68th Lindau Nobel Laureate Meeting

Annual Report 2018

LINDAU NOBEL LAUREATE MEETINGS

EDUCATE. INSPIRE. CONNECT. SINCE 1951 · LINDAU NOBEL LAUREATE MEETINGS WITH YOUNG SCIENTISTS

68th Lindau Nobel Laureate Meeting

Annual Report 2018

LINDAU
NOBEL LAUREATE
MEETINGS

Contents

68th Lindau Nobel Laureate Meeting

PARTICIPANTS, PARTNERS, SUPPORTERS

SCIENTIFIC PROGRAMME

SOCIAL PROGRAMME

Articles & Interviews

Outreach Projects & Mission Education

COUNCIL & FOUNDATION

The Power of Scientific Dialogue

Greeting by Countess Bettina Bernadotte and Jürgen Kluge

Countess Bettina Bernadotte

At this year's 68th Lindau Nobel Laureate Meeting dedicated to physiology and medicine 39 Nobel Laureates joined almost 600 young scientists from 84 countries to engage in dialogue, to discuss science – and to work on ways to better communicate it. We are especially pleased that these encounters had more space this year, a development which was facilitated by our move to the renovated and improved venue Inselhalle. After construction lasting two years, we are truly grateful to all involved for creating a modern, open space for new encounters.

The new Inselhalle allowed us to fill the meeting week with an exciting and even more interactive programme. New ideas, new formats like the Agora Talks, Science Walks, Laureate Lunches and our own new Science Breakfast were a welcome addition to established programme highlights.

On-site, personal exchange is at the heart of the Lindau Nobel Laureate Meetings. However, globally we have to face an atmosphere of intense debate and volatility characterising public discourse. Over the last year, nationalist movements have even grown in strength and size across the globe, fake news, disinformation strategies and censorship appear to find a foothold in the international arena. A supposedly growing number of people reject facts and findings, reject the advancements made in society through the freedom of thought, speech and academia. In Lindau, we believe in enlightenment and the power of science as a reliable anchor for the public and for politics in an increasingly tempestuous world. Science, in the ideal case, positively impacts daily life in a multitude of ways. The science of medicine and physiology is a very appropriate example, as numerous breakthroughs (many awarded with the Nobel Prize) in this field over the last century have improved and even saved countless lives.

The global scale of science, with all its challenges and opportunities, was one of the overarching themes of this year's meeting from beginning to end. Nobel Laureate Elizabeth Blackburn used her keynote address during the opening ceremony to make an impassioned appeal to the gathered young scientists to adopt a new agreement for sustainable global research cooperation. The discussions during the week not only touched on scientific advances but also on the ethical implications of these breakthroughs. The pressure on early career researchers to 'publish or perish' and the opportunities of open access publishing was another key debate during the week, highlighted during an impassioned panel discussion on the future of scientific publishing. During the closing panel discussion, Nobel Laureates and young scientists discussed science communication in a seemingly 'post-factual' world.

The Lindau Meetings have aimed at connecting people since 1951: our founding fathers Franz-Karl Hein, Gustav Wilhelm Parade and Count Lennart Bernadotte envisioned the international gathering of Nobel Laureates and young scientists as a way to overcome borders between people using the language of science. Their belief in working towards a better, more prosperous future of peace and progress in this way is still a crucial guiding principle today. And yet, we need to be critical of our own goals: Does the language of science still reach the public, or are we merely preaching to the choir? How can we re-connect science to the public, defend the value of science and the scientific method while also opening science to people from all backgrounds?

We are also aware of the ecological footprint of bringing almost a thousand people from all over the world to Lindau. The Mainau Declaration 2015 on Climate Change, announced on the final day of the 65th Lindau Nobel Laureate Meeting and signed by 76 Nobel Laureates, is an appeal we see as a continuous obligation. The same is true of the Green Charter of Mainau, initiated in 1961. We work hard to make our meetings as environmentally friendly and sustainable as we can. In addition to our ongoing measures, we have initiated a project together with local authorities and nature conservation organisations – the Degermoos marshland renaturation project – as a way of giving something back to the environment and thus reducing our CO_2 footprint.

A central element of our digital strategy is our growing mediatheque. Most lectures and Agora Talks from the 68th Lindau Meeting are accessible to the general public through this portal, in addition to 600 videos of past lectures and more. The mediatheque is part of our 'Mission Education', and its potential has been increased by the addition of Teaching Guides, making the content even more useful for teachers, students and other interested people.

We do our best to make this intense week of intergenerational and international encounters a once-in-a-lifetime experience for the young scientists. When they leave, they ideally take

Jürgen Kluge

with them new ideas, personal connections and professional networks. This year, we have continued to work towards ensuring that the impact of this special week endures with our Lindau Alumni initiative. The Lindau Alumni Network was extensively updated and improved in time for the 68th Lindau Meeting and serves as a digital hub for our global community of brilliant scientists and a first stop for those interested in our alumni activities.

The intense exchanges between Nobel Laureates and young scientists show that intergenerational, international dialogue is possible and important. Instead of despairing in the face of enormous global challenges, the incomparable Lindau Spirit focuses us on our goals and our leitmotif: Educate. Inspire. Connect.

“Previous Nobel Laureates told me ‘You definitely want to go to that meeting in Lindau!’ and they were right: what a fantastic place, what a fantastic venue!”

Michael Rosbash, Nobel Laureate in Physiology or Medicine 2017

New Inselhalle – Home of the Lindau Meetings

After two years of extensive modernisation, the conference venue Inselhalle shines in new splendour and has again become the home of the Lindau Nobel Laureate Meetings. At #LINO18, the renovated venue was met with great enthusiasm by all meeting participants.

Thanks to generous support from the Free State of Bavaria, the City of Lindau was able to realise the renovation of the Inselhalle, which they did with great dedication and substantial financial commitment.

At the 68th Lindau Nobel Laureate Meeting, the Nobel Laureates and young scientists could benefit from the considerable advantages of the refurbished venue. As Nobel Laureate Michael Young pointed out during this years' meeting: "The auditorium in this lecture hall works very well; the ability to hear and see everything that is going on is really outstanding."

An enlarged event area with additional breakout rooms, a generous foyer as well as modernised technical equipment enables new and innovative programme formats – such as the Agora Talks or the Science Breakfast.

As the future home of the Lindau Nobel Laureate Meetings, the new Inselhalle will certainly play an important role in contributing to the extraordinary Lindau Spirit.

A video with more impressions of the new Inselhalle is available in the mediatheque.

"The meeting in Lindau provides an excellent opportunity to convey the inspiration of Alfred Nobel particularly to young scientists."

Carl-Henrik Heldin, Chairman, Nobel Foundation, Sweden

Carl-Henrik Heldin at the opening ceremony of the 68th Lindau Nobel Laureate Meeting

Good Science for the Good of Humanity

Nobel Laureate Elizabeth Blackburn used her keynote lecture at #LINO18 to propose that a far-sighted, global approach that serves the interests of all of mankind is needed if science is to meet the great challenges of this age.

Improving the way we do and communicate science is key to tackling the grand challenges of our time including climate change, inequality and wars, argued Nobel Laureate Elizabeth Blackburn in her keynote address at the 68th Lindau Meeting. "Scientific knowledge brings understanding, and that understanding can guide and inform how society can meet such great, global challenges. So, let's use our scientific prowess to be more active politically and in other ways," Blackburn appealed.

The role of science is great, but in order to rise to the occasion, scientists need to think about not only how science can be done better but how its benefits can be felt by all mankind. Blackburn argued that for science to serve all humanity, it must focus on the most critical issues facing the world. This, in turn, is dependent on science becoming more cooperative on a global scale. To achieve this, Blackburn used the occasion of this year's Lindau Meeting to propose a new agreement for sustainable global research cooperation that could be modelled on the Paris Climate Agreement and signed by leading scientists during the 70th Lindau Nobel Laureate Meeting in 2020.

Blackburn envisages this agreement for cooperation as being based on a commitment to research focused on the most critical issues facing mankind. Also, this cooperation should aim to include the whole of humanity and a broader range of experts and to move away from competition to a science that is based on collaboration and sharing.

The importance of curiosity-driven, basic research

Blackburn sees basic research as the "long-term engine" that, if properly supported, can make decisive contributions to solving many of society's problems. "Research asking 'why?' gets to universal truth and is fuelled by our common human interest and curiosity, and it's not directed because we don't know where it will lead, and it needs to be diverse and inclusive."

Blackburn cites examples from her own research to show how insights from curiosity-driven research can have important implications for social policy: She received her Nobel Prize in recognition of her discoveries related to telomeres, structures that form protective caps at the end of chromosomes. It is now known that telomere shortening is involved in many age-related diseases and is affected by lifestyle, diet and pollution, factors that are strongly affected by socioeconomic conditions. These insights demonstrate how basic research can provide tangible, measurable evidence to inform policy makers.

Moving from exclusion and competition to inclusion and collaboration

Blackburn pointed out that scientists need to share data more openly with each other and noted that, thankfully, the young generation of scientists is exploiting new technologies to do so. In addition, she stressed that "some of the most impactful science comes when you learn from others with a different outlook, experience, expertise, life history and culture," arguing that if we are to solve all of humanities great challenges, we need *all* of humanity involved. This means that scientists should seek advice and inspiration also from other disciplines, and, in addition, it means that if science is to properly reflect and respond to the various problems afflicting the world, scientists must be drawn from all different ethnic, religious and social backgrounds.

Resources have tended to be managed with nationalistic, short-term and competitive aims in mind. Our goal must be to move towards global, sustained and cooperative ways of sharing resources, because, as Blackburn points out quoting Chekhov, "There is no national science, just as there is no national multiplication table; what is national is no longer science." She stressed that only when resources are harnessed and exploited in a global and collaborative way, will we be able to respond appropriately to the great challenges of our age, many of which are going to come at humanity out of the blue.

Blackburn noted that we often do a good job of responding quickly and effectively in the short-term to challenges such as natural disasters such as floods or to epidemics. However, what evidence is there that an ambitious, long-term plan for sustain-

"Let's use our scientific prowess to be more active politically and in other ways."

Elizabeth Blackburn

“That’s the importance of Lindau: these hundreds of young scientists are the future of science.”

Elizabeth Blackburn

Elizabeth Blackburn with young scientists at the #LINO18 science picnic on Mainau Island

able research can work? Blackburn points to the Paris Climate Accord as a successful example of “thinking proactively for the long-term shared benefit of humanity and applying these motivations to basic research.”

Blackburn also offered encouragement to those who might feel overwhelmed by the scale of global challenges such as climate change, inequality and war. We need to “listen, read, learn and vote – because everyone counts,” stressed Blackburn. “Only a forceful expression of our scientific authority will move publics and policy makers.”

To conclude her powerful plea, Blackburn addressed the attending young scientists directly: “What can you, the young scientists, the rising generation and hope that we all have, with your training and your talents, what can you bring to this dialogue? I think you can bring three things: first of all, your clear thinking. With your training and your scientific acumen, you have learned to appreciate one of the great things in science: evidence. You’ve learned to sift it, to scrutinise it, to use it, so use it to help those making policies, to help them base policy decisions on the best evidence that you can help them critically assess. So that means share your science – speak out. Each of us with our own communities, with use of communication technologies we must tray and reach larger publics, as I repeat again, scientists mustn’t be modest about their own power. So, clear thinking, speaking, but finally don’t lose sight of the essentials. Sometimes it’s simple. Learn when to trust yourself. Don’t forget to listen to your heart too, and do good science for the good of humanity.”

» Motivated by Elizabeth Blackburn’s appeal, 2018 Lindau Alumni Maude Giroud and Juhwan Noh have started a collaborative project on leadership and management in science. Lindau Alumni can find out more in the Lindau Alumni Network.

A video of Elizabeth Blackburn’s full speech is available in the mediatheque.

68

An Anchor of Confidence in a Complex World

In her speech at the 68th Lindau Nobel Laureate Meeting, German Federal Minister of Education and Research Anja Karliczek emphasised the importance of the Lindau Meetings in these increasingly complex times and stressed the social impact of scientific exchange and science communication.

Lindau is a very special place. Every year in June, for a few days, the city turns into something like the world's scientific hub. The two Lindau physicians Franz Karl Hein and Gustav Parade are unlikely to have dared hope for this when, in 1951, they had the fantastic idea of bringing together German doctors and researchers with Nobel Laureates. After the physical and spiritual devastation of the Second World War they wanted to build bridges, scientific bridges between peoples. They wanted to demonstrate that science lives on exchange and needs networking across borders. And they wanted to overcome the isolation in which German science was trapped at that time – a condition that is completely unimaginable for us today.

Back then, on 11 June 1951, seven laureates and around 400 physicians met in Lindau. That was the beginning. Since then, the annual meetings have evolved continuously. They have developed into an international forum for exchange, a forum that is unique in the world in this form. Unique, in particular, because in Lindau exchange is not only facilitated across nations, but also across generations, as even young scientists and students can swap ideas with Nobel Laureates.

"We need researchers who live up to their responsibilities and come out of their ivory towers."

Anja Karliczek

This personal contact gives the meeting its special accent – and is also what makes it a success now. Because Lindau continues to set one record after another: almost 40 laureates have gathered at Lake Constance this year, more than ever before at a Lindau Meeting dedicated to medicine. And further: the approximately 600 participants come from as many as 84 countries! Half of them are women. [...]

Your motto, the motto of the Lindau Nobel Laureate Meetings, impresses me: Educate, Inspire, Connect. It stands for an attitude that the world today needs more than ever: first, to impart knowledge and explain science, then to spark people's enthusiasm for science and, finally, to engage in a dialogue around the opportunities and risks of research. It demonstrates that you, the scientists, are willing to accept social responsibility, that you have recognised that your work is socially relevant, that it can hold society together. [...]

We live in a complex, often very confusing time, where future developments are harder to predict than ever. New challenges are emerging in addition to the better-known, major social and economic challenges. These include combating terrorism and poverty and providing good health services and power supply for all the people of the world. However, these challenges also increasingly concern digitisation, globalisation and migration and, as a result, growing nationalism. It's all about understanding and shaping this complex world.

To meet these challenges, society needs scientific analyses and tools. If we – let me express this passionately and with some pathos – if we intend to save the world, we need researchers who live up to their responsibilities and come out of their ivory towers. Then we need researchers who get involved. That's why I like what you do here in Lindau so much. Because my wish is that, in times of simple answers, the voice of science is clearly heard – as an anchor of confidence. Simple answers no longer exist in such an interconnected world as we experience it today. This is why it's good that the Lindau Meeting is looking into the role of science in the 'post-factual era'. Science must go to the people. It must convey to people: why are we doing this kind of research? What use is it? What are the risks? In this way, it can succeed in reinstating confidence in science, confidence that has unfortunately diminished in recent years. All citizens must be able to recognise how scientific knowledge can help them in their daily lives. [...]

Our world needs dialogue both among scientists and between scientists and lay people, across all borders and cultures. We need scientific exchange at all levels, not only between individual disciplines, but also between nations and research cultures. Science diplomacy, as practised here at the Lindau Meeting, is more important than ever in days like these. It already sounds almost like a platitude, but it needs to be repeated again and again: no one country alone can find solutions to the challenges of our times! [...]

I am therefore delighted that the German Federal Government is supporting the Lindau Meetings as prime examples of the excellent science and research landscape in our country. And it is an honour for me to welcome you, the international community of 'the brightest minds', here on behalf of the German Federal Government. When excellent researchers from around the world get together, the best conditions for innovation have been created. When fresh, possibly unconventional, young researchers' ideas meet with the expertise of experienced scientists, as happens here in Lindau, it expands your perspective, thus creating space for new approaches. [...]

A video of the speech is available in the mediatheque.

68

A Celebration of Scientific Exchange

In a personal review of #LINO18, Stefan Kaufmann and Klas Kärre, scientific chairpersons of the 68th Lindau Nobel Laureate Meeting, express their satisfaction that the new programme formats proved to be successful and share some of their memorable experiences.

Stefan Kaufmann (right) and Klas Kärre (left) at the opening ceremony together with moderator Marc Pachter

This year's Lindau Nobel Laureate Meeting could not have started any better. From the very first day, the many attendants of #LINO18 could not fail to be impressed and moved by the newly renovated Inselhalle. The new meeting venue was conceived to provide a unique location for the lofty goals of the Lindau Nobel Laureate Meetings and to further the central ideas of educating, inspiring and connecting young scientists through exhilarating encounters with Nobel Laureates. Notably, the large variety of different rooms in the modernised venue made it possible to integrate parallel sessions for the first time in the meetings' long history. Accordingly, the original concept was broadened from one primarily based on lectures in which a speaker talks in front of a large audience, to a diversity of more interactive presentations.

Of course, lectures to a large audience without competing sessions are still of great value for a big event such as a Lindau Meeting, especially when you have the largest gathering of laureates imaginable. In fact, this year, a record number of 39 laureates came together to interact with 600 superb early career stage researchers from 84 countries. Hence, this type of presentation remained part of the meeting's programme.

At the 2018 Lindau Meeting, some of the most recent Nobel Laureates in Physiology or Medicine offered lectures of the canonical style, which were very well received by all meeting participants. Firstly, 2016 Nobel Laureate Yoshinori Ohsumi described the far-reaching impact of autophagy on numerous aspects of life ranging from physiology to pathology. Secondly, Michael Rosbash and Michael W. Young, 2017 Nobel Laureates, talked about the molecular biology of circadian rhythms, while also describing the increasing evidence for the impact of cellular circadian rhythms on our everyday lives. Obviously, the question of whether and how understanding the basic principles of circadian rhythms can be harnessed to get rid of jet lag was a highly attractive topic for the international audience. Of equal interest was the lecture by Edvard Moser, 2014 Nobel Laureate, on the brain's codes for space and time – again with enormous implications for how we orient ourselves and navigate in the three-dimensional world.

The opening speech by 2009 Nobel Laureate Elizabeth Blackburn, concerning science policy and science and society, touched on the sensitive issue of our global research legacy, which she modelled on the Paris Climate Accord. This topic led to a whole series of intensive and lively discussions which culminated in the final panel discussion on 'Science in a Post-Factual World' on beautiful Mainau Island. The discussion featuring the Nobel Laureates Steven Chu and Peter Doherty, science communicator Brian Malow and two young scientists circled around questions of truth and falsehood in the context of science and everyday life – a theme that appears timelier than ever!

The Agora Talks represented a first major change in this year's scientific agenda. The programme format was slightly different depending on the laureates involved. Generally, these talks were more lively than conventional presentations, with some being conceived as discussion rounds or interviews with a Nobel Laureate. In other Agora Talks, the laureates gave a shorter presentation followed by extensive discussions with the audience. On occasion, two laureates presented their ideas in a complementary fashion, such as the joint Agora Talk by Elizabeth Blackburn and Martin Chalfie on how to improve science individually and more generally. This format resulted in particularly interactive and lively sessions.

Beyond that, the newly implemented Laureate Lunches, Science Walks and the Science Breakfast hosted by the Lindau Meetings offered additional opportunities for inspirational interactions between young scientists and Nobel Laureates. During the Laureate Lunches, a dozen young researchers had the opportunity to sit at a lunch table with a Nobel Laureate of their choice to discuss common research themes and receive personal advice. On the Science Walks, a group of students accompanied a Nobel Laureate on a stroll around Lindau, and the Science Breakfasts allowed young scientists to discuss the timely topic of gene modification with laureates over their morning meal. All these types of interactive events were highly appreciated by all participants.

In conclusion, this year's Lindau Meeting was truly a celebration of scientific exchange and engendered a large degree of excitement in all participants, Nobel Laureates as well as young scientists. On the first day, we promised that #LINO18 would be a game changer in how the young scientists will look at their research, perform it and accomplish their goals. Having had the opportunity to speak to young scientists during the week, we can gladly say that our mission was accomplished.

Scientific Chairpersons #LINO18
Klas Kärre
Professor of Molecular Immunology, Department of Microbiology, Tumor and Cell Biology, Karolinska Institutet
Chairperson, Nobel Assembly for Physiology or Medicine at Karolinska Institutet, Stockholm

Stefan H.E. Kaufmann
Professor for Microbiology and Immunology, Charité University Clinics, Berlin
Director, Max Planck Institute for Infection Biology, Berlin

New Programme Sessions

Richard J. Roberts in discussion with young scientists
during the Science Breakfast in the new foyer of the Inselhalle

Agora Talk with Elizabeth Blackburn and Martin Chalfie

Michael Levitt and young scientists
at a Science Walk

Participants of the Laureate Lunch with Harald zur Hausen

Sir John E. Walker in conversation with moderator Kai Kupferschmidt
during an Agora Talk

Torsten Wiesel during his Life Lecture

Opening Day

Opening Ceremony

Welcome & Interview
Countess Bettina Bernadotte, President, Council for the Lindau Nobel Laureate Meetings

Greetings from Stockholm
Carl-Henrik Heldin, Chairman, Nobel Foundation, Sweden

Welcome Address
Anja Karliczek, Federal Minister of Education and Research, Germany

Opening Speech
SCIENCE POLICY AND SCIENCE AND SOCIETY
Elizabeth H. Blackburn, Nobel Laureate in Physiology or Medicine 2009, President Emerita, Salk Institute for Biological Studies, USA

Interview
– Stefan H. E. Kaufmann, Scientific Chairperson, 68th Lindau Nobel Laureate Meeting
– Klas Kärre, Scientific Chairperson, 68th Lindau Nobel Laureate Meeting

Master of Ceremonies
Marc Pachter, Director Emeritus, National Portrait Gallery, Smithsonian Institution, USA

Countess Bettina Bernadotte and Marc Pachter

Anja Karliczek

The Nobel Laureates greet the audience

Reception and Concert

hosted by the Federal Ministry of Education, Science and Research, Austria

Welcome Address
Heinz Faßmann, Federal Minister of Education, Science and Research, Austria

Ensemble of the Vienna Philharmonic Orchestra

Heinz Faßmann

Ensemble of the Vienna Philharmonic Orchestra

Foundation Dinner

hosted by the Foundation Lindau Nobel Laureate Meetings

Welcome Address
Jürgen Kluge, Chairman of the Board of Directors, Foundation Lindau Nobel Laureate Meetings

Greetings
– Carrie Lam, Chief Executive, Hong Kong Special Administrative Region, China
– Marion Kiechle, Bavarian State Minister of Science and the Arts

Carrie Lam

Anja Karliczek, Countess Bettina Bernadotte, Marion Kiechle

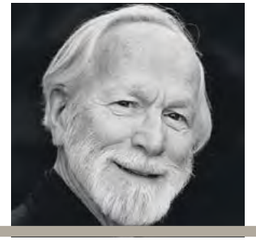
Nobel Laureates

Peter Agre

Nationality: USA
Nobel Prize: Chemistry
Year: 2003
Prize Motivation: "for discoveries concerning channels in cell membranes"

Bruce A. Beutler

Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 2011
Prize Motivation: "for discoveries concerning the activation of innate immunity"

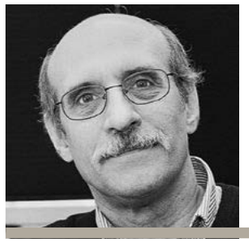


J. Michael Bishop

Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 1989
Prize Motivation: "for the discovery of the cellular origin of retroviral oncogenes"

Elizabeth H. Blackburn

Nationality: Australia/USA
Nobel Prize: Physiology or Medicine
Year: 2009
Prize Motivation: "for the discovery of how chromosomes are protected by telomeres and the enzyme telomerase"

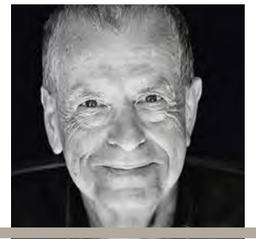


Martin Chalfie

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

Steven Chu

Nationality: USA
Nobel Prize: Physics
Year: 1997
Prize Motivation: "for development of methods to cool and trap atoms with laser light"



Aaron Ciechanover

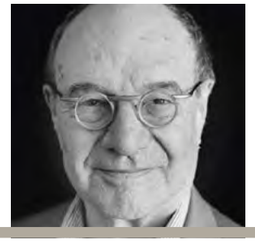
Nationality: Israel
Nobel Prize: Chemistry
Year: 2004
Prize Motivation: "for the discovery of ubiquitin-mediated protein degradation"

Peter C. Doherty

Nationality: Australia
Nobel Prize: Physiology or Medicine
Year: 1996
Prize Motivation: "for discoveries concerning the specificity of the cell mediated immune defence"

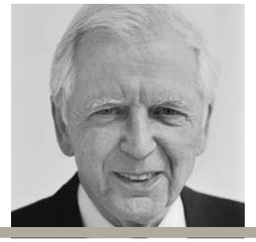
Joachim Frank

Nationality: Germany/USA
Nobel Prize: Chemistry
Year: 2017
Prize Motivation: "for developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution"



Walter Gilbert

Nationality: USA
Nobel Prize: Chemistry
Year: 1980
Prize Motivation: "for their contributions concerning the determination of base sequences in nucleic acids"



Harald zur Hausen

Nationality: Germany
Nobel Prize: Physiology or Medicine
Year: 2008
Prize Motivation: "for his discovery of human papilloma viruses causing cervical cancer"

Stefan W. Hell

Nationality: Germany
Nobel Prize: Chemistry
Year: 2014
Prize Motivation: "for the development of super-resolved fluorescence microscopy"

Laureates at #LINO18

40 LAUREATES

21 Physiology/ Medicine

17 Chemistry

1 Physics

\+

1 ACM A.M. Turing Award

NATIONALITIES

10

16
6
4
4
3
2
2
1
1
1

AGE

Youngest: Stefan Hell (55)
Oldest: Torsten Wiesel (94)

RECORDS

First Participations

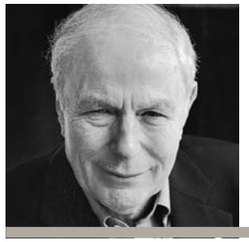
Joachim Frank
Louis J. Ignarro
Robert J. Lefkowitz
Michael Levitt
Edvard Moser
Yoshinori Ohsumi
Michael M. Rosbash
Michael W. Young

Most Participations

1. Robert Huber (22)
2. Hartmut Michel (21)
3. Erwin Neher (16)

Earliest Award

Walter Gilbert (1980)

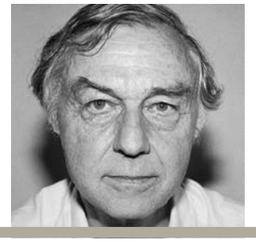


Avram Hershko

Nationality: Israel
Nobel Prize: Chemistry
Year: 2004
Prize Motivation: "for the discovery of ubiquitin-mediated protein degradation"

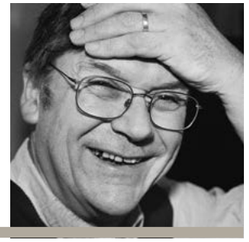
Jules A. Hoffmann

Nationality: France
Nobel Prize: Physiology or Medicine
Year: 2011
Prize Motivation: "for their discoveries concerning the activation of innate immunity"



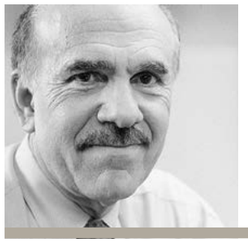
Robert Huber

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



Sir Tim Hunt

Nationality: United Kingdom
Nobel Prize: Physiology or Medicine
Year: 2001
Prize Motivation: "for their discoveries of key regulators of the cell cycle"

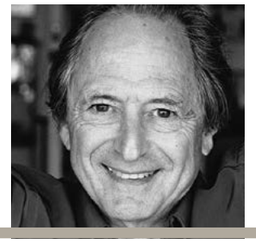


Louis J. Ignarro

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

Robert J. Lefkowitz

Nationality: USA
Nobel Prize: Chemistry
Year: 2012
Prize Motivation: "for studies of G-protein-coupled receptors"



Michael Levitt

Nationality: USA/Israel
Nobel Prize: Chemistry
Year: 2013
Prize Motivation: "for the development of multiscale models for complex chemical systems"

Tomas Lindahl

Nationality: Sweden
Nobel Prize: Chemistry
Year: 2015
Prize Motivation: "for mechanistic studies of DNA repair"

Hartmut Michel

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

Edvard Moser

Nationality: Norway
Nobel Prize: Physiology or Medicine
Year: 2014
Prize Motivation: "for their discoveries of cells that constitute a positioning system in the brain"

Ferid Murad

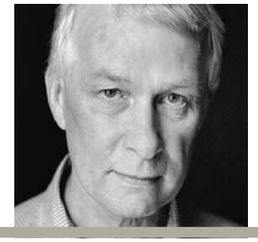
Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 1998
Prize Motivation: "for discoveries concerning nitric oxide as a signalling molecule in the cardiovascular system"

Erwin Neher

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

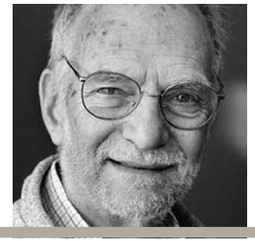
Yoshinori Ohsumi

Nationality: Japan
Nobel Prize: Physiology or Medicine
Year: 2016
Prize Motivation: "for his discoveries of mechanisms for autophagy"



Sir Richard J. Roberts

Nationality: United Kingdom
Nobel Prize: Physiology or Medicine
Year: 1993
Prize Motivation: "for their discovery of split genes"

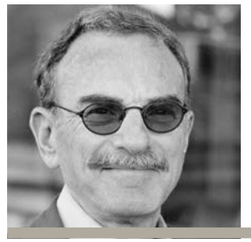


Michael M. Rosbash

Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 2017
Prize Motivation: "for their discoveries of molecular mechanisms controlling the circadian rhythm"

Bert Sakmann

Nationality: Germany
Nobel Prize: Physiology or Medicine
Year: 1991
Prize Motivation: "for their discoveries concerning the function of single ion channels in cells"

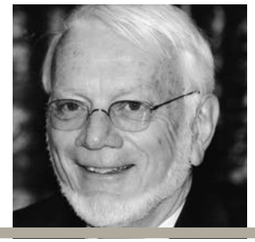


Randy W. Schekman

Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 2013
Prize Motivation: "for their discoveries of machinery regulating vesicle traffic, a major transport system in our cells"

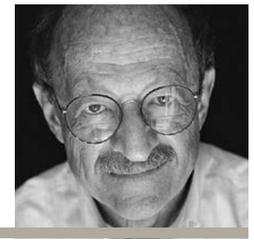
Dan Shechtman

Nationality: Israel
Nobel Prize: Chemistry
Year: 2011
Prize Motivation: "for the discovery of quasicrystals"



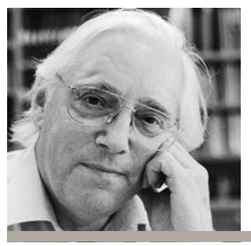
Thomas A. Steitz

Nationality: USA
Nobel Prize: Chemistry
Year: 2009
Prize Motivation: "for studies of the structure and function of the ribosome"



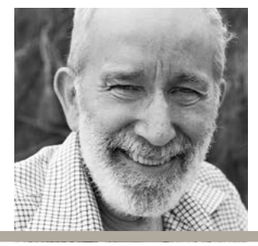
Harold E. Varmus

Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 1989
Prize Motivation: "for their discovery of the cellular origin of retroviral oncogenes"



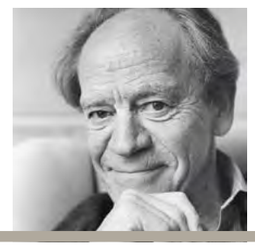
Sir John E. Walker

Nationality: United Kingdom
Nobel Prize: Chemistry
Year: 1997
Prize Motivation: "for their elucidation of the enzymatic mechanism underlying the synthesis of adenosine triphosphate (ATP)"



J. Robin Warren

Nationality: Australia
Nobel Prize: Physiology or Medicine
Year: 2005
Prize Motivation: "for their discovery of the bacterium Helicobacter pylori and its role in gastritis and peptic ulcer disease"



Torsten N. Wiesel

Nationality: Sweden
Nobel Prize: Physiology or Medicine
Year: 1981
Prize Motivation: "for their discoveries concerning information processing in the visual system"

Kurt Wüthrich

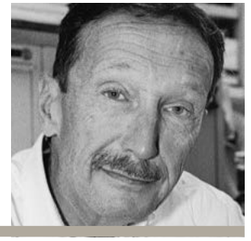
Nationality: Switzerland
Nobel Prize: Chemistry
Year: 2002
Prize Motivation: "for his development of nuclear magnetic resonance spectroscopy for determining the three-dimensional structure of biological macromolecules in solution"

Ada E. Yonath

Nationality: Israel
Nobel Prize: Chemistry
Year: 2009
Prize Motivation: "for studies of the structure and function of the ribosome"

Michael W. Young

Nationality: USA
Nobel Prize: Physiology or Medicine
Year: 2017
Prize Motivation: "for their discoveries of molecular mechanisms controlling the circadian rhythm"



Rolf M. Zinkernagel

Nationality: Switzerland
Nobel Prize: Physiology or Medicine
Year: 1996
Prize Motivation: "for their discoveries concerning the specificity of the cell mediated immune defence"

Leslie G. Valiant

Nationality: United Kingdom
Award: ACM A.M. Turing Award
Year: 2010
Prize Motivation: "for transformative contributions to the theory of computation, including the theory of probably approximately correct (PAC) learning, the complexity of enumeration and of algebraic computation, and the theory of parallel and distributed computing"

» All portraits taken from the photo series 'Nobel Laureates photographed by Peter Badge'. For more information see p. 95

The mediatheque contains profiles of more than 400 Nobel Laureates.

Young Scientists at #LINO18

595 from 84 countries

MOST REPRESENTED NATIONS

GENDER BALANCE

♂ 51% ♀ 49%

AGE

Oldest	Youngest	Average
35 years	20 years	29 years

ACADEMIC DEGREES

25% Undergraduate
19% Master/Diploma
56% PhD

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 science and research bodies both from the public and private sectors are entitled to nominate young scientists for participation in the Lindau Meetings.

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

For the 68th Lindau Nobel Laureate Meeting, 185 academic partners received a call for nomination of young scientists, and 141 of them participated in nominations.

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 Application, 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 interconnection 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 trustees of a constant pursuit of excellence and enablers of intergenerational and intercultural dialogue.

Partnerships 2018

In 2018, official partnerships with the following international institutions have been established or renewed:

Academy of Science of South Africa (ASSAf)

Bavarian State Ministry of Science and the Arts

Canadian Student Health Research Forum (CSHRF)

Department of Science & Technology, Government of India

Estonian Academy of Sciences

Government of the Principality of Liechtenstein

Human Frontier Science Program

Innovative Business Foundation, Ltd., Hong Kong

Lomonosov Moscow State University, Russia

Mexican Academy of Sciences

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

Mongolian Academy of Sciences

OIC Standing Committee on Scientific and Technological Cooperation (COMSTECH), Pakistan

Pakistan Institute of Engineering & Applied Sciences (PIEAS)

Pyongyang University of Science & Technology (PUST), North Korea

Research Foundation – Flanders (FWO), Belgium

Saint-Petersburg State University, Russia

Sino-German Center for Research Promotion, China

The Korean Academy of Science and Technology (KAST), South Korea

The National Academy of Sciences of Uruguay

The Russian Rectors' Union

The Scientific and Technological Research Council of Turkey (TÜBİTAK)

Weizmann Institute of Science, Israel

Renewal of the memorandum of understanding with the Sino-German Center for Research Promotion (SGC) for the participation of young scientists from China: Fan Yingjie, Chinese Director (SGC), Xincheng Xie, Vice President, National Natural Science Foundation of China, Academician, Chinese Academy of Sciences, and Legal Representative (SGC), Ingrid Krüßmann, German Director (SGC), Peter Strohschneider, President, German Research Foundation (DFG), Countess Bettina Bernadotte, Jürgen Kluge

Application Process

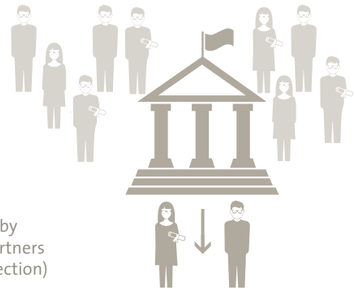
REQUIREMENTS

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:

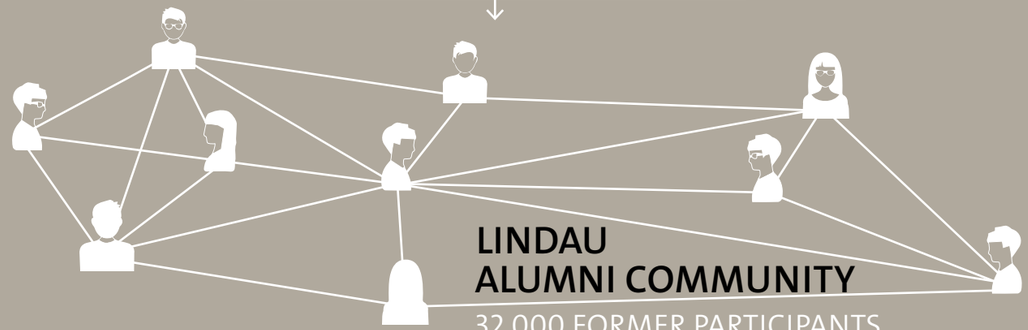
Open Application (If No Academic Partner Is Responsible)

EVALUATION & SELECTION

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

PARTICIPATION

One-Time Only



LINDAU ALUMNI COMMUNITY

32,000 FORMER PARTICIPANTS SINCE 1951

Nominating Institutions

With Accepted Candidates at #LINO18

Academia Sinica, Taiwan
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
Austrian Academy of Sciences
Bangladesh Academy of Sciences
Brazilian Academy of Sciences
Bulgarian Academy of Sciences
Canadian Institutes of Health Research (CIHR)/
Instituts de recherche en santé du Canada (IRSC)
Canadian Student Health Research Forum (CSHRF)
Carl von Ossietzky Universität Oldenburg, Germany
Centre National de la Recherche Scientifique (CNRS), France
Charité – Universitätsmedizin Berlin, Germany
Chilean Academy of Sciences
Columbus Association
Council of Finnish Academies
Croucher Foundation
Danish Council for Independent Research
Department of Science & Technology, Government of India
Dieter-Schwarz-Stiftung gemeinnützige GmbH
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
Georg-August-Universität Göttingen, Germany
Gerhard C. Starck Stiftung
German Academic Exchange Service (DAAD)
German National Academy of Sciences Leopoldina
Global Young Academy (GYA)
Goethe University Frankfurt, Germany
Göttingen Graduate School for Neurosciences, Biophysics,
and Molecular Biosciences (GGNB), Germany
Heidelberg University, Germany
Helmholtz Association of German Research Centres
Human Frontier Science Program
Internationale Bodensee-Hochschule
Irish Research Council
Jacobs University Bremen, Germany
Japan Society for Promotion of Science (JSPS)
Johannes Gutenberg University Mainz, Germany
Julius-Maximilians-Universität Würzburg, Germany
Justus Liebig University Giessen, Germany
Kiel University, Germany
King Abdullah University of Science and Technology,
Saudi Arabia
Leibniz Association
Leipzig University, Germany
Ludwig-Maximilians-Universität München, Germany
Luxembourg National Research Fund (FNR)
Max Planck Institute for Biophysical Chemistry, Germany
Max Planck Society

Academic partner representatives during the 68th Lindau Meeting

Medizinische Hochschule Brandenburg Theodor Fontane, Germany
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
National Academy of Sciences of the Republic of Armenia (NAS RA)
National Research Foundation Singapore
National Science and Technology Development Agency, Thailand
Nepal Academy of Science and Technology (NAST)
OIC Standing Committee on Scientific and Technological
Cooperation (COMSTECH), Pakistan
ORAU (Oak Ridge Associated Universities), USA
Paderborn University, Germany
Pakistan Institute of Engineering and Applied Sciences
Philipps-Universität Marburg, Germany
Pyongyang University of Science & Technology (PUST),
North Korea
Robert Bosch Stiftung
Royal Netherlands Academy of Arts and Sciences
RWTH Aachen University, Germany
Saint-Petersburg State University, Russia
Sechenov First Moscow State Medical 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
Szeged Scientists Academy, Hungary
Technical University of Munich, Germany
Technische Universität Braunschweig, Germany
Technische Universität Darmstadt, Germany
Technische Universität Dresden, Germany
The Czech Academy of Sciences (CAS)
The Korean Academy of Science and Technology (KAST)
The Norwegian Academy of Science and Letters
The Research Council, Oman
The Royal Society
The Russian Rectors' Union
TU Dortmund, Germany
TÜBİTAK, Turkey
TWAS – The World Academy of Sciences
Ulm University, Germany
Universität zu Lübeck, Germany
University Medical Center Hamburg-Eppendorf, Germany
University of Bonn, Germany
University of Cologne, Germany
University of Duisburg-Essen, Germany
University of Greifswald, Germany
University of Kassel, Germany
University of Liechtenstein
University of Münster, Germany
University of Rostock, Germany
University of Stuttgart, Germany
University of Tübingen, Germany
Weizmann Institute of Science, Israel
Wilhelm Sander-Stiftung

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

Renewal of the memorandum of understanding with the Mexican Academy of Sciences: Countess Bettina Bernadotte, José Luis Morán-López, President of the Mexican Academy of Sciences, Jürgen Kluge

Scientific Programme

Mohamed A. El-Brolosy, co-winner of the #LINO18 Poster Session, presenting his research to Bruce A. Beutler and fellow young scientists

Scientific Programme

Lectures (in alphabetical order)

Bruce A. Beutler	Detecting and Solving Mammalian Phenotypes in Real Time
Steven Chu	Recent Advances in Biomolecular and Biomedical Imaging
Joachim Frank	Single-Particle Cryo-EM of Biological Molecules – the Sky Is the Limit
Harald zur Hausen	Specific Infections as Trigger of Random Mutations – Their Role in Human Colon and Breast Cancers
Louis J. Ignarro	The Road to Stockholm – A Nobel Mission
Robert J. Lefkowitz	G Protein-Coupled Receptors
Michael Levitt	The Future of Basic Science Research
Edvard Moser	The Brain's Codes for Space and Time
Yoshinori Ohsumi	Lessons From Yeast – Autophagy: Intracellular Recycling System
Michael M. Rosbash	The Circadian Rhythm Story: Past, Present and Future
Randy W. Schekman	Sorting of Small RNAs Into EVs Secreted by Human Cells
Ada E. Yonath	Next Generation Species-Specific Eco-Friendly Antibiotics and Thoughts About the Origin of Life
Michael W. Young	Circadian Rhythms and Their Impact on Physiology and Behavior

Edvard Moser

Yoshinori Ohsumi

Along with approximately 800 videos, all lectures from #LINO18 can be watched in the mediatheque.

Ada E. Yonath

Robert J. Lefkowitz

Heidelberg Lecture

The Heidelberg Laureate Forum (HLF) was founded in 2013 after the model of the Lindau Nobel Laureate Meetings by Klaus Tschira, one of the most committed supporters of the Lindau Meetings and member of the Honorary Senate of the Foundation. Since then, the HLF has become the annual meeting of prize-winning and aspiring young mathematicians and computer scientists. As both meetings are so closely linked, the concept of the Heidelberg Lectures in Lindau and the Lindau Lectures at the Heidelberg Laureate Forum have been established to underline this outstanding partnership. Each year, an excellent scientist from the field of computer sciences or mathematics is invited to come to Lindau and speak about a particular topic of his academic research.

In his Heidelberg Lecture at #LINO18, titled 'Biology as Computation', British computer scientist Leslie Valiant spoke about how our current understanding of computation can revolutionise our understanding of biology, and in particular, neuroscience and evolution.

BIOLOGY AS COMPUTATION
Leslie G. Valiant, ACM A.M. Turing Award 2010, John A. Paulson School of Engineering and Applied Sciences, Harvard University, USA

Life Lecture

At past Lindau Meetings, several Nobel Laureates have given inspiring lectures with considerable insights into their own scientific paths, including helpful and practical hints for academic careers. Particular highlights are the lectures by Christian de Duve, Oliver Smithies or Sir Harold Kroto, just to name a few.

Consequently, this type of lecture has officially been implemented as a new format in the scientific programme at #LINO18: the 'Life Lecture' intends to cover the life experiences of a Nobel Laureate rather than a scientific topic. It is designed to motivate and inspire the young audience and numbers among the emotional highlights of the Lindau Meeting's lecture programme.

The Life Lecture of Nobel Laureate Torsten Wiesel at #LINO18, titled 'Exploration of the Visual Cortex', drew the audience's attention to the deep sense of wonder at the beauty and elegance of the processes by which the eye and brain capture the visual world.

EXPLORATION OF THE VISUAL CORTEX
Torsten Wiesel, Laboratory of Neurobiology, The Rockefeller University, New York, USA

Leslie Valiant

Torsten Wiesel

Sessions of the Scientific Programme of #LINO18

7 BREAKFAST SESSIONS
Early Morning Panel Discussions
6 Partner & 1 Science Breakfast
Presented by Partners & Supporters

AGORA TALKS
Laureates Interact During Presentation
Moderator Leads Q&A from the Audience
Flexible and Interactive
16

PANEL DISCUSSIONS
Topical and Relevant Issues
Discussions Involving the Audience
3

13 LECTURES
By Nobel Laureates
Free Choice of Topics

MASTER CLASSES
Young Scientists Showcase Their Research
Nobel Laureates Give Advice
4

30 OPEN EXCHANGES
Time for Q&A
Informal Atmosphere

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

30 POSTER FLASHES
Two-Minute Presentations
One Session

Agora Talks (in alphabetical order)

Peter Agre	Opening Doors Worldwide Through Medical Science **Moderator:** Marc Pachter, Director Emeritus, National Portrait Gallery, Smithsonian Institution, USA
J. Michael Bishop & Harold E. Varmus	Can Scientific Careers Be Planned? **Moderator:** Marc Pachter, Director Emeritus, National Portrait Gallery, Smithsonian Institution, USA
Elizabeth H. Blackburn & Martin Chalfie	Thoughts on Improving Science, Individually and More Generally **Moderator:** Olov Amelin, Director, Nobel Museum, Sweden
Aaron Ciechanover	The Revolution of Personalised Medicine: Its Promises and Obstacles **Moderator:** Alaina Levine, consultant and author, Quantum Success Solutions, USA
Peter C. Doherty	Science Communication **Moderator:** Zulfikar Abbany, science journalist, Deutsche Welle, Germany
Avram Hershko	Lessons From the Discovery of the Ubiquitin System **Moderator:** Ingrid Wünning Tschol, Senior Vice President, Robert Bosch Stiftung, Germany
Robert Huber	The Proteasome, Structure, Mechanism, Ligand-Binding, and Application in Drug Design and Development **Moderator:** Melissae Fellet, science writer & Lindau Alumna, USA
Tomas Lindahl	Search for Alternative Life Forms on Earth **Moderator:** Klas Kärre, Scientific Chairperson, 68th Lindau Nobel Laureate Meeting
Hartmut Michel	Membrane Proteins: Importance, Functions, Mechanisms **Moderator:** Alaina Levine, consultant and author, Quantum Success Solutions, USA
Ferid Murad	Nitric Oxide and Cyclic GMP in Cell Signaling and Drug Development **Moderator:** Tobias Maier, Scientific Head, National Institute for Science Communication, Germany
Erwin Neher	Ion channels: Past, Present and Future **Moderator:** Alaina Levine, consultant and author, Quantum Success Solutions, USA
Sir Richard J. Roberts	Nobel Laureate Campaign Supporting GMOs **Moderator:** Adam Smith, Chief Scientific Officer, Nobel Media, Sweden
Bert Sakmann	Lovely Lindau for Laureates and Scholars **Moderator:** Olov Amelin, Director, Nobel Museum, Sweden
Dan Shechtman	Colour of Insects and Colour From Insects **Moderator:** Adam Smith, Chief Scientific Officer, Nobel Media, Sweden
Sir John E. Walker	Microbial Drug Resistance **Moderator:** Kai Kupferschmidt, science journalist, Germany
Rolf M. Zinkernagel	How to Measure Immunological Specificity **Moderator:** Stefan H. E. Kaufmann, Scientific Chairperson, 68th Lindau Nobel Laureate Meeting

Moderator Adam Smith and Richard J. Roberts

Agora Talk with Tomas Lindahl, moderated by Klas Kärre

Rolf Zinkernagel

Questions from the audience

Peter Agre and moderator Marc Pachter

Panel Discussions

CHALLENGES IN PERSONALISED MEDICINE

Panellists
– Erwin Böttinger, Professor for Digital Health and Personalised Medicine, Hasso Plattner Institute, Germany
– Aaron Ciechanover, The Rappaport Faculty of Medicine and Research Institute, Technion – Israel Institute of Technology, Israel
– Ruairi Robertson, Sir Henry Wellcome Research Fellow, Barts and the London School of Medicine and Dentistry, United Kingdom
– Gintvile Valinciute, German Cancer Research Centre (DKFZ), Germany

Moderator
Susanne Schultz-Hector, Member of the Board of Directors, GLS Treuhand, Germany

PUBLISH OR PERISH

Panellists
– Maria Leptin, Director, EMBO (European Molecular Biology Organization), Germany
– Daniel Ropers, Chief Executive Officer, Springer Nature, United Kingdom
– Randy W. Schekman, Department of Molecular and Cell Biology, University of California, Berkeley, USA
– Amy Shepherd, Florey Department of Neuroscience and Mental Health, University of Melbourne, Australia
– Harold E. Varmus, Weill Cornell Medical College, USA

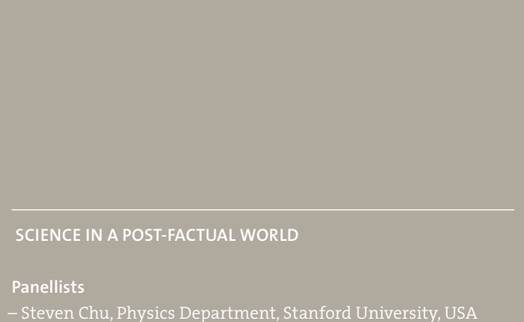
Moderator
Alaina Levine, consultant and author, Quantum Success Solutions, USA

» More information on the panel discussion on ‘Publish or Perish’ on p. 70

SCIENCE IN A POST-FACTUAL WORLD

Panellists
– Steven Chu, Physics Department, Stanford University, USA
– Peter C. Doherty, Department of Microbiology and Immunology, University of Melbourne, Australia
– Brian Malow, science communicator, USA
– Arunima Roy, Division of Molecular Psychiatry, Julius-Maximilians-Universität Würzburg, Germany
– Adam Whisnant, Institute for Virology and Immunology, Julius-Maximilians-Universität Würzburg, Germany

Moderator
Adam Smith, Chief Scientific Officer, Nobel Media, Sweden



Aaron Ciechanover

‘Publish or Perish’ with Maria Leptin, Randy Schekman and Amy Shepherd

Panel discussion on ‘Science in a Post-Factual World’: Adam Smith, Arunima Roy and Peter Doherty

Adam Whisnant and Steven Chu

Panel discussion on personalised medicine: Susanne Schultz-Hector, Erwin Böttinger, Gintvile Valinciute, Ruari Robertson, Aaron Ciechanover

Poster Presentations

Over the past years, both Poster Sessions and Poster Flashes have become parts of the scientific programme of the Lindau Meetings. During the two-minute Poster Flash presentations at #LINO18, young scientists explained their research in a concise way to an audience of Nobel Laureates and other meeting participants.

In total, 470 young scientists applied to present posters during the 68th Lindau Nobel Laureate Meeting; 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 three winners – two first places, one second place – were then determined by a public vote among the participating Nobel Laureates and young scientists.

At the 68th Lindau Meeting, the poster presentations were supported by the German Association of Research-Based Pharmaceutical Companies (vfa).

Topic Areas
– Infection and Immunity
– Genetics
– Cell Biology
– Technology
– Structural Biology
– Neurobiology

Alexandra C. Walls from the University of Washington presenting her research to Martin Chalfie and #LINO18 participants

Co-winner Takato Honda during his Poster Flash

Maude Giroud from the Helmholtz Zentrum München in front of her poster

Nicholas Cohrs from ETH Zurich presenting his poster

The Winners

1st Place
Mohamed A. El-Brolosy
Max Planck Institute for Heart and Lung Research, Germany
for his poster
MUTANT MRNA DECAY CONFERS GENETIC ROBUSTNESS TO MUTATIONS THROUGH TRIGGERING TRANSCRIPTIONAL UPREGULATION OF RELATED GENES

1st Place
Takato Honda
International Institute for Integrative Sleep Medicine (WPI-IIIS), University of Tsukuba, Japan
for his poster
INVESTIGATION OF SLEEP/WAKE REGULATORY MECHANISMS BY ANALYSIS OF THE SIK3 GENE IDENTIFIED THROUGH FORWARD GENETICS

2nd Place
Miaohui Hu
Institute of Biophysics, University of Chinese Academy of Sciences, China
for her poster
ARCHITECTURE AND GATING MECHANISM OF TRIC CHANNELS

Siegfried Throm, Director Research/Development/Innovation, German Association of Research-Based Pharmaceutical Companies (vfa), at the poster prize ceremony

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

Scientific chairpersons Stefan Kaufmann and Klas Kärre framing the poster prize winners Takato Honda, Miaohui Hu and Mohamed A. El-Brolosy

Master Classes

Ge Gao

PROTEIN DYNAMICS IN HEALTH AND DISEASE
chaired by Aaron Ciechanover and Tim Hunt

Speakers
– Ge Gao, Institute of Neuroscience, University of Chinese Academy of Sciences, China
– Lukas Landegger, Harvard Medical School, USA
– Julian Nuechel, University of Cologne, Germany

Peter Doherty giving feedback on Jimmy Patel´s presentation

THE KILLER DEFENCE: INFECTION AND CANCER
chaired by Peter C. Doherty and Rolf Zinkernagel

Speakers
– Jimmy Patel, Rutgers New Jersey Medical School, USA
– Maxim Shevtsov, Technical University of Munich, Germany
– Bianca Verlinden, University of Pretoria, South Africa

Harold Varmus and Giacomo Corleone

ADVANCES IN UNDERSTANDING AND EXPLOITING THE GENETIC BASIS OF CANCER
chaired by J. Michael Bishop and Harold E. Varmus

Speakers
– Myron Best, VU University Medical Center, Netherlands
– Giacomo Corleone, Imperial College London, United Kingdom
– Fides Zenk, Max Planck Institute of Immunobiology and Epigenetics, Germany

Ilana Gabanyi

ROLES OF INNATE AND ADAPTIVE IMMUNITY DURING INFECTIONS AND INFLAMMATION
chaired by Bruce A. Beutler and Jules Hoffmann

Speakers
– Ilana Gabanyi, Institut Pasteur, France
– Samantha B. Larsen, Rockefeller University, USA
– Hadir Marei, Institute of Biochemistry II, Goethe University Frankfurt, Germany

Myron Best

Bruce Beutler

Science Breakfast

For the first time, the Lindau Nobel Laureate Meetings hosted their own Science Breakfast, welcoming all participants to attend. Short provocative statements by Nobel Laureates and scientists (via video) were jointly discussed by the audience at various tables.

GENE MODIFICATION
hosted by the Lindau Nobel Laureate Meetings

Statements
– Tim Hunt, Okinawa Institute of Science and Technology (OIST), Japan
– Richard J. Roberts, New England Biolabs, Inc., USA

Video Messages
– Peter Dabrock, Department of Theology, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
– (subsequently) Emmanuelle Charpentier, Director, Max Planck Institute for Infection Biology, Berlin, Germany

Moderator
Anna Sjöström-Douagi, Programme Director, Nobel Center, Sweden

The video messages by Emmanuelle Charpentier and Peter Dabrock can be watched in the mediatheque.

Nobel Laureate Sir Tim Hunt enjoying a conversation with young scientists over breakfast

Anna Sjöström-Douagi

Video message by Emmanuelle Charpentier

Video message by Peter Dabrock

Partner Breakfasts

DEVELOPING STRONGER SCIENCE LEADERSHIP IN DIFFERENT CULTURES – CHINA, US/EUROPE AND OTHERS AS BASIS FOR INNOVATION
facilitated by McKinsey & Company, Inc.

Panellists
– Carrie Lam, Chief Executive, Hong Kong Special Administrative Region, China
– Ferid Murad, Palo Alto Veterans Medical Center, Stanford University, USA
– Kurt Wüthrich, The Scripps Research Institute (TSRI), USA

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

CROWDSOURCING TO DRIVE MEDICAL ADVANCEMENTS
hosted by Mars, Incorporated

Panellists
– Michael Levitt, Department of Structural Biology, Stanford University, USA
– Justin Siegel, Genome Center, University of California, Davis, USA
– Martina Mustroph, Department of Neurological Surgery, Harvard University, USA

Moderator
Meeri Kim, science journalist, USA

Ferid Murad and Carrie Lam

Matthias Evers, Kurt Wüthrich, Ferid Murad and Carrie Lam

Meeri Kim, Michael Levitt, Martina Mustroph, Justin Siegel

Partner Breakfasts

EXCELLENCE IN SCIENCE FOR SOCIETY
hosted by Rolex SA

Panellists
– Andrew Bastawrous, The Peek Vision Foundation, London, London School of Hygiene & Tropical Medicine, United Kingdom
– Aaron Ciechanover, The Rappaport Faculty of Medicine and Research Institute, Technion - Israel Institute of Technology, Israel

Moderator
Francesco Raeli, Senior Program Officer, Rolex SA

Questions from the audience

Francesco Raeli, Aaron Ciechanover and Andrew Bastawrous

PRECISION IMMUNOTHERAPY TO FIGHT INFECTIONS, INFLAMMATION (AND CANCER)
hosted by the Austrian Federal Ministry of Education, Science and Research

Panellists
– Bruce A. Beutler, Center for the Genetics of Host Defense, UT Southwestern Medical Center at Dallas, USA
– Cecilia Domingues Conde, Ludwig Boltzmann Institute for Rare and Undiagnosed Diseases (LBI-RUD) and Research Center for Molecular Medicine (CeMM), Austria

Moderator
Sylvia Knapp, Laboratory of Infection Biology, Medical University of Vienna and Research Center for Molecular Medicine (CeMM), Austria

Cecilia Domingues Conde and Bruce Beutler

SCIENCE MEETS SOCIAL ENTREPRENEURSHIP
hosted by Boehringer Ingelheim, Making More Health

Panellists
– Martina Brueckmann, Co-Founder of Health Community Workers, Germany
– Francesca Fedeli, Co-Founder of Fightthestroke.org, Italy

Moderator
Sabine Emmerich, Boehringer Ingelheim, Making More Health, Germany

HEALTH INNOVATION IN AFRICA: THE WAY FORWARD
hosted by Global Perspectives Initiative

Panellists
– Peter Agre, Johns Hopkins Malaria Research Institute, Bloomberg School of Public Health, USA
– Roseanne Diab, Executive Officer, Academy of Science of South Africa (ASSAf)
– Aaron Ciechanover, The Rappaport Faculty of Medicine and Research Institute, Technion – Israel Institute of Technology
– Sambuddha Ghosh, Associate Medical Director, Otsuka Novel Products GmbH, Germany
– Jürgen Kluge, Chairman of the Board of Directors, Foundation Lindau Nobel Laureate Meetings
– Peter G. Kremsner, Director, Institute of Tropical Medicine, University of Tübingen, Germany
– Brenda Kwambana, Medical Research Council Unit The Gambia at London School of Hygiene and Tropical Medicine, Gambia
– Michael Makanga, CEO, EDCTP Association, Netherlands
– Edith Phalane, North-West University, South Africa

Moderators
– Ingrid Hamm, Co-Founder and CEO, Global Perspectives Initiative, Germany
– Stefan H. E. Kaufmann, Scientific Chairperson, 68th Lindau Nobel Laureate Meeting

Sabine Emmerich, Martina Brueckmann and Francesca Fedeli

Michael Makanga and Edith Phalane

Brenda Kwambana

Innovation Forum

The Innovation Forums were established in 2010 upon the 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 Innovation Forum of the 68th Lindau Nobel Laureate Meetings covered two seemingly unrelated topics, which in the end revealed surprising links.

Session I: What AI can Learn from Neuroscience – and Vice Versa
Humans will most likely never again win against computers in games like chess, Jeopardy! and Go, and artificial intelligence might soon overtake humans in devising successful stock market investment strategies. In the realm of medicine, meanwhile, there is the rather concrete promise that medical diagnosis and treatment will become more efficient and precise with artificial intelligence (AI).

Yet, all these applications are still very specialised, relying on fixed rule sets and large amounts of structured data. Building an AI that can perform general tasks has long been a dream in the world of machine learning. However, developing a general, versatile AI that can solve all the problems the human brain can remains incredibly difficult. So why not have a closer look at how the human intellect does it? How do human inquisitiveness, imagination and memory work, for example?

In the first session, Nobel Laureate Edvard Moser and Google DeepMind scientist Matthew Botvinick explained the current state of research and explored how neuroscience and AI research can learn from each other.

Session II: Improving Healthcare in Developing Countries
The most common approach to improving healthcare in developing countries was for a long time to train more and more doctors and to improve the availability of medical supplies and the quality of treatment infrastructures – and there is nothing wrong with that.

Another, maybe even more powerful strategy includes raising awareness and improving education, for example, with regards to sanitation, HIV prevention or low-level measures against diseases spread by insects such as malaria. The next element of this approach is teaching people how to educate themselves. With the increasing availability of smartphones and internet connections even in rural areas of developing countries, this indirect method may yield enormous benefits in the mid-term.

On the subject of smartphones: there is little doubt that these devices will become the new pocket doctors very soon. They have an impressive set of sensors that can help with diagnosis, they are communication tools that may save a patient a several-hour drive or walk to the next hospital, they can store patient records and they provide access to health information and education. What's more: we can rather safely assume that in the not too distant future, even powerful AI health applications will be widely accessible to patients – wherever they might be.

In the second session, Peter Agre shared his experiences with the difficulties of setting up distribution channels and networks in Africa to fight malaria. Sabine Emmerich and Hilke Rosskamp introduced a social start-up initiative that, among other aspects, fosters digital skill enhancement, and thereby creates better access to health information.

Matthew Botvinick

Peter Agre and Arun Sharma

Presentations Session I
GRID CELLS, NEURAL COMPUTATION AND ARTIFICIAL INTELLIGENCE
Edvard Moser, Kavli Institute for Systems Neuroscience and Centre for Neural Computation, Norwegian University of Science and Technology, Norway

NEUROSCIENCE AND AI: A VIRTUOUS CIRCLE
Matthew Botvinick, Google DeepMind and Gatsby Computational Neuroscience Unit, United Kingdom

Discussion Moderator
Matthias Evers, McKinsey & Co., Germany

Presentations Session II
MALARIA CONTROL IN SUB-SAHARAN AFRICA
Peter Agre, Johns Hopkins Malaria Research Institute, Bloomberg School of Public Health, USA

MAKING MORE HEALTH: IMPROVING HEALTHCARE IN SOUTH INDIA THROUGH DIGITAL TRAINING
Sabine Emmerich & Hilke Rosskamp, Making More Health, Germany

Discussion Moderator
Arun Sharma, Infinite Potentials Consulting, Germany

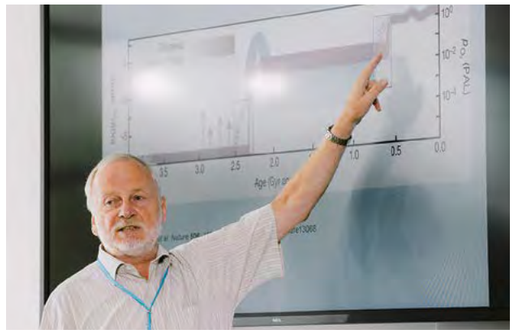
Edvard Moser

Matthias Evers and Hilke Rosskamp

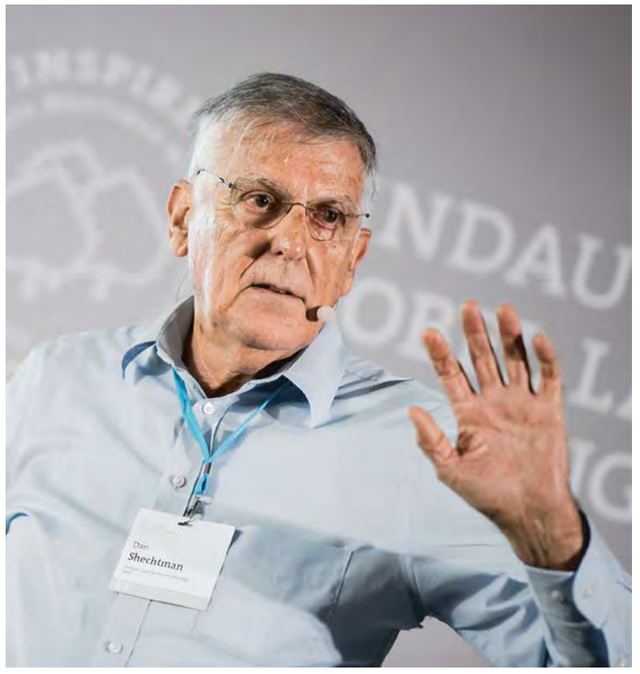
Impressions

Young scientist Johanna Magdalena Schmidt giving a presentation during the Poster Flashes

Hartmut Michel



Dan Shechtman



Michael W. Young giving his lecture on ‘Circadian Rhythms’

Beate Hein-Bennett, daughter of the Lindau Meeting’s co-founder Franz Karl Hein, during an Agora Talk discussion

Social Programme

Summer Festival of Science

hosted by the German Federal Minister of Education and Research Anja Karliczek

Reception at Eilguthalle, Lindau

Welcome Addresses
– Anja Karliczek, Federal Minister of Education and Research
– Countess Bettina Bernadotte

Dinner at Eilguthalle, Lindau

Fireworks

Anja Karliczek with young scientist Keith Ncube from South Africa and Jürgen Kluge

International Day

dedicated to China

Partner Breakfast
DEVELOPING STRONGER SCIENCE LEADERSHIP IN DIFFERENT CULTURES – CHINA, US/EUROPE AND OTHERS AS BASIS FOR INNOVATION
facilitated by McKinsey & Company, Inc. (see p. 47)

International Get-Together
dedicated to China

Welcome
Countess Bettina Bernadotte

Greeting
Michael Ong, CEO, Miloc Group, Hong Kong Ambassador of the Lindau Nobel Laureate Meetings, China

Welcome Address
Xincheng Xie, Vice President, National Natural Science Foundation of China, Academician, Chinese Academy of Sciences, Legal Representative, Sino-German Center for Research Promotion, China

Interview
NOBEL LAUREATES' EXPERIENCES IN CHINA
– Aaron Ciechanover, The Guangdong Technion-Israel Institute of Technology (GTIIT), Shantou, China
– Michael Levitt, Department of Structural Biology, Stanford University, USA

Moderator
Marc Pachter, Director Emeritus, National Portrait Gallery, Smithsonian Institution, USA

Cultural Performance
Chinese Acrobatics: Duo YingLing

Countess Bettina Bernadotte welcoming the guests

Martin Chalfie and Stefan Hell

Xincheng Xie

Michael Ong

Bavarian Evening

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

Welcome Address
Countess Bettina Bernadotte
Bernd Sibler, Bavarian State Minister for Education, Germany

Presentations
BAVARIA – LAND OF SCIENCE AND RESEARCH
Harald zur Hausen, German Cancer Research Center, Germany

CURRENT RESEARCH PROJECTS WITHIN THE ELITE NETWORK OF BAVARIA
Tanja Müller and Andreas Puschnik, Fellows of the Elite Network of Bavaria

Traditional Bavarian Music & Folk Dance
4 Hinterberger Musikanten und Trachtenverein

Bernd Sibler receives a copy of Peter Badge's Nobel Heroes from Countess Bettina Bernadotte

Harald zur Hausen presenting Bavarian qualities

Baden-Württemberg Boat Trip

hosted by the State of Baden-Württemberg

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

Exhibition
Presentations by selected research institutions and projects of Baden-Württemberg

Poster Awards Ceremony
Winners of the #LINO18 Poster Sessions
Supported by German Association of Research-Based Pharmaceutical Companies (vfa)
(see p. 42 for details)

Science Picnic
hosted by the Ministry of Science, Research and the Arts, Baden-Württemberg

Ulrich Steinbach

Michael Levitt with young scientists at the science picnic

Presentation by research institutions from Baden-Württemberg

Science Walks

Science Walks were introduced as a new session format at the 68th Lindau Meeting to offer yet another opportunity for informal discussion between Nobel Laureates and young participants. With one laureate and ten young scientists each participating, 13 walks in the beautiful surroundings of Lindau were organised – from longer hikes to short strolls.

Elizabeth H. Blackburn
Martin Chalfie
Steven Chu
Joachim Frank
Sir Tim Hunt
Louis J. Ignarro
Robert J. Lefkowitz
Michael Levitt
Sir Richard J. Roberts
Randy W. Schekman
Dan Shechtman
Thomas A. Steitz
Michael W. Young

Science Walk with Louis Ignarro

Science Walk with Michael Levitt

Laureate Lunches

Occasionally, there had been luncheons between young scientists and Nobel Laureates in previous years. However, beginning with #LINO18 this format has been implemented as a permanent feature. One Nobel Laureate sits together with up to ten young scientists at a local restaurant in Lindau to talk informally over lunch. Nearly all participating laureates took part in this new session.

Jules A. Hoffmann with young scientists during his Laureate Lunch

Grill & Chill

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

Welcome Address
– Gerhard Ecker, Lord Mayor of Lindau
– Countess Bettina Bernadotte

Donations
The proceeds and donations were divided among two institutions for projects within the administrative district of Lindau: the Mentor Stiftung Deutschland and the Degermoos marshland renaturation project (see p. 86 for further information).

Support
Continental AG
Stadtwerke Lindau

Lord Mayor Gerhard Ecker with Thomas Gläßer, Stadtwerke Lindau

Academic Dinners

Hosts
Academy of Science of South Africa (ASSAf)
Alexander von Humboldt Stiftung
Australian Academy of Science
Dieter Schwarz Stiftung
Federal Ministry of Science, Research and Economy (BMWFW), Austria
German Academic Exchange Service (DAAD)
Elite Network of Bavaria
Helmholtz Association
Human Frontier Science Program
Max Planck Society
Mexican Academy of Sciences
ORAU (Oak Ridge Associated Universities)

Avram Hershko at the dinner with the US delegation hosted by ORAU

#LINO18 in Colours

After each meeting, every young scientist is asked to evaluate the event. In view of the many changes and novelties at #LINO18 – new venue, new programme formats, new caterer as well as many other changes – this year's feedback was particularly interesting. The overall results are very positive, a selection is visualised here.

(1) Has the meeting succeeded in fostering a dialogue between/that...

laureates and young scientists? – 92.4%

young scientists from different countries? – 93.90%

young scientists from different disciplines? – 85.8%

will influence your career? – 68.6 %

motivates you? – 92.3 %

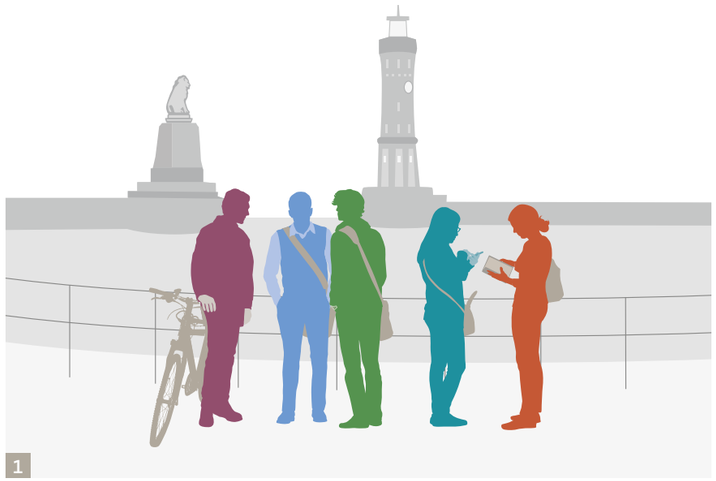
(2) What is your general opinion of the whole programme, including all sessions and events?

very good – 57.2 %

good – 35.3%

fair – 5.8%

poor – 1.7%



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(3) How would you rate the overall experience with the new Inselhalle?

very good – 74.4%

good – 22.0%

fair – 3.2%

poor – 0.4%

(4) What programme components are most important to you?

Life and research experience of laureates – 81.8%

Science in society – 61.2%

Opportunities for YS to present their own research – 44.5%

Panel discussions on current topics – 57.5%

One-on-one interactions – 78.5%

(5) As Lindau Alumni, would you be interested in...

engaging in a mentorship programme with younger scientists or scientists from different countries? – 74.8%

engaging in other activities relating to science in society? – 78.4%

organising a local alumni group at your university? – 46.9%

organising activities like visits or lectures at local schools? – 55.6%

participating in Lindau events around the world? – 89.1%

supporting the Lindau Meetings in the future? – 71.7%

Explanation:

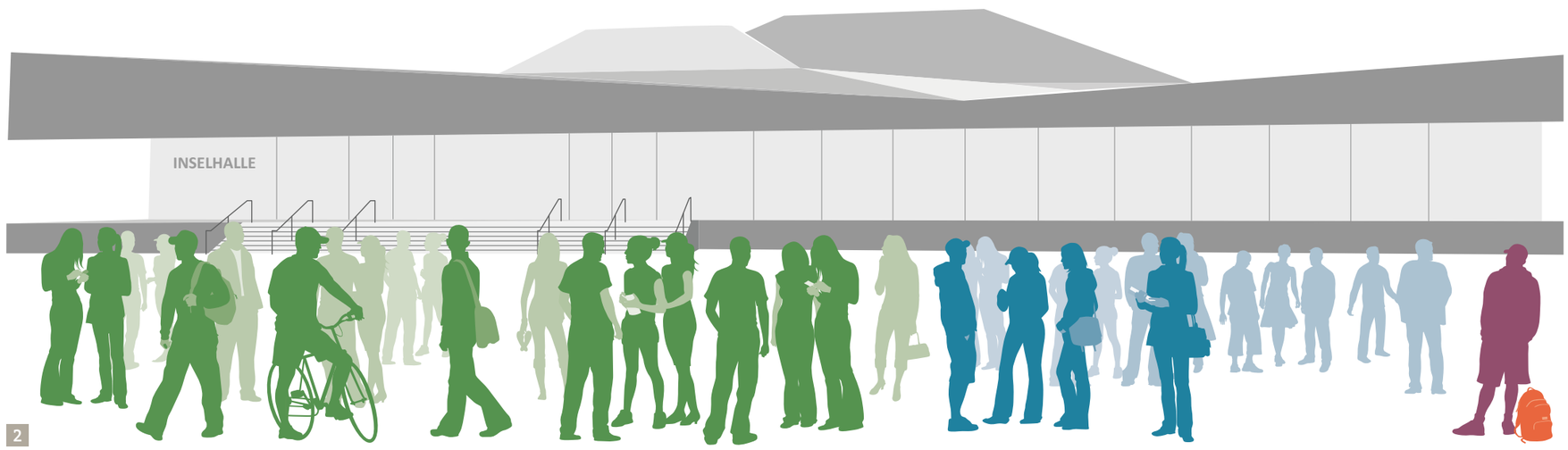
Generally, coloured areas denote percentages.

For single-choice questions (#2, #3), compare areas in one colour to areas in other colours. Different shades count together as one.

For multiple-choice questions (#1, #4, #5), compare the coloured part of a figure (including bags, bikes, books, etc.) to the brownish, neutral part of the figure. If a figure is 90% coloured, with 10% being brownish, that denotes a result of 90% for the respective option. Relative sizes of figures are irrelevant, and only a result of perspective.

3

4



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"This was the most exciting and rewarding meeting I have ever attended."

Louis J. Ignarro, Nobel Laureate in Physiology or Medicine 1998

68

Timeless in Lindau

Joachim Frank, Nobel Laureate in Chemistry 2017, found the 68th Lindau Nobel Laureate Meeting to prompt reflections on his youth and his place in the grand scheme of things. Here, he shares his personal impressions.

"Keep your eyes wide open, and keep looking for the unexpected in your peripheral vision."

Joachim Frank

Born in Germany, a visit back to my home country is always pregnant with memories and associations. My wife Carol was with me in Lindau, and I let her see the town with its medieval roots through my slightly nostalgic eyes.

As a student, I looked up at Nobel Laureates as though they had descended from Olympus. I still remember my first face-to-face encounter with a laureate in Munich. I was part of a small circle of people, all supported by the Studienstiftung des Deutschen Volkes (German Academic Scholarship Foundation), who met to discuss interdisciplinary subjects like cybernetics, symmetry, and the meaning of time. As a group we approached Konrad Lorentz asking him for some of his precious time to meet with us. Awe-struck, we sat in his office in Seewiesen and listened to him talk about the behaviour of grey geese and humans. The memory of this encounter gives me a perspective when I'm surrounded by students now asking for clues on how to find a direction in their careers. Every question came with the expectation that I can draw answers from an infinite supply of wisdom. Yet in truth, part of me still feels just like I felt as a student, worried about getting things right – or wrong in some embarrassing way.

In my lecture at the Lindau Meeting I chose to retrace the history of my work, decades ago, which was in part a history of happenstance and unintended consequences. I started out as a physicist, worked my way into biology, and was awarded the Nobel Prize in Chemistry. Go figure! With this experience, the advice I gave to students was this: keep your eyes wide open, and keep looking for the unexpected in your peripheral vision.

Here is an instance of my peripheral vision in Lindau. It was curious for me to find this sign, ZEITLOS, or timeless, displayed above a second-hand shop in one of the town's small streets – Felsgässele. What a coincidence: "timeless" happens to be the name of one of the genes implicated in the regulation of the circadian rhythm, for which Michael Young from Rockefeller along with two others was awarded the 2017 Nobel Prize in Physiology or Medicine. (Michael and his wife Laura, good friends of ours now, were in Lindau as well, and later, when I sent him the picture, he had a good e-mail laugh). As a moniker of the boutique, the sign is supposed to denote the lasting value of items for sale, immune to the changing fashions. But to me in my new-found acclaim, the word gave me a jolt: it sounded like a description of the new state of being I experience now, a step closer toward immortality if you will – if not in the flesh, then in the memory of generations.

The word also spoke to me about the depth of perspective on my own life that the Nobel Prize had added overnight. Suddenly, I had opportunities to meet classmates from high school and college-mates, to marvel about the way their lives had turned, and to relive my own life through their stories. Finally, it reminded me eerily of the hand-less clock in Ingmar Bergman's film Wild Strawberries, which by its design negated the very concept of time. I remember it well since I was in high school and took a girl on a date, and we argued about the meaning and value of the film way into the night.

I had the most enjoyable time in Lindau spending it with students in an informal way. A group of students signed up for a leisurely circular walk with me around an enclosure of the big lake, bordered by flower gardens and a park. And a special honour: Countess Bernadotte decided to join us. Kaffee und Kuchen were served at some place along the way, and I had the chance to talk to everyone about the station in life they were at.

But, being still the student inside while being the septuagenarian on the outside, I couldn't help listening and arguing with myself.

Joachim Frank on his Science Walk through Lindau with Countess Bettina Bernadotte and young scientists

68

Educated. Inspired. Connected.

Young Irish scientist Philip Lewis reflects on his experience at the 68th Lindau Nobel Laureate Meeting.

Philip Lewis (second from right) with Nobel Laureate Elizabeth Blackburn and other young scientists

Nobel Laureate Michael Rosbash was correct when stating during his 2017 Nobel Banquet that "scientific careers rely on inheritance, environment and random events like all biological phenomena." Indeed, most laureates at the 68th Lindau Nobel Laureate Meeting attributed their Nobel recognition to hard-work, good decision making and a touch of luck. Such attributes may be applied to my participation at Lindau as I have taken an interdisciplinary path. [...] After 1.5 years as a post-doc and still learning the trade, I did not expect to receive the invitation to participate in such a prestigious event as the Lindau Meeting!

With excitement galore, preparation began almost immediately. After all, a scientist is what a scientist does, and the research must be done: websites, blogs, videos, tweets, profiles, even PubMed contains information on the Lindau Meetings! My research was geared toward answering the question: "What does one even say to a Nobel Prize winner?" Even after the meeting, I do not have a one-size-fits-all answer. However, a good place to start is to ask for opinions on scientific concerns beyond the lab bench. For instance, the laureates were happy to bare their experiences on navigating the academic industry including finding funding and publishing papers and to discuss each topic within the current academic climate. [...]

The most valuable research document is of course the official programme booklet. Fittingly, the first words from the meeting's Council in the welcome address of the programme take the form of a question: "Is post-factual the new normal?" The Council put forward a major challenge faced by the scientific community for the attendees to chew on: "The challenge may be to reconnect science to the public and to political decision makers." Indeed, from my research of the meeting, it is clear that the science-society interface goes back a ways as an ingrained meeting thread. I count myself lucky that my first day in Lindau included some coaching and rehearsal in presenting my research to a non-scientific audience for a German television programme. Moreover, another of the attendees at this rehearsal, Arunima Roy, has written a blog post for the meeting on post-facts and communication issues. The meeting had not yet officially started, and I was already learning important lessons for scientists.

It gets better – the very first lectures were given by Michael Rosbash and Michael Young, joint recipients of the 2017 Nobel Prize in Physiology or Medicine for the work on the genetic basis of the circadian system in the fruit fly and other organisms. In other words, two of the top-dogs of the field I work in are presenting first. [...] That evening I was fortunate to sit at Michael Young's table for dinner. There were exacerbations of my imposter syndrome but that was quickly eased. A laureate's approval of your current scientific investigation can do that (who said you should never meet your heroes?)

As the meeting drew on, it got better still. The young scientists were the key. Almost no one knew each other beforehand and we were outside of the traditional lab group comfort zone clique that can occur at some conferences. Interaction was inevitable, and the first question of "so what do you research" put people into their comfort zones from the start. It quickly became clear that when two or more scientists sit down and start talking research, everything in the background that could be a distraction disappears. Over 600 people in one room having conversations and only being able to hear the person sitting next to you talking about their research is quite the physiological adaptation – I wonder is it just scientists who have adapted in such a way? [...]

Now, this may sound like a conference of stroking egos, but there was a fair share of controversy and contrasting views amongst the laureates themselves, the young scientists themselves and between the laureates and the young scientists. This, of course, is to be expected with frontier research, a wide range of age differences and experiences and having over 80 different countries represented. However, contrasting viewpoints served only to improve the scientific discussion.

Indeed, many laureate views were challenged as being outdated or naïve. The panel discussion on 'Publish or Perish' got quite feisty from time to time regarding ethics and responsibility, impact on scientific lives and asking what can be done to improve the process. Young scientist Amy Shepherd, who had already written an excellent blog on pressures in academia, provided a powerful voice for young scientists. [...] Overall, it was a long week but a great one. This event was a unique experience that I wish every young scientist had the opportunity to benefit from because they undoubtedly would. #LINO18 has surpassed all expectations and then some. There is so much more I could potentially include in this text, from lunch with Elizabeth Blackburn to the dancing on the boat from Mainau, but there would not be enough space in a novel for everything.

From this meeting, I can take away friendships from all over the world, new potential collaborators, an increased sense of responsibility to confront and discuss the most important issues facing our society, and confidence that we have young scientists all over the world with the capabilities to address these major issues both in the laboratory and in conveying the appropriate messages to society. The Federal Minister of Education and Research, Anja Karliczek, stated at the outset, "If we want to save the world, we need researchers who stand up and speak up." I have been motivated to do so, and I know the other young scientists have as well.[...]

Lindau is a special place and the meeting is a special time. I have been educated, inspired, and connected and I now understand what is meant by the Lindau Spirit! There is something at this meeting for everybody.

"I now understand what is meant by the Lindau Spirit!"

Philip Lewis

Philip Lewis' full review of his week in Lindau can be found on our blog: lindau-nobel.org/blog

Tracing the Beginnings of a Scientific Career

The new Agora Talks feature one or two Nobel Laureates and a moderator, discussing a topic of the laureates' choosing. Participants are given the opportunity to ask questions in an open forum setting. Lindau Alumna Melissae Fellet on the #LINO18 Agora Talk by J. Michael Bishop and Harold Varmus on scientific careers.

Young scientists attending a Lindau Nobel Laureate Meeting frequently ask the laureates for career advice, so it was not surprising that they filled the room for a discussion with J. Michael Bishop and Harold Varmus about career planning. Seeing colleagues seated in the front row, Bishop quipped: "It seems like even some laureates are considering a second career."

The men, who shared the 1989 Nobel Prize in Physiology or Medicine, started the discussion by sharing stories about the beginning of their careers. They recounted experiences from their childhood, scientific training and early years in research.

The title of the discussion was "Can Scientific Careers Be Planned?", although it seemed both Bishop and Varmus ended up as researchers without much advanced planning. Both advocated prolonging adolescence until they were 30 years old, first following their interests and passions to study humanities in college. When each man finally entered medical school, they sought opportunities to learn molecular biology, efforts that would become the basis for their Nobel Prize-awarded work on the genetics of cancer-causing viruses.

Bishop grew up in a town of 400 people in rural Pennsylvania. He attended school at a two-room schoolhouse until eighth grade. Little science was taught there, he said, but one of his teachers inspired a passion for learning and studying history. In college, Bishop said he took just enough science classes to prepare him for medical school. Meanwhile, he also studied history, literature and philosophy. Following the recommendation of a teacher, he applied to Harvard University for medical school, even though he had never heard of the school. In medical school, Bishop noticed that some of his teachers taught facts, while others taught how those facts were acquired. "I realised I was more interested in discovery than applying known knowledge," he said.

A pathology fellowship following his second year of medical school presented an opportunity to do some research, and it also provided free time to read. Bishop discovered a passion for the emerging science of molecular biology, traveling to the library at the neighbouring Massachusetts Institute of Technology to read the latest papers in the Journal of Molecular Biology.

Returning to his third year of medical school, Bishop continued to follow his new passion by taking a course in animal virology. He realised little was known about the viruses in animal cells and the tools of molecular biology could be used to learn more. Bishop worked with the course's teacher doing research on genetics of RNA viruses. He found research so engaging that he planned to not complete his final year of medical school. The school's dean compromised with Bishop, finding a way for him to finish his last year of school while still spending most of his time in the lab.

After two years of training as a physician at Massachusetts General Hospital, Bishop entered the Research Associate Training Program at the National Institutes of Health to train as a researcher. Then a job at the University of California, San Francisco, brought the opportunity to work with a virus that causes cancer in chickens, the beginning of his work recognised by the Nobel Prize.

Bishop summarised elements of his story that were key to discovery, including an eye for the main chance, a willingness to take risks tempered with appropriate reality checks and a faith in the universality of nature – that the cancer-causing genetic elements in a chicken virus would also apply to human cancers. Finishing with a reflection on the cause of his few self-described major failures as a scientist, he said: "I lost trust in my own ideas and surrendered to someone else's scepticism."

Bishop and Varmus met in 1969, when Varmus was looking for a post-doctoral position in California. The men quickly discovered that they shared the same ideas about viral connections to cancer, and Bishop has described their ensuing collaboration as one of co-equals. When Varmus eventually joined the faculty at UCSF, he and Bishop shared lab facilities, personnel, and funds. A photo of smiling scientists at a group dinner shows what happens when you create an environment in the lab where people want to gather both in and out of the lab, Varmus said.

Varmus acknowledged that young scientists face different challenges today, with fewer positions and funding opportunities available. For the best individual career advice, Bishop and Varmus recommended finding a trusted person who knows your personal situation and experience.

Nobel Laureates J. Michael Bishop and Harold Varmus during their Agora Talk

Find videos of all Agora Talks in the mediatheque.

What Will the Future of Scientific Publishing Look Like?

‘Publish or perish’ – anyone working in research or academia knows that phrase all too well. Possible solutions and pitfalls of the current publishing system were discussed at a high-profile panel discussion during the 68th Lindau Nobel Laureate Meeting. Science journalist Judith Reichel sums up a lively debate.

The original idea behind publishing new results was to disseminate and archive knowledge. However, while the exchange of knowledge has always been an integral part of research and academia, the current way of researchers climbing over one another to get a publication in one of the major journals seems unsustainable. Recently, there have been more and more attempts to change that system and to find a new way of measuring scholarly achievements other than via the impact factor.

A paper in a journal like Nature, Science or Cell with a high impact factor promises high visibility for the leading authors and presumably increases their prospects when applying for new grants. The impact factor, however, is averaged over all papers a journal publishes in a year. A few outstanding and highly cited articles thus increase the impact factor of the entire journal.

Many researchers, including some of the panel participants, are demanding a new system to assess scholarly achievements. Randy Schekman, who received the Nobel Prize in 2013 in Physiology or Medicine for the discovery of the machinery regulating vesicle traffic and is the editor of eLife since 2011, highlighted: “The impact factor is a simplification and often times a mismeasurement of scholarship!” Harold Varmus, 1989 Nobel Laureate in Physiology or Medicine for studies of the genetic basis of cancer, added: “We can’t allow the publishing process to become a surrogate for measuring scholarly value!” Yet, especially young scientists often feel pressured into publishing in journals with a high impact factor. “We are constantly told that we need a high-impact paper to advance our career,” argued Amy Shepherd, graduate student at the University of Melbourne, Australia.

Maria Leptin, Director of the European Molecular Biology Organization (EMBO), in turn emphasised that her organisation knows “not everyone can have a high-impact-factor paper at the end of their PhD. When we evaluate prospective candidates, we value their motivational statement far more than their publication history.” She introduced the San Francisco Declaration on Research Assessment (DORA) – an initiative that recommends less reliance on the impact factor and more on other aspects of a researcher’s work output. Other funding opportunities like the Wellcome Trust Fund and Howard Hughes are already following suit.

The current publishing system tends to frustrate young scientists who worry about their academic future as well as experienced scientists who have come up against paywalls time and again, all the while carrying out the bulk of the peer-review work. Panellist Daniel Ropers, CEO of Springer Nature, pointed out that Nature and similar outlets have a long-standing tradition and that this rigorous peer-review process makes them reliable and essential publishing houses. This sets them apart from the black sheep, the so-called predatory journals, which actively seek out authors, mostly young researchers at lesser known institutes yearning for a publication to beef up their resume. Predatory journals forego the peer-review process, which means there is no control over content and almost any study or claim can get published this way.

The topic of Open Access (OA) was brought up, sparking a lively debate about the fact that a handful of publishers exercise a monopoly over all scientific publishing. Ropers stated that the road towards an OA publishing system will be long and difficult. To this, Leptin gave an impassioned response: “No, the time is now! Politicians have already decided, and the big publishing houses will have to adjust quickly to survive!” She was referring to a recent EU guideline which demands any results coming out of a publicly EU-funded research grant be published in an OA journal.

Towards the end of the debate, a few additional issues were raised: published results are only a fraction of the data that have been collected. Especially ‘negative’ results are rarely published. Here, negative doesn’t refer to an opposite or unexpected result, but that certain approaches don’t work. The current tendency is to hide these data away, leaving someone else to try the same approach again – wasting time and money in the process.

Coming full circle, when confronted with the fact that many supervisors still regard high-impact-factor papers as the ultimate goal, Varmus sums up the main issue: “The change of the publication process has to come out of the scientific community. But we can’t expect our trainees to do the right thing unless we lead by example!”

Watch the full panel discussion in the mediatheque.

Impressions

Official opening of the new Inselhalle on 8 August 2018:
Markus Söder, Minister-President of the Free State of Bavaria

Carsten Holz, Managing Director of the Lindau Tourismus und Kongress GmbH, Nikolaus Turner, Verena Kast, Scientific Director of the Lindau Psychotherapy Weeks, Minister-President Markus Söder, HRH Herzog Franz von Bayern, Gerhard Ecker, Lord Mayor of Lindau, and Wolfgang Schürer, Honorary Chairman of the Foundation, at the official opening of the Inselhalle

Get together outdoors

Morning workout at #LINO18

Open Discussions About Science Communication

The 2018 Euroscience Open Forum (ESOF) took place in Toulouse, France. The Lindau Meetings were present at the largest pan-European, multidisciplinary conference with a booth and a panel on 'Bridging the Gap Between Experts and the People: Rethinking Science Communication'. Panellist Alaina Levine summarises the vigorous debate.

The panellists (from left): Nobel Laureate Venki Ramakrishnan, Minu D. Tizabi, Fabiola Gerpott, Alaina G. Levine and moderator Tobias Maier

Everyone on the panel had a connection to Lindau: Tobias Maier, Scientific Head of the National Institute for Science Communication (NaWik), and I have attended several times and this year hosted Agora Talks with Nobel Laureates. Sir Venkatraman Ramakrishnan, President of the Royal Society and group leader at the UKRI-MRC Lab Cambridge, UK, participated in the 2015 Lindau Meeting as a Nobel Laureate. Minu Tizabi, medical doctor and writer from Heidelberg and Fabiola Gerpott, economics professor at TU Berlin, have contributed to previous Lindau Nobel Laureate Meetings as young scientists.

The panel was designed as a 'fishbowl' format, the chairs were essentially set up in a circle and the panel members sat in the middle. One element of the panel that I thought was especially creative was the placement of an empty chair on the stage. Meant to be an invitation to the members of the audience, the chair literally and metaphorically symbolised an open opportunity for contributions and ideas from ESOF attendees. As the panel commenced, Maier informed the audience of this special opportunity and asked if anyone was a science journalist who would like to join us on stage. Brooke Borel, a freelance science journalist, was quick to accept the invitation and joined us in the fishbowl.

The goal of this panel was simple: to create an open dialogue with the ESOF delegates about the role of science communication in the scientific enterprise and discuss ways in which we can improve science communication methods, channels and mechanisms. With more opportunities and channels for communication, scientists are in closer contact with the public than at any other period. Almost every scientific institution has an educational outreach programme, complete online courses are available for free, and open data and open publishing trends gain momentum.

At the same time, the distrust in science has reached a peak point and there is a substantial and growing amount of public disagreement about basic scientific facts, expressed both in democratic voting results but also in governmental policy. Has science communication failed completely? How does science communication need to respond to a changing environment of distrust in facts and the scientific method? Does every scientist also need to be a science communicator? Does communication need to be an obligatory part of university curricula? Are Twitter, YouTube and similar social media services really a way to bridge the gap or just self-promotion tools within the filter bubble? Do we actually reach new audiences?

As moderator and chair, Tobias Maier kicked off the session with an overview of the highlights of our concerns and introductions of those on the panel. He brought up very interesting ideas and astutely gave each panellist and the audience a chance to chime in on these important topics. We discussed different ways of communicating to the public, including Twitter, outreach and journalism. It was also brought up whether all scientists should be engaged in extensive and active science communication to all publics. The panel agreed (and the audience seemed to concur as well) that scientists can and should communicate better with the public, and as Ramakrishnan noted, they should be open to doing so. But it would not be possible for scientists to be completely engaged on all social media channels, and in public outreach and in writing blogs and op-eds and still maintain the excellence required of their field. After all, without the foundation of quality scientific outputs, all communications goals, however ambitious, will not be achieved. Several audience members brought up the role of visual communications in the communications spectrum, and two scientific illustrators identified themselves. I was so glad they brought up the idea of how the type of media, whether it is written, video, photos or illustrations, can tell different stories. I recalled how visuals have been indispensable to me in learning and remaining excited about particle physics, in fact, it was through cute and funny drawn images that I still remember the six original types of quarks that constitute the Standard Model of Physics.

Lindau Alumna Fabiola Gerpott speaks during the ESOF panel.

We really appreciated the audience's participation and questions. Clearly, the attendees were engaged, as demonstrated by their level of enthusiasm and enjoyment as they interacted with the panel. We had so many questions we weren't able to answer them all!

All in all, I think the panel was a great success. The panellists all presented excellent and valuable insights, given that we are in different stages of our careers and present a diversity of experiences. It is useful to engage in these types of experiences to highlight trends, questions and concerns, and it is important to identify these challenges and seek solutions in an open forum, and indeed, ESOF provided this advantageous opportunity. I look forward to further conversations both with my colleagues and new friends as well as with the greater scientific workforce. We simply can't afford to not keep the conversation going.

Follow Your Scientific Passion

Nataly Naser Al Deen is a PhD candidate at the American University of Beirut, Lebanon, who is doing research on breast cancer. Physicist and science writer Ulrike Böhm talked with Nataly about her inspirations, her work and her highlights of the 68th Lindau Meeting

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

Nataly Naser Al Deen: Growing up, I remember the library at my grandparents' house with medical and biology books that belonged to my mother and maternal uncles. I used to flip through the books with fascination, looking at images that seemed like magic to me.

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

NN: I want to make an impact in the cancer research field, mainly through basic and translational research, and teach courses in oncology, and hopefully later have my own research team. However, I am fully devoted to my academic and professional responsibilities and I feel responsible for my community and the alumni networks that I am part of. Thus, as a dedicated activist for breast cancer research and prevention, I dream of expanding my exercise health initiative for breast cancer survivors (Pink Steps) to other countries and establishing it as an NGO.

UB: What advice do you have for other women interested in science?

NN: I salute every single woman in science that has paved the way for all the current female scientists and physicians to contribute to the countless accomplishments in the STEM field, and I encourage every single aspiring woman who is passionate about science to pursue her dreams to the fullest. My only advice would be to follow your scientific passion, find what drives you in science and in aiding others, give it your all, and believe in yourself and your capabilities.

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

NN: I am beyond proud of all the great accomplishments and efforts that are made in the STEM field by many influential and dedicated young and established women in science. I am a strong believer in women's scientific power in our current time, and I keep on hoping for the number to grow exponentially. I have enjoyed witnessing that the majority of current graduate students (at least in the biological and cancer research field) are ambitious and hardworking female scientists. Being granted equal access to science, research and grant money, whether at the graduate or professorship level, is the key to ensuring more participation and contribution for women in science.

UB: What were your highlights of #LINO18?

NN: The 68th Lindau Nobel Laureate Meeting was indeed a once-in-a-lifetime experience and it by far exceeded our expectations. The scientific spirit around the Inselhalle and the entire Lindau island was phenomenal. We got the chance to meet with Nobel Laureates in many interactive settings, including Agora Talks, Open Exchanges, the Master Classes, and to attend various lectures by laureates, which we learned a lot from. I was very honoured to have gotten the chance to participate in a panel discussion along with Nobel Laureate Peter Agre on 'Medical Innovations in Developing Nations' and to conduct a video interview with one of my hero Nobel Laureates Michael Bishop.

Being able to connect with 600 talented young scientists from all over the world was very fruitful. We all discussed our scientific projects without any boundaries, and we also shared insights and experiences on future collaborations and scientific advice, be it exchanging ideas regarding experimental procedures or asking each other insightful questions, which made us think of our research projects from various perspectives and multidisciplinary fields. One of my favourite moments was when I held the farewell speech on behalf of the young scientists to thank everyone that made this meeting happen and reflect upon this surreal week. I was also beyond happy to participate in the Max Planck post event that was on its own a very educational and inspiring trip.

"The scientific spirit around the Inselhalle and the entire Lindau island was phenomenal."

Nataly Naser Al Deen

Nataly Naser Al Deen

Find the #LINO18 farewell addresses of Nataly Naser Al Deen and Nobel Laureate Michael Rosbash in the mediatheque.

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

Nataly Naser Al Deen with Nobel Laureate Michael Rosbash and Countess Bettina Bernadotte

Focus on South Africa in 2019

In 2019, South Africa will be hosting the International Day of the 69th Lindau Nobel Laureate Meeting. Roseanne Diab, Executive Director of the Academy of Science of South Africa (ASSAf), talked with Alaina G. Levine during #LINO18 about South Africa's scientific potential and revealed plans for #LINO19.

Roseanne Diab

Alaina G. Levine: What is ASSAf doing and how is it advancing the needs of science in South Africa?

Roseanne Diab: We are at an apex of the organisation. We are an honorific organisation and a science academy, and we do a lot of studies to help and advise the government. At the same time, we have a strong focus on young scientists: we just instituted the young scientists' network, and six South African young scientists are attending Lindau. It is a once-in-a-lifetime opportunity to send students to the Lindau Meeting. Young scientists are the future of our nation and the whole of Africa, so we are excited for this opportunity to help them succeed.

AGL: Can you give us some background on the Academy?

RD: We are membership-based – members are elected by their peers who are existing members. We have been established in 1996, which was an important year in South Africa in terms of our history, because in the past, there were science academies that attracted only certain sections of the population. It was only decided after democracy was established that there was a need for one academy that represented us all. 1994 was the establishment of our democracy, and we were established in 1996 to represent South Africa in the international arena.

AGL: What are the challenges facing ASSAf?

RD: We come from a history of apartheid and it is under that when the early elections for our academy took place. It was a predominantly white racial group and it's quite difficult to change that profile going forward. It's going to take time, and there is also a numbers issue, the number of black and white scientists is growing, but to change the proportions we have to have much more black membership. Regarding gender, compared to other academies, we are probably ranked in the top 10 but it is still only 24–25% women. (...)

AGL: What are the challenges and opportunities for South African science and scientists?

RD: What one has to be careful of in a developing nation is that you focus all your funding on the applied sciences. There is government funding for basic science and we cannot lose sight of keeping the funding alive for basic funding. We have research strengths in biodiversity, structural biology, science communications and infectious diseases such as HIV and TB. We are also known for astronomy – we have this vast area in the centre of the continent with clear skies, no rain, no pollution, which is absolutely ideal for astronomy. Our biggest initiatives are the establishment of centres of excellence – fully funded centres within universities, containing a critical mass of researchers.

AGL: Why is it important to be at the Lindau Meeting?

RD: It is important to the academy because we have a very strong mission to promote young scientists – they are the future of our country, so we have to get involved in activities that involve and promote them. Lindau opens doors for these young scientists. We have a strong presence here because South African scientists have been nominated for these meetings even before our academy became an academic partner. They came here as individuals and never fed back into the system. The gamechanger for us is to bring the young scientists here as a group and to make sure we use every opportunity to network them. [...] Another important thing is that we don't think of the Lindau Meeting as a one-off event. We have a pre-event for our young scientists and prepare them in this two-day meeting to coach them so that they know what to expect, and we even bring in some alumni. They get so motivated [...] for the Lindau Meeting. At this same pre-meeting, we incorporate outreach activities. We stress that it's not just about you as an individual – you are an ambassador for the country, and you are giving back to the nation. This year, they went to a local school in a very poor area and talked about why it's important to study science. And then we try to keep the alumni networking! Just networking is so important; it's a confidence booster. It comes through all the time in these meetings. We tell them not to be afraid to go up to the laureates and talk to them, and the young scientists are happy to do so – something they never would have done before.

"Just networking is so important; it's a confidence booster."

Roseanne Diab

AGL: What does it mean to you to be a global science diplomat?

RD: It is very exciting. I think of it in a networking way. I don't always think of myself as a scientific diplomat, but I recognise that a very big part of what I do is networking. Our presence is very important in these kinds of meetings.

AGL: Can you give us a teaser for what we can expect next year when South Africa hosts the International Day at the 69th Lindau Nobel Laureate Meeting?

RD: We have very exciting plans. People will definitely know it is a South African International Day and Get-Together right from the music and the décor to the dancing, and we have lots of plans to make sure that you go away with a South African flavour.

Find the interview in full length on our blog:
lindau-nobel.org/blog

Africa's Next Generation – How to Support Africa's Science Structures

Several Lindau Alumni as well as partners of the Lindau Meetings were asked about their thoughts on the current status of scientific excellence in Africa, what progress has been made and what still needs to change. The full article is part of the Nature Outlook on #LINO18, focussing on science in emerging economies.

While the situation greatly varies among African countries, the last decade has seen a considerable growth of scientific agencies, programmes, networks and conferences, and certainly an improvement of the situation.

To no one's surprise, South Africa is spearheading this development with its National Research Foundation, established almost 20 years ago. Current programmes such as the South African Research Chairs Initiative and the Centres of Excellence funding scheme contribute to keeping excellent scientists in Africa, says Roseanne Diab, Executive Officer of the Academy of Science of South Africa (ASSAf). But she also highlights various cross country-initiatives: "The African Institute for Mathematical Sciences (AIMS) is a pan-African network of centres of excellence for postgraduate education, research and outreach in mathematical sciences established in 2003. This was followed more recently by the AIMS Next Einstein Initiative, the goal of which is to build fifteen centres of excellence across Africa by 2023."

Most progress has been made in the area of health; all the more important as a bad public health situation has countless negative effects on people, economies and countries – and on science. [...]

Yet, only 1% of global investment in R&D is spent in Africa, and the continent holds a tiny 0.1% share of the world's patents, as ASSAf's liaison officer Edith Shikumo points out. But money doesn't seem to make up the top priority on younger scientists' list of concerns. "I don't want to mention the usual obstacles like lack of proper infrastructure and expensive equipment; I would rather focus on the lack of tolerance for new and innovative ideas, the fear associated to out-of-the-box thinking and the tendency to avoid risk accompanying entrepreneurship are the main obstacles for a thriving science and research culture", says Ghada Bassioni, guest professor at the Technical University of Munich and coordinator of Egypt-Germany collaboration, with the Science and Technology Development Fund of the Ministry of Higher Education and Scientific Research, Egypt – and Lindau Alumna.

Mark Williams-Wynn, who attended the Lindau Meetings in 2016 and is currently a post-doctoral fellow at the University of KwaZulu-Natal, adds: "One of the biggest obstacles that I have noticed is the tendency to avoid questioning the status quo. There is an attitude which exists not only among academic institutions, but throughout society: 'if it isn't broken, why fix it'. This applies not only to innovation, but also to how people go about their work." [...]

When asked about the availability of suitable, reliable career paths, everyone agrees that this is one of the major problems that limits progress and success of African research: Excellent young African PhD students are lured away by better conditions, more exciting science and more money, and due to the research structure situation, they may not be coming back. Of those who return, a large number chooses South Africa, where conditions are still the best. Plus, many are absorbed by industry, where they are lost from research fields, as Williams-Wynn observes.

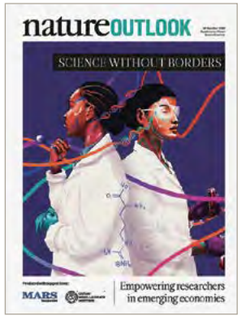
But there is hope, says Berhanu Abegaz, former executive director of the African Academy of Sciences: "There are many networks and organisations that are now available to help young people and to get them focused on African issues and also get them to stay in Africa." These include the African Academy's Affiliates program, the Next Einstein Forum, the AIMS, the Africa-Oxford Initiative, the Organisation for Women in Science for the Developing World, the African Women in Agricultural Research and Development, leadership academies, young academies and others. Yet only a few African countries invest enough money in such structures and programmes. [...]

Some of the programmes mentioned have been initiated and funded by Northern countries, mainly Europe and the United States. However, Europe's history in the colonisation of Africa and the resulting sentiment that supporting Africa means paying an outstanding debt doesn't fit to a modern approach. Abegaz clarifies that "engagements will be beneficial to all parties if the driving philosophy is equitable partnerships. This would have to begin in the agenda setting stage and defining the basis of the partnerships. Some European partners like the Welcome Trust accept, at least in principle, this approach." [...]

Downsides of foreign partners are linked to research agendas being drawn by funders that do not serve Africa's interests nor research needs. As a consequence, more South-to-South partnerships need to be encouraged for Africa's development.

In a shift of perspective and wording, it is no longer help that African countries are requesting, but partnership, explains Rhyman as she adds: "We African scientists cannot consider ourselves to be always in a position of requesting help from others, it is high time for us to wake up and work. For how long the support will continue? Why do they need to support us? When will we stand on our feet?"

» All Lindau Nobel Laureate Meetings that have taken place since 2010 have been featured in Nature Outlook, the supplement to the scientific journal. The 2018 edition 'Science Without Borders' was published on 18 October 2018 and is available online. All supplements could be produced thanks to the support of Mars, Incorporated.



"It was really an honour and a privilege to sit and discuss matters that concern Africa; I have never been given such an opportunity."

Edith Phalane, participant of the 68th Lindau Nobel Laureate Meeting, North-West University, South Africa

Young African scientists with Nobel Laureate Peter Agre during the 68th Lindau Nobel Laureate Meeting

» As participation from Africa in the Lindau Meetings was lagging behind for many years, the Africa Outreach Initiative under the patronage of former German Federal President Horst Köhler was started in 2015. Supported by the Robert Bosch Stiftung, the initiative helped to bring more than 150 excellent young African scientists to Lindau. In 2019, South Africa will be hosting the meeting's 'International Day' – a highlight of Africa's presence at the Lindau Nobel Laureate Meetings.

Mission Education

Pupils exploring the Lindau Science Trail on a guided tour during #LINO18

The Lindau Science Trail

The Lindau Science Trail opened in 2017 and consists of a total of 21 knowledge pylons. Fifteen 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. All information is available in English as well as in German.

Guided Tours
With a special children's section on every pylon, the trail invites students and schools to discover the exciting world of science. Guided tours of the trail were popular among students and schoolchildren during #LINO18 and can now be booked as part of school trips to Lindau.

Mobile App
A mobile app expands the Lindau Science Trail on-site: by means of augmented reality functions, one can meet virtual Nobel Laureates at various places in Lindau. They describe why they received the Nobel Prize and explain more about their research. With numerous quiz questions, the app also allows users to test their freshly acquired knowledge on a Science Rallye.

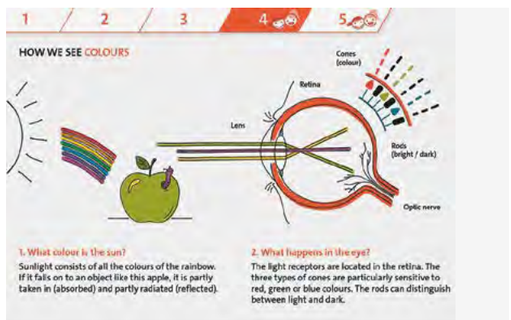
Virtual Science Trail
A new feature has been added in 2018: the web-based Virtual Science Trail takes users on a virtual walk through the existing science trail – irrespective of space and time. The pylons can be easily located through a vivid online map containing site pins to access any chosen pylon. Impressive panoramic images enriched with multimedia elements ensure a truly immersive navigation experience. The Virtual Science Trail, available in both German and English, reaches out to an even wider audience as the trail can be explored from afar.

The Lindau Nobel Laureate Pier and the Lindau Science Trail could be realised thanks to the support of the city of Lindau and the Beisheim Stiftung.

The Virtual Science Trail can be accessed at www.wissenspfad.de

The Virtual Science Trail takes users on an exciting online tour.

Schoolchildren studying a pylon of the Lindau Science Trail during #LINO18



The Lindau Nobel Laureate Pier

To be completed in 2019, the Lindau Nobel Laureate Pier will honour the more than 400 Nobel Laureates who have participated in the Lindau Meetings since 1951. With its 42 metres of length, the pier will constitute the central station of the Lindau Science Trail. Its guardrails bear the names and disciplines of the Nobel Laureates as well as the year of the award and the year of the laureate's first participation in the Lindau Meetings. The complete pier is enclosed by a guardrail comprising 1,000 individual metal bars – sufficient for future Nobel Laureates who will participate in the Lindau Meetings to come.

The pier protrudes into the Kleiner See and borders the new Therese-von-Bayern-Platz in front of the Inselhalle. A knowledge pylon at the entrance to the pier portrays the history of the Nobel Prize. While recognising the outstanding achievements and merits of the scientists and visionaries who have attended the Lindau Meetings, the pier also serves as a visible account of the meetings in the townscape of Lindau.

The official opening of the pier is scheduled for the 69th Lindau Nobel Laureate Meeting.

Artist's impression of the Lindau Nobel Laureate Pier

Marshland Restoration to Mitigate Carbon Footprint

International conferences like the Lindau Meetings leave a large carbon footprint. To compensate for the environmental impact of our meetings we have been implementing various eco-friendly measures and are supporting a local marshland restoration project in the Degermoos area near Lindau.

Renaturated water area at Degermoos

Since 2014, the Lindau Nobel Laureate Meetings have been committed to becoming a greener, more environmentally conscious conference. We have implemented a variety of guidelines and measures for our day-to-day work, before and during the annual meetings. We, for example, recycle all our produced waste and make sure to only purchase equipment made from sustainable, recyclable materials. Our power comes from renewable sources and we try to avoid unnecessary heating. We avoid disposable plastic catering items and only offer fully organic and when possible local food at our meetings. We try to limit printing and only use CO_2 neutral materials. With these small yet significant changes we can avoid some of the wasteful behaviour harming our planet. There are, however, environmentally damaging aspects to such large international conferences as ours that are more difficult to offset. Catering, lodging, printing materials and travel all lead to CO_2 emissions. Of those emissions, participant travel plays by far the largest role, causing 93 % of all CO_2 emissions.

Why are CO_2 emissions so harmful?

In the atmosphere, CO_2 acts as a greenhouse gas, meaning it traps heat radiation just like the windowpanes trap heat in a gardener's greenhouse. Consequently, more CO_2 in the atmosphere results in a warmer climate. Besides CO_2, there are other greenhouse gases, such as methane (CH_4) and nitrous oxide (N_2O) that are both much more potent in trapping heat radiation than CO_2. However, due to their low abundance they are currently of minor relevance in global warming.

What can we do against excess CO_2 in the atmosphere and to mitigate climate change?

The most evident action is to reduce CO_2 emissions as much as possible. Planting trees is one potential strategy to compensate for too much CO_2, as green plants and algae take up atmospheric CO_2 and use it to build biomass. Much larger amounts of organic carbon can be stored for thousands or even millions of years when biomass is buried in oxygen-deficient environments where it cannot be degraded by microorganisms. That is what happened to prehistoric plants that formed the coal we are mining today and to prehistoric algae that turned into the oil we are drilling for.

Unfortunately, storing away substantial amounts of organic carbon by coal or oil formation takes much too long to help us mitigate today's climate change. A more feasible strategy to reduce atmospheric CO_2 that works in a similar fashion but on a much shorter time scale is the restoration and preservation of marshlands.

Marshlands can help us to mitigate climate change

Marshlands are unique ecosystems that are rich in biodiversity and home to many plant and animal species that have adapted to this extreme environment. Unimpaired marshlands take up CO_2 from the atmosphere; however, from a greenhouse gas perspective they are essentially climate-neutral. The reason for this is that in addition to CO_2 uptake by mosses and other wetland plants, small amounts of the potent greenhouse gas methane are released into the atmosphere and offset the positive effect of CO_2 uptake on the climate. Nevertheless, in the long run marshlands can accumulate substantial amounts of organic carbon and store it in their wet anoxic soils.

Contemporary marshlands store about 700 tons of organic carbon per hectare; a comparably large amount that was accumulated over a period of about 12,000 years. Unfortunately, nearly all the original 1.5 million hectares of marshland were drained between the 18th and 20th centuries in Germany, releasing vast amounts of CO_2 back into the atmosphere. Drained marshlands where peat degradation is not completed can be restored by well managed rewetting measures where they return to an essentially climate-neutral state and CO_2 emissions from peat degradation cease. Each hectare of restored marshland can save up to 30 tons of CO_2 per year. Thus, the restoration of former marshlands can be an immediate and efficient measure to mitigate climate change. In addition, it has the positive side effect that valuable ecosystems are restored, fostering biodiversity and the return of rare wetland species.

Due to these hard scientific facts and our responsibility towards the environment, we are committed to support the local renaturation of the Degermoos marshland, which is just 15 km away from Lindau, to offset our CO_2 emissions. The Degermoos covers an area of 72 hectares. Renaturation allows for the storage and avoidance of approximately 30 tons of CO_2 per hectare per year, resulting in an annual CO_2 compensation of 2,160 tons.

We have set up a website with a donation function to offer the opportunity to everyone who has participated in the Lindau Nobel Laureate Meetings, past or present, to offset their CO_2 emissions in the form of a monetary contribution to help rewet the Degermoos marshland.

If you are interested in finding out more about our project and how to donate, please visit www.degermoos.org.

Impressions

Daniel Ropers, CEO of Springer Nature, talking to a young scientist

Walter Gilbert in discussion with young scientists

Robert Huber in conversation with a group of pupils

Steven Chu and participants
at the Grill & Chill

Edvard Moser with young scientists

Keeping the ‘Lindau Spirit’

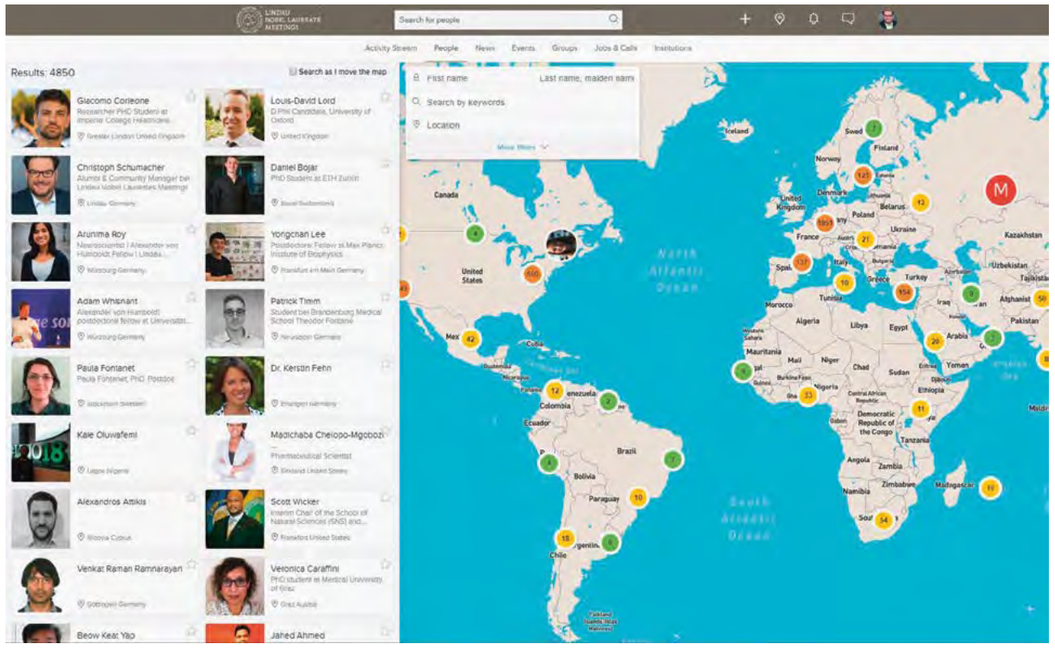
Lindau Alumni Network

Attending a Lindau Nobel Laureate Meeting is a once-in-a-lifetime experience for young scientists and young economists that hopefully has a lifelong impact. Lindau Alumni share memories and motivation created by the unique ‘Lindau Spirit’. 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 an online social networking platform: the Lindau Alumni Network.

In spring 2018, the Lindau Alumni Network was extensively updated with a new infrastructure, creating an improved digital space for former meeting participants. In addition to a growing database, this online community includes tools that enable users worldwide to share their work, swap stories and find Lindau Alumni events. In this way, 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. All former and future participants are invited to join this community and to enrich it with their own ideas and perspectives.

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



Lindau Alumni Events

The Lindau Alumni initiative aims to extend the ‘Lindau Spirit’ beyond the boundaries of a weeklong conference. A further step in this direction was taken in 2018 with a series of alumni events, both online and offline.

The highlight of the year for the Lindau Alumni initiative was an in-person encounter with Nobel Laureate Sir Venkatraman Ramakrishnan in Toulouse, France in July at the sidelines of ESOF 2018 (see p. 93). Venki Ramakrishnan turned a brief reception with the international group of Lindau Alumni into an impromptu open exchange session, taking the time to answer a wide range of questions from career success to what makes a Nobel Prize-awarded discovery to his life as a scientist and laureate. Afterwards, science writer and career consultant Alaina Levine held a career advice and networking workshop for the alumni.

Starting in March, Lindau Alumni took part in three webinars produced by the Lindau Meetings with Alaina Levine as presenter. In March, more than 100 Lindau Alumni tuned in to an engaging talk on maximising their potential in career development. The second webinar in May discussed perfect networking practices at conferences and meetings. The third instalment of the series in October introduced ideal methods for science communication.

The Lindau Nobel Laureate Meetings encourage alumni to engage in science outreach projects and in the future will continue to offer member-exclusive opportunities and events and will seek to support Lindau Alumni in local initiatives.

Lindau Alumni Peer Review

The newly renovated meeting venue, Inselhalle, offered more space in which young scientists can present their research to the Nobel Laureates and the Lindau community in the form of Master Classes and Poster Sessions. As part of their application for these additional formats, young scientists handed in about 500 abstracts in 2018. The review process for the Poster Sessions and Master Classes represented a new opportunity to involve former participants in the shaping of the discussions at the Lindau Meeting. Lindau Alumni are closely connected to current, cutting-edge research, have already experienced the Lindau Meetings and are in a unique position to review the work of the new young scientists.

More than 60 Lindau Alumni volunteered to become peer reviewers and as such were actively involved in the 68th Lindau Meeting. We would like to thank the first Lindau Alumni reviewers for volunteering their time and expertise and thereby giving back to the Lindau Meetings community. We are looking forward to continuing this successful new cooperative effort for the upcoming 69th Lindau Nobel Laureate Meeting, dedicated to physics.

To find out more about volunteering as a reviewer or to suggest other Lindau Alumni projects, write to alumni@lindau-nobel.org

Nobel Laureate Venki Ramakrishnan and Lindau Alumnus Jorge Ivan Amaro-Estrada

Young scientists in discussion during the Poster Session

Representation Abroad

Nobel Heroes Hong Kong

In April 2018, the Lindau Nobel Laureate Meetings participated in a series of events in Hong Kong: they presented the book 'Nobel Heroes' by Peter Badge with an exhibition, promoted the Lindau Meeting and connected with partners in the region, including several Lindau Alumni.

On 7 April, the Lindau Meetings and the Hong Kong Society of Economists (HKSOE) facilitated a panel discussion with Nobel Laureates Aaron Ciechanover and Tim Hunt on the theme '40 years of Reform and Opening: The Interaction between China and the World'.

Peter Badge's Nobel Heroes was presented during a gala dinner hosted by HKSOE in the presence of Carrie Lam, Chief Executive, Hong Kong Special Administrative Region. The evening included a discussion featuring Nobel Laureates José Manuel Ramos-Horta, Tim Hunt, Aaron Ciechanover and Finn Kydland. The Laureate in Economic Sciences James A. Mirrlees took also part in this event as a guest.

On 8 April, Nobel Laureates José Ramos-Horta, Finn Kydland, Aaron Ciechanover, Tim Hunt and Lindau Alumni were among the distinguished guests of a matinee upon invitation of the German Consul General in Hong Kong Dieter Lamlé at his residence.

Forum at UC Davis

On 1 May 2018, the Lindau Nobel Laureate Meetings participated in the 'Forum on the Future of Food, Health and Nutrition' at the University of California, Davis, organised by our long-standing endowment contributor and supporter Mars, Incorporated.

Two Laureates in Economic Sciences attended the Forum: Eric Maskin and Daniel McFadden. They were joined by Lindau Alumni, Countess Bettina Bernadotte, Jürgen Kluge, Nikolaus Turner and representatives of Mars, Incorporated, such as the member of the Honorary Senate Pamela Mars, for a day of discussion and networking. Opening remarks by Gary S. May, Chancellor of UC Davis, a keynote by Larry Smarr, Director of the California Institute for Telecommunications and Information Technology (Calit2), and remarks by Nobel Laureates Eric Maskin and Daniel McFadden preceded the panel discussion.

Panel Discussion
THE FUTURE OF FOOD, HEALTH AND NUTRITION

Panellists
– Eric Maskin, Laureate in Economic Sciences 2007, USA
– Daniel McFadden, Laureate in Economic Sciences 2000, USA
– Mark Dean, University of Tennessee, USA
– Jean-Christophe Flatin, President, Mars Edge, Mars, Incorporated, USA
– Markita Landry, Assistant Professor at UC Berkeley and Lindau Alumna 2010, USA
– Cathie Woteki, Former Under Secretary USDA, USA

Moderator
Rachael Goodhue, University of California, Davis, USA

ESOF 2018

The Lindau Nobel Laureate Meetings were represented at the 8th Euro Science Open Forum, 9–14 July in Toulouse, France. The theme of the interdisciplinary science meeting was 'Sharing Science: Towards New Horizons.' At the Lindau Meetings' booth young scientists, representatives of universities and European institutions as well as Lindau Alumni and journalists could learn more about current projects and the upcoming meeting. In addition, the Lindau Nobel Laureate Meetings organised a panel discussion in a fish bowl format as part of the science programme (see also p. 74).

Panel Discussion
BRIDGING THE GAP BETWEEN EXPERTS AND THE PEOPLE: RETHINKING SCIENCE COMMUNICATION
– Sir Venkatraman Ramakrishnan, Nobel Laureate in Chemistry 2009, United Kingdom
– Fabiola Gerpott, Lindau Alumna 2014, Germany
– Minu D. Tizabi, Lindau Alumna 2015, Germany
– Alaina Levine, consultant and author, USA
– Brooke Borel, science journalist, USA

Moderator
Tobias Maier, Scientific Head, National Institute for Science Communication (NaWiK), Germany

AAAS 2019 Annual Meeting

The Lindau Nobel Laureate Meetings will be present at the American Association for the Advancement of Science (AAAS) 2019 Annual Meeting, which will take place in Washington, DC, 14–17 February 2019. The overarching theme of the meeting will be 'Science Transcending Boundaries'.

As in 2017, the Lindau Meetings will be represented with a joint booth together with the Heidelberg Laureate Forum (HLF). Throughout the meeting, young scientists can find out how to attend the meetings, journalists can receive more information on covering the meeting and representatives of universities and research institutions will be able to discuss the global academic partner network.

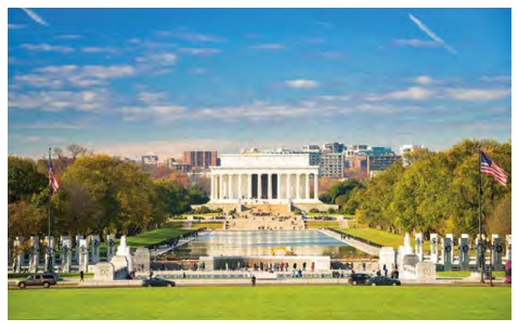
There will be an event for Lindau Alumni in the context of the AAAS 2019 Annual Meeting.

If you are interested in attending the Lindau Alumni event or if you will be attending the AAAS 2019 Annual Meeting, please contact us at alumni@lindau-nobel.org.

Lindau Alumnus Terence Kwan and Nikolaus Turner present the Lindau Nobel Laureate Meetings.

Daniel McFadden

Carlos Moedas, European Commissioner for Research, Science and Innovation, at the Lindau Meetings' booth



Sketches of Science

The series ‘Sketches of Science’ by German photographer Volker Steger is an ongoing project of the Foundation Lindau Nobel Laureate Meetings. Its concept is simple: ask Nobel Laureates to make a sketch of the discovery for which they received the Nobel Prize and photograph them with their sketch. The results, however, are as varied as the personalities of the laureates themselves. Sometimes reflective, but sometimes also quirky and a lot of fun.

In his photos, Volker Steger captures the spontaneity and creativity of Nobel Laureates and the enthusiasm of these outstanding scientists and researchers. An exhibition of 50 photos of the series was launched at the Nobel Museum in Stockholm in June 2012, and has been on tour around the globe ever since.

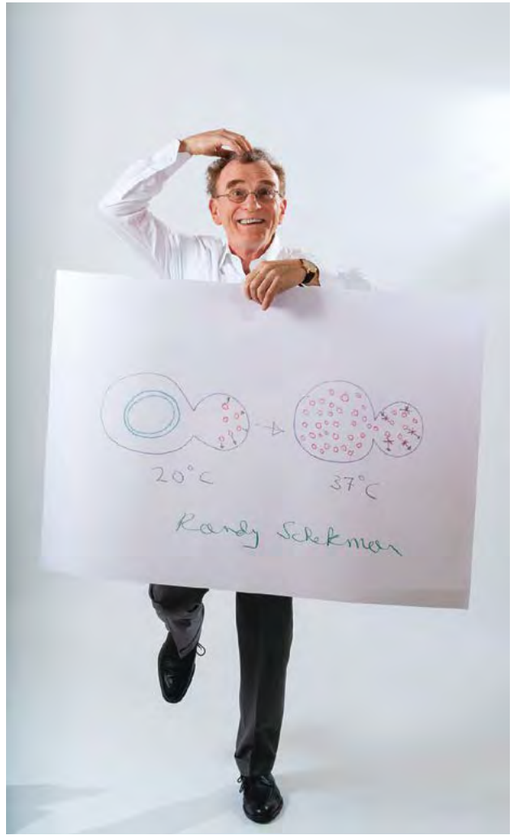
The following countries have hosted ‘Sketches of Science’ so far: Germany, Japan, Malaysia, the Russian Federation, Singapore, South Korea, Sweden and the United States.

Project Partner
Nobel Museum, Stockholm

Principal Funder
Klaus Tschira Foundation

An artbook with a wide selection of sketches is available for download in the mediatheque.

Robert Lefkowitz draws his research at #LINO18.



Randy Schekman having fun presenting his sketch on cell membrane vesicle trafficking

Nobel Heroes

Since 2000, German photographer Peter Badge has been traveling around the globe on an ambitious mission: to take a picture of every living Nobel Laureate. As part of this long-term project, more than 400 laureates have already been photographed. Each portrait of this remarkable array of black-and-white photographs reveals a haunting, authentic and fascinating impression of the laureate’s unique personality and serves to highlight for their scientific, literary or humanitarian achievements.

In 2018, a three-month exhibition of Nobel Laureates photographed by Peter Badge was hosted by the Los Alamos History Museum in New Mexico. Beyond that, a selection of portraits as well as the coffee table book ‘Nobel Heroes’ were presented in various locations worldwide, e.g. at the ‘Nobel Heroes Day’ in Hong Kong (see p. 92), at the University of California, Davis and at the Bodensee Business Forum in Friedrichshafen.

Exhibition 2018
Los Alamos (NM), USA
Los Alamos History Museum
12 January–27 April 2018

Project Partners
Mars, Incorporated
Los Alamos Historical Society

The project ‘Nobel Laureates photographed by Peter Badge’ is commissioned by the Lindau Nobel Laureate Meetings and supported by the Klaus Tschira Foundation. In 2017, German publisher Gerhard Steidl published a coffee table book titled ‘Nobel Heroes’ with 400 of Peter Badge’s black-and-white photographs.

Selected portraits of female Nobel Laureates on display at the Inselhalle

Los Alamos History Museum, USA

Impressions

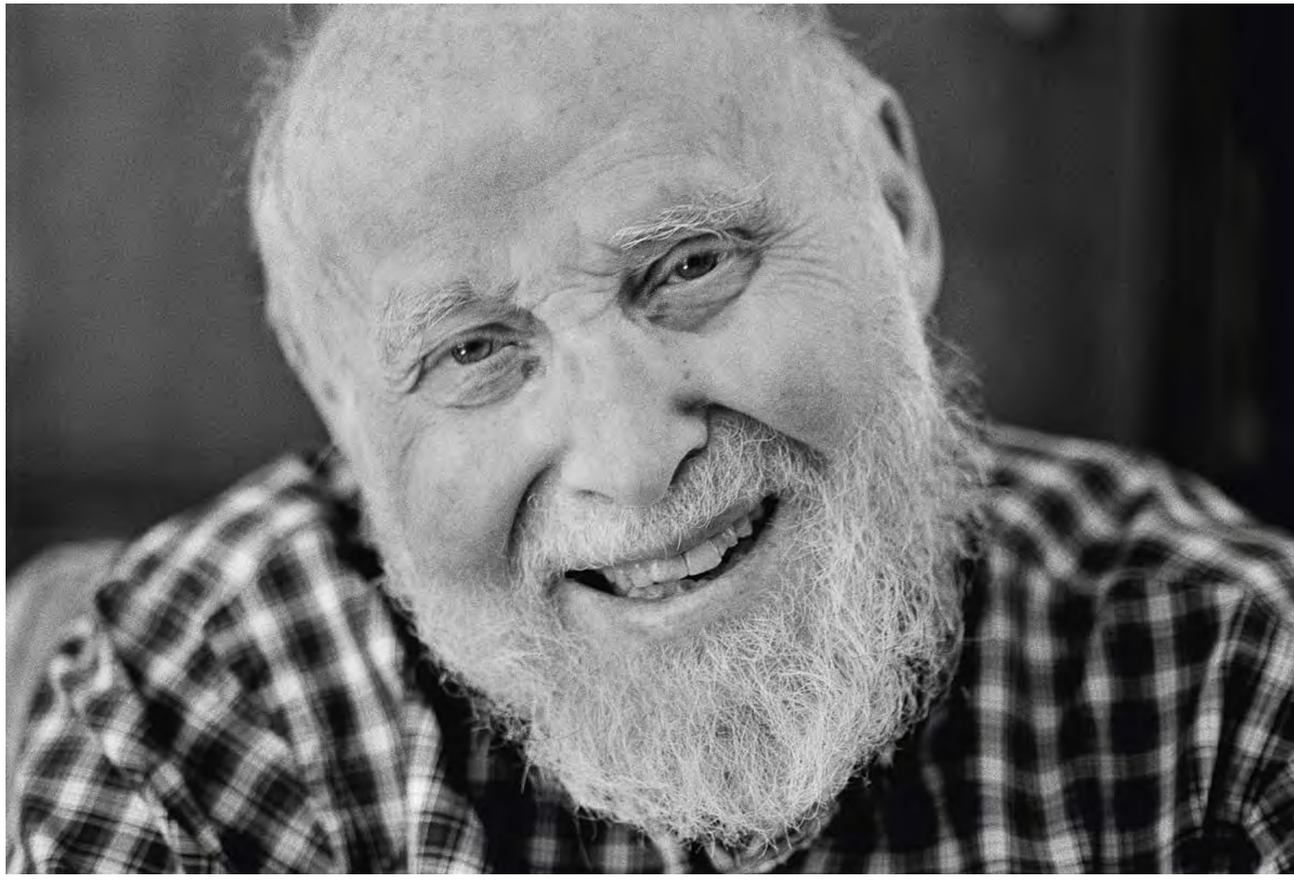
Countess Bettina Bernadotte interviewed by science journalist Karsten Schwanke for our media partner ARD-alpha

Martine Abboud, the first recipient of the Eddy Fischer Lindau Fellowship by the Vallee Foundation, with Nikolaus Turner and Ernst Ludwig Winnacker, Director of The Vallee Foundation

Thimo Schmitt-Lord, Executive Director, Bayer Foundations, at the '2nd Bayer Science Start-Up Pitch Night'

"The Lindau Nobel Laureate Meetings make a great contribution by promoting dialogue between young scientists and Nobel Laureates. In my entire scientific career, beginning in the 1940s, mentorship was a critical element. I received guidance and inspiration from many scientists including Nobel Laureates like Hans Bethe. Now, at 96, as the oldest individual to be honoured with the Nobel Prize in its long history, I salute the Lindau tradition of connecting the generations and wish the meeting all the best for the future."

Arthur Ashkin, Nobel Laureate in Physics 2018



When photographed by Peter Badge, the recently announced Nobel Laureate Arthur Ashkin kindly provided us with these engaging remarks.

A profound interview with Arthur Ashkin about his fascinating life filmed in November 2018 can be watched in the mediatheque.

The Mediatheque

New Content 2018

With unique content dating back to 1952, the mediatheque of the Lindau Meetings maps the rich history of scientific dialogue of these unique gatherings. The platform provides access to more than 600 original lectures by Nobel Laureates, including the recent lectures, Agora Talks and panel discussions held during #LINO18. New Mini Lectures, Topic Clusters and Nobel Labs 360° have also been added in 2018. The mediatheque represents a platform and resource that can be used by scientists, educators and those interested in science and is constantly being updated and improved.

TOPIC CLUSTER ON MODEL ORGANSIMS

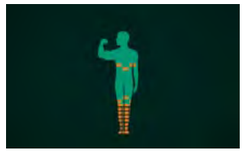
Model organisms are very diverse, ranging from yeast to soil-living worms and flies. This Topic Cluster provides an introduction to the scientific use of model organisms applied to study processes, diseases and phenomena that cannot be easily examined in other organisms.

NOBEL LAB 360°: RANDY W. SCHEKMAN

Randy W. Schekman received the 2013 Nobel Prize in Physiology or Medicine 'for discoveries of machinery regulating vesicle traffic, a major transport system in our cells'. Visit his Nobel Lab to learn more about Schekman's research focus, lab environment and experimental procedures.

MINI LECTURE: DNA

These three short Mini Lectures introduce the basic functions and principles of genetics, a field that was widely discussed during #LINO18. The videos highlight three key areas, namely the molecular structure of the DNA molecule, genetic replication and duplication.



MINI LECTURE: IMMUNOLOGY

The three parts of this Mini Lecture deal with the structure and function of the immune system. The videos take a look at active and passive immunity, herd immunity and laboratory techniques specifically developed for individual characteristics of a patient's disease.

TOPIC CLUSTER ON RADIOACTIVITY AND X-RAYS

Radioactivity and radiation applied as a research tool have enabled discoveries about atomic structure, the nature of energy and many other fundamental phenomena. In this Topic Cluster you can learn more about radioactivity research that also underlies numerous medical procedures.

TOPIC CLUSTER ON ADVICE FROM NOBEL LAUREATES

The Lindau Nobel Laureate Meetings are unique for young scientists as they receive personal glimpses into the lives of Nobel Laureates, encouragement as well as philosophical and practical advice. This Topic Cluster effectively groups re-occurring pieces of advice into nine broad items.

HISTORICAL LECTURES

Nearly 200 original lectures of the more than 800 presentations from the past have been made available in the mediatheque so far. Every year, prominent historical lectures are added, e.g. in 2018 Rosalyn Yalow's presentation on 'Radioactivity in the Service of Man' held at the 1981 Lindau Meeting.

Recently added to the collection of virtual lab tours: the Nobel Lab 360° of Ben Feringa, Nobel Laureate in Chemistry 2016

mediatheque.lindau-nobel.org

Educational Outreach

Educational Section Mediatheque

The constant technical and content-related advancement of the mediatheque aims to provide a unique learning infrastructure and research source for scientists, teachers, students and generally those fascinated by science. Much of the material in the mediatheque is well-suited for use in schools. To meet the rising demand from teachers and students, the educational section has been augmented with didactic features that intend to facilitate the teaching and learning routine.

Teaching Guides
In collaboration with lehrer-online.de, one of the leading and most renowned providers of learning materials in German-speaking countries, 18 learning units based on the mediatheque's Mini Lectures, Topic Clusters and Nobel Labs 360° have been developed and made available for teachers. Each dossier includes precise lesson design proposals, worksheets and other training materials. This collaboration proved to be very successful: in June 2018, it was awarded the Comenius EduMedia Seal of Approval for distinguished, digital educational media. This prize is awarded each year by the German Society for Pedagogy, Information and Media (GPI).

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 the English and Swedish languages. With the support of the German Federal Ministry of Education and Research, the 2017 Nobel Posters have been translated into German and distributed among secondary schools in Germany.

Teaching guides and Nobel Posters are available for download in the educational section of the mediatheque.

Teaching Guides

The poster explaining the Nobel Prize in Medicine or Physiology 2017. Two of the three Nobel Laureates, Michael Rosbash and Michael Young, attended #LINO18.

Cooperations

The educational outreach activities of the Lindau Nobel Laureate Meetings aim to spread the fascination with science and research to society at large and to share the archived knowledge of the mediatheque with pupils, students and generally interested laypersons. In 2018, the Lindau Meetings extended their cooperation with educational content providers to reach an even wider audience within the educational sector.

Cooperation With Educational Content Providers
With the aim of imparting and further disseminating scientific information by and about Nobel Laureates, the Lindau Meetings embarked on a strategy to collaborate with non-profit providers of digital educational content, mainly public providers of didactic material for teachers.

Partners
– AK Schulförderung des Verbandes der Chemischen Industrie (VCI)
– Education Group GmbH, Landesmedienzentrum Oberösterreich
– European Commission, Directorate-General Education and Culture
– European Schoolnet
– Goethe-Institut Philippines
– Goethe-Institut Thailand
– Kärntner Medienzentrum für Bildung und Unterricht
– Landesinstitut für Schulqualität und Lehrerbildung Sachsen-Anhalt
– Landesmedienzentrum Rheinland-Pfalz
– Landesmedienzentrum Salzburg
– Learning Resource Exchange Belgium
– 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
– SESAM – Landesmedienzentrum Baden-Württemberg
– Schulmedienzentrum Vorarlberg
– School Education Gateway
– Schulmediathek Hamburg
– Scientix
– Supratix
– Tes Global
– Tiroler Bildungsinstitut – Medienzentrum des Landes Tirol
– Thüringer Institut für Lehrerfortbildung, Lernplanentwicklung und Medien

Antares Project
In addition to the partners mentioned above, the content of the mediatheque is offered to teachers in all federal states of Germany through a cooperation with the Antares Project GmbH. Antares is a media interface for the distribution of digital educational content used by 250 to 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
– Medienzentren Baden-Württemberg, Brandenburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen
– MeSax Sachsen
– Thüringer Institut für Lehrerfortbildung, Lehrplanentwicklung und Medien

Mini Lectures and further content from the mediatheque on School Education Gateway

Engaging Future Generations

Teaching Spirit

Scientific curiosity and a passion for research can be instilled at a young age in children, especially when teachers go above and beyond in sharing that passion with their students. Therefore, every year the Lindau Nobel Laureate Meetings invite a select number of excellent teachers to honour their educational performance and dedication and to provide them with new impulses for their work.

Twenty engaged chemistry and biology teachers from Austria, Germany and Switzerland were invited to take part in two days of the 68th 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 #LINO18.

School Visit

During #LINO18, Bert Sakmann, Nobel Laureate in Physiology or Medicine 1991, gave a lecture at the Bodensee-Gymnasium for more than 100 selected high school students from the four-country region of Lake Constance, including Austria, Germany, Switzerland and Liechtenstein. Bert Sakmann explained the principal questions about how membranes work and how his discoveries have led to the understanding of how medication influences the brain to alleviate pain. The detailed lecture was followed by an intensive exchange with the students, in which he answered questions on his personal background, his research and career.

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

Bert Sakmann at the school visit

Experimental workshop for chemistry and biology teachers during #LINO18

Inspiring Lindau

Explaining the Nobel Prizes

It has become a tradition at the beginning of a new year that the Lindau Nobel Laureate Meetings invite Lindau citizens for a lecture programme and subsequent reception to celebrate the awarding of the latest Nobel Prizes. In January 2018, a Council member, a physician from the region, a Lindau Alumna as well as a chemistry teacher gave easily understandable and entertaining presentations to explain the research findings of the laureates being awarded with the Nobel Prize in 2017.

Presentations

THE NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE:
MICHAEL W. YOUNG, MICHAEL ROSBASH, JEFFREY C. HALL
Paul-Jürgen Hülser, Clinic Manager and Chief Physician, Neurobiological Clinic, Waldburg-Zeil Kliniken

THE NOBEL PRIZE IN CHEMISTRY:
JOACHIM FRANK, JACQUES DUBOCHET, RICHARD HENDERSON
Stephan Förbs, participant of 'Teaching Spirit' at the 67th Lindau Meeting in 2017, teacher at the Rupert-Neß-Gymnasium Wangen

THE NOBEL PRIZE IN PHYSICS:
RAINER WEISS, KIP S. THORNE, BARRY C. BARISH
Rainer Blatt, Member of the Council and scientific co-chair of the Lindau Meetings dedicated to physics, 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: RICHARD H. THALER
Andrea Wrba, Lindau Alumna of the 6th Lindau Meeting on Economic Sciences in 2017, doctoral student and research assistant at the Technical University of Munich

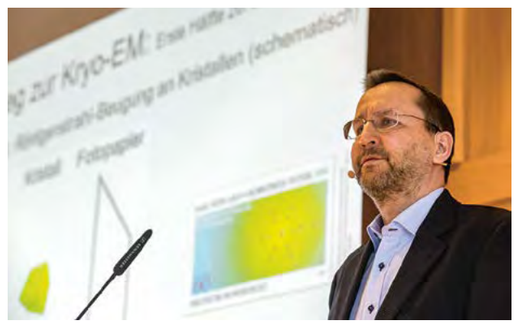
Moderator
Jasmin Off, Head of the Digital Editorial Department, Schwäbische Zeitung

Partners
City of Lindau
Schwäbische Zeitung/Lindauer Zeitung
Sparkasse Memmingen-Lindau-Mindelheim

Andrea Wrba

Rainer Blatt

Stephan Förbs



@AvHStiftung

It's not every day you talk to two Nobel Prize winners about science, career and life in general. At the Lindau Nobel Laureate Meeting last week, #Humboldtians met with Ada E. Yonath and Bruce Beutler. #LINO18
Andrew Keinsley, University of Kansas, USA

@Antonella0608

Such a great first webinar! Thank you @lindaunobel and @AlainaGLevine for the inspiration and guidance. #Lindauforlife
Antonella Coccia, Lindau Alumna 2017, Belgrano University, Argentina

@Audreydsg

Ada Yonath opens this last day of conferences @lindaunobel with a wonderful talk. Such an inspiring woman! #LINO18
Audrey Desgrange, Paris Descartes University, France

@CLCockburn

I made attending @lindaunobel my goal when I started grad school 5 years ago. Today it's becoming reality. Dreams do come true y'all!
Chelsea Cockburn, Virginia Commonwealth University, USA

@EMBL

"Our world needs dialogue. Across borders. Scientists need to come out their desks and communicate with society. Only then we will regain society's trust in a populist post-truth era." Education & Research Minister @AnjaKarliczek at @lindaunobel #LINO18 #LindauTakeover
Mariana Alves, European Molecular Biology Laboratory, Heidelberg, Germany

@amylasenz

A common theme coming out of the panel trying to address science in a post-factual era is that it's super important to meet people on a level they can relate to – try discuss with them what's important, using their language, in ways that matter to them #LINO18
Amy Shepherd, University of Melbourne, Australia

@_myrsini_

#LINO18 Science walk with #NobelLaureate Sir Richard Roberts of @NEBiolabs – discussed pretty much everything. Gene splicing, bacterial epigenetics, GMOs, public outreach, scientific responsibility, failures, funding, work life balance, brexit. Buzzing afternoon.
Myrsini Kaforou, Imperial College London, UK

@Chenkaiwww

Really got a lot of encouragement from #nobellaureate Steven Chu on studying climate change and health! Thanks again @lindaunobel and @AvHStiftung
Kai Chen, Helmholtz Zentrum München, Germany

@ErwinBottinger

Nobel Laureate Liz Blackburn calls for a 'Lindau Declaration' for sustainable long term resources for science in keynote at opening @lindaunobel #LINO18 @HPI_DE
Erwin Böttinger, Hasso Plattner Institute, Germany

@MarsGlobal

We want to find new solutions to the food, agriculture and health grand challenges facing society. That's why we joined #LINO18 last week, speaking to Nobel Laureates and the brightest young scientists from around the world. @lindaunobel
Mars, Incorporated

@Elisabetta91

Elizabeth Blackburn and Martin Chalfie discussing gender inequality in science. It will take 280 years to cancel gender gap in computer science #LINO18
Elisabetta Cacace, European Molecular Biology Laboratory, Heidelberg, Germany

@ptimshel

Crucial "Perish or Publish" debate on the future of publishing, changing metrics for evaluating scientific scholarship, promoting open access and open science, pre-prints, publishing of negative results. Harold E. Varmus: "it's up to us scientists to make the change" #LINO18
Patrick Timshel, University of Copenhagen, Denmark

@HLForum

#NobelLaureate Peter Agre encourages #journalists to focus their energy on young researchers – they are doing the research of today and the research of tomorrow #LINO18
Heidelberg Laureate Forum, Germany

@Mottiekind

Amazing talk by Peter Agre filled with humour, anecdotes and inspiration #scientificdiplomacy #humanitarian #LINO18 @lindaunobel
Eileen Thomas, University of Stellenbosch, South Africa

@rdivia

Overheard at #LINO18: "I hate football"
Divya Rajagopal, The Economic Times, India

@BlessingAhiant3

I also want to say a very big thank you to @ASSAf_Official and @lindaunobel for the consideration of pregnant female scientist like me. I felt a sense of belonging in the scientific world even in my pregnant state. @ASSAf_Official @lindaunobel @WomenScience @OWSD_SA @SAYAS_SA
Blessing Ahiante, North-West University, South Africa

@enrique_lins

Incredibly grateful with @lindaunobel for this awesome experience at #LINO18. I leave with a lot of great advice, renewed inspiration and commitments, new friends and future collaborators across the world and amazing memories! Thanks!! #LindauForLife #LindauSpirit #LindauAlumni
Enrique Lin Shiao, University of Pennsylvania, USA

@martina_kapitza

Today at the teaching spirit-workshop at the 68th Lindau Nobel Laureate Meeting! Thank you @lindaunobel, giving us the opportunity to be a part of this inspiring event!
Martina Kapitza, Leibniz Institute for Science and Mathematics Education (IPN), Kiel, Germany

@stefan_fraessle

Honored to having been selected to present my work at the Lindau Nobel Laureate Meeting last week. Thanks to everyone who came by at my poster for the interesting discussions and valuable feedback
Stefan Frässle, ETH Zurich, Switzerland

@aydzhouyuan

A wonderful discussion with Nobel Laureate Michael Young about sequencing in families. #LINO18 @lindaunobel @MSResearchAust. At Menzies @ResearchMenzies, we are conducting the whole genome sequencing in large MS family to identify novel genes for new treatments.
Yuan Zhou, University of Tasmania, Australia

@MohamedBrolosy

So honored to win the best poster prize at the Lindau Nobel Laureate Meeting. Comes with the laureates' blue ribbon and a Nobel medal (actually a chocolate one!). Thanks @lindaunobel and @vfapharma for this amazing opportunity! #LINO18
Mohamed El Brolosy, Max Planck Institute for Heart and Lung Research, Bad Nauheim, Germany

@KaleFemi

Young Scientists from eighty-four (84) nations interacted freely with 39 Nobel Laureates and other special invited guests. We were educated, inspired and connected with friends and great intellectuals #LINO18 @lindaunobel
Kale Oluwafemi, Babcock University, Nigeria

@DocBruggsBunny

Fantastic week at the @lindaunobel meeting on the beautiful Lake Constance! Insights from Nobel Prize-winners, spirited debates about the state of science, brilliant young scientists from across the globe. Exhausting, but exhilarating! Huge thanks to @MSCActions! #LINO18
Stefaan Verbruggen, Queen Mary University of London, UK

@frank_barreraf

Prof. Elizabeth Blackburn, a @NobelPrize winner: Exposing the importance of recognizing #science as a non-national culture but rather as a global culture. Therefore, encouraging a global, collaborative, and resource-sharing approach in the knowledge generation. @lindaunobel
Frank Barrera, Universidad Autónoma de Nuevo León, Mexico

@D_Langenmayr

I met James Mirrlees once, as a PhD student at a dinner at the Lindau Nobel Laureate Meetings @lindaunobel in 2011. He was a very kind and humble man. I will remember him each time I teach my MSc Tax Policy course, which draws heavily on his contributions to optimal tax theory.
Dominika Langenmayr, Lindau Alumna 2011, Catholic University of Eichstätt-Ingolstadt, Germany

@HayleyA_Mc

What a #Nobel party! Very vibrant dance floor at the #International Get-together! #LINO18 #LindauAussies #scientistswhodance
Hayley McNamara, Australian National University, Australia

Lindau Meetings on Twitter
#LINO18

Communications

Media Representatives

Scientific American, The Economic Times, Times Higher Education, Spektrum der Wissenschaft, FAZ, Springer Medizin – media representatives from all around the world were present at #LINO18.

About 100 journalists and communications professionals from 15 countries seized the opportunity to be inspired by interesting new topics from science and research and to get in touch with Nobel Laureates and young scientists. They attended the various lectures, Agora Talks, panel discussions, special press events and the social programme highlights. Once again, the Lindau Meetings assisted with organising interviews with the participants.

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

Nobel Laureates Bert Sakmann and Erwin Neher being interviewed by Carsten Könneker and Andreas Jahn from Spektrum der Wissenschaft

Front pages of editorial supplements covering #LINO18 in Germany's two most renowned dailies Frankfurter Allgemeine Zeitung (left) and Süddeutsche Zeitung (right)

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 hosted its exciting TV format 'ARD-alpha Campus Talks' for the first time in Lindau. In this popular educational series, nine young scientists were given the opportunity to present their research and findings in a simple and entertaining manner to a broad, live audience. The Campus Talks aired on 18 and 25 September 2018 on ARD-alpha.

CAMPUS TALKS – FORSCHUNG AUF DEN PUNKT GEBRACHT
presented by ARD-alpha

Young Scientists
– Haitham Al Mahrouqi, Oman
– Philip Lewis, Ireland
– Vivian Lobo, India
– Naomi Mburu, USA
– Mohd Ghows Mohd Azzam, Malaysia
– Arunima Roy, India
– Amy Shepherd, Australia
– Pascal Timshel, Denkmark
– Miriam Van Dyke, USA

Moderator
Jeanne Rubner, Managing Editor Science and Education Policy, Bayerischer Rundfunk

Campus Talks participant Arunima Roy explaining her research

Press Talk

INNOVATIONS IN HEALTH CARE FOR DEVELOPING COUNTRIES
presented by Deutsche Welle

Accredited journalists were invited to join this topical panel discussion at #LINO18. Peter Agre and young scientists discussed projects and challenges for improving health care in developing countries around the world. Agre investigates the molecular basis of malaria and is actively involved in disease prevention and treatment in Zambia and Zimbabwe. Young scientist Nataly Naser Al Deen has founded the health initiative 'Pink Steps', which aims to promote physical fitness and a healthy lifestyle in breast cancer survivors in Lebanon. Jeerapond Leelawattanachai is working on the development of affordable tuberculosis diagnostic tools for developing countries, especially her home country Thailand. Svenja Kohler is one of the founding members of the charity organisation 'Future E.D.M.', which trains young locals in Senegal to become health ambassadors and to teach citizens in rural areas of their country.

Panellists
– Peter Agre, Nobel Laureate in Chemistry (2003), Bloomberg Distinguished Professor and Director of Johns Hopkins Malaria Research Institute, Johns Hopkins University, USA
– Nataly Naser Al Deen, American University of Beirut, Lebanon
– Jeerapond Leelawattanachai, National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency (NSTDA), Thailand
– Svenja Kohler, Institute for Cardiogenetics, University of Lübeck, Germany

Moderator
Alaina Levine, consultant and author, Quantum Success Solutions, USA

Svenja Kohler and Jeerapond Leelawattanachai during the Press Talk

Press Conference

THE INNER CLOCK

with the 2017 Nobel Laureates in Physiology or Medicine Michael Rosbash and Michael W. Young

The human body – as do those of other organisms – functions differently during the day than it does during the night. This phenomenon, referred to as the circadian rhythm, is an adaptation to the drastic changes in the environment over the course of the 24-hour cycle in which the Earth rotates around its own axis. The circadian rhythm affects our sleep patterns, our metabolism, hormone levels and blood pressure. For elucidating how this biological clock works on a molecular level, Jeffrey C. Hall, Michael Rosbash and Michael W. Young were awarded the Nobel Prize in Physiology or Medicine 2017.

Moderator
Zulfikar Abbany, science journalist, Deutsche Welle, Germany

Nobel Laureates Michael W. Young and Michael Rosbash with Zulfikar Abbany

The Lindau Meetings Online

» Blog

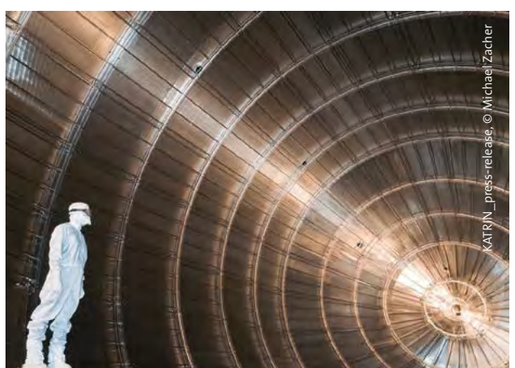
The blog of the Lindau Nobel Laureate Meetings features articles on research news and science history targeted at a broad audience as well as background stories on the Lindau Meetings and interviews with their participants. Contributors – ranging from professional science writers to young scientists, Lindau Alumni and Nobel Laureates – have helped develop the blog into the central online platform and content hub of the Lindau Meetings throughout the year.

This is just a small selection of the topics covered in 2018. For more please visit lindau-nobel.org/blog

Fact-Checking – An Effective Weapon Against Misinformation?

Women in Research at #LINO18

CRISPR-Cas: The Holy Grail Within Pandora's Box



The Unbearable Lightness of Neutrinos

Lucidity in the Post-Factual Era

» Social Media

Connecting people to share ideas has always been part of the Lindau Meetings' mission. In 2018, social media has continued to be part of the 'Lindau Spirit'.

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

Facebook
The official Facebook page of the Lindau Nobel Laureate Meetings keeps more than 13,000 followers continuously updated. We share our own and our partners' content and engage in vivid discussions science-related topics with the community. Science comedian Brian Malow posted Facebook Live videos during the 68th Lindau Meeting, including popular interviews with young scientists.

Twitter
During the meeting, participants enthusiastically engaged on Twitter using the hashtag #LINO18 and created a digital space of discussion, including heartfelt comments and glimpses of the social aspects of the week. Just like last year, the hashtag #LINO18 trended in Germany on the first day of the meeting.

YouTube
For the 68th Lindau Meeting, a series of short interviews with Nobel Laureates and young scientists were produced by UK-based Econ Films and have been added to the Lindau Meetings' YouTube channel. A selection of mediatheque content, especially the Mini Lectures released this year, is also available on YouTube to increase awareness of the Lindau Meetings and to spread some of the educational content within a medium widely used by a younger audience.

LinkedIn
Since spring this year, the Lindau Meetings are also present on LinkedIn. With a growing audience of followers, we're using the networking community for professionals to create and uphold relationships. LinkedIn is an ideal platform to re-engage Lindau Alumni and to refer them to the Lindau Alumni Network.

Instagram
Last year, we began engaging a growing audience on Instagram, sharing photographic highlights from the Lindau Meetings and our outreach projects throughout the year. During the days of the meeting, participants joined in sharing their views of Lindau.

FlickR
Our FlickR 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 acknowledged accordingly.

Young scientists working in front of the #LINO18 Twitter wall.

Video Coverage

Live Videos

As in 2017, science writer and comedian Brian Malow attended the 68th Lindau Nobel Laureate Meeting and interviewed Nobel Laureates including Robert Lefkowitz and Randy Schekman. In addition, he recorded videos live on Facebook with young scientists, talking about their work, their background and their Lindau experience. The Facebook live videos gathered up to 13,000 views.

You can find all #LINO18 Facebook Live videos on the Lindau Meetings' Facebook page.

Instagram Videos

The leadup to #LINO18 saw the release of several videos which Brian Malow had recorded during the 68th Lindau Nobel Laureate Meeting. Here, Nobel Laureate Stefan Hell talks about the reliability and importance of science, Nobel Laureate Richard Schrock discusses the all-encompassing nature of chemistry and Lindau Alumni from 2018 reflect on what fascinates them in their research.

You can find these videos and more on the Lindau Meetings' Instagram profile.

Brian Malow talks to Nataly and Martine live on Facebook.

Stefan Hell: How Science Can Make a Difference in the World

Robert Lefkowitz on His Prize-Winning Research

Alumna Hlamulo Makelane: The Most Exciting Moment

Interviews

In 2018, the Lindau Nobel Laureate Meetings continued their collaboration with London-based Econ Films to produce a series of short interviews during the meeting week. The videos feature Nobel Laureates, young scientists and guests alike. The interviews touch on a broad range of topics, from key points of discussion like the publish-or-perish debate, the current projects of Nobel Laureates Martin Chalfie and Edvard Moser to Elizabeth Blackburn's belief in science and the academic heroes of an international group of young scientists. The interviews were distributed through social media.

All interviews are available on the Lindau Meetings' YouTube channel.

A Perfect Setting

The Lindau Meetings collaborated with a production team from the Filmakademie Baden-Württemberg to create a new, humorous opening video for the 68th Lindau Nobel Laureate Meeting. Working with the Filmakademie and Econ Films teams, a new video for the official opening ceremony of our venue Inselhalle was produced during #LINO18. In this film, beautiful images of the Inselhalle and surrounding Lindau island are combined with statements by Nobel Laureates, young scientists and guests explaining why Lindau is a "perfect setting for bringing in the future of science".

Find the opening videos and the Inselhalle video in our mediatheque.

Edvard Moser on the Neuroscience of Time and Space

Opening Film #LINO18

Ruairi Robertson on Meeting Nobel Laureate Robin Warren

A Perfect Setting for Bringing in the Future of Science

"Every moment is special to me and words are not enough to describe this phenomenally fascinating week!"

Harshita Sharma, participant of the 68th Lindau Nobel Laureate Meeting, University of Oxford, United Kingdom

Picture of the Science Picnic on Mainau Island, supported by the State of Baden-Württemberg

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. He was followed by his wife Countess Sonja in 2004 and then by his daughter Countess Bettina in 2008, who still chairs the Council.

The purpose of the non-profit Council 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

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Rainer Blatt
Thomas Ellerbeck (Spokesman)
Klas Kärre
Stefan H. E. Kaufmann
Jürgen Kluge
Heiner Linke
Hartmut Michel
Torsten Persson
Reinhard Pöllath
Klaus Schmidt

Corresponding Members
Lars Bergström
Astrid Gräslund
Hans Jörnvall
Sten Orrenius

Permanent Guests
Gerhard Ecker
Thomas Gruber (until 10/2018)
Urs Schwager

Council meeting at the Royal Swedish Academy in Stockholm, March 2018, upon invitation of the Swedish Council members

The Foundation

The Foundation Lindau Nobel Laureate Meetings was established in the year 2000 by fifty 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 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

Alfred Nobel overlooking members of the Council and the Foundation

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 2018, 338 Nobel Laureates constitute the assembly.

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

Chen Ning Yang, Nobel Laureate in Physics 1957 from China and member of the Founders Assembly. Portrait from the photo series 'Nobel Laureates photographed by Peter Badge'

Honorary Senate

The members of the most prestigious committee of the Foundation Lindau Nobel Laureate Meetings, the Honorary Senate, function as advisors to the board and distinguished ambassadors for the cause of the Lindau Meetings. With their considerable experience and expertise, they are dedicated to advance the values and aims of Lindau's 'Mission Education'.

Members

Josef Ackermann
Suleiman Jasir Al-Herbish
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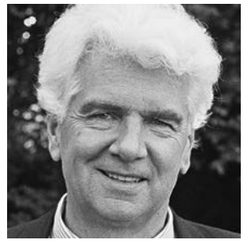
Ulrich Wilhelm
Ernst-Ludwig Winnacker
Martin Winterkorn
Hansjörg Wyss

Pamela Mars, member of the Honorary Senate of the Foundation, at the 68th Lindau Meeting

In Memoriam



Günter Blobel
1936–2018

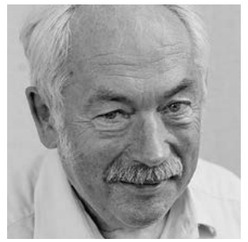
Nobel Laureate in Physiology or Medicine 1999

Lindau Meetings:
2000, 2003, 2005, 2007

Paul D. Boyer
1918–2018

Nobel Laureate in Chemistry 1997

Lindau Meetings:
1998, 2000, 2002



Peter Grünberg
1939–2018

Nobel Laureate in Physics 2007

Lindau Meetings:
2008, 2010, 2012

Leon M. Lederman
1922–2018

Nobel Laureate in Physics 1988

Lindau Meeting:
1991

Sir James A. Mirrlees
1936–2018

Laureate in Economic Sciences 1996

Lindau Meetings:
2004, 2006, 2011, 2014, 2017

Osamu Shimomura
1928–2018

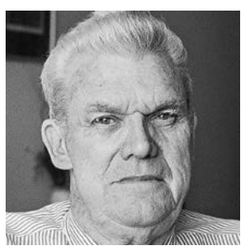
Nobel Laureate in Chemistry 2008

Lindau Meetings:
2009, 2010

Thomas A. Steitz
1940–2018

Nobel Laureate in Chemistry 2009

Lindau Meetings:
2011, 2014, 2017, 2018



Richard E. Taylor
1929–2018

Nobel Laureate in Physics 1990

Lindau Meeting:
1994

Impressions

Party on the Baden-Württemberg Boat Trip back to Lindau:
young scientists turning into Lindau Alumni

The mascots of the State of Baden-Württemberg welcome the participants
onto the boat trip to Mainau Island

‘Einstein and the coolest stuff in the universe’: Lindau Lecture by Nobel Laureate Bill Phillips at the 6th Heidelberg Laureate Forum 2018

Organisation

Executive Secretariat

Director
Wolfgang Huang

Conference Management
Susanne Wieczorek
Head and Deputy Director
Katja Merx
Sabrina Lummer
Greta Meier
(04–06/2018)

Young Scientist Support and Academic Partner Relations
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Head
Nesrin Karabag
Karen Otto
Kai Lohbeck
(04–11/2018)
Greta Meier
(10–12/2018)

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Gero von der Stein
Head
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Preliminary Account 2018: Expenditures

	(in Euro)
Travel	
Nobel Laureates	143,325.81
Young Scientists	27,758.20
Media	11,168.47
Others	24,461.17
Lodging	
Nobel Laureates	66,881.94
Young Scientists	260,173.80
Media	6,891.50
Others	68,847.12
Boarding	
Nobel Laureates	9,655.33
Young Scientists	351,811.48
Media	6,257.69
Others	37,869.27
Meeting Organisation	
Scientific Programme & Selection of Young Scientists	23,901.09
Rental Fees Locations	87,854.80
Technical Equipment	249,943.64
Utilities & Services	54,254.41
On-Site Staff	71,096.53
Transfers	21,993.25
Supporting Programme	31,966.93
Printed Matters	46,310.42
Expendable Items	23,620.93
Audio, Video & Web Productions	74,817.28
Science & Media Services	56,482.87
Website	9,642.22
Telecommunications, Postage	25,249.73
IT Services, Hardware, Software	101,443.78
Accounting, Legal Advice, Insurances	51,331.32
Other Costs	15,721.31
Executive Secretariat	
Staff	785,684.93
Office Operating Costs	84,989.64
Office Supplies & Equipment	10,754.36
Expected Total Expenditures	2,842,161.22

Please note:
The total expected costs include 513,575.78 € of expected costs for October–December 2018.
The budget does not include costs of the meeting covered directly by the Foundation.

Preliminary Account 2018: Revenues

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Total Revenues*	**2,842,161.22 €**

***Note:**
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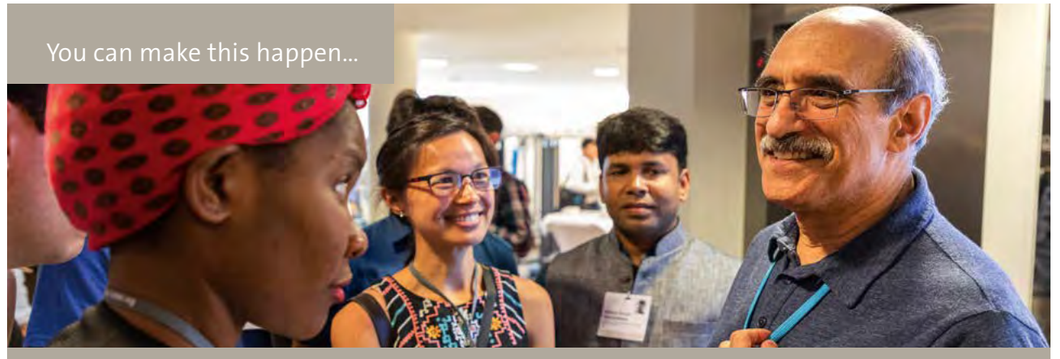

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