, surrounded by a crowd of young people, answering questions and engaging in lively discussions.

A novel feature of this year's meeting was a set of nine 'speed-dating' seminars. In each seminar, ten young economists had six minutes each to present an idea for a new paper, followed by three minutes of questions and comments by up to six laureates. While intense and demanding for the presenters, the laureates and the audience, these seminars served as a stepping stone. In more conventional speed-dating events, once two parties get interested in each other they enter into a much longer exchange. In Lindau, the exchange amounted to long discussions after the seminars or during meals and social events, not only between laureates and young economists, but also among the young economists themselves.

As in previous meetings, each of the laureates gave a thirty-minute lecture on his current research. These talks covered a broad range of economic and political questions. For example, Eric Maskin used social-choice theory to explain the pitfalls of the US electoral system and a proposal for 'A Better Way to Choose Presidents'. Oliver Hart asked 'Should a Company Pursue Shareholder Value?', arguing forcefully that a company may well pursue other objectives if its founders codified this in the corporate charter. Talking about 'Debt and Money Markets', Bengt Holmström argued that more transparency is not always a good thing in financial markets, as it may reduce liquidity in times of crisis. Peter Diamond discussed 'Good Pension Design', Christopher Pissarides reflected on 'Work in the Age of Robots', and Lars Peter Hansen on 'Wrestling with Uncertainty in Climate Economic Models'. The young economists were fascinated, not just by the profusion of ideas but also by the different manners of thinking and arguing.

Another set of events to stimulate intellectual exchange were three panel discussions, each featuring three laureates and one young economist, and the audience posing questions via a smartphone app. One of the panels traditionally covers the intellectual history of a recent award – in this case, the 2016 prize

awarded to Oliver Hart and Bengt Holmström for their contributions to contract theory. This panel also included Jean Tirole, honoured in 2014 for his closely related work on regulation, and young economist Sarah Auster. The laureates reflected on how they had developed their main ideas and on the impact of their discoveries. They also engaged in a lively discussion on the theoretical foundations of incomplete contracts, a topic that has received renewed interest due to current developments in behavioural economics. Sarah Auster contributed additional insights from her own work on optimal contracts when some partners are unaware of possible contingencies or suffer from ambiguity aversion.

In their panel on 'New Conditions for Monetary and Fiscal Policy', laureates Peter Diamond, Edward Prescott, Christopher Sims and young economist Chiara Perillo expressed opposing views on what monetary and fiscal policy should look like in Europe and in the USA. The panellists engaged in a lively debate on the pros and cons of various interventions, such as quantitative easing and deficit-financed spending.

The closing panel addressed the question 'What Could and Should We Do About Inequality?'. On beautiful Mainau island, laureates James Heckman, Daniel McFadden, Christopher Pissarides and young economist Rong Hai debated this topic, which looms large behind the political divisions we currently observe in many countries. They discussed a number of topics, such as whether we should redistribute income and wealth in the working population, or rather engage in early childhood interventions to level the playing field in education. This discussion spurred a lot of interest among the young economists and stimulated lively discussions on the boat trip back to Lindau.

Torsten Persson



Martin Hellwig

6 Laureates



Robert J. Aumann
Nationality: Israel/USA
Prize: Economic Sciences
Year: 2005
Prize Motivation: “for having enhanced our understanding of conflict and cooperation through game-theory analysis”



Peter A. Diamond
Nationality: USA
Prize: Economic Sciences
Year: 2010
Prize Motivation: “for their analysis of markets with search frictions”



Lars Peter Hansen
Nationality: USA
Prize: Economic Sciences
Year: 2013
Prize Motivation: “for their empirical analysis of asset prices”



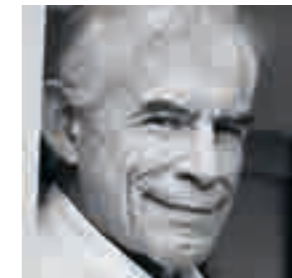
Oliver Hart
Nationality: United Kingdom/USA
Prize: Economic Sciences
Year: 2016
Prize Motivation: “for their contributions to contract theory”



Edward C. Prescott
Nationality: USA
Prize: Economic Sciences
Year: 2004
Prize Motivation: “for their contributions to dynamic macroeconomics: the time consistency of economic policy and the driving forces behind business cycles”



Myron S. Scholes
Nationality: USA
Prize: Economic Sciences
Year: 1997
Prize Motivation: “for a new method to determine the value of derivatives”



Christopher A. Sims
Nationality: USA
Prize: Economic Sciences
Year: 2011
Prize Motivation: “for their empirical research on cause and effect in the macroeconomy”



Jean Tirole
Nationality: France
Prize: Economic Sciences
Year: 2014
Prize Motivation: “for his analysis of market power and regulation”



James J. Heckman
Nationality: USA
Prize: Economic Sciences
Year: 2000
Prize Motivation: “for his development of theory and methods for analyzing selective samples”



Bengt R. Holmström
Nationality: Finland
Prize: Economic Sciences
Year: 2016
Prize Motivation: “for their contributions to contract theory”



Finn E. Kydland
Nationality: Norway
Prize: Economic Sciences
Year: 2004
Prize Motivation: “for their contributions to dynamic macroeconomics: the time consistency of economic policy and the driving forces behind business cycles”



Eric S. Maskin
Nationality: USA
Prize: Economic Sciences
Year: 2007
Prize Motivation: “for having laid the foundations of mechanism design theory”



Brian P. Schmidt
Nationality: USA/Australia
Nobel Prize: Physics
Year: 2011
Prize Motivation: “for the discovery of the accelerating expansion of the Universe through observations of distant supernovae”



Daniel L. McFadden
Nationality: USA
Prize: Economic Sciences
Year: 2000
Prize Motivation: “for his development of theory and methods for analyzing discrete choice”



Sir James A. Mirrlees
Nationality: United Kingdom
Prize: Economic Sciences
Year: 1996
Prize Motivation: “for their fundamental contributions to the economic theory of incentives under asymmetric information”



Roger B. Myerson
Nationality: USA
Prize: Economic Sciences
Year: 2007
Prize Motivation: “for having laid the foundations of mechanism design theory”



Sir Christopher A. Pissarides
Nationality: Cyprus/United Kingdom
Prize: Economic Sciences
Year: 2010
Prize Motivation: “for their analysis of markets with search frictions”

» All portraits can be found in Peter Badge's new book 'Nobel Heroes' (see p. 69).

» The mediatheque contains profiles of more than 400 Nobel Laureates.

Laureates at #LiNoEcon

17 LAUREATES



16

Economic Sciences



1

Physics

NATIONALITIES

8



Most Participations Sir James A. Mirrlees (6) Daniel L. McFadden (5) Brian P. Schmidt (5)	First Participations Oliver Hart James Joseph Heckman Bengt Holmström Jean Tirole	Longest Streak Sir James A. Mirrlees: all 6 Lindau Meetings on Economic Sciences 2004–2017
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AGE

Youngest: Brian Schmidt (50)
Oldest: Robert J. Aumann (87)

6 Nominating Institutions

» Academic Partners With Accepted Candidates at #LiNoEcon

- Aalto University, Finland
- Académie Nationale des S & T du Sénégal
- Academy of Science of South Africa (ASSAf)
- African Academy of Sciences (AAS)
- Alexander S. Onassis Public Benefit Foundation
- Alexander von Humboldt-Stiftung
- Alpen-Adria-Universität Klagenfurt, Austria
- American University of Beirut, Lebanon
- Bank of Canada
- Bank of Finland
- Barcelona Graduate School of Economics, Spain
- Bergische Universität Wuppertal, Germany
- Boston University, USA
- Brazilian Academy of Sciences
- Bulgarian Macroeconomics Association
- California Institute of Technology, USA
- Carl von Ossietzky Universität Oldenburg, Germany
- CEMFI, Madrid, Spain
- Central Bank of Malta
- Centre for European Economic Research, Germany
- Centre National de la Recherche Scientifique (CNRS), France
- Christian-Albrechts-University Kiel, Germany
- Cologne Institute for Economic Research, Germany
- Columbia University, USA
- Columbus Association
- Cornell University, USA
- Danish Council for Independent Research
- Elite Network of Bavaria
- Estonian Academy of Sciences
- Europa-Universität Viadrina-Frankfurt (Oder), Germany
- European Commission
- European University Institute, Italy
- FernUniversität in Hagen, Germany
- Fonds Wetenschappelijk Onderzoek – Vlaanderen (FWO), Belgium
- Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- Georgetown University, USA
- German Academic Exchange Service (DAAD)
- German Institute for Economic Research
- Global Young Academy (GYA)
- Goethe University Frankfurt, Germany
- Harvard University, USA
- Heinrich-Heine-Universität Düsseldorf, Germany
- Humboldt-Universität zu Berlin, Germany
- Hungarian Academy of Sciences
- Institut für Arbeitsmarkt- und Berufsforschung der Bundesagentur für Arbeit, Germany
- International Monetary Fund
- Internationale Bodensee-Hochschule
- Irish Research Council

Representatives of the Alexander S. Onassis Public Benefit Foundation, their nominated young economists and laureates



Memorandum of Understanding with the Bulgarian Macroeconomics Association: Jürgen Kluge, Countess Bettina Bernadotte and Vassil Karaivanov, Chairman



6

» Academic Partners With Accepted Candidates at #LiNoEcon

Japan Society for Promotion of Science/ISPS
 Julius-Maximilians-Universität Würzburg, Germany
 Kiel Institute for the World Economy, Germany
 Leibniz-Gemeinschaft
 Leipzig University, Germany
 Leopold-Franzens-Universität Innsbruck, Austria
 Lomonosov Moscow State University, Russia
 London School of Economics, United Kingdom
 Ludwig-Maximilians-Universität München, Germany
 Luxembourg National Research Fund (FNR)
 Max-Planck-Gesellschaft
 Ministry of Science & Technology (MOST), Taiwan
 National Academy of Sciences of the Republic of Armenia (NAS RA)
 National Research Foundation, Singapore
 OIC Standing Committee on Scientific and Technological Cooperation (COMSTech), Pakistan
 ORAU (Oak Ridge Associated Universities), USA
 Österreichische Akademie der Wissenschaften, Austria
 Pakistan Institute of Engineering and Applied Sciences
 Philipps-Universität Marburg, Germany
 Princeton University, USA
 Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Germany
 Robert Bosch Stiftung
 Royal Netherlands Academy of Arts and Sciences

Saint-Petersburg State University, Russia
 Sino-German Center for Research Promotion, China
 Social Sciences and Humanities Research Council of Canada
 Spanish National Research Council (CSIC)
 Stanford Business School, USA
 Stanford University, USA
 Stockholm University, Sweden
 Technische Universität Dresden, Germany
 Technische Universität München, Germany
 The Czech Academy of Sciences (CAS)
 The Graduate Institute of International and Development Studies, Switzerland
 The Hebrew University, Israel
 The University of Chicago, USA
 Tilburg University, Netherlands
 Tsinghua University, China
 TU Wien, Austria
 TUBITAK, Turkey
 Universidad de Chile
 Università Bocconi, Italy
 Universität Bayreuth, Germany
 Universität Hamburg, Germany
 Universität Siegen, Germany
 Universität Ulm, Germany

Academic Partner representatives of the ORAU with young economists and laureates



Souhad Khriesat, OPEC Fund for International Development (OFID), and Stanley Maphosa, Academy of Science of South Africa (ASSAf)



University College London, United Kingdom
 University of Augsburg, Germany
 University of Bonn, Germany
 University of Bremen, Germany
 University of Cambridge, United Kingdom
 University of Chicago, USA
 University of Cologne, Germany
 University of Copenhagen, Denmark
 University of Kassel, Germany
 University of Konstanz, Germany
 University of Liechtenstein
 University of Oslo, Norway
 University of Oxford, United Kingdom
 University of Pittsburgh, USA

University of Rochester, USA
 University of Stuttgart, Germany
 University of Vienna, Austria
 University of Warwick, United Kingdom
 University of Zurich, Switzerland
 Verein für Socialpolitik
 Volkswagen Aktiengesellschaft
 Yale University, USA
 Zukunftskolleg, University of Konstanz, Germany

» The nomination process in Germany was conducted in cooperation with the Wirtschafts- und Sozialwissenschaftlicher Fakultätentag e.V.

Academic partner representatives of the Sino-German Center for Research Promotion, China, with young economists and laureates



'High-Frequency Trading and the Informativeness of Stock Prices'

Presentation by young economist Jasmin Gider, University of Bonn, Germany



www.lindau-nobel.org

6 Scientific Programme

» Lectures

Robert J. Aumann	Mechanism Design Design: Why Consciousness Evolved
Peter A. Diamond	Good Pension Design
Lars Peter Hansen	Wrestling With Uncertainty in Climate Economic Models
Oliver Hart	Should a Company Pursue Shareholder Value?
James J. Heckman	Unordered Monotonicity
Bengt R. Holmström	Debt and Money Markets
Finn E. Kydland	Innovation, Capital Formation and Economic Policy
Eric S. Maskin	A Better Way to Choose Presidents
Daniel L. McFadden	Foundations of Welfare Economics
Sir James A. Mirrlees	Bounded Rationality and Economic Policy
Roger B. Myerson	Local Agency Costs of Political Centralisation
Sir Christopher A. Pissarides	Work in the Age of Robots
Edward C. Prescott	Fiat Value in the Theory of Value
Myron S. Scholes	The Evolution of Investment Management
Christopher A. Sims	The Myth of the Stand-Alone Central Bank
Jean Tirole	Moral Reasoning, Markets and Organisations



Roger B. Myerson




Sir James A. Mirrlees

Lars Peter Hansen



Finn E. Kydland



 All lectures from #LiNoEcon can be watched in the mediatheque, which contains more than 750 videos.

6

» Panel Discussions

CONTRACTS, INCENTIVES AND ORGANISATIONS

Panellists

- Sarah Auster, Bocconi University, Italy
- Oliver Hart, Department of Economics, Harvard University, USA
- Bengt R. Holmström, Department of Economics, Massachusetts Institute of Technology (MIT), USA
- Jean Tirole, Toulouse School of Economics (TSE), France

Moderator

Klaus M. Schmidt, Ludwig-Maximilians-Universität München, Germany

NEW CONDITIONS FOR MONETARY AND FISCAL POLICY?

Panellists

- Peter A. Diamond, Department of Economics, Massachusetts Institute of Technology (MIT), USA
- Chiara Perillo, University of Zurich, Switzerland
- Edward C. Prescott, Arizona State University, USA, Australia National University, Australia, and Federal Reserve Bank of Minneapolis, USA
- Christopher A. Sims, Department of Economics, Princeton University, USA

Moderator

Martin F. Hellwig, Max Planck Institute for Research on Collective Goods, Germany

Martin Hellwig and Edward Prescott



WHAT COULD AND SHOULD WE DO ABOUT INEQUALITY?

Panellists

- Rong Hai, University of Miami, USA
- James J. Heckman, Center for the Economics of Human Development, University of Chicago, USA
- Daniel L. McFadden, Department of Economics, University of California, Berkeley, USA
- Sir Christopher A. Pissarides, The London School of Economics and Political Science, United Kingdom

Moderator

Torsten Persson, Institute for International Economic Studies, Stockholm University, Sweden

Peter A. Diamond



Panel discussion on inequality: Daniel L. McFadden, Rong Hai, James J. Heckman and Sir Christopher A. Pissarides

Sarah Auster



Panel discussion 'Contracts, Incentives and Organisations': Klaus Schmidt, Oliver Hart, Bengt Holmström, Jean Tirole and Sarah Auster



6

» Seminars

For the first time in the history of the Lindau Meetings, seminars took place at #LiNoEcon. In these sessions, 85 young economists presented their research in ten-minute presentations and received feedback from laureates.

Topics

- Microeconomics
- Macroeconomics
- Applied Microeconomics



Laureates listening to the presentations by young economists

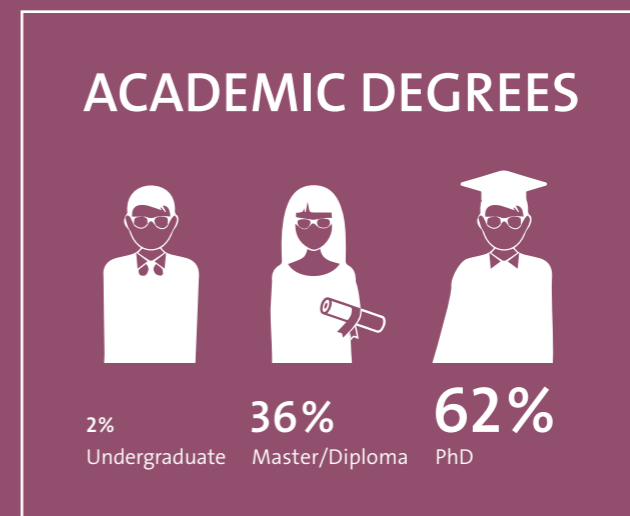
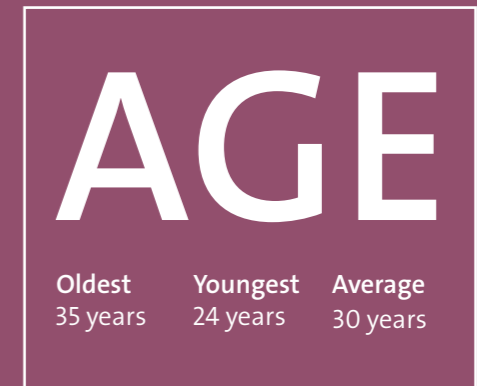
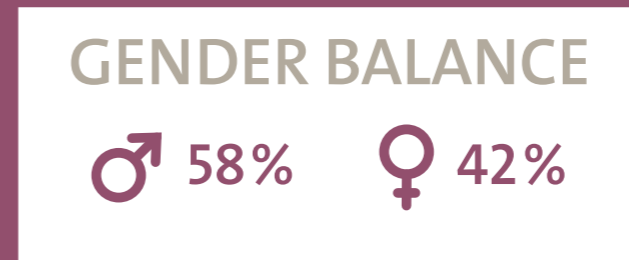
Alexandra Heimisch presenting during a seminar on applied microeconomics



Feedback from James Heckman



Young Economists at #LiNoEcon



6

» Partner Breakfasts

ADDRESSING ECONOMIC INEQUALITY IN A GLOBALISED WORLD
hosted by Mars, Incorporated

Panellists

- Eric S. Maskin, Department of Economics, Harvard University, USA
- Howard-Yana Shapiro, Chief Agricultural Officer, Mars, Incorporated, and Department of Plant Sciences, University of California, Davis, USA
- Devaki Ghose, University of Virginia, USA

Moderator

Romesh Vaitilingam, economics writer and member of the editorial board of Vox, United Kingdom

Eric Maskin, Devaki Ghose and Howard-Yana Shapiro at the Mars breakfast on inequality



RESTARTING PRODUCTIVITY GROWTH IN ADVANCED ECONOMIES
hosted by McKinsey & Company, Inc.

Speakers

- Jan Mischke, Senior Fellow, McKinsey Global Institute, Switzerland
- Eckart Windhagen, Senior Partner, McKinsey, and Council Member, McKinsey Global Institute, Germany

Moderator

Matthias Evers, Senior Partner, McKinsey

Eckart Windhagen



Sessions of the Scientific Programme of #LiNoEcon

2 BREAKFAST SESSIONS

Early Morning Panel Discussions
Presented by Partners & Supporters

PANEL DISCUSSIONS

Topical and Relevant Issues
Discussions Involving the Audience

3

16 LECTURES

By Laureates
Free Choice of Topics

SEMINARS

Young Economists Present Their Research
Several Laureates Give Advice

9

6 Innovation Forum

» New Protectionism – The End of Globalisation?

The second Innovation Forum in 2017 covered two very current topics: protectionism and globalisation.

Walls seem to be (back) in fashion these days. It may well be the most memorable promise of the last presidential election campaign in the United States: to build a wall. While one may question whether this particular wall will actually ever be built, European countries are pulling up fences at their borders desperately hoping they can stop migration dynamics.

The idea that walls and fences are appropriate measures to define a nation, a society, its people, and protect them from everything outside and from a globalised world currently seems to be a widely-held view. Yet, only a few years ago, globalisation seemed unstoppable, and with the internet disrupting all and every traditional, confined habitat, no one wanted to be alone, isolated; everyone wanted to be connected, in the new hub.

Today, there are not only walls, there is also the Brexit, and there are other exits, there is the sudden and surprising end of TTIP and possibly other trade agreements, there are new taxes and tariffs

W. Michael Blumenthal



about to be imposed. There is also a new nationalism in many countries, such as Hungary or Turkey, but also the USA and the UK, that does not seem to favour exchange of ideas, thoughts, lifestyles or values.

The speakers, panellists and participants at the 10th Innovation Forum shed light on the question of what effects these trends will have on industry and trade, on science and research, on cultural exchange political climate and ultimately on society and its citizens.

The first part of the debate was stimulated by two impulse statements: Nobel Laureate Brian P. Schmidt, who currently serves as Vice-President of the Australian National University, very precisely and comprehensively presented the various devastating effects of academic protectionism on research progress but also democratic societies and economic well-being. Bayer's CEO Werner Baumann emphasised the importance of free trade for a global economy of wealth, but also showed perspectives for how companies can work in such adverse environments.

Comment by laureate Christopher A. Sims



Fabrizio Campelli

The second part of the debate had a focus on monetary policy, finances and investment, with three impulses by Stephen S. Poloz, Fabrizio Campelli and Henry Cai.

Both rounds were followed by panel debates moderated by Karan Khemka. The speakers were joined by W. Michael Blumenthal, who not only shared many experiences and insights from his fascinating career, but also brought the Innovation Forum to an end with a truly impressive summary and outlook.

Impulses

PROTECTIONISM & ACADEMIA

Brian P. Schmidt, Vice-Chancellor, Australian National University

PROTECTIONISM & INDUSTRY

Werner Baumann, CEO, Bayer AG

PROTECTIONISM & NATIONAL ECONOMIES

Stephen S. Poloz, Governor, Bank of Canada

Werner Baumann



PROTECTIONISM & FINANCIAL MARKETS

Fabrizio Campelli, Global Head of Wealth Management, Deutsche Bank

PROTECTIONISM & INVESTMENTS

Henry Cai, Chairman, AGIC Capital

Final Thoughts

W. Michael Blumenthal, Founding Director, Jewish Museum Berlin, US Secretary of the Treasury 1977–79

Panel & Audience Discussions

– Werner Baumann

– W. Michael Blumenthal

– Henry Cai

– Fabrizio Campelli

– Stephen S. Poloz

– Brian P. Schmidt

Moderator

Karan Khemka

Henry Cai



Panel moderated by Karan Khemka

6 Social Programme

» Get-Together

hosted by the Council & Foundation Lindau Nobel Laureate Meetings

Reception

Welcome Address

Countess Bettina Bernadotte, President of the Council for the Lindau Nobel Laureate Meetings

Dinner Speech

Peter Altmaier, Head of the German Federal Chancellery and Federal Minister for Special Tasks

Dinner and Music at Dornier Museum, Friedrichshafen

Federal Minister Peter Altmaier



» Bavarian Evening

hosted by the Free State of Bavaria

Bavarian Buffet

Traditional Bavarian Music & Parade

Die 4 Hinterberger Musikanten

Countess Bettina Bernadotte and Lord Mayor Gerhard Ecker leading the guests into the marquee



» Boat Trip to Mainau Island

supported by Deutsche Post Foundation

Welcome

Countess Bettina Bernadotte, President of the Council for the Lindau Nobel Laureate Meetings

Greetings on behalf of Deutsche Post Foundation

Hilmar Schneider, Chief Executive Officer, IZA Institute of Labor Economics, Germany

Exhibition

Presentations by selected partner institutions and projects

Science Picnic

Science Picnic



» Academic Lunches

Hosts

Alexander S. Onassis Public Benefit Foundation

Dieter Schwarz Stiftung

Mars, Incorporated

The Opec Fund for International Development (OFID)

ORAU, USA

Sino-German Center for Research Promotion, China

Academic lunch hosted by Director-General Suleiman Jasir Al-Herbish, OFID



Impressions

Sir James A. Mirrlees and a young economist at Lindau City Theatre



#LiNoEcon participants Angela De Martiis and Zeinab Aboutalebi



Ding Xuan Ng presenting his research



Lars Peter Hansen



Finn E. Kydland talking with young economists



Myron Scholes surrounded by young economists

The Lindau Science Trail

The Lindau Science Trail was officially inaugurated by Bavarian State Minister of Education, Science and the Arts, Ludwig Spaenle, during the 67th Lindau Meeting. It serves as a permanent embodiment of the Lindau Nobel Laureate Meetings and their history, and makes 'Nobel knowledge' accessible to everyone.

The trail consists of a total of 21 knowledge pylons, 15 of them are located on the island of Lindau, three pylons each are on the mainland of Lindau and on Mainau Island. At the pylons, visitors can learn more about the everyday applications of scientific phenomena that have been honoured with the Nobel Prize. The pylons cover the three natural science disciplines – physics, chemistry and physiology/medicine – as well as economic sciences, peace and literature. Two more provide insight into the history of the Lindau Nobel Laureate Meetings and tell the story behind the Nobel Prizes.

The children's section of the pylon on cancer research



The respective topic is always directly connected to the site – thus, for example, the physics pylon at the lighthouse at Lindau harbour discusses the various findings on the subject of light. The pylons contain links to the respective Nobel Laureates who have been awarded in this particular field. All information is presented in English as well as in German.

The Lindau Science Trail addresses grown-ups as well as children and explains complex scientific phenomena in plain language. With a special children's section on every pylon, it particularly invites students and schools to discover the exciting world of science, e.g., on guided tours around the trail.

A mobile app expands the Lindau Science Trail, making it accessible even to those who are not able to visit Lindau. One can discover the knowledge pylons virtually on a smartphone or tablet. Users in Lindau profit from special features: by means of augmented reality functions, one can meet virtual Nobel Laureates at various places in Lindau. They explain why they received the Nobel Prize and talk more about their research. With numerous quiz questions, the app also gives the opportunity to test the freshly acquired knowledge in a Science Rallye.

The mobile app of the Lindau Science Trail



From 2018 on, the trail will include a pier, which will constitute the central station directly at the conference venue Inselhalle, in recognition of the more than 450 Nobel Laureates who participated in the Lindau Meetings since 1951. The whole project could be realised thanks to the support by the city of Lindau and the Prof. Otto Beisheim-Stiftung.

» The free app for iOS and Android can be downloaded at wissenspfad.de.



Young economists on a guided tour during #LiNoEcon

The official inauguration of the Lindau Science Trail: Elmar Stegmann, Head of the District Authority, Ludwig Spaenle, Bavarian State Minister of Education, Science and the Arts, Countess Bettina Bernadotte, Jürgen Kluge, Fredy Raas, Chairman of the Board, Prof. Otto Beisheim-Stiftung, Gerhard Ecker, Lord Mayor of Lindau, Hugo Trütsch, Member of the Board, Prof. Otto Beisheim-Stiftung, Nikolaus Turner and Nobel Laureate Hartmut Michel



The Mediatheque

» New Content 2017

With unique content dating back to 1952, the mediatheque maps the Lindau Meetings' rich history of scientific dialogue. It provides access to more than 500 original lectures by Nobel Laureates, including the recent lectures and panel discussions held during #LiNo17 and #LiNoEcon. New Mini Lectures, Topic Clusters and Nobel Labs 360° have been added in 2017. The mediatheque is gradually being developed further to provide a learning platform and research source for scientists and those fascinated by science. To meet the rising demand from teachers and students, an educational section has been added to the mediatheque in 2017.



TOPIC CLUSTER ON GLOBAL WARMING

As one of the most pressing problems of our times, global warming was one of the most discussed issues during this

year's Lindau Meetings. Accordingly, a new topical dossier deals with this global concern.



NOBEL LABS 360°: JOHN E. WALKER

John E. Walker received the Nobel Prize in Chemistry 1997 together with Paul D. Boyer "for their elucidation of the

enzymatic mechanism underlying the synthesis of adenosine triphosphate (ATP)." Let the Nobel Laureate show you around his lab and learn more about his research.



MINI LECTURE: IMAGING IN SCIENCE

In the past decades, scientific imaging has allowed us to see and therefore discover fundamental processes in

diverse fields. This mini lecture explains the different scientific imaging methods whose discoveries paved the way for diverse Nobel Prizes.



MINI LECTURES: INEQUALITY

These three short Mini Lectures deal with the critical matter of inequality, an issue that was extensively discussed

during #LiNoEcon. They shed light on different aspects of the subject, namely, globalisation, lending and redistribution.



TOPIC CLUSTER ON DNA, GENES AND GENETIC ENGINEERING

Follow the history of research on DNA, the molecule that carries the genetic information of all known living organisms.

From its first discovery up to the state-of-the-art genetic modifications of DNA, this Topic Cluster invites you to learn more about the blueprint of life.

LIFE PATHS

The Life Paths project, suggested by Nobel Laureate Arno Penzias a decade ago, has developed into an amazing tool for data visualisation over the past two years. Today, more than 350 biographies of Nobel Laureates are available and are continuously updated. The data is accessible not only as text, but can also be visualised as an interactive world map of all major life events and the places where they happened.

mediatheque.lindau-nobel.org

» Educational Section

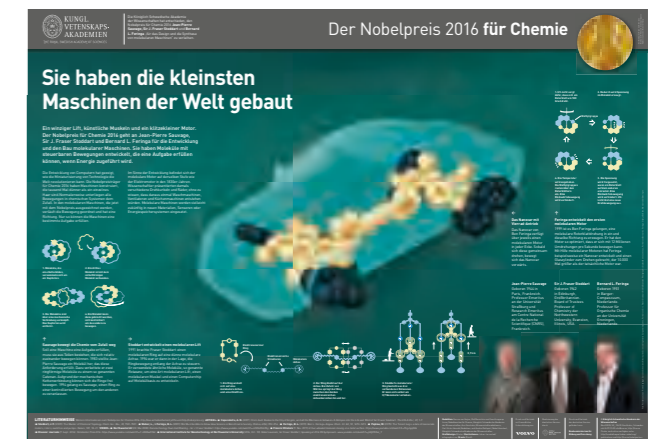
The mediatheque is gradually being developed further to provide a learning platform and research source for scientists and those fascinated by science. Much of the material in the mediatheque is well-suited for use in schools. The mediatheque now contains tools that allow the easy allocation of contents suitable for the classroom.

Didactic Filter

The didactic filter aligns the contents of the Mini Lectures, the Nobel Labs 360° and the Topic Clusters to curricula of the federal states of Germany and Austria. Educators can filter the content according to country, state, subject and level.

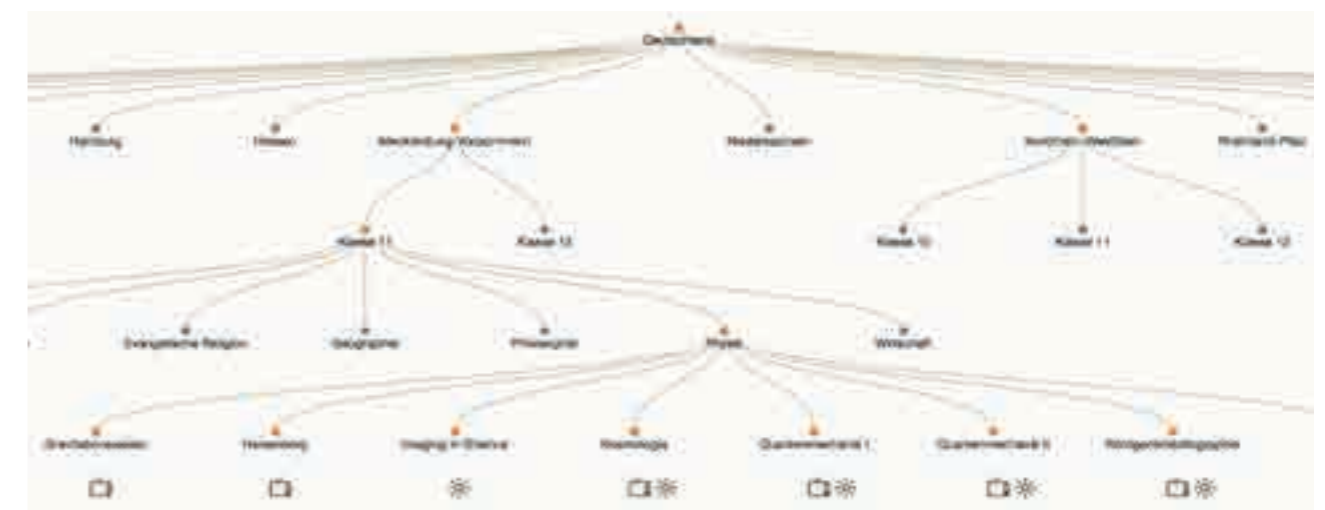
Nobel Posters

Every year, the Royal Academy of Sciences and the Karolinska Institute publish a poster series explaining the discoveries of the Nobel Prize in English and Swedish. With the support of the German Federal Ministry of Education and Research, the 2016 posters have been translated into German and distributed among more than 3,000 secondary schools in Germany. Accordingly, the Nobel Posters 2017 will be provided in early 2018. All posters are available online in the educational section of the mediatheque.



The poster explains the Nobel Prize in Chemistry 2016. Two of the three Nobel Laureates, Ben Feringa and Jean-Pierre Sauvage, attended #LiNo17.

Didactic Filter



Educational Outreach

» Cooperations

The aim of the educational outreach activities of the Lindau Nobel Laureate Meetings is to spread the fascination with science and research to society at large and to share the archived knowledge of the mediatheque with pupils, university students and generally interested laypersons. In 2017, the Lindau Meetings particularly extended their cooperation with educational content providers to reach an even wider audience within the educational sector.

Cooperation With Educational Content Providers

With the goal of imparting and further disseminating scientific information by and about Nobel Laureates, the Council and the Foundation embarked on a strategy to collaborate with non-profit providers of digital educational content, mainly public providers of pedagogic material for teachers.

'Lehrer-Online'

In collaboration with lehrer-online.de, one of the leading and most renowned providers of learning materials in German-speaking countries, several learning units based on the mediatheque's Mini Lectures, Topic Clusters and Nobel Labs 360° are being developed and made available for teachers. This includes the development of teaching guides, worksheets, digital experiments or exams.

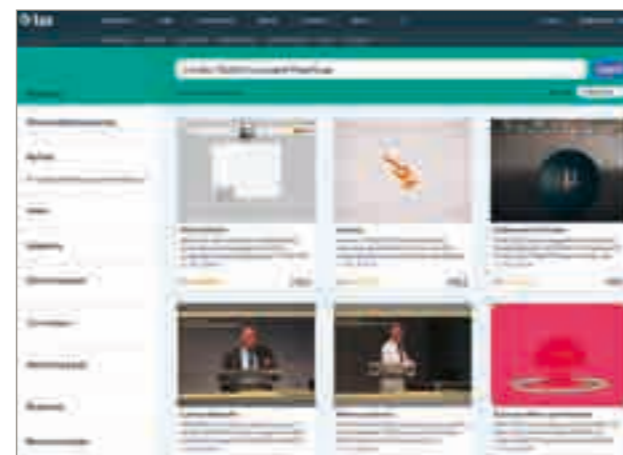
Promotion of a teaching unit with mediatheque content on lehrer-online.de



Additional Partners

- AK Schulförderung des Verbandes der Chemischen Industrie (VCI)
- Education Group, Landesmedienzentrum Oberösterreich
- European Commission, Directorate-General for Education and Culture
- European Schoolnet
- Goethe-Institut Philippines
- Goethe-Institut Thailand
- Kärntner Medienzentrum für Bildung und Unterricht
- Landesmedienzentrum Rheinland-Pfalz
- Landesmedienzentrum Salzburg
- Lehramtsausbildung der FU Berlin
- Leibniz Institute for Science and Mathematics Education
- LVR-Zentrum für Medien und Bildung, Medienzentrum für die Landeshauptstadt Düsseldorf
- LWL-Medienzentrum für Westfalen
- mebis – Landesmedienzentrum Bayern des Bayerischen Staatsministeriums für Unterricht und Kultus
- Mediencenter Burgenland
- Medienverleih des Amtes für Film und Medien – Autonome Provinz Bozen, Südtirol
- NÖ Medienzentrum, Niederösterreich
- Schulmedienzentrum Vorarlberg
- Scientix
- School Education Gateway
- Supratix
- SESAM – Landesmedienzentrum Baden-Württemberg
- STEM Learning
- Tes Global
- Tiroler Bildungsinstitut – Medienzentrum des Landes Tirol

Mini Lectures and further contents from the mediatheque on Tes' online network for teachers



Antares Project

In addition to the partners mentioned above, the content of the mediatheque is offered to teachers in all federal states of Germany in cooperation with the Antares Project GmbH. Antares is a media interface for the distribution of digital educational content used by 250–400 media centres in Germany.

Partnerships in Cooperation With Antares

- EDMOND NRW
- Emutube – Bildungsserver Sachsen-Anhalt
- FWU Institut für Film und Bild in Wissenschaft und Unterricht
- Institut für Qualitätsentwicklung an Schulen Schleswig-Holstein
- Landesinstitut für Lehrerbildung und Schulentwicklung Hamburg
- Landesinstitut für Pädagogik und Medien Saarland
- Landesinstitut für Schule Bremen
- Landesinstitut für Schulqualität und Lehrerbildung Sachsen-Anhalt
- Medienzentren Baden-Württemberg, Brandenburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen
- MeSax Sachsen
- Thüringer Institut für Lehrerfortbildung, Lehrplanentwicklung und Medien

Schoolchildren exploring the Lindau Science Trail



Engaging Future Generations

» Teaching Spirit

In times of 'alternative facts', society more than ever needs qualified and passionate teachers that are able to generate enthusiasm for science in the young generation. Every year, the Lindau Nobel Laureate Meetings invite a select number of excellent teachers, who are honoured for their educational performance and who are provided with new impulses for their work.

21 engaged chemistry teachers from Germany and Austria were invited to take part on two days of the 67th Lindau Nobel Laureate Meeting. Their programme included lectures, panel discussions and a workshop organised jointly with the Leibniz Institute for Science and Mathematics Education (IPN). During a lunch with several Nobel Laureates, the Bavarian Evening and the Baden-Württemberg Boat Trip, they also had the opportunity to mingle with the participants of #LiNo17.

Experimental workshop for chemistry teachers during #LiNo17



» School Visit

During #LiNo17, Harald zur Hausen, Nobel Laureate in Physiology or Medicine 2008, gave an inspiring talk at Lindau's Valentin-Heider-Gymnasium. About 80 students from five schools in Bavaria, Baden-Württemberg and Vorarlberg attended the school visit of the laureate. He talked about the search for new disease-causing pathogens and his research on human papilloma viruses (HPV) and cervical cancer. His easily comprehensible lecture was followed by an intensive exchange with the students in which he answered questions on his personal background and his scientific career.

To inspire the younger generation and to actively involve local students in the Lindau Nobel Laureate Meetings, the Council organises a visit to a local school for one of the participating Nobel Laureates every year.

Harald zur Hausen at the school visit



Inspiring Lindau

» Explaining the Nobel Prizes

It has become a tradition at the beginning of a new year that the Council invites Lindau citizens for a lecture programme and a subsequent reception to celebrate the awarding of the latest Nobel Prizes. In January 2017, Council members, a Lindau Alumna and an Austrian teacher gave readily understandable and entertaining presentations to explain the research findings of the laureates being awarded with the Nobel Prize in 2016.

Presentations

THE NOBEL PRIZE IN CHEMISTRY: BEN FERINGA, SIR J. FRASER STODDART AND JEAN-PIERRE SAUVAGE
Wolfgang Lubitz, Vice-President of the Council and scientific co-chair of the 67th Lindau Meeting, Director, Max Planck Institute for Chemical Energy Conversion, Germany

THE NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE: YOSHINORI OHSUMI

Beat Grabherr, participant of 'Teaching Spirit' at the 64th Lindau Meeting in 2014, teacher at the Bundesgymnasium Bregenz, Austria

Sabine Elmiger



THE NOBEL PRIZE IN PHYSICS: F. DUNCAN M. HALDANE, J. MICHAEL KOSTERLITZ AND DAVID J. THOULESS
Rainer Blatt, Member of the Council and scientific co-chair of the 66th Lindau Meeting, Professor of Experimental Physics at the University of Innsbruck and Scientific Director of the Institute for Quantum Optics and Quantum Information (IQOQI) of the Austrian Academy of Science

THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL: OLIVER HART AND BENGT HOLMSTRÖM

Sabine Elmiger, participant in the 5th Lindau Meeting on Economic Sciences in 2014, doctoral candidate at the Institute of Banking and Finance, University of Zurich

Moderator

Christoph Plate, Deputy Editor-in-Chief, Schwäbische Zeitung

Partners

City of Lindau
Schwäbische Zeitung/Lindauer Zeitung

Rainer Blatt explaining the 2016 Nobel Prize in Physics with pretzels.



Beat Grabherr



Preparing for Intellectually Stimulating Days With Physical Exercise

Morning workouts at #LiNo17 and #LiNoEcon

Staying Connected


» Lindau Alumni Network

The Lindau Meetings are a once-in-a-lifetime experience for young scientists and young economists that hopefully has a lifelong impact. Lindau Alumni share memories and motivation inspired by the extraordinary 'Lindau Spirit'.

The combination of a diverse pool of over 32,000 brilliant scientists and an ongoing tradition since 1951 has created a unique, global community. The alumni initiative of the Lindau Meetings aims to strengthen this community by identifying existing connections and retying loose ends. The connecting centrepiece of this effort is a new online social platform: the Lindau Alumni Network.

Launched in time for the 67th Lindau Nobel Laureate Meeting, the Lindau Alumni Network is an exclusive digital space for Lindau Alumni. In addition to a powerful search function that will allow alumni to access the growing database, this online community includes tools that enable users worldwide to share their work, swap stories and collaborate on projects. The Lindau Alumni Network is a further way to educate, inspire and connect.

The Lindau Meetings express their sincere gratitude to the German Federal Ministry of Education and Research for supporting the project and invite all former and future participants to join this community and to enrich it with their own ideas and perspectives.

 Log in to the Lindau Alumni Network at alumni.lindau-nobel.org

Images of Lindau Alumni in Myanmar shown in the Lindau Alumni Network



» Lindau Alumni Reunions

The Lindau Alumni activities aim to extend the 'Lindau Spirit' beyond the boundaries of a week-long conference. A further step in this direction was taken in 2017 with a series of alumni reunion events.


In February, Lindau Alumni met in Los Angeles with Nobel Laureates Louis Ignarro, William Sharpe, Sir J. Fraser Stoddart, and Ariel Warshel for a Bavarian breakfast at the residency of the German Consul General. They were also invited to the closing ceremony of the 'Brain' exhibition with photos of Nobel Laureates by Peter Badge at the El Segundo Museum of Art.

Coinciding with the Annual Meeting of the American Association for the Advancement of Science (AAAS), Lindau Alumni as well as alumni of the Heidelberg Laureate Forum reunited for lunch in Boston. There, they shared stories with Nobel Laureates Jerome Friedman, Walter Gilbert and Eric Maskin and ACM A.M. Turing Award laureate John Hopcroft. In London in September, a smaller group of Lindau Alumni enjoyed a reunion dinner with Nobel Laureate Peter Agre.

Lindau Alumni and guests at the Bavarian breakfast in Los Angeles



The Lindau Nobel Laureate Meetings encourage alumni to engage in science outreach projects and in future will offer a host of member-exclusive opportunities ranging from career advice to continued education and regional events all over the world as well as online webinars.

 Follow the Lindau Meetings on social media or write to alumni@lindau-nobel.org to get the latest news regarding the alumni initiative.

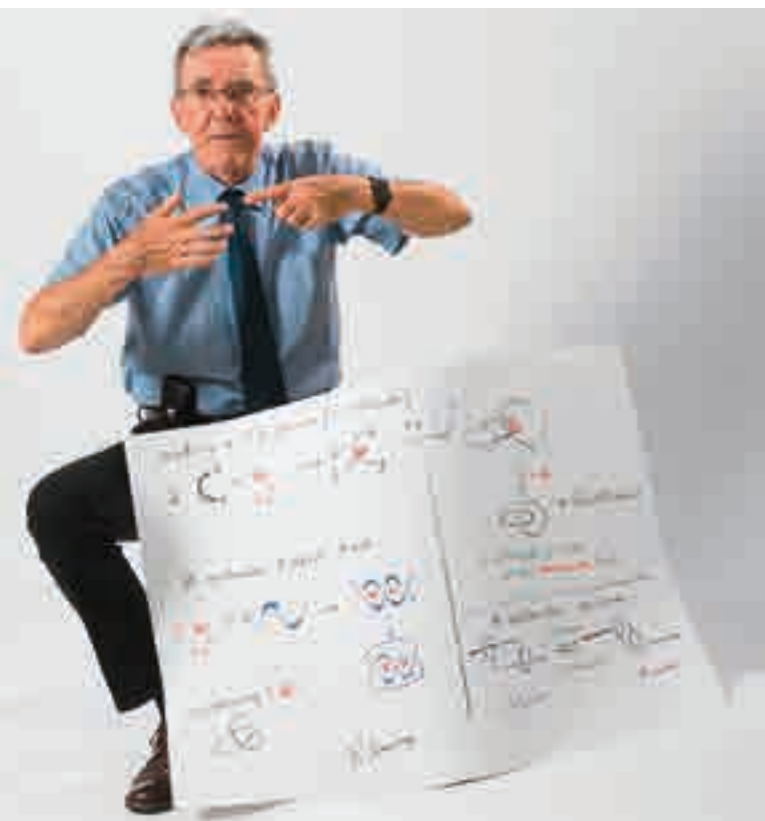
Lap-Chee Tsui, President Academy of Sciences of Hong Kong (left), Dennis Lo, Chinese University of Hong Kong (centre), David Foster, Director of the Croucher Foundation (second from right), and Nikolaus Turner (right) with Lindau Alumni at the reunion in Hong Kong



Nobel Laureate Peter Agre with Lindau Alumni in London

Sketches of Science

In his series 'Sketches of Science', photographer Volker Steger takes unique pictures of Nobel Laureates and their discoveries. At #LiNo17, science writer and Lindau Alumna Melissae Fellet accompanied Steger on his latest photo shoot.



Jean-Pierre Sauvage describes the assembly and motion of knotted molecules.

When Nobel Laureates come to Lindau, photographer Volker Steger presents each with a surprise task. One by one, he brings them to a desk with a blank white posterboard and a queue of chubby, colourful wax crayons. Then Steger asks: For what did you get your Nobel Prize?

Each laureate sketches his or her answer, following the only guidelines to make the sketch big and use multiple colours. After finishing and signing the picture, Steger photographs

each laureate with his or her drawing. The whole process takes about 20 minutes.

This year, he photographed three laureates: Tomas Lindahl, Ben Feringa and Jean-Pierre Sauvage. I accompanied Steger on his photo shoot with Sauvage at the Hotel Bad Schachen on Wednesday afternoon. Once Steger presented his challenge, we left Sauvage alone with the paper and crayons, listening for several minutes from the hallway to crayons clicking on the desk, a sound similar to that of chalk on a chalkboard.

Sauvage emerged from the room smiling and ready to explain each of his drawing's three sections: the synthesis of a molecule with two interlocking rings called a [2]catenane, the synthesis of a more complicated molecular trefoil knot, and the contraction and expansion of a molecular muscle. Steger and I whisked Sauvage down the hall to a makeshift photo studio to continue the explanation.

Between shutter clicks, Steger asked Sauvage to demonstrate the molecular motion with his hands. I passed Sauvage a stool so he could sit down and prop his sketch against his leg, leaving his hands free to trace the twists of molecular knots.

In contrast to traditional posed portraits where a twinkling eye or smile hints at someone's personality, the physicality in Steger's portraits directly connects each laureate to his or her intellectual work. When Steger first imagined this project, titled 'Sketches of Science', he says: "I wanted to learn about each person and their work at the same time in a playful, fun way." The idea worked right away.

In his photo, Sir Harold W. Kroto pretends to kick a buckyball colored like a soccer ball. When Anthony J. Leggett wanted to twist his arms to show the atomic arrangement that allows for superfluidity, he asked Steger to tape the sketch to his body.

Some laureates prefer words to pictures, diagrams and physical demonstration. Robert F. Curl, Jr. filled two sheets of paper with

the story of his discovery, quoting his co-laureates and sketching diagrams of his experiments. Roald Hoffmann filled most of his posterboard with a poem titled "Orbitals and Sex."

The sketches remain in Lindau under the care of the Foundation Lindau Nobel Laureate Meetings, and they may eventually be archived at the Nobel Museum in Sweden. All of the project's photographs can be viewed in a gallery and downloaded as an e-book from the Lindau Mediatheque. The e-book also contains Steger's notes from each shoot, revealing the stories behind the sketches.

Sir Martin J. Evans' second sketch – a mouse – pays homage to the lab animals needed for his Nobel-winning research. Martinus J. G. Veltman depicted a scientist as a person climbing a mountain just to see what's on the other side. And Leon M. Lederman drew Nobel Laureates having a party, with a lady joining the group, hearts filling her speech bubble. "As I was later told by another laureate," Steger wrote, "this is just what happened to Leon Lederman after he won his Nobel Prize!"

Over the past eight years, Steger has photographed 100 Laureates. The collection has been exhibited around Germany, in the United States, Japan and Russia. It will travel next to Australia for an exhibition.

When Steger started this project, he had one question for himself: "Is there something that all the laureates have in common?" Now that 'Sketches of Science' is nearing its end, he has an answer: "Yes – they all have a Nobel Prize and that's it. They are a very diverse group of personalities."



Ben Feringa magically suspends his sketch of the molecular motor recognised by his 2016 Nobel Prize in Chemistry.

» The series 'Sketches of Science' by Volker Steger is an ongoing project of the Foundation. The exhibition is touring the world, is run in collaboration with the Nobel Museum, Stockholm, and is generously funded by the Klaus Tschira Foundation.

Representation Abroad

» AAAS 2017 Annual Meeting

The Lindau Nobel Laureate Meetings participated in the American Association for the Advancement of Science (AAAS) 2017 Annual Meeting, which took place 16–20 February in Boston, MA.

At the joint booth of the Lindau Meetings and the Heidelberg Laureate Forum Foundation (HLFF), young scientists were provided with detailed information on how to participate in the two meetings. Representatives of universities and research institutions could learn more about the global academic partner network, and journalists received information on covering the meetings.

The theme of the 2017 AAAS Meeting was ‘Serving Society through Science Policy’. Among the topics discussed were scientific reproducibility and social responsibility, communicating science and technologies of the future.

Young scientists at the joint booth of the Lindau Meetings and the HLFF



Panel discussion at the AAAS Annual Meeting 2017: Robin Mishra, John Hopcroft, Kristina Mallory, Eric Maskin, Gunes Parlakgul and Jean-Pierre Bourguignon

Panel Discussion
hosted by the Lindau Nobel Laureate Meetings and the Heidelberg Laureate Forum Foundation

SCIENCE POLICY AND SCIENCE DIPLOMACY: INTERGENERATIONAL DIALOGUE
– Eric Maskin, Laureate in Economic Sciences 2007
– John Hopcroft, ACM A.M. Turing Award 1986
– Jean-Pierre Bourguignon, President of the European Research Council
– Gunes Parlakgul, Lindau Alumnus 2011
– Kristina Mallory, Heidelberg Laureate Forum Alumna

Moderator
Robin Mishra, Head of the Science and Technology Section, German Embassy, USA

Reunion Lunch for Alumni and Laureates
hosted by the Lindau Nobel Laureate Meetings and the Heidelberg Laureate Forum Foundation

Nobel Laureate Jerome Friedman at lunch with Lindau Alumni



» THE World Academic Summit 2017

The THE World Academic Summit 2017 was held 3–5 September at King’s College London with the overarching theme ‘Collaborating for a Better World: New Models for Research Universities’.

Panel Discussion
in association with the Lindau Nobel Laureate Meetings

SCIENCE POLICY AND SCIENCE DIPLOMACY: INTERGENERATIONAL DIALOGUE
– Peter Agre, Nobel Laureate in Chemistry 2003
– Rivka Isaacson, Senior Lecturer in Chemical Biology, King’s College London
– Prabha Kotiswaran, Reader in Law and Social Justice, King’s College London

Chair
John Gill, Editor, Times Higher Education

Alumni Dinner With Nobel Laureate Peter Agre
hosted by the Lindau Nobel Laureate Meetings

Panel discussion at the THE World Academic Summit: Prabha Kotiswaran and Peter Agre



The joint booth of the Lindau Nobel Laureate Meetings and the HLFF


» World Conference of Science Journalists 2017

For the first time this year, the Lindau Nobel Laureate Meetings were among the exhibitors at the World Conference of Science Journalists (WCSJ), together with the Heidelberg Laureate Forum Foundation (HLFF).

The 10th WCSJ took place 26–30 October in San Francisco, CA and brought together about 1,200 journalists and PR professionals. The overarching theme ‘Bridging Science and Societies’ reflected the vital role of science communication and the fact that journalists interpret science in context for diverse societies.

The joint booth together with the HLFF provided detailed information for journalists interested in covering the meetings.




 @Frances_Coppola

Macroeconomist Sir Chris Pissarides has just advocated a universal basic income. I am stunned. #LiNoEcon
Frances Coppola, economics writer, United Kingdom

 @MrJurgenWillems

I like that @lindaunobel meeting thinks about the environment with glass water bottles for everyone. #LiNoEcon #WalkTheTalk #NoPlastic
Jurgen Willems, Universität Hamburg, Germany

 @b_steininger

@peteraltmaier cites Kurt Tucholsky: "Germans, buy German lemons!"
Great example against nationalism and protectionism #LiNoEcon
Bertram Steininger, RWTH Aachen, Germany


 @martammatut

Motivation, ideas and inspiration. Thank you for the opportunity to be here with Laureates and economists. I will never forget #LiNoEcon.

Marta Martínez-Matute, Banco de España, Spain

 @ainafedtun


"I'm not sure if we're any wiser after the #LiNoEcon, but at least we're confused at a higher level." Says Prof. T. Persson @lindaunobel
Ifedotun Victor Aina, University of Ilorin, Nigeria

 @moonfant


"Part of being a scientist is knowing not to be swindled by your own work" #JeffreyKovac #LiNo17
Mariia Klimova, Max Planck Institute for Biophysical Chemistry, Germany

 @dismonik


One of best moments today at #LiNo17 comes with Ada Yonath encouraging @Women_Research: We can be both, mothers and scientists @lindaunobel
Monica Gimenez-Marques, Ecole Normale Supérieure, Paris, France

 @fiona_chembot

Dr. Peter Agre gave an incredibly heartwarming speech about his science and the life of himself and co-workers! #LiNo17 #LiNo17usa
Fiona Lynn Kearns, University of South Florida, USA

 @samueldanilola


'We have to listen to people if we are going to learn about our own ignorance.' – Jean Tirole
#LiNoEcon
Samuel Danilola, Nigeria

 @Hennjule

Inspiring dinner with Nobel Laureate Daniel McFadden last night! #LiNoEcon #NobelLaureate
Juliane Hennecke, Freie Universität Berlin, Germany

 @AndrewKeinsley


#LiNoEcon starting this week. Attending was one of the most inspiring moments in my short professional career. @lindaunobel
Andrew Keinsley, University of Kansas, USA

 @hlosswald

"Never look for a perfect partner. Thermodynamically they don't exist!" Good humor in Dan Shechtman's talk. #LiNo17
Heather L. Osswald, Purdue University, USA

 @eugen_dimant


Just arrived in beautiful Lindau for the 6th Lindau Meeting on economics. Humbling experience, trying to inhale everything #LiNoEcon
Eugen Dimant, University of Pennsylvania, USA

 @MarsGlobal

What an amazing week at 67th @LindauNobel talking and learning from 28 Nobel Laureates and the world's best young scientists! #LiNo17
Mars, Incorporated

 @KarenStroobants


John Walker at #LiNo17: "Return to tribalism is simply not appropriate" #brexit #peace #science
Karen Stroobants, University of Cambridge, United Kingdom

 @DrMatiasAcosta


Thank you #LiNo17! Great event and awesome lessons! Quite valuable for both young and experienced scientists!
Matias Acosta, University of Cambridge, United Kingdom

 @BenitoMiron


"Believe me in Mexico there are no climate change deniers because we suffer its consequences everyday" says @aurelionuno #LiNo17 @lindaunobel
Benito Mirón, Director General de Relaciones Internacionales, Secretaría de Educación Pública, Mexico

 @NobelPrize


30 Nobel Laureates will meet with 400 international young scientists @lindaunobel 25–30 June
The Nobel Prize, Sweden

 @HZowawi

I was honored to be invited to speak @lindaunobel #LiNo17 & share the stage with chem. Nobel Laureate Martin Chalfie
Hosam Zowawi, The University of Queensland, Australia

 @BattyBoffin

Aww, makes me nostalgic already! Thanks for making me a part of this amazing community @lindaunobel #LiNo17
Aditi Borkar, University of Cambridge, United Kingdom

 @synapse101

We visited Stefan Hells lab thanks to @Science_Academy after @lindaunobel 2015. The massive set ups baffled me, but I knew they were cool!
Emma Beckett, The University of Newcastle, Australia

 @GermanyinBoston

Lindau Nobel Laureate Meeting #LiNo17 goes Boston. Thx to @lindaunobel for hosting a Nobel Laureate dinner tonight.
German Consulate General in Boston, USA

 @scientist_kenni


Steven Chu delivers a heartfelt plea for #climateaction #LiNo17 @lindaunobel @ASSAf_Official
Paul Kennedy, science journalist, South Africa

 @SaaedWessam

Thank you @lindaunobel and good bye Lindau, I will come again not as young scientist but a Nobel laureate. #LiNo17
Wessam Saaed Abdrabo, Benha University, Egypt

 @wolfgang_huang


That's what we spend one year of preparation for: 500 happy people! #LiNo17 #ScienceIsFun
Wolfgang Huang, Director of the Executive Secretariat, Lindau Nobel Laureate Meetings

 @BGoldsm

I am looking forward to attending #LiNo17 soon! I hope to further discuss how #MachineLearning and #DataMining can give materials insights.
Bryan Goldsmith, University of Michigan, USA

 @zulfikarabbany

#LiNo17: German Research Minister Johanna Wanka says "we need free minds and protection against state intervention" in #science.
Zulfikar Abbany, Deutsche Welle, Germany

 @ElsonbatySciCom

Good bye Lindau. One of the best experiences of my life with lovely science journalists from everywhere! #LiNo17 #ScienceJournalism
Mohamed Elsonbaty, Science Writer, Egypt

 @ChemistryKit

The best thing about #LiNo17? The laureates have all been SO generous with their time to young scientists: fun, engaged, interested.
Kit Chapman, Chemistry World, United Kingdom

Lindau Meetings on Twitter

#LiNo17 #LiNoEcon

Communications

» Media Representatives

Bloomberg TV, ARTE, The Independent, Wirtschaftswoche, El País – media representatives from all around the world were present at #LiNo17 and #LiNoEcon.

In total, about 180 journalists and communications professionals from 32 countries seized the opportunity to get in touch with Nobel Laureates and young scientists. They attended the various lectures, panel discussions, press events as well as the social programme highlights. Once again, the Lindau Meetings assisted with organising interviews with the participants.

For the fourth year in a row, the Lindau Meetings cooperated with the International Journalists' Programmes (IJP) and provided travel grants to science journalists from remote countries.

Front pages of editorial supplements covering #LiNo17 in Germany's two most renowned dailies, Frankfurter Allgemeine Zeitung (left) and Süddeutsche Zeitung (right)



Nobel Laureate Stefan Hell was interviewed by the reporter Mia from the German children's news programme ZDF logo!



» Media Partnerships

The Lindau Meetings have a long history of premier media partnerships. The following partners played a key role in covering the Lindau Meetings:

- Bayerischer Rundfunk & ARD-alpha
- Deutsche Welle
- Nature Publishing Group
- Schwäbische Zeitung with Lindauer Zeitung

Germany's national public educational TV station ARD-alpha broadcasted an 'alpha-Forum extra', a high-profile panel discussion recorded at #LiNo17.

EMOTIONS OVER FACTS – SCIENCE IN A CRISIS OF CONFIDENCE presented by ARD-alpha

Panellists

- Johanna Wanka, German Federal Minister of Education and Research
- Andreas Sentker, head of the science department of the German weekly DIE ZEIT
- Nicolas Jäckel, Saarland University, Germany
- Helga Nowotny, Vice-President of the Council for the Lindau Meetings, former President of the European Research Council, Austria

Moderator

Stefan Geier, science journalist, ARD/Bayerischer Rundfunk

TV talk 'alpha-Forum extra' with Nicolas Jäckel and Johanna Wanka



» Press Talks

Accredited journalists were invited to join press talks, topical panel discussions with laureates, young scientists and guests.

SCIENCE IN A POST-TRUTH ERA

presented by Deutsche Welle

Is this really the post-truth era? And is Donald Trump the lord of all lies? Love him or hate him, President Trump has become the kingpin of a new age in society and the sciences. Even before Trump took the White House, scientists were up in arms, fearing he'd reject all evidence-based decisions. But if you look at some of the other facts, science is no angel either. Its history is littered with fake studies, fudged results, disgraced researchers, and at the very least a raft of divergent opinions on the hardest of facts. Scientists like to insist that facts are king. Others say emotive, persuasive argument is it. But they can't both be right. Or can they? Is this how the 'new truth' looks? And is there no option for scientists but to get on board?

Panellists

- William E. Moerner, Nobel Laureate in Chemistry 2014, Stanford University, USA
- Helga Nowotny, Vice-President of the Council for the Lindau Meetings, former President of the European Research Council, Austria
- Arturo Borja, Director of International Cooperation at the Consejo Nacional de Ciencia y Tecnología (CONACYT), Mexico
- Marian Nkansah, Kwame Nkrumah University of Science and Technology, Ghana
- Melania Zauri, Research Center for Molecular Medicine of the Austrian Academy of Sciences

Moderator

Zulfikar Abbany, Deutsche Welle

Press talk presented by Deutsche Welle at #LiNo17



THE FUTURE OF THE EUROPEAN ECONOMY

presented by the Lindau Nobel Laureate Meetings

After a long period of lacklustre economic performance, there are positive signs for the European economy. But a great many challenges remain, including creating jobs (especially for young people), promoting innovation, improving education and financing retirement, tackling inequality and accelerating the shift to a decarbonised and more resource-efficient economy. This panel discussion tackled some of the key issues facing policy-makers in Europe: taking the next steps on economic and monetary union, designing effective regulation of the financial sector and the dominant market players of the digital revolution and responding to the threats from global warming. The laureates and young economists also considered the implications for Europe of the outcomes of recent and upcoming national votes in a number of countries – as well as major political and social developments elsewhere in the world.

Panellists

- Sir Christopher A. Pissarides, Laureate in Economic Sciences, The London School of Economics, United Kingdom
- Eric S. Maskin, Laureate in Economic Sciences, Harvard University, USA
- Frances Coppola, economics writer and author of the Coppola Comment finance & economics blog, United Kingdom
- Lenka Fiala, Tilburg School of Economics and Management, Netherlands
- Veronika Stolbova, Department of Banking & Finance, University of Zurich, Switzerland

Moderator

Romesh Vaitilingam, economics writer and member of the editorial board of Vox

Sir Christopher A. Pissarides speaking at the press talk at #LiNoEcon



The Lindau Meetings Online

» Website and Blog

In 2017, the blog of the Lindau Nobel Laureate Meetings celebrated its 1000th post. It frequently features easily comprehensible articles on research news and science history as well as background stories on the meetings and interviews with their participants. With contributors ranging from professional science writers to young scientists and Nobel Laureates, the blog has evolved into the central online community platform and content hub of the Lindau Meetings throughout the year.

➤ This is just a small selection of the topics covered in 2017. For more please visit blog.lindau-nobel.org



Big Data Analytics Deliver Materials Science Insights

©Hamster3d/istock.com



The Myth of the Independent Central Bank



Imaging a World Without Electrical Sockets

©courtesy of fjeon



Academic Freedom Under Threat: The Spectre Haunting Science

© G.Pigrid01 (the stock of CEU) [CC BY-SA 3.0], Wikimedia Commons



Stopping Chemical Warfare

©OPCW, CC BY-NC 2.0

» Social Media

Connecting people to share ideas has always been a core element of the mission of the Lindau Meetings. In 2017, social media has continued to be an integral part of the 'Lindau Spirit'.

Meeting App

Based on last year's positive feedback, the Lindau Meetings offered their own app for all participants to download onto their iOS and Android devices. The app allowed the creation of personal timetables and contained all relevant, updated information on the programme sessions.

Facebook

The official Facebook page of the Lindau Nobel Laureate Meetings keeps its more than 11,800 followers continuously updated. We share our own and our partners' content and vividly discuss science-related topics with the community. Science comedian Brian Malow posted Facebook Live videos during the 67th Lindau Meeting, including popular interviews with young scientists.

Twitter

During both meetings, participants enthusiastically engaged on twitter using the hashtags #LiNo17 or #LiNoEcon and created a digital space of discussion, including insightful comments and glimpses of the social aspects of the week. The respective hashtags again trended in Germany.

Instagram

Starting this year, we are also engaging a growing audience on Instagram, sharing photographic highlights from the meetings and our outreach projects throughout the year. During the days of the meeting, participants joined in sharing their views of Lindau.

FlickrR

The FlickrR photostream is home to hundreds of pictures, accessible to everyone wanting to relive memories of their meeting participation or searching for high quality pictures for reports on the Lindau Meetings. Editorial use is free but the copyrights must be indicated accordingly.

YouTube

Working with UK-based Econ Films for the 6th Lindau Meeting, a series of short interviews with economists were added to the Lindau Meetings' YouTube channel, ranging from young economists describing their Lindau experience to Nobel Laureates giving advice to Donald Trump. A selection of the footage offered in the mediatheque is also available on YouTube in order to increase awareness of the Lindau Meetings and to spread some of the educational content within a medium used widely.

Geoffrey Carr and Nobel Laureate Richard Schrock using the #LiNo17 app during a panel discussion



#LiNoEcon meeting app



Video Coverage

» #LiNo17

Leading up to the 67th Lindau Nobel Laureate Meeting, a number of YouTube videos were released featuring alumni from 2016. As in 2016, science writer and comedian Brian Malow was in attendance this year and recorded a series of videos, many of them streamed live on Facebook.

➤ You can find all #LiNo17 Facebook Live videos on the Lindau Meetings' Facebook page.



5 Scientists From 5 Countries at the Lindau Nobel Laureate Meeting



Ada Yonath: Do What Is Burning Inside You

» #LiNoEcon

In cooperation with the production company Econ Films, the Lindau Nobel Laureate Meetings produced a series of videos for and about #LiNoEcon. The videos mostly feature the participants of the 6th Lindau Meeting on Economic Sciences, their areas of research as well as their opinions on important economical topics.

➤ This is just a small selection of the video coverage of #LiNoEcon. For more please visit www.youtube.com/NobelLaureateMeeting



Nobel Laureates on the Future of Economics



#LiNoEcon Participant Barbara Engels on the Lindau Meetings

Zeppelin Flights During #LiNo17

In 2016, the Helmholtz expedition 'Clockwork Ocean' utilised a zeppelin for their marine and coastal research. At #LiNo17, the Helmholtz Association let the zeppelin fly again, giving a few young scientists and Nobel Laureates the opportunity to enjoy spectacular views over Lake Constance and learn about the research performed using the zeppelin.

During the three flights that started in Friedrichshafen, expedition director Burkard Baschek from the Helmholtz-Zentrum Geesthacht explained why and how a zeppelin with its special aeronautical properties is perfect for his research.



Nobel Laureate Peter Agre

Expedition director Burkard Baschek explains the research of 'Clockwork Ocean'



The zeppelin over Lindau harbour



*“Education is not only important for scientists.
It’s important to everybody. Science is a thing that
everybody should know.”*

Eddy Fischer, Nobel Laureate in Physiology or Medicine 1992



NEUER LEUCHTTURM

LICHT
UND SEINE
ZUSAMMENSETZUNG



Die Lichtemission eines Leuchtturms ist ein physikalisches Phänomen, das auf der Erzeugung von Licht durch eine Lichtquelle beruht. In diesem Fall wird das Licht durch eine Leuchtquelle erzeugt, die in der Mitte des Turms befindet ist. Das Licht wird durch eine Linse gebrochen und in alle Richtungen ausgesandt. Die Lichtemission ist ein physikalisches Phänomen, das auf der Erzeugung von Licht durch eine Lichtquelle beruht. In diesem Fall wird das Licht durch eine Leuchtquelle erzeugt, die in der Mitte des Turms befindet ist. Das Licht wird durch eine Linse gebrochen und in alle Richtungen ausgesandt.



NEUER
LEUCHTTURM

NEUER
LEUCHTTURM

Academic Partners

To ensure the scientific excellence of their participants, the Lindau Nobel Laureate Meetings maintain a strong global network of more than 200 academic partner institutions. World-renowned entities in science and research both from the public and private sectors are entitled to nominate young scientists for participation in the Lindau Meetings.

These institutions include academies of sciences, leading universities, research institutions, foundations and innovative enterprises throughout the world.

For the 67th Lindau Nobel Laureate Meeting, 189 academic partners received a call for nomination of young scientists, and 155 of them participated in nominations. In total, 152 of 194 academic partners who received the call nominated young economists for the 6th Lindau Meeting on Economic Sciences.

Generally, young scientists are nominated by official academic partner institutions and apply through them. In exceptional cases, applications can be submitted directly to the Council via Open Applications, for example, when an applicant studies or works in a country where the Lindau Meetings do not yet have an academic partner.

The partner network is continuously being expanded by means of memoranda of understanding. In these, both the Lindau Meetings and their partners commit themselves to the inter-connection and promotion of aspiring young scientists and thus spreading Lindau's 'Mission Education' worldwide.

By engaging in a symbiotic relationship, academic partners become vital nodes in a world-spanning network of progressive young minds for which the Lindau Meetings function as a hub. They are the trustees of a constant pursuit of excellence and enablers of intergenerational and intercultural dialogue.



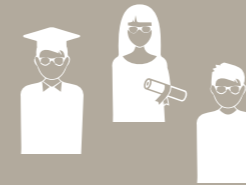
Partnerships 2017

In 2017, official partnerships with the following international institutions have been established or renewed:

- Academia Sinica, Taiwan
- Academy of Sciences Malaysia
- Bulgarian Macroeconomics Association
- Council of Finnish Academies
- Danish Council for Independent Research
- Foundation for Polish Science
- Government of the Principality of Liechtenstein
- ICREA, Spain
- Indian Council of Social Science Research
- Irish Research Council
- Japan Society for the Promotion of Science
- Mexican Academy of Sciences
- National Academy of Sciences of the Republic of Armenia
- National Science and Development Agency (NSTDA), Thailand
- Norwegian Academy of Science and Letters
- Royal Netherlands Academy of Arts and Sciences
- Sino-German Center for Research Promotion, China
- Szeged Scientists Academy, Hungary
- The Research Council of the Sultanate of Oman
- University of Malta

Renewal of the memorandum of understanding with Thailand:
 (back row) Chadamas Thuvasethakul, NSTDA, HRH Princess Maha Chakri Sirindhorn, Dhiravat Bhumichitr, Ambassador of Thailand,
 (front row) Nikolaus Turner, Jürgen Kluge, Countess Bettina Bernadotte, Narong Sirilertworakul, President of the NSTDA, Pairash Thajchayapong, NSTDA

Application Process



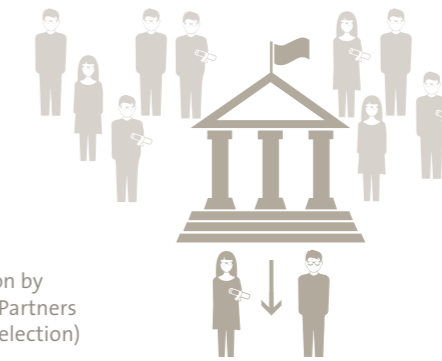
REQUIREMENTS

Undergraduates, Master or PhD Students, or Post-Docs <35 Years of Age

Top 5% of Class Recommendations

APPLICATION

Web-Based
Two Procedures



Regular:

Nomination by Academic Partners (Internal Selection)

Exception:

Open Application (If No Academic Partner Is Responsible)



EVALUATION & SELECTION

Review Panel of the Council
400–600 Participants (Depending on Meeting Type)



PARTICIPATION

One-Time Only
Supported Through Fellowships



ALUMNI COMMUNITY

32,000 FORMER PARTICIPANTS SINCE 1951

A Meeting Update

» New Programme

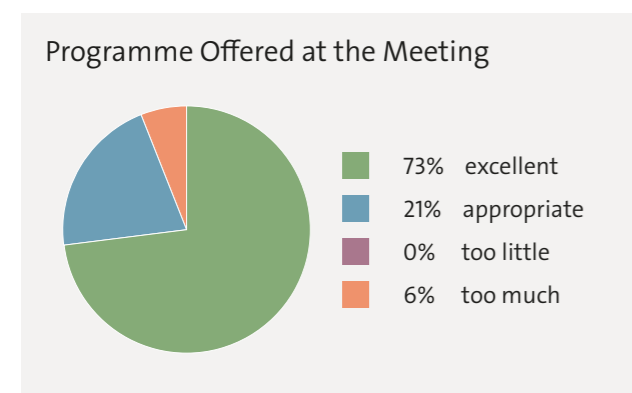
Every year after the meeting(s), Nobel Laureates and young scientists are asked to fill out a comprehensive survey. The results are then discussed during the Council meetings in autumn and in the executive secretariat. The conclusions affect the programme structure as well as organisational aspects such as food, transport or housing.

The last two years were special years, as the meetings had to be held at Lindau's city theatre instead of the Inselhalle. The meeting's home for the last 35 years is currently still undergoing extensive renovation and enlargement but will re-open in late spring 2018. While the city theatre offered only a limited seating capacity and no breakout rooms, the new Inselhalle will provide ample space. This will finally allow for a variety of changes and improvements in the scientific programme, which have been under discussion for some time now.

While the general assessment of the programme quality as stated in the surveys is very good (bottom left), certain suggestions keep reappearing in all surveys of the past few years (bottom right). Mainly, participants wish for a less packed programme, which at the same time features more innovative formats and allows more interaction and discussion. Some of the laureates prefer the well-known and tested structure as it is, but the majority is open for changes: "We are giving plenary lectures at every conference, why not do something out of the ordinary at Lindau?"

With this background and as the new Inselhalle will be available next year, the Council tasked the chairmen of the 2018 Meeting with developing an updated and more interactive programme. A detailed discussion is currently in full swing, and the new programme is taking shape.

Survey results from the 67th Lindau Nobel Laureate Meeting (Chemistry) show that the programme quality is excellently rated...



One of the challenges of the programme design in Lindau is that, by tradition, every Nobel Laureate is offered a lecture and an accompanying afternoon discussion. Once all these slots are filled, there is not much space left in the programme.

Agora Talks

The new programme may slightly ease this rule: A new format will combine an interview or discussion part with a Q&A session, offering more interaction. This format is especially suitable for controversial and new topics. As several of these agora talks may take place in parallel, time restrictions are reduced.

Laureate Lunches

Small groups of max. ten students will be invited for lunch by a Nobel Laureate.

Science Walks

Although the new Inselhalle will be modern, bright and inviting, some fresh air may be very stimulating: Do as the Greeks did and engage in discussions while strolling around.

Partner Events & Science Breakfast

The 2018 programme will also offer a greater variety of options for partner events, such as the science pitch introduced last year. In addition, a new science breakfast will stimulate lively debates and may also incorporate topics suggested by young scientists.

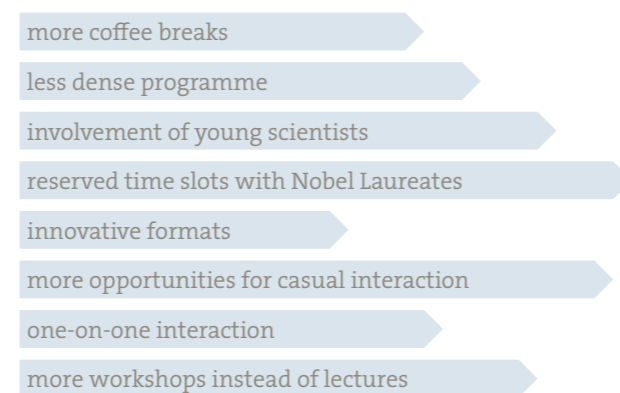
Posters

The poster sessions as well as the highly successful poster flashes will be continued but in a more suitable surrounding.

Life Lecture

This talk will honour the lifetime achievement of a Nobel Laureate.

...yet a large number of participants are in favour of a more diverse, less packed, more innovative programme.



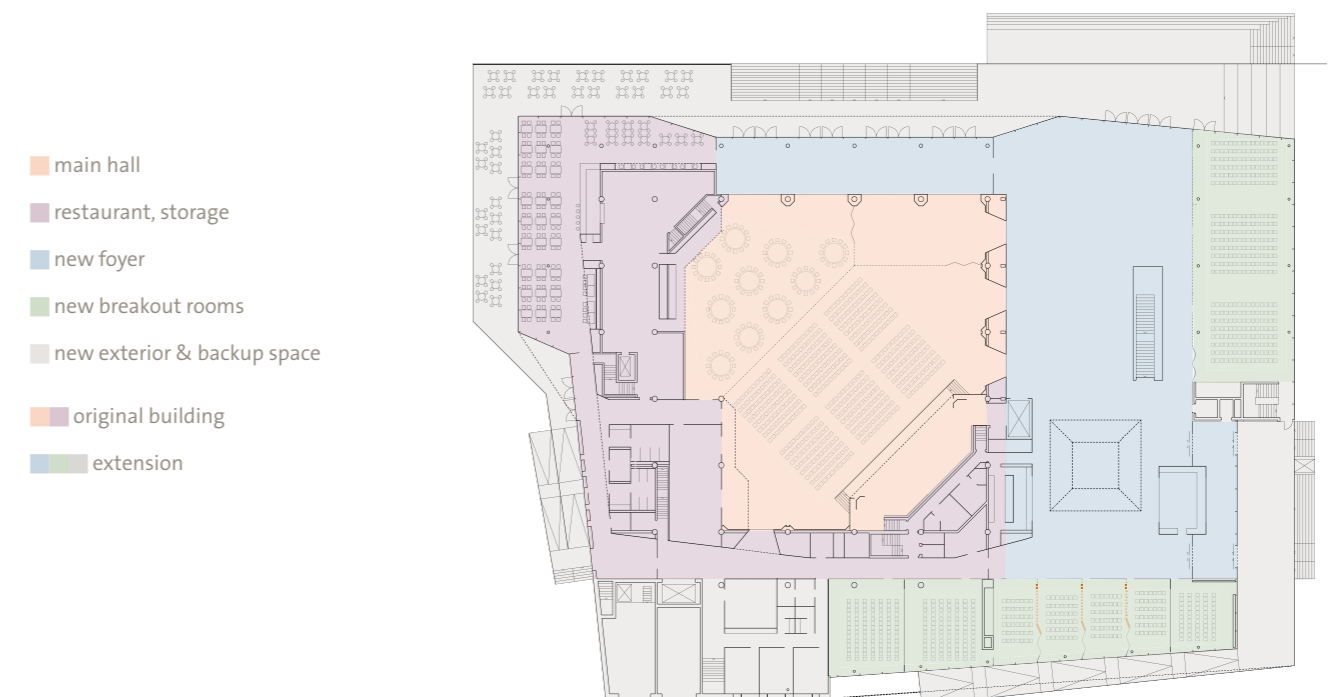
» New Venue

With major support from the Free State of Bavaria, the new Inselhalle will open in spring 2018 after two years of renovation and extension.

It offers double the space than previously, adds new breakout rooms, a generous foyer, additional banqueting space and all the facilities and amenities a modern venue requires.

The new breakout rooms are a particularly important addition that greatly enhances the flexibility of programme design, and allows for a central meeting place.

The new foyer provides ample space to meet – a major improvement to the old hall. Generous banqueting space in the lower level also makes the catering tents unnecessary.



A modern interior will allow lots of daylight into the new Inselhalle; large windows offer beautiful views of the lake.



The new Inselhalle with the adjacent newly created city square and the parking garage.



The Council and the Foundation

» 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, one of the three founders of the meetings, became the first president of the Council.

The purpose of the Council, a non-profit organisation, is to organise the annual meetings. This includes the establishment and maintenance of close relations with scientific partners worldwide. The Council maintains an executive secretariat at Lindau.

Honorary President

Count Lennart Bernadotte af Wisborg †

Board

Countess Bettina Bernadotte af Wisborg
President

Wolfgang Lubitz
Vice-President

Helga Nowotny
Vice-President

Nikolaus Turner
Treasurer

Members

Rainer Blatt
Thomas Ellerbeck (Spokesman)
Martin F. Hellwig (until 10/2017)
Klas Kärre
Stefan H. E. Kaufmann
Jürgen Kluge
Hartmut Michel
Torsten Persson
Reinhard Pöllath
Klaus Schmidt

Corresponding Members

Lars Bergström
Astrid Gräslund
Hans Jörnvall
Sten Orrenius

Permanent Guests

Gerhard Ecker
Thomas Gruber
Urs Schwager

» The Foundation

The Foundation Lindau Nobel Laureate Meetings was established in the year 2000 upon the initiative of 50 Nobel Laureates.

The Foundation's general objective is to promote science, research and related societal activities. In particular, its main purpose is to ensure the continuance and further development of the Lindau Meetings. This includes the support of outreach projects and initiatives.

The tax-exempt Foundation is registered on Mainau Island. In the interest of a close collaboration with the Council, the office of the Foundation is also based in Lindau.

Honorary Presidents

Count Lennart Bernadotte af Wisborg †
Roman Herzog †

Honorary Chairman

Wolfgang Schürer

Board of Directors

Jürgen Kluge
Chairman
Nikolaus Turner
Managing Director
Countess Bettina Bernadotte af Wisborg
Thomas Ellerbeck
Reinhard Pöllath

Council and Foundation at the Council meeting in Innsbruck in March 2017



Thomas Ellerbeck, Reinhard Pöllath, Jürgen Kluge,
Countess Bettina Bernadotte, Nikolaus Turner (from left)



Founders Assembly

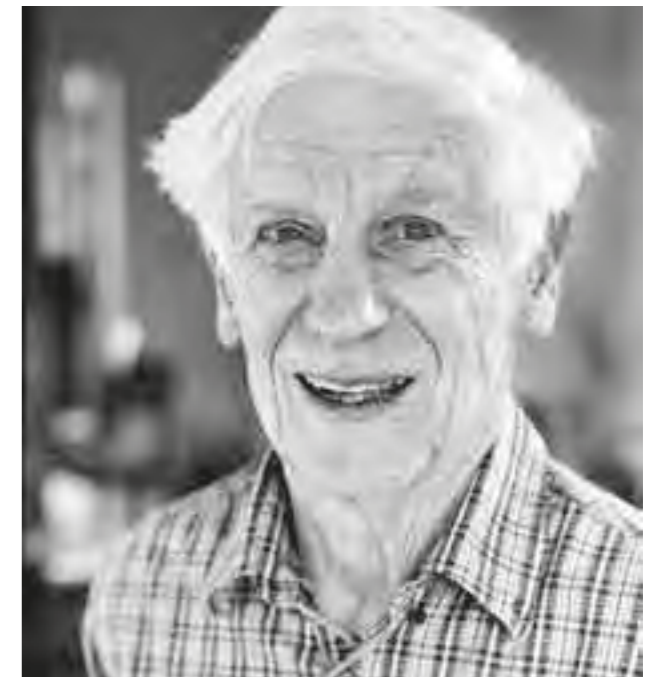
The Foundation Lindau Nobel Laureate Meetings was established in 2000 by 50 Nobel Laureates, the Bernadotte family and Council members. Through their membership in the Founders Assembly, Nobel Laureates demonstrate their strong support of the Lindau Meetings. As of November 2017, the assembly is composed of 326 Nobel Laureates.

Alexei Abrikosov	Georges Charpak
Peter Agre	Yves Chauvin
Martti Ahtisaari	Steven Chu
Isamu Akasaki	Aaron Ciechanover
George A. Akerlof	Ronald H. Coase
Svetlana Alexievich	Stanley Cohen
Zhores Alferov	Claude Cohen-Tannoudji
Maurice Allais	Leon Cooper
Sidney Altman	Elias J. Corey
Hiroshi Amano	John Warcup Cornforth
Philip W. Anderson	Mairead Corrigan Maguire
Werner Arber	James W. Cronin
Kenneth J. Arrow	Paul J. Crutzen
Robert J. Aumann	Robert F. Curl jr.
Richard Axel	Angus Deaton
Julius Axelrod	Hans G. Dehmelt
David Baltimore	Johann Deisenhofer
Barry C. Barish	Peter A. Diamond
Francoise Barré-Sinoussi	Peter C. Doherty
Gary S. Becker	Renato Dulbecco
Johannes Georg Bednorz	Christian de Duve
Baruj Benacerraf	Gerald Edelman
Paul Berg	Manfred Eigen
Hans A. Bethe	Robert Engle
Eric Betzig	François Englert
Bruce A. Beutler	Richard R. Ernst
Gerd Binnig	Gerhard Ertl
J. Michael Bishop	Leo Esaki
James Black	Martin Evans
Elizabeth H. Blackburn	Eugene F. Fama
Günter Blobel	John B. Fenn
Nicolaas Bloembergen	Bernhard L. Feringa
Baruch S. Blumberg	Albert Fert
Paul D. Boyer	Edmond Fischer
Sydney Brenner	Ernst Otto Fischer
James M. Buchanan	Robert W. Fogel
Linda Buck	Jerome Friedman
William Campbell	Milton Friedman
Mario R. Capecchi	Robert F. Furchgott
Jimmy Carter	D. Caletan Gajdusek
Thomas R. Cech	Andre Geim
Martin Chalfie	Murray Gell-Mann

Riccardo Giacconi	Eric R. Kandel
Ivar Giaever	Charles K. Kao
Walter Gilbert	Jerome Karle
Alfred G. Gilman	Tawakkol Karman
Vitaly L. Ginzburg	Martin Karplus
Donald Glaser	Imre Kertész
Sheldon L. Glashow	Wolfgang Ketterle
Roy J. Glauber	Har Gobind Khorana
Joseph L. Goldstein	Lawrence R. Klein
Mikhail Gorbachev	Frederik Willem de Klerk
Clive Granger	Klaus von Klitzing
Paul Greengard	Aaron Klug
David J. Gross	Makato Kobayashi
Robert H. Grubbs	Brian K. Kobilka
Peter Grünberg	Walter Kohn
Roger Guillemin	Arthur Kornberg
John B. Gurdon	Roger D. Kornberg
Theodor W. Hänsch	Masatoshi Koshihira
Duncan Haldane	J. Michael Kosterlitz
John L. Hall	Edwin Krebs
Lars Peter Hansen	Herbert Kroemer
Serge Haroche	Harold W. Kroto
Oliver Hart	Finn Kydland
Lee Hartwell	Willis E. Lamb
Herbert A. Hauptman	Robert Laughlin
Harald zur Hausen	Paul C. Lauterbur
Richard F. Heck	Leon M. Lederman
Alan C. Heeger	David M. Lee
Stefan Hell	Tsung-Dao Lee
Richard Henderson	Yuan Tseh Lee
Dudley R. Herschbach	Robert J. Lefkowitz
Avram Hershko	Jean-Marie Lehn
Antony Hewish	Rita Levi-Montalcini
Peter Higgs	Michael Levitt
Jules A. Hoffmann	Edward B. Lewis
Roald Hoffmann	Tomas Lindahl
Bengt Holmström	William N. Lipscomb
Gerardus 't Hooft	Robert E. Lucas Jr.
H. Robert Horvitz	Alan G. MacDiarmid
David H. Hubel	Roderick MacKinnon
Robert Huber	Peter Mansfield
Russel Hulse	Rudolph A. Marcus
John Hume	Harry M. Markowitz
Timothy Hunt	Barry Marshall
Leonid Hurwicz	Toshihide Maskawa
Andrew F. Huxley	Eric S. Maskin
Louis Ignarro	John C. Mather
Brian Josephson	Arthur B. McDonald
Daniel Kahneman	Daniel L. McFadden
Tahaaki Kajita	Simon van der Meer

Craig C. Mello	Richard J. Roberts
Bruce Merrifield	Heinrich Rohrer
Robert C. Merton	Joseph Rotblat
Hartmut Michel	Alwin Roth
James A. Mirreles	James E. Rothman
Mo Yan	F. Sherwood Rowland
Paul Modrich	Carlo Rubbia
William E. Moerner	Bert Sakmann
Rudolf Mößbauer	Paul A. Samuelson
Mario Molina	Bengt Samuelsson
Luc Montagnier	Aziz Sancar
Dale T. Mortensen	Frederick Sanger
Edvard Moser	Juan Manuel Santos
May-Britt Moser	Thomas J. Sargent
Karl Alexander Müller	Kailash Satyarthi
Kary B. Mullis	Jean-Pierre Sauvage
Robert A. Mundell	Andrew V. Schally
Ferid Murad	Randy W. Schekman
Joseph E. Murray	Thomas C. Schelling
Roger B. Myerson	Brian Schmidt
Shuji Nakamura	Myron S. Scholes
Yoichiro Nambu	Melvin Schwartz
John F. Nash jr.	John Robert Schrieffer
Ei-ichi Negishi	Richard R. Schrock
Erwin Neher	Reinhard Selten
Marshall Nirenberg	Amartya Sen
Douglass C. North	William F. Sharpe
Konstantin Novoselov	K. Barry Sharpless
Ryoji Noyori	Lloyd S. Shapley
Christiane Nüsslein-Volhard	Dan Shechtman
Paul M. Nurse	Robert J. Shiller
John O'Keefe	Osamu Shimomura
George A. Olah	Kai M. Siegbahn
Satoshi Ōmura	Christopher A. Sims
Douglas Osheroff	Ellen Johnson Sirleaf
Arno Allen Penzias	Jens C. Skou
Saul Perlmutter	Richard Smalley
Edmund S. Phelps	Hamilton O. Smith
William D. Phillips	Michael Smith
Christopher A. Pissarides	Vernon L. Smith
John Polanyi	Oliver Smithies
John Pople	George F. Smoot
Lord George Porter	Wole Soyinka
Edward C. Prescott	Robert M. Solow
Ilya Prigogine	Jack Steinberger
Venkatraman Ramakrishnan	Ralph M. Steinmann
José Ramos Horta	Thomas A. Steitz
Norman F. Ramsey	Joseph E. Stiglitz
Robert Richardson	James Fraser Stoddart
Burton Richter	Thomas C. Südhof

John Sulston	Ariel Warshel
Aung San Suu Kyi	James D. Watson
Akira Suzuki	Thomas H. Weller
Jack W. Szostak	Carl E. Wieman
Henry Taube	Eric F. Wieschaus
Joseph Taylor	Elie Wiesel
David J. Thouless	Torsten N. Wiesel
Samuel C. C. Ting	Frank Wilczek
Jean Tirole	Maurice H.F. Wilkens
Susumu Tonegawa	Jody Williams
Charles H. Townes	Robert Wilson
Tomas Tranströmer	David J. Wineland
David Trimble	Kurt Wüthrich
Roger Y. Tsien	Rosalyn Yalow
Daniel C. Tsui	Shinya Yamanaka
Desmond Mpilo Tutu	Chen Ning Yang
Mario Vargas Llosa	Ada Yonath
Harold E. Varmus	Muhammad Yunus
Martinus Veltman	Ahmed Zewail
John E. Walker	Rolf Zinkernagel
Robin Warren	



Recently joined the Founders Assembly: David J. Thouless, Nobel Laureate in Physics 2016. Portrait from the photo series 'Nobel Laureates photographed by Peter Badge'.

Farewell to Martin Hellwig

Martin Hellwig, Professor of Economics and Director of the Max Planck Institute for Research on Collective Goods in Bonn, Germany, served as a member of the Council for the Lindau Nobel Laureate Meetings 2004–2017. He chaired all Lindau Meetings on Economic Sciences since their establishment in 2004. In this role, he played a key role in shaping the programme of the meetings and ensured their advancement and their global recognition.

It was his cherished aim to establish the Lindau Meetings as a hub for discussions focused solely on the scientific aspects of economics. By hosting a large number of panel discussions during the meetings, he covered the whole array of the economic sciences

and the different schools of economic thought. With his large network among the scientific community, Martin Hellwig facilitated the participation of many laureates as well as other high-profile representatives of the economic sciences.

During the recent Council meeting on Mainau Island in October 2017, Countess Bettina Bernadotte thanked him warmly on behalf of the Council for his outstanding commitment and support.

Klaus Schmidt succeeds Martin Hellwig in both his capacities as member of the Council and as scientific chair of the Lindau Meetings on Economic Sciences.

Honorary Senate

The most prestigious committee of the Foundation Lindau Nobel Laureate Meetings is the Honorary Senate. Its members function as advisors to the board and distinguished ambassadors for the Lindau Meetings.

In appreciation of his accomplishments as a business leader and his long-time friendship with and support of the Lindau Meetings, Klaus Kleinfeld, former Chairman and CEO of Siemens AG, Alcoa Inc. and Arconic Inc., was appointed a member of the Honorary Senate during the 67th Lindau Nobel Laureate Meeting.

Jürgen Kluge, Chairman of the Board of Directors of the Foundation, offered the following appreciation of Klaus Kleinfeld's achievements: "An integral part of his leadership is the conviction that leaders need to be personally independent but

at the same time team players, leveraging the team's resources and information. Therefore, his leadership mantra is: 'Nobody is perfect, but a team can be.' Apart from his accomplishments as a business leader, he is a long-time companion and supporter of the Lindau Nobel Laureate Meetings and its purpose, always willing to help when dearly needed."

In his acceptance speech, Klaus Kleinfeld, who currently serves as CEO of NEOM, paid tribute to the Lindau Meetings in the following terms: "This is a special event. The meeting stands for so many things. I think it makes a better world. Innovation and technological innovation play a major role in that. We have to shape the future for the next generation. I feel very honoured and happy to be here."



In Memoriam

» Roman Herzog



In January 2017, the Lindau Meetings mourned the loss of their dear friend and Honorary President Roman Herzog (1934–2017).

Herzog cared deeply about science, technical and economic innovation, as well as about educating the young. As a former German Federal President and also as a former President of Germany's Federal Constitutional Court, he fulfilled numerous assignments and functions in Germany and abroad, and he supported the Lindau Nobel Laureate Meetings actively. "The Nobel Laureates, all members of the Lindau bodies, and the Bernadotte family are very grateful to him," says Countess Bettina Bernadotte, President of the Council for the Lindau Nobel Laureate Meetings.

Roman Herzog was the first German President to visit a Lindau Meeting in 1995. "Since then we have known him as a loyal and also scrutinising companion. He has encouraged us to further develop the meetings boldly and purposefully," said Countess Bettina Bernadotte when she presented the Lennart Bernadotte Medal to Roman Herzog in 2010. Herzog knew and appreciated the Lindau Nobel Laureate Meetings from his time as Minister for Education and Cultural Affairs of the German federal state of Baden-Württemberg in the late 1970s, and he shared Count Lennart Bernadotte's vision. Starting in 1999, after his presidency, Herzog increased his active support for the meetings. "The establishment of the Foundation, supported by Roman Herzog, was the crucial milestone to give the Lindau dialogue a sustainable and longterm perspective," Countess Bernadotte continued. On the one hand, he developed ideas and plans to render the Lindau Meetings more future-proof. On the other hand, he introduced distinguished professionals to the Council who would soon play a crucial role in reinventing the Lindau Meetings, namely Thomas Ellerbeck and Wolfgang Schürer.

After the Foundation was established in the year 2000, Roman Herzog became its Honorary President as well as a member of its Honorary Senate. "His unique way of approaching and of applying himself always impressed me profoundly, be it as our Federal President or in his support for the Lindau Meetings," Countess Bettina remembers. "Encountering this brilliant, modest and witty man in person was always very inspiring."

» Nobel Laureates



Nicolaas Bloembergen
1920–2017

**Nobel Laureate
in Physics 1981**

Lindau Meetings:
1982, 1985, 1988, 1991, 1994, 1997,
2000, 2004, 2005, 2008, 2010



Hans Georg Dehmelt
1922–2017

**Nobel Laureate
in Physics 1989**

Lindau Meeting:
1991



Peter Mansfield
1933–2017

**Nobel Laureate
in Physiology or Medicine 2003**

Lindau Meeting:
2005



George Andrew Olah
1927–2017

**Nobel Laureate
in Chemistry 1994**

Lindau Meetings:
1998, 2000, 2002



Oliver Smithies
1925–2017

**Nobel Laureate
in Physiology or Medicine 2007**

Lindau Meetings:
2010, 2011, 2014, 2015

Impressions

Federal Minister Peter Altmaier signing the guestbook of the Foundation



Heidelberg Lecture by ACM A.M. Turing Award laureate Joseph Sifakis during #LiNo17



Renewal of the Memorandum of Understanding with the Irish Research Council (IRC):
Jürgen Kluge, Countess Bettina Bernadotte,
Peter Brown, Assistant Director IRC

Presentations by partner institutions during the boat trip to Mainau Island



Thimo Schmitt-Lord, Executive Director, Bayer Foundations, congratulates the winners of the Bayer Science Pitch Florencia Marchini and Lu Yao



Stefan von Holtzbrinck, CEO Holtzbrinck Publishing Group,
talking to Stefan Hell and Erwin Neher



African Outreach Breakfast at #LiNo17

Organisation

» Executive Secretariat

Director Wolfgang Huang	Communications Gero von der Stein Head Lisa Vincenz-Donnelly (since 02/2017) Rebecca Henrichs (03–12/2017) Philipp Reichle (06–08/2017) Laura Schönhardt (05–08/2017) Vincenzo Hiemer (until 03/2017) Christoph Schumacher Alumni Manager (since 05/2017) Janis Hegwein Mediatheque Patricia Edema Mediatheque (temporary leave)
Conference Management Susanne Wiczorek Head and Deputy Director Greta Meier Katja Merx Sabrina Lummer (temporary leave)	
Young Scientist Support and Academic Partner Relations Nadine Gärber Head Nesrin Karabag Karen Otto	
Guest Relations, Secretariat and Accounting Anke Elben Monika Reichert	Additional Support Angélique Astruc Melachrini Georgas Angela Rowe

» Office of the Foundation

Management Nikolaus Turner Managing Director
International Benefactor Relations Mortimer von Plettenberg
Secretariat Margit Stütze

» Preliminary Accounts 2017: Expenditures

	67 th Lindau Nobel Laureate Meeting (Chemistry)	6 th Lindau Meeting on Economic Sciences
(in Euro)		
Travel		
Laureates	119,517	109,144
Young Scientists	17,955	13,135
Media	12,468	9,996
Others	45,503	5,443
Lodging		
Laureates	47,565	21,710
Young Scientists	206,211	149,325
Media	8,961	4,713
Others	52,180	27,344
Boarding		
Laureates	13,210	7,558
Young Scientists	124,125	109,814
Media	7,752	7,573
Others	25,435	17,526
Meeting Organisation		
Scientific Programme & Selection of Young Scientists	15,851	26,667
Rental Fees of Locations incl. Tents	103,356	58,508
Technical Equipment	251,550	157,463
Utilities & Services	50,056	48,108
On-Site Staff	79,215	59,217
Transfers	21,647	12,834
Supporting Programme	17,410	44,884
Printed Matters	42,842	31,572
Expendable Items	18,287	3,230
Audio, Video & Web Productions	17,164	29,712
Science & Media Services	54,601	32,514
Website	6,511	3,256
Telecommunications, Postage	17,957	8,979
IT Services, Hardware, Software	82,712	41,356
Accounting, Legal Advice, Insurances	33,354	13,747
Other Costs	57,810	52,522
Executive Secretariat*		
Staff	522,040	261,020
Office Operating Costs	59,219	29,610
Office Supplies & Equipment	7,091	3,545
Associated Projects		
Including Teaching Spirit, Innovation Forum, publications, alumni activities, as well as further Foundation activities	136,700	53,500
Expected Total Expenditures	2,276,258	1,455,523

The Lennart-Bernadotte-Haus in Lindau, a donation by the Klaus Tschira Foundation, domicile of the executive secretariat of the Council as well as the premises of the Foundation



*Two thirds of the costs of the executive secretariat have been allocated to the 67th Lindau Nobel Laureate Meeting (Chemistry) and one third to the 6th Lindau Meeting on Economic Sciences. The budget contains €552,218.94 of expected costs for Oct–Dec 2017.

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Total Revenues*	3,731,781.00 €
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***Note:**

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