65th Lindau Nobel Laureate Meeting

Annual Report 2015

LINDAU
NOBEL LAUREATE
MEETINGS

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Greeting

Dear Nobel Laureates and young scientists,
Dear partners and friends of the Lindau Meetings,

It is our privilege to present our annual report of 2015 to you. This year, 65 Nobel Laureates participated in the 65th Lindau Nobel Laureate Meeting. We have celebrated a truly significant anniversary and reached an important milestone in 2015. We hereby invite you to share our delight in this.

Since the first "European Meeting of Nobel Laureates in Medicine" in 1951, the Lindau Meetings have served as a forum for debate between generations of scientists. In his opening address of the very first meeting, Count Lennart Bernadotte af Wisborg highlighted the "universitas of thought" as the guiding principle of the meetings: the universal spirit of science beyond divisions of disciplines, nationality, faith or culture. Back then, he was drawing on a long tradition that had been disrupted during the age of totalitarianism. This year's interdisciplinary meeting also proved that, in a globalised world, his vision remains valid and relevant as the global networking of science is a precondition to understanding our world and finding long-term solutions to its challenges. Today, Lindau can serve as a global hub for science and research. As a forum for exchange and dialogue, its influence extends far beyond Lindau and the circle of participants selected each year. Our alumni serve as ambassadors of the "Lindau spirit" on all continents.

Such a favourable development could certainly not be considered as a foregone conclusion. It required the commitment and dedication of many personalities involved. We would like to take this opportunity to express our sincere gratitude. Special thanks are due to each Nobel Laureate who has ever participated in a Lindau Meeting – over 450 to date. Their passion for their subject, but also for the exchange with young scientists lies at the heart of the Lindau Meetings. We appreciate the vision of the founders, Count Lennart Bernadotte, Franz Karl Hein and Gustav Wilhelm Parade, whom we keep in high esteem. Our network of academic partners has contributed considerably in realising this vision. Their commitment to excellence is exemplary.

Since the establishment of the Foundation Lindau Nobel Laureate Meetings in 2000, various partners from the public, private and non-profit sectors have given testimony of their commitment to the Mission Education. We are deeply grateful for the various and generous contributions.

Our profound gratitude is due to all the distinguished personalities having voluntarily served as members of the boards of the Council and the Foundation. Particularly, we would like to commemorate those who have passed away. Their commitment has been the driving force behind a truly remarkable development. Helga Nowotny and Wolfgang Lubitz as newly elected Vice-Presidents of the Council as well as Jürgen Kluge and Reinhard Pöllath as designated chairman and member of the foundation board respectively, are taking over the responsibilities as trustees of the Lindau spirit.

Respecting our leitmotif "Educate. Inspire. Connect." we will continue our work for the dialogue between generations and nations, for the vision of Count Lennart Bernadotte. It is as timeless as it is timely. Today, it also includes a lively discourse between the scientific community and society at large, promoting the general public perception of science and research as sources and drivers of innovation.

In his speech at the opening of this year's meeting, German Federal President Joachim Gauck drew attention to how important it is for scientists to think along broader lines, to overcome both personal and global boundaries, and to always maintain a critical perspective. In view of the dynamics which unfolded at Lindau and Mainau during this year's meeting, we are convinced of the sustainability of this agenda.

In view of the United Nations Climate Change Conference COP21, 72 Nobel Laureates signed the Mainau Declaration 2015 to express their sincere concern over the consequences of climate change. With their action they followed the vision of Alfred Nobel using their potential "for the benefit of mankind".

Countess Bettina Bernadotte af Wisborg & Wolfgang Schürer

Countess Bettina Bernadotte af Wisborg,
President of the Council, and Wolfgang Schürer,
Chairman of the Board of Directors of the Foundation

» Wolfgang Schürer holds office as Chairman of the Board of Directors of the Foundation until the end of 2015. Sincerest thanks are already due to him at this instance for his outstanding services to the Lindau Meetings. An official leave-taking ceremony will be held during the 66th Lindau Nobel Laureate Meeting in 2016.

65th Lindau Nobel Laureate Meeting
Interdisciplinary Meeting
28 June–3 July 2015

Responsible Scientists – Indispensable for a Critical Public

In his speech at the opening ceremony, German Federal President Joachim Gauck emphasised the demand for an enlightened discourse on the ethical dimension of science. He called upon scientists to actively partake in societal debates.

It is such an amazing feeling to look around this room. People from all around the world have come together to share something precious with each other in the coming days: their knowledge, their research topics and their brilliance. Perhaps this will give rise to an idea that will change all our lives tomorrow. It is a great pleasure for me to have been invited to the opening of the 65th Lindau Nobel Laureate Meeting.

The fact that I am able to experience a world conference of this nature in Germany fills me with gratitude. This place is of great symbolic significance. In comparison with 1951, when the first conference took place here in Lindau, German science has long been out of the shadows of isolation. [...]

It was, of course, a long process for our country to win back something that was barely imaginable for many after the Second World War, namely international recognition and friends, and partners for an intensive dialogue. In short, trust.

Today, I would like to recall who was among the first to reach out their hand to the German scientific community. It was, Countess, your father Count Lennart Bernadotte who drew on his close connections to the Swedish royal family and who, above all, was committed enough and courageous enough to assume the role of "honorary patron".

Many other patrons and partners of the Lindau Nobel Laureate Meetings joined him in the years that followed, including personalities and institutions from the worlds of science and politics, business and society – from home and abroad. The list would fill an entire book. I would like to thank you all most sincerely for supporting the Lindau project financially or contributing your ideas.

And, of course, I would also like to thank the Nobel Laureates for offering their time and expertise for no financial reward in order to allow young, excellent up and coming scientists to share in their experiences. Esteemed laureates, your commitment is priceless in every single way. Thank you! [...]

I know, of course, ladies and gentlemen here in the room today, that you in particular are proponents of joined-up thinking. It is precisely people such as you who overcome borders. Sixty-five of you have already achieved what Alfred Nobel once termed the "greatest benefit" for mankind. And a hundred others, especially also young researchers, are eager to follow your example. You, esteemed audience, are the epitome of science's capacity to surprise and of all the hopes that are bound up with this quality. How often has research managed to overcome fundamental problems and helped millions, if not even billions of people to enjoy a better life?

We therefore have good reason to be optimistic that science will continue to solve problems in the future, that it will achieve progress through innovation, and that it can make amends for – at least to a certain extent – the errors of the past. For me, the enormous potential of your work is beyond question. And yet we know that science is not only the driver of progress, that it is not only a solution or corrective force. Scientific findings can, in themselves, sometimes become an open question or problem. You, esteemed guests, sometimes experience this in your daily theory and practice. Even award-winning international joint research can quickly reach a point at which numbers and facts are no longer sufficient to justify one's own actions. People working in basic research – and especially in fields of application – who often set the course for other people, even for humanity, are of fundamental importance. Anyone who works in such situations without recourse to moral categories is guilty of inappropriate, even reckless actions.

This problem is also on the agenda of this year's conference. Our French partners have given tomorrow's science breakfast the title "Science and Ethics". Countless lectures also touch on moral and social issues, sometimes even in their very title, such as "The Revolution of Personalised Medicine: Are We Going to Cure All Diseases and at What Price?"

While I am, of course, not in a position nor do I intend to pre-empt the debates of this conference, allow me to mention a motif

@jalees_rehman
German President Gauck: Science thrives when there is open exchange of ideas. #LiNo15
Jalees Rehman, University of Illinois at Chicago, USA

@Moedas
Very honoured to attend the 65th Lindau Nobel Meeting. Thank you for inviting me. #LiNo15
Carlos Moedas, European Commissioner for Research, Science and Innovation

"I wish to encourage you to take the spirit of interdisciplinarity and the spirit of Lindau back with you to your desks, your seminar rooms and laboratories."

Joachim Gauck, Federal President of Germany

Federal President Joachim Gauck among Nobel Laureates

that I find to be of central importance for such topics, namely human dignity. Article 1 of the Basic Law for the Federal Republic of Germany, which was adopted in 1949, reads: "Human dignity shall be inviolable."

I had to think of this sentence when I recently read newspaper reports on gene modifications to embryonic stem cells. What does it mean then for human dignity when human genetic material is modified – and even with the best of intentions as a way to prevent specific diseases? And what does the attempt to achieve genetic perfection mean for the dignity of others who are not perfect – i.e. for all of us? [...]

Where exactly does the boundary between feasibility and desirability lie? Where is the final instance? And, above all, who is actually leading this difficult debate? And is it enough if this debate is only held now and then in ethics commissions, parliaments or in high-brow newspapers? I don't think that it is. The debate should be pursued across a broader base as it is about nothing less than our conception of the human being. How do we want to live tomorrow? Who do we want to be tomorrow? And which yardsticks do we want to measure both by? Questions such as these need space to develop in society. We need discourses and agreements that go beyond the scientific community. Science can and should not bear its great responsibility alone. What we need is a critical public, and one not with occasional, but with enduring and intensive participation by scientists. We are, unfortunately, a long way away from a truly broad-based debate of this kind. Many contemporaries shy away from fundamental questions or banish them to a point in the very distant future. Most people are more familiar with the Star Wars films than with the actual state of research on the universe or the rapid developments in the area of artificial intelligence. Stephen Hawking has, at any rate, recently made inroads into diverse specialist magazines, feuilletons and online forums with his warning at a London conference. His scenario of robots becoming so intelligent within the next 100 years that they could overtake humans and take control was a well-calculated provocation.

A provocation that we were evidently in need of hearing. Public opinion on the subject seems to be completely frozen stiff, however. This is the impression that you often get anyway. Either that, or it is panic-stricken time and again by phenomena such as genetically modified maize, for instance. It is often the case that great challenges and significant questions, the answers to which are about nothing less than the basis of our existence, are debated with an inherent lack of knowledge and with limited recourse to the respective scientific discipline. Indeed one of my perennial concerns, ladies and gentlemen, is the fact that these kinds of debates often lead to more uproar than enlightenment. And this is why we need you, as specialists, to lead such debates, or at least to guide them constantly and more intensively than before. That is my urgent appeal.

And what can we do to promote such a change? In order to promote a new public awareness, we evidently need far more international and disciplinary forums such as here in Lindau. And we need to build even more bridges. Physics and biochemistry can benefit from a dialogue with philosophy and political science, for example, just as medicine needs to see itself in constant relation to ethics. This is why I wish to encourage you to take the spirit of interdisciplinarity and the spirit of Lindau back with you to your desks, your seminar rooms and laboratories. [...]

After 65 years, the Lindau Nobel Laureate Meetings continue to be so attractive because something happens here that works best between one human and another, namely inspiration! An email makes things infinitely easier, but it can be no replacement for a personal conversation that a Nobel Laureate holds with a student to encourage them to broaden their focus, follow a new lead or to tread their own paths. In a way, inspiration also emerges as part of an interdisciplinary act – as a product of the brain and heart, and as the bridge between what we experience and what we dare to dream. As humans, we are characterised by our capacity to be inspired and by our ability to assume responsibility.

Young scientists,
With this in mind, you should make every effort to ensure that your research work lives up to high ethical standards, for which you will need an open and, wherever possible, international exchange of views. Above all, however, you will need the firm conviction that knowledge and knowledge building are one of the greatest resources of freedom – if not perhaps the greatest. Knowledge empowers people to no longer be afraid or dependent, to no longer be subjects of or surrendered to their fate.

One of Alfred Nobel's great legacies is the following insight: The benefit of science is not only brought about for humankind, but is also achieved by humankind.

May this sentiment be your guide for this year's conference.

Joachim Gauck

Countess Bettina Bernadotte and Federal President Joachim Gauck

A video of the opening ceremony of the 65th Lindau Nobel Laureate Meeting including the speech by Federal President Joachim Gauck is available in the mediatheque.

Opening Day

Opening Ceremony

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

Welcome Address
Joachim Gauck, President of the Federal Republic of Germany

Greeting
Carl-Henrik Heldin, Chairman of the Board of the Nobel Foundation, Sweden

Induction of New Members to the Honorary Senate of the Foundation
– Bertrand Gros, Chairman of the Board, Rolex SA, Switzerland
– Ulrich Wilhelm, Director General, Bayerischer Rundfunk (Bavarian Broadcasting), Germany
Laudator
Wolfgang Schürer, Chairman of the Foundation's Board of Directors

Presentation
"Urban Gaga, Ultra Modern Life and Societies"
Kjell A. Nordström, Institute of International Business (IIB),Stockholm School of Economics, Sweden

Master of Ceremony
Zulfikar Abbany, Deutsche Welle, Germany

Carl-Henrik Heldin

Kjell Nordström

Federal Minister Johanna Wanka, Countess Bettina Bernadotte and Philipp Haug

Concert

upon invitation of the Federal Ministry of Science, Research and Economy, Austria
Ensemble phil Blech Wien, Vienna Philharmonic Orchestra

Foundation Dinner

Reception and dinner at Hotel Bad Schachen

Welcome Address
Wolfgang Schürer, Chairman of the Board of Directors

Greeting
Carlos Moedas, Commissioner for Research, Science and Innovation, European Commission

Front row with Gerd Müller, German Federal Minister for Economic Cooperation and Development, Adrian Hasler, Prime Minister of the Principality of Liechtenstein, Johanna Wanka, Carl-Henrik Heldin and Horst Köhler, former German Federal President (from right)

Gerhard Ecker, Lord Mayor of Lindau, Countess Bettina Bernadotte, Joachim Gauck, Beate Merk, Bavarian State Minister for European Affairs and Regional Relations, and Gerd Müller

Carlos Moedas

Impressions

Stefan Hell with young scientists

François Englert and Carlo Rubbia

Mainau Declaration 2015 on Climate Change

›› Already Signed by 72 Nobel Laureates

On 3 July 2015, 36 Nobel Laureates initially signed the "Mainau Declaration 2015 on Climate Change", an emphatic appeal for climate protection.

In view of the United Nations Climate Change Conference COP21 (30 November – 11 December 2015), 36 further Nobel Laureates decided to endorse the declaration and thus expressed their active support of the appeal. By 15 November 2015, 72 laureates belonged to the group of signatories.

With the Mainau Declaration 2015, Nobel Laureates used the platform of the Lindau Meetings for the second time after 1955 to jointly take a stand on social policy issues.

More information, the complete list of all signatories as well as the text of the declaration in all six official languages of the United Nations and in German is available at mainaudeclaration.org

INITIAL SIGNATORIES

Peter Agre
Michael Bishop
Elizabeth Blackburn
Martin Chalfie
Claude Cohen-Tannoudji
Steven Chu
James Cronin
Peter Doherty
Gerhard Ertl
Edmond Fischer
Walter Gilbert
Roy Glauber
David Gross
John Hall
Stefan Hell
Serge Haroche
Jules Hoffmann
Klaus von Klitzing
Harold Kroto
William Moerner
Ferid Murad
Ei-Ichi Negishi
Saul Perlmutter
William Phillips
Richard Roberts
Kailash Satyarthi
Brian Schmidt
Hamilton Smith
George Smoot
Jack Szostak
Roger Tsien
Harold Varmus
J. Robin Warren
Arieh Warshel
Robert Wilson
Torsten Wiesel

22 of the signatories upon presentation of the Mainau Declaration on Mainau Island

Mainau Declaration 2015 on Climate Change

We undersigned scientists, who have been awarded Nobel Prizes, have come to the shores of Lake Constance in southern Germany, to share insights with promising young researchers, who like us come from around the world. Nearly 60 years ago, here on Mainau, a similar gathering of Nobel Laureates in science issued a declaration of the dangers inherent in the newly found technology of nuclear weapons—a technology derived from advances in basic science. So far we have avoided nuclear war though the threat remains. We believe that our world today faces another threat of comparable magnitude.

Successive generations of scientists have helped create a more and more prosperous world. This prosperity has come at the cost of a rapid rise in the consumption of the world's resources. If left unchecked, our ever-increasing demand for food, water, and energy will eventually overwhelm the Earth's ability to satisfy humanity's needs, and will lead to wholesale human tragedy. Already, scientists who study Earth's climate are observing the impact of human activity.

In response to the possibility of human-induced climate change, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to provide the world's leaders a summary of the current state of relevant scientific knowledge. While by no means perfect, we believe that the efforts that have led to the current IPCC Fifth Assessment Report represent the best source of information regarding the present state of knowledge on climate change. We say this not as experts in the field of climate change, but rather as a diverse group of scientists who have a deep respect for and understanding of the integrity of the scientific process.

Although there remains uncertainty as to the precise extent of climate change, the conclusions of the scientific community contained in the latest IPCC report are alarming, especially in the context of the identified risks of maintaining human prosperity in the face of greater than a 2°C rise in average global temperature. The report concludes that anthropogenic emissions of greenhouse gases are the likely cause of the current global warming of the Earth. Predictions from the range of climate models indicate that this warming will very likely increase the Earth's temperature over the coming century by more than 2°C above its pre-industrial level unless dramatic reductions are made in anthropogenic emissions of greenhouse gases over the coming decades.

Based on the IPCC assessment, the world must make rapid progress towards lowering current and future greenhouse gas emissions to minimise the substantial risks of climate change. We believe that the nations of the world must take the opportunity at the United Nations Climate Change Conference in Paris in December 2015 to take decisive action to limit future global emissions. This endeavor will require the cooperation of all nations, whether developed or developing, and must be sustained into the future in accord with updated scientific assessments. Failure to act will subject future generations of humanity to unconscionable and unacceptable risk.

Mainau Island, Germany
3 July 2015

“We’re running against the clock”

At a press conference before the signing of the Mainau Declaration, five Nobel Laureates expressed their deep concern about the ramifications of climate change and urged politicians worldwide to tackle this fundamental issue for human viability.

“With this declaration, we outline the scale of the threat of climate change, and we provide the best possible advice,” said Brian P. Schmidt, a spokesperson of the initiators. He continued that he felt a “moral bound duty as a scientist on an issue that has such lasting consequences.” Schmidt was joined in discussing this threat to mankind and possible steps and solutions by his fellow laureates Steven Chu, former US Secretary of Energy, George Smoot, David Gross, and Peter Doherty.

Reporting of his recent visit to the Indian region Ladakh in the Himalayas, David Gross exemplified that climate change actually already manifests itself: “There are fragile communities which are very dependent on the rivers that spring from the Himalayan glaciers, and they are the ones that suffer first.” He pointed out that in the future, there may even be wars fought over water in several regions of the world. Peter Doherty quoted from the Lancet Commission’s latest report: “They say that we may expect the breakdown of civil society in 21st century. And the poor on the planet are going to be the most affected, as always.”

All five Nobel Laureates agreed unanimously that there was overwhelming evidence that emissions of greenhouse gases would cause global warming. “There might be some uncertainties left,” Steven Chu conceded. “It’s like in the 1950s when people didn’t know what happened if you smoked one pack of cigarettes per day – but the lung cancer rate was rising so rapidly that something had to be done.” Nowadays we can calculate the cancer risk of smoking quite precisely. “But do we want to wait fifty years until we know what will happen with global warming?”, he asked, and added: “You don’t wait until your house is on fire before you take out fire insurance.” Doherty gave another analogy: When the HI virus was first discovered, many people, even scientist, doubted its role in the AIDS epidemic. But once the virus’ life cycle was understood and could be disrupted with antiviral drugs, most denial dropped.

Doherty also defined the difference between denial and scepticism: “If you’re sceptic, you talk to other researchers, you look at the data. If you’re in denial, you simply reject everything that’s being published.” Steven Chu explained that the best data on climate change are provided by satellites: they clearly show how glaciers are shrinking all over the world, from Greenland and the Arctic to the Himalaya, the Alps and some parts of Antarctica. “But there are people in the US Congress who don’t want to look at satellite pictures,” he remembered from his time in politics. “That’s what I call denial.”

In view of the 2015 UN Climate Change Conference in Paris, the Nobel Laureates agreed that politicians should act immediately to “lower the current and future greenhouse gas emissions”, as the Mainau Declaration states. “It takes half a century to turn the boat,” stated Chu. It was true that renewable energy technologies keep getting cheaper, but this would take time. “At some point, the technology will be competitive.” Smoot added: “You need infrastructure for that. This will also create jobs.” Doherty stated that not only politicians would need to reach results, but that voters would need to urge their leaders to act: “Politicians care about nothing except votes. So you have to convince the people who vote.” Schmidt affirmed that voters could and should indeed be informed about climate change. “But many politicians will realise that they have a responsibility – it’s not only about votes.”

In general, the laureates were cautiously optimistic, for instance in view of the 2014 US-China Joint Announcement on Climate Change. “It shows that we can move forward in the divide between developing and developed nations,” Smoot explained. This divide was one of the main obstacles in the past UN Climate Change Conferences in Copenhagen and Rio de Janeiro. The laureates believe that the global warming challenge can be met with a combination of politics and technology. Doherty: “We’ll solve this through policy and technological innovation - and the latter drives economy.”

Chu concluded: “I’m a technological optimist and political optimist. It is possible to find a solution, but we’re running against the clock.”

Susanne Dambeck

“I see this issue as the single greatest threat to human prosperity, and I believe it is important for the best scientific evidence to be used by policy makers in making their decisions.”

Brian Schmidt, Nobel Laureate in Physics 2011

Press conference with Nobel Laureates Brian Schmidt, Steven Chu, David Gross, George Smoot, and Peter Doherty

MAINAU DECLARATION 1955

On the occasion of the 5th Lindau Nobel Laureate Meeting in 1955, 18 Nobel Laureates signed an appeal for the peaceful use of nuclear energy and warned of the dangers inherent in its application for military purposes. Ultimately, 51 Nobel Laureates backed this first “Mainau Declaration”, which originated from the initiative of Werner Heisenberg, Nobel Laureate in Physics 1932. He was prompted to “rethink the humanitarian side of science” as Nobel Peace Laureate Albert Schweitzer attended the 1954 Lindau Meeting. The new book “Science at First Hand. 65 years Lindau Nobel Laureate Meetings” by Ralph Burmester provides more information on the Mainau Declaration of 1955 (p. 94).

The first Mainau Declaration from 1955

Science – All Around the World

A project by participant
Sarah-Katharina Meisenheimer

Lasting Impressions – a Retrospect by the Scientific Chairpersons

The scientific chairpersons are the members of the Council who are entrusted with conceiving the scientific programme of the Lindau Meetings. For the 2015 interdisciplinary meeting, all six worked together to lay the ground for sophisticated scientific exchange. Asked for their impressions, they drew a vivid picture.

Professor Lubitz,
the 65th Lindau Nobel Laureate Meeting was the fourth interdisciplinary meeting. Has the idea of bringing scientists from the three scientific disciplines together every five years proved a success?

"Interdisciplinarity is the embodiment of the fundamental core of the Lindau Nobel Laureate Meetings. The much vaunted and, in my view, essential act of 'thinking outside the box' is rooted in the idea that scientists can interact and think beyond the boundaries of their disciplines which often leads to collaborations on concrete research projects. The founders of the Lindau Meetings already supported this idea by facilitating the dialogue across generations and nations. With the interdisciplinary meetings, the Lindau-specific focus is extended to include the additional dimension of informal interaction between the scientists. However, there is no question of this being allowed to replace the monodisciplinary meetings, as dialogue between hundreds of scientists working in the same field may be even more likely to lead to new research ideas. However, interdisciplinarity adds an important dimension to the Lindau context, that is the self-awareness of the scientists of being part of an interdependent community."

Professor Gräslund,
the programme for the Lindau Nobel Laureate Meetings is characterised by its variety of formats. Which of the sessions stand out as forums in which the participants are most likely to experience real scientific dialogue in your view?

"The Lindau Meetings are inconceivable without the Laureates' lectures. These have been the keystone of the spirit of Lindau since the outset. The scientific luminaries allow the participants from their specialist fields – and, thanks to the possibilities of modern technology (read: the mediatheque), people all over the world – to partake in their research and in their invaluable life experience as scientists. The laureate lectures clearly stand out for this reason. Over the years, however, new formats have emerged, which specifically foster the integration of young scientists and other participants in the scientific debate. This arises most obviously, of course, in the master classes and discussion sessions, but I would also like to highlight the importance of the panel discussions here. However, the most important dialogue aspect of the meetings, as many young scientists have told me, are the close interactions and discussions they have with the laureates during the more informal afternoon sessions."

@Phil_Baty
Very excited to be attending my first @lindaunobel next week. Outstanding programme with 65 Nobel laureates! #LiNo15
Phil Baty, editor, THE World University Rankings

Professor Blatt,
why did selecting the participants prove a particular challenge this year?

"In the case of the 'normal' Lindau Nobel Laureate Meetings, around 500 to 600 places can be allocated to the top people in the dedicated field. However, with an interdisciplinary meeting, the places have to be divided between three fields. My colleagues from the review panel did not make life easy for themselves when they undertook the task of rigorously selecting from the outstanding applications from all over the world and whittling them down to the 650 young scientists from all corners of the globe who received invitations to Lindau. The Nobel Laureates who have been participating in the Lindau Meetings since the 1990s constantly tell us that the level of the young scientists has increased consistently over the years. I cannot comment on this trend as I attended my first Lindau Meeting in 2010. But I am constantly astounded at the expertise of the young scientists, and I see this as proof of the unadulterated success of our model of close cooperation with our academic partners throughout the world."

Professor Kaufmann,
the 650 young participants at this year's meeting included 32 young scientists of African origin – more than ever before. Why do you view this extension of the participant pool as a source of new opportunities?

"The participation of the African scientists was made possible by a newly established fellowship programme under the auspices of former German Federal President Horst Köhler. It gives these young people the unique opportunity to participate as equals in scientific dialogue with other top scientists from all over the world, and to exchange information about key experiences in their everyday research life. This means that in Lindau we not only spoke 'about' Africa but also 'with' Africa as Horst Köhler himself had called for in an outstanding speech in 2014: 'We must cease with the lectures and judgements, we must learn to listen, we must allow a culture of debate on an equal footing to develop.' The Lindau Nobel Laureate Meetings can contribute to the establishment and development of an international network and to the organisation of cooperation with colleagues beyond national borders. I was touched by how Maxwell Barffour, a post-doc student from Ghana, appealed to his fellow scientists at the end of the Lindau Meeting to support Africa in developing the scientific infrastructure it needs and in counteracting the brain drain. Thanks to such heartfelt appeals, we may within a matter of years be in a position to welcome an African scientist to Lindau who has been awarded the Nobel Prize for his or her research work in Africa."

@Marcia4Science
Yet another superb talk at #LiNo15, by Ada Yonath, on how and why antibiotics work. The Nobel women sure know how to communicate science!
Marcia McNutt, Editor-in-Chief, Science family of journals

@MarsGlobal
We're proud to be a part of an event that fosters scientific dialogue & cross-disciplinary collaborations. #LiNo15
Mars, Incorporated

@ungaakademin
Good advice from Nobel Laureate William Moerner to young scientists – don't forget to have fun! #LiNo15
Young Academy of Sweden

"Alfred Nobel would have loved to be here. I'm sure that meetings of this kind are what he had in mind when he established his prizes to the benefit of mankind."

Carl-Henrik Heldin, Chairman of the Nobel Foundation, Stockholm

Professor Bergström,
you are Secretary of the Nobel Committee for Physics and directly involved in bestowing the Nobel Prize in Physics. Where do you identify the interfaces between the Nobel Prize and the Lindau Meetings?

"As we know, Alfred Nobel founded the Nobel Prize to honour people who 'have conferred the greatest benefit to mankind'. In his speech at the opening of this year's Lindau Meeting, my friend and colleague Professor Carl-Henrik Heldin, Chairman of the Board of the Nobel Foundation, described very aptly the extent to which this legacy is also lived out in Lindau. The scientists honoured with the Nobel Prize come together here with the next generation of scientists and allow the latter to partake in their ideas and visions. The dialogue between the two select groups alone can serve the collective good of humanity. To be able to perform at the highest level, the young scientists need motivation, knowledge and networking, something on which great emphasis is placed in Lindau. I can only echo Heldin's appeal to the young researchers not to be shy and to actively seek out discussion with the laureates. After the meeting, the new insights gained here can not only be incorporated into the young generation's research, they can also be shared with the rest of society. It is true that Alfred Nobel, in his will, only explained carefully how each year new scientific and cultural achievements should be awarded. I am certain, however, that Alfred Nobel would also have been an avid supporter of the Lindau Meetings with their link between past and future generations fostering his ideas."

Professor Kärre,
65 represents a milestone in the history of the Lindau Meetings. How is the meeting positioned for the future in your view?

"Did you know that when you reach 65 here in Sweden, you usually retire? Although the Lindau Nobel Laureate Meetings have reached this milestone, they are further away from retirement than ever. Given the record number of 65 participating Nobel Laureates and the ever-increasing professionalism and internationality of the young scientists, I had the feeling this year, in particular, that the Lindau Meetings are getting younger and younger; a breath of fresh air flowed constantly through the old rooms of the Inselhalle conference venue at Lindau. Of course, such an important anniversary offers the opportunity to pause, look back and reflect on the past. But essentially this only applies to those responsible for the meetings and the returning guests. The young scientists, for whom participation in the meetings is a unique experience, do not waste time on such melancholy musings. They avail themselves of every opportunity to respond with motivation to the solidarity and sheer joy of the stimulating input provided. For this fundamental reason alone, the meetings are extremely lively every year and optimally equipped to continue for the next 65 years."

SCIENTIFIC CHAIRPERSONS OF THE 65TH LINDAU NOBEL LAUREATE MEETING

Lars Bergström
Professor of Theoretical Physics, Stockholm University, and Secretary of the Nobel Committee for Physics, Royal Swedish Academy, Deputy Member of the Board of Directors, Nobel Foundation

Rainer Blatt
Professor of Experimental Physics, University of Innsbruck; Scientific Director, Institute for Quantum Optics and Quantum Information (IQOQI), Austrian Academy of Sciences

Astrid Gräslund
Professor of Biophysics, Stockholm University; former Secretary of the Nobel Committee for Chemistry, Royal Swedish Academy; former Deputy Member of the Board of Directors, Nobel Foundation

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

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

Wolfgang Lubitz
Director, Max Planck Institute for Chemical Energy Conversion, Mülheim/Ruhr

Participants

Nobel Laureates

The commitment of Nobel Laureates to foster the exchange among scientists has been the mainstay of the Lindau Nobel Laureate Meetings ever since their beginnings in 1951. To this day, more than 350 recipients of the esteemed Nobel Prize have followed the annual invitation to meet the next generation of leading scientists at Lindau. For many Nobel Laureates, the Lindau Meetings have become an integral part of their yearly schedule.

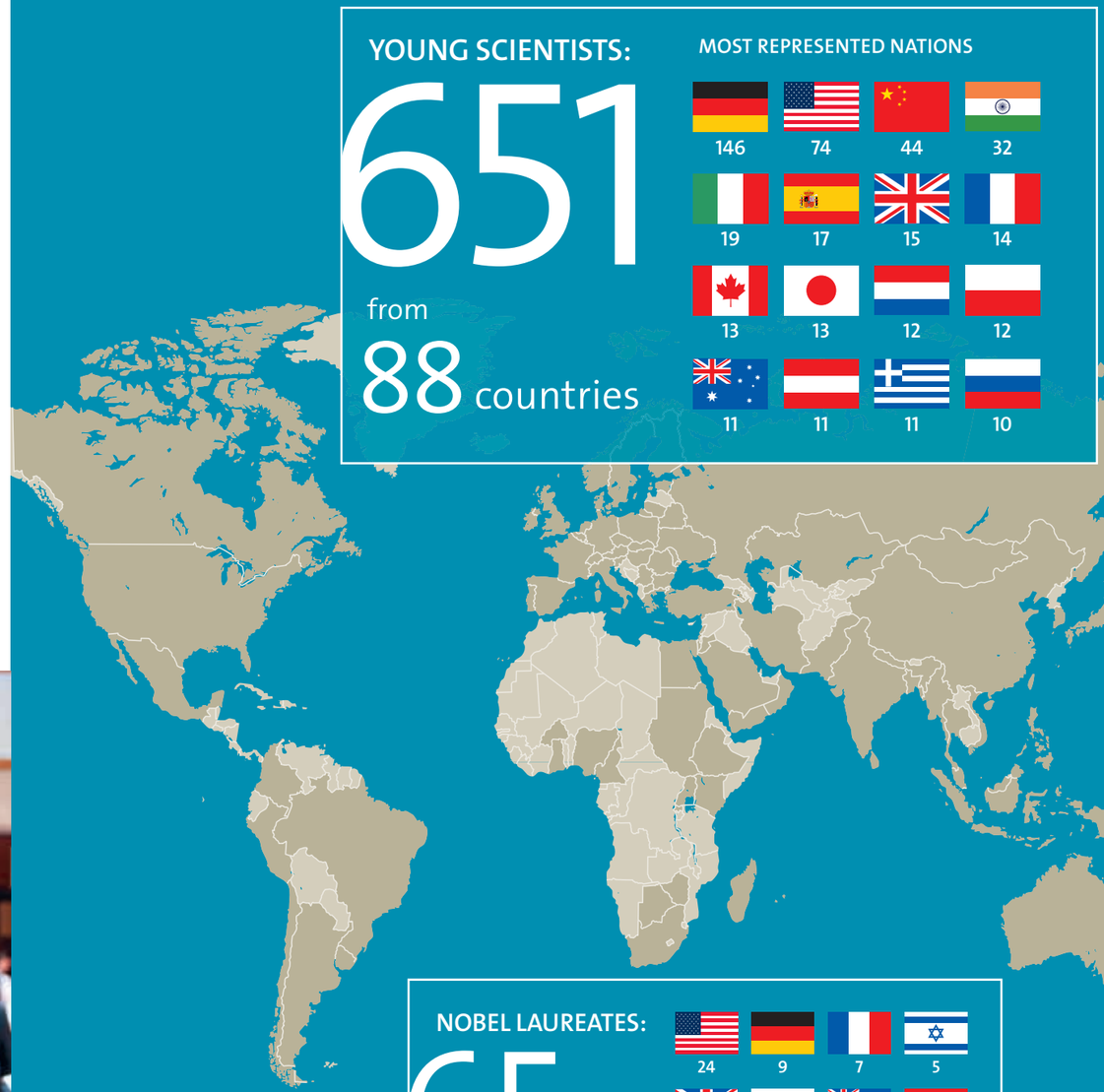
The interdisciplinary Lindau Meetings, taking part every five years, are dedicated to the three Nobel Prize disciplines Physiology or Medicine, Chemistry, and Physics. A record number of 65 laureates followed the invitation to this year's meeting: 63 scientists, Indian Nobel Peace Laureate Kailash Satyarthi, and Nigerian Nobel Literature Laureate Wole Soyinka.

Young Scientists

The opportunity to gather with Nobel Laureates is provided exclusively to outstanding young scientists aged up to 35 – undergraduates, PhD students, and post-doc researchers. In order to participate in a meeting, they have to pass a multi-step application and selection process. For this emerging generation of leading scientists and researchers, it is a valuable opportunity to meet these undisputed role models and mentors, to seek their advice in special technical issues or in personal matters, to exchange thoughts and views, and to discuss current developments in science and beyond.

At the 65th Lindau Meeting, the 651 young scientists from 88 countries represented the scientific fields of medicine, physiology, biology, chemistry, and physics.

Origin of Participants



Peter Agre
Nationality: United States
Nobel Prize: Chemistry
Year: 2003
Prize Motivation: "for the discovery of water channels"

Werner Arber
Nationality: Switzerland
Nobel Prize: Physiology or Medicine
Year: 1978
Prize Motivation: "for the discovery of restriction enzymes and their application to problems of molecular genetics"

Françoise Barré-Sinoussi
Nationality: France
Nobel Prize: Physiology or Medicine
Year: 2008
Prize Motivation: "for the discovery of human immunodeficiency virus"

Eric Betzig
Nationality: United States
Nobel Prize: Chemistry
Year: 2014
Prize Motivation: "for the development of super-resolved fluorescence microscopy"

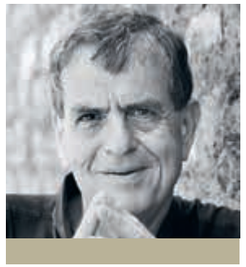
Bruce A. Beutler
Nationality: United States
Nobel Prize: Physiology or Medicine
Year: 2011
Prize Motivation: "for discoveries concerning the activation of innate immunity"

J. Michael Bishop
Nationality: United States
Nobel Prize: Physiology or Medicine
Year: 1989
Prize Motivation: "for the discovery of the cellular origin of retroviral oncogenes"

Elizabeth H. Blackburn
Nationality: Australia/United States
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: United States
Nobel Prize: Chemistry
Year: 2008
Prize Motivation: "for the discovery and development of the green fluorescent protein, GFP"

Steven Chu
Nationality: United States
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"

Claude Cohen-Tannoudji
Nationality: France
Nobel Prize: Physics
Year: 1997
Prize Motivation: "for development of methods to cool and trap atoms with laser light"

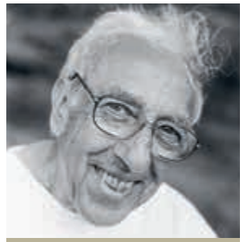
James W. Cronin
Nationality: United States
Nobel Prize: Physics
Year: 1980
Prize Motivation: "for the discovery of violations of fundamental symmetry principles in the decay of neutral K-mesons"

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"

François Englert
Nationality: Belgium
Nobel Prize: Physics
Year: 2013
Prize Motivation: "for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles, and which recently was confirmed through the discovery of the predicted fundamental particle, by the ATLAS and CMS experiments at CERN's Large Hadron Collider"

Gerhard Ertl
Nationality: Germany
Nobel Prize: Chemistry
Year: 2007
Prize Motivation: "for studies of chemical processes on solid surfaces"

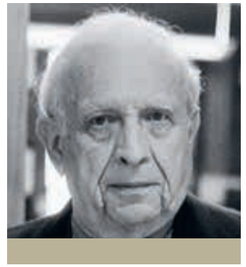
Albert Fert
Nationality: France
Nobel Prize: Physics
Year: 2007
Prize Motivation: "for the discovery of Giant Magnetoresistance"



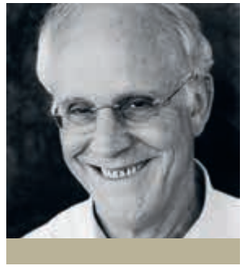
Edmond H. Fischer
Nationality: United States
Nobel Prize: Physiology or Medicine
Year: 1992
Prize Motivation: "for discoveries concerning reversible protein phosphorylation as a biological regulatory mechanism"

Ivar Giaever
Nationality: Norway
Nobel Prize: Physics
Year: 1973
Prize Motivation: "for experimental discoveries regarding tunneling phenomena in semiconductors and superconductors, respectively"

Walter Gilbert
Nationality: United States
Nobel Prize: Chemistry
Year: 1980
Prize Motivation: "for contributions concerning the determination of base sequences in nucleic acids"



Roy J. Glauber
Nationality: United States
Nobel Prize: Physics
Year: 2005
Prize Motivation: "for the contribution to the quantum theory of optical coherence"



David J. Gross
Nationality: United States
Nobel Prize: Physics
Year: 2004
Prize Motivation: "for the discovery of asymptotic freedom in the theory of the strong interaction"

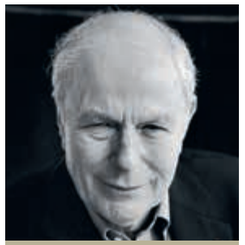
John L. Hall
Nationality: United States
Nobel Prize: Physics
Year: 2005
Prize Motivation: "for the contributions to the development of laser-based precision spectroscopy, including the optical frequency comb technique"

Theodor W. Hänsch
Nationality: Germany
Nobel Prize: Physics
Year: 2005
Prize Motivation: "for the contributions to the development of laser-based precision spectroscopy, including the optical frequency comb technique"

Serge Haroche
Nationality: France
Nobel Prize: Physics
Year: 2012
Prize Motivation: "for ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems"

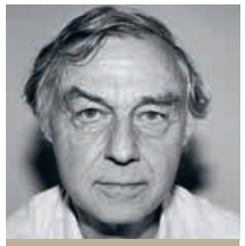
Harald zur Hausen
Nationality: Germany
Nobel Prize: Physiology or Medicine
Year: 2008
Prize Motivation: "for the discovery of human papilloma viruses causing cervical cancer"

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



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

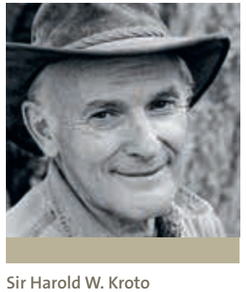
Jules A. Hoffmann
Nationality: France
Nobel Prize: Physiology or Medicine
Year: 2011
Prize Motivation: "for discoveries concerning the activation of innate immunity"



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

Brian D. Josephson
Nationality: United States
Nobel Prize: Physics
Year: 1973
Prize Motivation: "for theoretical predictions of the properties of a supercurrent through a tunnel barrier, in particular those phenomena which are generally known as the Josephson effects"

Klaus von Klitzing
Nationality: Germany
Nobel Prize: Physics
Year: 1985
Prize Motivation: "for the discovery of the quantisised Hall effect"



Sir Harold W. Kroto
Nationality: United Kingdom
Nobel Prize: Chemistry
Year: 1996
Prize Motivation: "for the discovery of fullerenes"

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

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

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

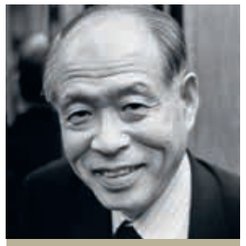
William E. Moerner
Nationality: United States
Nobel Prize: Chemistry
Year: 2014
Prize Motivation: "for the development of super-resolved fluorescence microscopy"

Luc Montagnier
Nationality: France
Nobel Prize: Physiology or Medicine
Year: 2008
Prize Motivation: "for the discovery of human immunodeficiency virus"

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

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

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



Ryoji Noyori
Nationality: Japan
Nobel Prize: Chemistry
Year: 2001
Prize Motivation: "for the work on chirally catalysed hydrogenation reactions"

Saul Perlmutter
Nationality: United States
Nobel Prize: Physics
Year: 2011
Prize Motivation: "for the discovery of the accelerating expansion of the Universe through observations of distant supernovae"

William D. Phillips
Nationality: United States
Nobel Prize: Physics
Year: 1997
Prize Motivation: "for development of methods to cool and trap atoms with laser light"

Venkatraman Ramakrishnan
Nationality: United States/ United Kingdom
Nobel Prize: Chemistry
Year: 2009
Prize Motivation: "for studies of the structure and function of the ribosome"

Sir Richard J. Roberts
Nationality: United Kingdom
Nobel Prize: Physiology or Medicine
Year: 1993
Prize Motivation: "for the discoveries of split genes"

Carlo Rubbia
Nationality: Italy
Nobel Prize: Physics
Year: 1984
Prize Motivation: "for decisive contributions to the large project, which led to the discovery of the field particles W and Z, communicators of weak interaction"

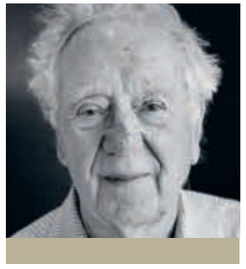
Bert Sakmann
Nationality: Germany
Nobel Prize: Physiology or Medicine
Year: 1991
Prize Motivation: "for discoveries concerning the function of single ion channels in cells"

Kailash Satyarthi
Nationality: India
Nobel Prize: Peace
Year: 2014
Prize Motivation: "for the struggle against the suppression of children and young people and for the right of all children to education"

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

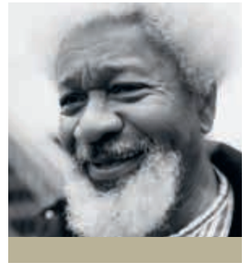
Dan Shechtman
Nationality: Israel
Nobel Prize: Chemistry
Year: 2011
Prize Motivation: "for the discovery of quasicrystals"

Hamilton O. Smith
Nationality: United States
Nobel Prize: Physiology or Medicine
Year: 1978
Prize Motivation: "for the discovery of restriction enzymes and their application to problems of molecular genetics"



Oliver Smithies
Nationality: United Kingdom
Nobel Prize: Physiology or Medicine
Year: 2007
Prize Motivation: "for the discoveries of principles for introducing specific gene modifications in mice by the use of embryonic stem cells"

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

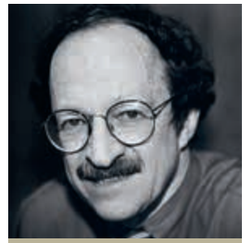


Wole Soyinka
Nationality: Nigeria
Nobel Prize: Literature
Year: 1986
Prize Motivation: "who in a wide cultural perspective and with poetic overtones fashions the drama of existence"

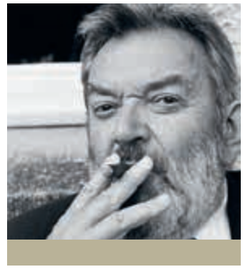
Jack W. Szostak
Nationality: United States
Nobel Prize: Physiology or Medicine
Year: 2009
Prize Motivation: "for the discovery of how chromosomes are protected by telomeres and the enzyme telomerase"

Susumu Tonegawa
Nationality: Japan
Nobel Prize: Physiology or Medicine
Year: 1987
Prize Motivation: "for the discovery of the genetic principle for generation of antibody diversity"

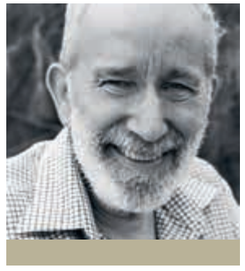
Roger Y. Tsien
Nationality: United States
Nobel Prize: Chemistry
Year: 2008
Prize Motivation: "for the discovery and development of the green fluorescent protein, GFP"



Harold E. Varmus
Nationality: United States
Nobel Prize: Physiology or Medicine
Year: 1989
Prize Motivation: "for the discovery of the cellular origin of retroviral oncogenes"

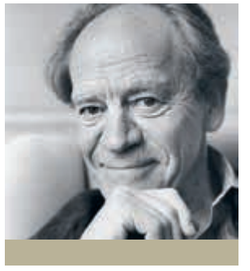


Martinus J.G. Veltman
Nationality: Netherlands
Nobel Prize: Physics
Year: 1999
Prize Motivation: "for elucidating the quantum structure of electroweak interactions in physics"

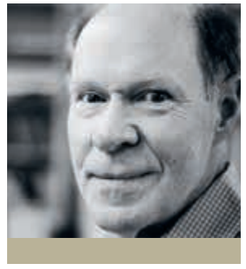


J. Robin Warren
Nationality: Australia
Nobel Prize: Physiology or Medicine
Year: 2005
Prize Motivation: "for the discovery of the bacterium Helicobacter pylori and its role in gastritis and peptic ulcer disease"

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



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



Robert W. Wilson
Nationality: United States
Nobel Prize: Physics
Year: 1978
Prize Motivation: "for the discovery of cosmic microwave background radiation"

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

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

The mediatheque contains profiles of more than 400 Nobel Laureates.

"I had all my good ideas when I was young. Now the best ideas are not my ideas but those of the young people I work with."

William D. Phillips, Nobel Laureate in Physics 1997

The Courage to Venture Beyond: Of Polymaths and Multidisciplinarians

The challenges and opportunities of interdisciplinary research were central at the 65th Lindau Meeting. Do we need polymaths in today's world of highly specialised science? This essay investigates this question and shares some of the advice and experiences of Nobel Laureates who have crossed the traditional boundaries of disciplines.

"Focus! Focus! Focus! Create a narrow area of scientific expertise in which you excel and develop a national or international reputation for excellence!" Established scientists often share this sort of advice with their younger peers who are about to embark on their academic career. It isn't a bad advice and I have known many scientists who have succeeded in academia by following it. A scientist with too broad of an area of scientific expertise or too many distinct scientific interests may drown in the ocean of newly generated knowledge. Being engaged in a broad array of research questions may take up so much effort that it leaves little time and resources to dig deeply and unearth high-impact knowledge in any one area.

Yet there are a number of scientists who forsake this traditional path. Such a scientist may start out studying protein X in a cell but after discovering that biomechanical forces regulate the levels of protein X, shift the focus of her research to cellular biomechanics. Her work on biomechanics may then lead to the engineering of novel devices and tools to control biomechanical forces and even address fundamental questions about the validity of applying physical concepts of force and tension to biological systems. Such a multidisciplinary path comes with a greater risk of failure because the scientist will not have any circumscribed area of expertise on which to build an academic reputation and because every transition from one discipline to another requires that the scholar devote an extraordinary amount of effort to acquiring skills and knowledge in the new discipline. But the potential for ground-breaking discoveries is also greater because the scholar's checkered background and intellectual diversity could lead to a cross-fertilisation of ideas from various disciplines and create a whole new area of research.

Polymaths and Multidisciplinarians

According to the Oxford English Dictionary, the expression "polymath" refers to "a person of great or varied learning; a person acquainted with many fields of study; an accomplished scholar". This is a rather broad definition which does not give any specific guidelines as to what qualifies as being "acquainted with many fields of study". Does one need formal academic training in multiple areas of study to be considered a polymath? Is it a requirement to make original and creative contributions to multiple disciplines? Perhaps even garner national and international recognition?

When prompted to name individuals who are polymaths, people educated in the European tradition often associate "polymaths" with the Renaissance because that era symbolises the integration of the arts, humanities and sciences. "Renaissance man" is commonly used as a synonym for polymath. Leonardo da Vinci (1452–1519) is a prime example of such a polymath, known not only for his paintings such as The Last Supper and the Mona Lisa, but also his numerous inventions and innovative designs of flying machines as well as his extensive anatomical studies based on the dissection of human corpses.

The German poet Johann Wolfgang von Goethe (1749–1832) is also a front-runner in the pantheon of polymaths because of his interests in geology, palaeontology and optics. During his lifetime, Goethe assembled one of the largest collections of rocks, minerals and fossils ever owned by an individual person, consisting of 18,000 specimens! Even though he is revered as the greatest poet of the German language, Goethe's longest published work is his treatise on a theory of colour, the Farbenlehre. He devoted two decades of his life to studying light and he thought that this 1000-page tome would be his most meaningful contribution to humankind.

Goethe and da Vinci are excellent examples of the creative synergy that arises when individuals are actively engaged in multiple disciplines. Are the da Vincis and Goethes anachronisms of the past? Many of us still revere the brilliance of the individual who straddles and demonstrates excellence in multiple disciplines and we continue to recognise the value of new knowledge and creative ideas that are formed when supposedly distinct disciplines converge. But we also need to recognise that the nature of knowledge is changing.

Our bar for what is an acceptable scholarly contribution today is very different from what it was five centuries ago. Peer review in its current form may have its flaws but it does prevent individuals from pontificating about scholarly topics based on idiosyncratic standards and whims. If Goethe had spent two decades studying the nature of light and colour today, we would expect him to regularly present his findings at conferences, publish peer reviewed abstracts and papers, and solicit critical input from other scientists at every stage of his work to test whether it was truly up to par.

Because of the dizzying growth of knowledge and technologies available to the modern scholar, most contemporary scientific research is conducted by individuals who are members of teams, in which each team member has years or even decades of training to achieve the required level of mastery. This shift in the nature of how we generate knowledge in order to accommodate the growing complexity of scholarly knowledge also requires that we rethink our veneration of the age-old "polymath", a person who as an individual achieves recognition and fame in a multitude of disciplines. A more apt term for today's polymath may be a "multidisciplinarian", an individual who is actively engaged in multiple scholarly, artistic or creative disciplines either as an individual or as a member of multidisciplinary teams.

Martin Chalfie received the 2008 Nobel Prize in Chemistry for discovering and developing green fluorescent protein and is a great example of a contemporary multidisciplinarian. He sees himself as a neurogeneticist, but routinely collaborates with physicists, engineers, biologists and physicians to study sensors. "I should emphasise that I have not become an expert in each of these areas. In fact, one of the terrific consequences of working in several different areas is that I get to learn from and work with other scientists," he says in an essay for the official blog of the Lindau Meetings..

Using a newer expression such as multidisciplinarian may also help remove some of the other connotations associated with the polymath. The historical association of polymaths

@maxplanckpress
"Interdisciplinarity either gets you the Nobel Prize or it gets you lost." Sybille Anderl kicking off panel discussion with Stefan Hell. #LiNo15
Max Planck Society

@MinuDTizabi
Moerner at #LiNo15: "Interdisciplinarity is not wrong, but you students should learn at least one field deeply!"
Minu D. Tizabi, University of Heidelberg, Germany

"Should scientists be deep or broad in their training and their science? As with everything else, they should pick what they feel most comfortable with, and having a mix of approaches is probably best."

Martin Chalfie, Nobel Laureate in Chemistry 2008

with the Renaissance also links it to an age of patriarchy in which men but not women were considered to be scholars. The expression "Renaissance man" as a synonym for polymath reminds us of this gender bias. When the staff of the British magazines The Economist and Intelligent Life profiled 20 contemporary polymaths, they did not include a single woman on the list. Merely switching from the expression "polymath" to "multidisciplinarian" is obviously not going to change existing prejudices or biases but it symbolises that a contemporary view of multidisciplinarity ought to be more inclusive and take into account a team-based approach to scholarly endeavours.

The Cornerstones of Multidisciplinarity: Courage and Humility

How do we define multidisciplinarity today? The very nature of multidisciplinarity defies a precise definition, but a key feature of multidisciplinarity is the active engagement in scholarly, artistic or creative endeavours involving multiple disciplines. Active is the key word here. We would probably not consider a molecular biologist that enjoys watching TV documentaries about quantum physics and listens to classical music a multidisciplinarian. A more active engagement would take the form of conducting experiments, presenting papers or performing on stage. Such active engagement also comes with the risk of rejection and failure. This brings us to one of the key characteristics of a multidisciplinarian: courage.

By leaving the beaten path, the multidisciplinarian will invariably find herself in a situation where she is a novice. Physicists who embark on studies of epigenetic regulation in cells, mathematicians who begin writing poetry or physicians who engineer novel devices not only have to learn a whole new set of skills, they also have to confront doubts that some of their specialist colleagues have regarding their qualifications. More established peers with narrow areas of expertise may reject the ideas of the multi-disciplinarian because these are plain naïve, or because they are too far ahead of their time. Physicians who work as basic scientists are often plagued by self-doubt, not knowing whether they can achieve true excellence in medicine and science. The intellectual curiosity and restlessness which triggers the desire

to venture beyond the boundaries of one's primary discipline can only be sustained with a strong measure of courage and at times even over-confidence to overcome the inevitable episodes of disappointment, rejection and failure. On the other, it is equally important that this courage and over-confidence not turn into arrogance. The courage of a multidisciplinarian has to be paired with the humility of recognising one's own limitations and seeking appropriate guidance in order to overcome these limitations.

The physicist Steven Chu is a multidisciplinarian who epitomises both courage and humility. He received the Nobel Prize for Physics in 1997 for developing methods to cool and trap atoms with laser light, but the breadth of his research interests are astonishing. Chu has introduced methods to visualise and manipulate single biomolecules, measure the force on actin filaments inside a cell and the mechanisms of how ribosomes "proofread" to ensure the accuracy of translated proteins, all in collaboration with biologists and physiologist from all around the world. One of the most remarkable demonstrations of his courage to take on new challenges was when he became the U.S. Secretary of Energy in 2009. Despite his extraordinary successes in so many disciplines, he retains a core sense of humility and says "I have been a scattered dilettante for my entire life".

@naturejobs
Impressions from #LiNo15: follow passions, #academia success=single-minded focus, #scicomm is important, #collaborate, #scientists are human!
naturejobs.com

@sandeeprtweets
"I'm not here to make you comfortable. I'm here to make you think." Harold Kroto at #LiNo15
Sandeep Ravindran, freelance science writer, New York, USA

Encouraging Multidisciplinarity in a Scientific Laboratory
As appealing as the idea of multidisciplinarity may sound, implementing it in a contemporary scientific environment can be challenging. It takes years of meticulously designed experiments to address specific scientific questions. How can one afford to vacillate between scientific disciplines, arts and humanities and still end up with tangible, defined scientific results?

Eric Betzig is a physicist who received the 2014 Nobel Prize in Chemistry for his ground-breaking work on super-resolution microscopy which has allowed biologists to study the interactions of individual protein molecules inside a cell. Betzig clarifies that multidisciplinary scientific work does not mean giving up focus. Instead, periods of intense focus alternate with periods of searching for inspiration from other disciplines.

"In my personal experience, it has been valuable at certain times of my life to seek out information and ideas across disciplines, and at other times to focus monomaniacally in isolation on a single problem. The former is necessary to make sure I choose the right problem and have the right tools at my disposal, and the latter is necessary to force both my conscious and sub-conscious mind to give 100% effort to finding an answer", he says.

Each multidisciplinary scientist has to develop her own path to grapple with the challenges of multidisciplinary work and many scientists may find a more focused scientific career more appealing than the life of a "scattered dilettante". In my own cell biology laboratory, we try to foster multidisciplinary thinking without necessarily forcing it onto lab members. At the end of a weekly laboratory meeting in which experimental data is presented, we devote a brief period of time to discussing a book (fiction or non-fiction) that a lab member has recently read, sharing haikus that the students have written about their research or touching on philosophical questions. These are not meant to be exhaustive discussions but just serve as gentle nudges that it may be fun to engage in various creative and intellectual enterprises outside of cell biology. I do not have any hard evidence that there is a tangible benefit of encouraging graduate students to write haikus or read books outside of science. The students learn to appreciate the power of language, imagery and metaphors. Distilling the essence of their research project down to a three verse haiku may also help them remember the "big picture" of their respective projects. The most important feedback I received from the students is that they enjoy venturing beyond the boundaries of disciplines. This matters to me because the joy of discovery and playful tinkering is the essence of science?

Jalees Rehman

LONGREADS IN THE BLOG
This essay's author Jalees Rehman is a stem cell biologist, cardiologist and Associate Professor of Medicine and Pharmacology at the University of Illinois at Chicago (UIC). He is also a science blogger for the Scilogs blogging network – and for the official blog of the Lindau Nobel Laureate Meetings. Rehman regularly posts "longreads" – in-depth reflections on science and society topics that stimulate online debates.

lindau-nobel.org/blog

"In my personal experience, it has been valuable at certain times of my life to seek out information and ideas across disciplines, and at other times to focus monomaniacally in isolation on a single problem."

Eric Betzig, Nobel Laureate in Chemistry 2014

Impressions

Françoise Barré-Sinoussi

Richard J. Roberts

David J. Gross

Oliver Smithies

Peter Agre

Ada Yonath

Ryoji Noyori

Academic Partners

The Lindau Meetings cooperate closely with more than 200 renowned science and research institutions worldwide to identify the most qualified participants. The academic partner network is a mainstay of the application and selection process.

Academies of science, leading universities, research institutions, foundations, and innovative enterprises throughout the world are entitled to nominate young scientists for participation in the Lindau Meetings. 107 of these academic partners were involved in the application process concerning the 65th Lindau Meeting.

In general, young scientists have to be nominated by an official academic partner institution in order to be able to apply for participation. Only by way of exception may applicants use the open application process and submit their application directly to the Council, for example if they are studying or performing research in a country where the Lindau Meetings do not yet have an academic partner.

The network is continuously being expanded. By means of memoranda of understanding, both sides commit themselves to connect and promote aspiring young scientists and thus disseminate Lindau's "Mission Education" worldwide. The academic partners are trustees of the constant pursuit of excellence at the Lindau Meetings – and they are beneficiaries of this process themselves.

Partnership sealed:
Thomas Auf der Heyde, Deputy Director-General of the Academy of Science of South Africa, Nikolaus Turner, Countess Bettina Bernadotte, Wolfgang Schürer, and Horst Köhler, former Federal President of Germany, patron of the Horst Köhler Fellowship Programme for African scientists (from left)

PARTNERSHIPS 2015

In 2015, the Lindau Meetings have agreed to establish or renew official partnerships with the following institutions:

Academy of Science of South Africa

Academy of Sciences Malaysia

African Academy of Sciences

CERN, European Organization for Nuclear Research

Croucher Foundation

Department of Science & Technology (Government of India)

Foundation for Polish Science

Human Frontier Science Program (HFSPO)

ICREA (Catalan Institution for Research and Advanced Studies)

Spanish National Research Council

Lomonosov Moscow State University and the Russian Rectors Union (for all Russian Universities)

Saint-Petersburg State University

Mexican Academy of Sciences

Mongolian Academy of Sciences

Organization of Islamic Cooperation (OIC), Ministerial Standing Committee on Scientific and Technological Cooperation

The Government of the Principality of Liechtenstein

The Norwegian Academy of Science and Letters

The Research Council of the Sultanate of Oman

University of Malta

Application Process

REQUIREMENTS

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

Top 5 % of Class
Recommendations

APPLICATION

Web-Based
2 Procedures

Regular:

Nomination by Academic Partners (internal selection)

Exceptional:

Open Application (if no academic partner is responsible)

EVALUATION & SELECTION

Review Panel of the Council
400–650 participants (depending on meeting type)

PARTICIPATION

One-time only
Supported Through Fellowships

ALUMNI COMMUNITY

25,000 FORMER PARTICIPANTS SINCE 1951

Academic Partners of the 65th Lindau Nobel Laureate Meeting

Academy of Finland
Academy of Sciences Malaysia
acatech – National Academy of Science and Engineering, Germany
African, Caribbean and Pacific Group of States (ACP)
Albert-Ludwigs-Universität Freiburg
Alexander S. Onassis Public Benefit Foundation, Greece
Alexander von Humboldt-Stiftung
Bangladesh Academy of Sciences
Bavarian Academy of Sciences and Humanities
Bergische Universität Wuppertal
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
Centre for the AIDS Programme of Research in South Africa (CAPRISA)
Centre National de la Recherche Scientifique (CNRS)
CERN European Organization for Nuclear Research
Charité – Universitätsmedizin Berlin
Chilean Academy of Sciences
Croucher Foundation, Hong Kong
Danish Council for Independent Research
Department of Science & Technology, Government of India
Department of Science and Technology, South Africa
Deutsche Bundesstiftung Umwelt
Deutsche Telekom Stiftung
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)
Eberhard Karls Universität Tübingen
Elite Network of Bavaria
Else Kröner-Fresenius-Stiftung (EKFS)
EMBO
Ernst-Moritz-Arndt-Universität Greifswald
Estonian Academy of Sciences
European Commission
European Molecular Biology Laboratory (EMBL)
European Science Foundation (ESF)
European Students' Conference
Federation of European Biochemical Societies (FEBS)
Fondation Jean Félicien Gacha
Fondazione Cariplo, Italy
Forman Christian College, Pakistan
Foundation for Polish Science
Fraunhofer-Gesellschaft
Freie Universität Berlin
Friedrich Schiller University Jena
Friedrich-Alexander Universität Erlangen-Nürnberg
Georg-August-Universität Göttingen
Gerhard C. Starck Stiftung
German Academic Exchange Service (DAAD)
German National Academy of Sciences Leopoldina
Global Young Academy (GYA)
Goethe University Frankfurt am Main
Göttingen Graduate School for Neurosciences, Biophysics, and Molecular Biosciences (GGNB)
Heidelberg University
Heinrich-Heine-Universität Düsseldorf
Helmholtz Association of German Research Centres
Human Frontier Science Program
Humboldt-Universität zu Berlin
Hungarian Academy of Sciences
ICREA (Catalan Institution for Research and Advanced Studies)
Industrie-Club e.V. Düsseldorf
Internationale Bodensee-Hochschule
Jacobs University Bremen
Japan Society for Promotion of Science (JSPS)
Johannes Gutenberg University Mainz
Johns Hopkins University School of Medicine
Justus Liebig University Giessen
Karlsruhe Institute of Technology (KIT)
King Abdullah University of Science and Technology, Saudi Arabia
King Saud University – Ministry of Higher Education, Saudi Arabia
Klaus Tschira Stiftung gGmbH
Körber Foundation
Laureate Education, Inc.
Leibniz Association
Leipzig University
Linde AG
Ludwig-Maximilians-University
Luxembourg National Research Fund (FNR)
Mars, Incorporated
Martin Luther University Halle-Wittenberg
Max Planck Institute for Biophysical Chemistry
Max-Planck-Gesellschaft
McKinsey & Company, Inc.
Mexican Academy of Sciences
Microsoft Corporation

Partnership renewed:
Johanna Wanka, German Federal Minister of Education and Research, Nikolaus Turner, Arabinda Mitra, Indian Department of Science and Technology, Harsh Vardhan, Indian Minister of Science and Technology

Partnership renewed:
Jaime Urrutia-Fucugauchi, President of the Mexican Academy of Sciences, (from right), Countess Bettina Bernadotte, and Wolfgang Schürer

Jaume Bertranpetit (left),
director of ICREA (Catalan Institution for Research and Advanced Studies)

Academic Partners of the 65th Lindau Nobel Laureate Meeting

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

Ministry of Foreign Affairs and International Cooperation, Botswana

Ministry of Science & Technology (MOST), Taiwan

Mongolian Academy of Sciences

Myanmar Book Centre Co., Ltd.

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

National Academy of Sciences of Uruguay

National Fund for Scientific Research, Belgium

National Research Foundation Singapore

National Science and Technology Development Agency, Thailand

Novartis

OIC Standing Committee on Scientific and Technological Cooperation (COMSTECH)

ORAU (Oak Ridge Associated Universities)

Österreichische Akademie der Wissenschaften

Otto-von-Guericke Universität Magdeburg

Pakistan Institute of Engineering and Applied Sciences

Philipps-Universität Marburg

Robert Bosch Stiftung

Royal Netherlands Academy of Arts and Sciences

Ruhr-Universität Bochum

RWTH Aachen University

Saint-Petersburg State University, Russia

Sciences Academy of Lisbon

Sharif University of Technology, Iran

Siemens AG

Sino-German Center for Research Promotion, China

Slovenian Academy of Sciences and Arts

Spanish National Research Council (CSIC)

Studienstiftung des deutschen Volkes

Swiss Re Ltd.

Technical University Darmstadt

Technische Universität Braunschweig

Technische Universität Chemnitz

Technische Universität Dresden

Technische Universität Kaiserslautern

Technische Universität München

The Australian Academy of Science

The Czech Academy of Sciences (CAS)

The Irish Research Council

The Korean Academy of Science and Technology (KAST)

The Lithuanian Academy of Sciences

The Nobel Foundation

The Norwegian Academy of Science and Letters

The Research Council, Oman

The Royal Society, UK

TU Dortmund

TÜBITAK, Turkey

TWAS – The World Academy of Sciences – for the advancement of science in developing countries

Ulm University

Universidad de los Andes, Colombia

Universität Bayreuth

Universität des Saarlandes

Universität Duisburg-Essen

Universität Osnabrück

Universität Paderborn

University Medical Center Hamburg-Eppendorf

University of Augsburg

University of Bonn

University of Cologne

University of Hamburg

University of Kassel

University of Liechtenstein

University of Lübeck

University of Malta

University of Paderborn

University of Regensburg

University of Rostock

University of Stuttgart

University of Würzburg

Verband der Chemischen Industrie e.V. (VCI)

Verein Deutscher Ingenieure e.V. (VDI)

Volkswagen Aktiengesellschaft

VolkswagenStiftung

Weizmann Institute of Science, Israel

Westfälische Wilhelms-Universität Münster

Wilhelm Sander-Stiftung

Zukunftskolleg, University of Konstanz

The nomination process in Germany was conducted in cooperation with the following academic faculty associations, serving as the national academic partner in their discipline:

Medizinischer Fakultätentag der Bundesrepublik Deutschland e.V. (MFT)

Mathematisch-Naturwissenschaftlicher Fakultätentag (MNFT)

The Croucher Foundation, represented by Director David Foster (right), serves as an academic partner in Hong Kong.

The Norwegian Academy of Science and Letters was represented by Secretary General Øivind Andersen (left).

Prime Minister Adrian Hasler (left) signed the agreement for the Principality of Liechtenstein.

Focus Africa

The Horst Köhler Fellowship Programme

With the Horst Köhler Fellowship Programme more young scientists from Africa than ever before were enabled to participate in the 65th Lindau Meeting. Former German Federal President Horst Köhler is the patron of this initiative of the Lindau Meetings launched in 2015. The programme is funded by Robert Bosch Stiftung and will be substantially expanded in the coming years.

For all 32 young African scientists who met the selection criteria and successfully mastered the application process, the participation fee as well as all travel expenditures were fully covered by the fellowship programme. The selected Africans represented the emerging generation of leading scientists and researchers of their respective countries.

The participants from Africa had the opportunity to exchange their experiences with Horst Köhler personally at a joint "Africa Outreach Breakfast" during the Lindau Meeting. They were joined by Nobel Laureate Francoise Barré-Sinoussi, who is strongly involved in efforts to improve research conditions in Africa, and the meeting´s scientific co-chair Stefan Kaufmann.

Former German Federal President Horst Köhler with African young scientists

Group picture of the Horst-Köhler-Fellows

Press Talk

At the 65th Lindau Meeting, the press talk "African Science: Today and Tomorrow" revolved around the questions "How will Africa take its place in a global knowledge economy?", "What are Africa's scientific strengths and weaknesses?", and "How can research in African countries be enhanced, and exploited for local benefit?".

Panellists
- Peter Agre, Nobel Laureate in Chemistry 2003, Director at the Johns Hopkins Malaria Research Institute, Baltimore, USA
- Melinda Barkhuizen, North-West University, Potchefstroom, South Africa
- Françoise Barré-Sinoussi, Nobel Laureate in Physiology or Medicine 2008, Département de Virologie, Institut Pasteur, France
- Serge Fobofou, Leibniz Institute of Plant Biochemistry, Halle, Germany
- Prosper Ngabonziza, University of Twente, Netherlands

Moderator
Jon Turney, science writer and editor, United Kingdom

Press Talk "African Science: Today and Tomorrow": Peter Agre, Françoise Barré-Sinoussi, Serge Fobofou, Melinda Barkhuizen, Prosper Ngabonziza, and Jon Turney

TV Talk

As one of the official media partners of the Lindau Nobel Laureate Meetings, Germany's national public service educational TV channel ARD-alpha broadcasted a high-profile panel discussion recorded at Lindau: "Africa – Mere Subject or Designer of Top-Level Research?". This "alpha-Forum extra" focused on the opportunities and challenges for young African scientists.

Panellists
- Thomas Baden, German Centre for Integrative Neuroscience, Tübingen, and Founder and Director of the NGO "TReND in Africa", participant in the 61st Lindau Meeting
- Maxwell Barffour, Johns Hopkins University, Baltimore, USA, participant in the 65th Lindau Meeting
- Hartmut Michel, Nobel Laureate in Chemistry 1988, Director at the Max Planck Institute of Biophysics, Frankfurt/Main, Germany
- Günter Nooke, Personal Representative of the German Chancellor for Africa, German Federal Ministry for Economic Cooperation and Development

Moderator
Iska Schreglmann, science journalist, Bayerischer Rundfunk (Bavarian Broadcasting)

ARD-alpha Forum extra: Günter Nooke, Maxwell Barffour, Iska Schreglmann, Thomas Baden, Hartmut Michel

When Survival is Learning Enough

In his lecture, Nobel Literature Laureate Wole Soyinka gave an alarming account of the devastating attack on civilisation perpetrated by Islamist extremists in Nigeria. He praised the great good of education and called for the defence of humanity's values.

I have been asked to speak about education in Africa and that is exactly what I propose to do. So, let me take you through a few learning environments, beginning with perhaps the most exotic. I invite you to follow me to my favourite foraging grounds, which is the nearest forested patch of land. We are tracking some animal spoors. Eventually, to our amazement, they lead to what looks like an abandoned human habitation. It is completely overgrown – inside and out. The roof has collapsed over tottering walls but you find an opening and, lo and behold, you are treading on cement floors, albeit cracked and potholed. There are semblances of rudimentary chairs, benches, desks, a blackboard and then, as you raise your head, your gaze fastens on a few newspaper clippings. When you open a drawer beneath the desk, you discover a class register.

No question about it, you are in an abandoned classroom. Abandoned? Not quite. The newspaper clipping indicates that there was human occupation barely three weeks earlier. Then you recall it is vacation time, the rainy season when weeds grow fast even within roofed enclosures when generously watered by rain through the gaping roofs, doors, and windows. There are animal droppings on the floor however, and so – to terminate your detective ruminations – it becomes clear that though you are in a classroom, it is one that is also shared by some quadrupeds. The pupils move out and – the animals move in.

An extreme case, without doubt, but true in every detail, as I can personally testify. When I am out in the forest seeking game, I have grown accustomed to stumbling on abandoned classrooms. Such learning environments are increasingly commonplace in many parts of the continent, especially in war ravaged zones, including even territories which are not even at war with any external enemy, not embroiled in an internal civil war, but find themselves victims of doctrinaire ideologies that a victim generation – the Malalas of the world – have come to typify.

Let us move to the more humanised scenarios, fortunately also prevalent, institutions which are well above the marker of what we would call the norm for any learning environment. We are speaking now of schools with facilities such as libraries and laboratories, where it is possible for pupils to experiment and innovate.[...]

On to our third scenario, and a greater contrast to the first would be difficult to conceive, this being nothing less than what we might call the Etonian transplant – after the famous public school in England – Eton, or its rival, Harrow. Now this is an unabashed study in alienation psychology. Within that setting, one feels transported to exotic places, remote from any African environment. Coat, tie, school blazers made of worsted wool under the tropical sun, a mini- United Nations of expatriate staff – British, Indian, French, German etc. [...] Yes, this also exists, and within that same town of mine, Abeokuta, where our commencing model will be found. These – and others like it – are privately owned, and most notoriously by former rulers who presided over the decay that we began by describing.[...]

There is still one model of interest, one that has featured directly or indirectly in the current blight on educational development on the continent, and is tragically bound – as I hinted earlier – to that very model of destitution with which we commenced. This final model is known as the – madrassa. In some cases, it is still situated as the core of that ambiguous policy known, for example, as – nomadic education.

The madrassa is an Islamic institution at the primary level where learning is largely by rote. The pupils memorise and eventual graduate by an accurate rendition of the Koran. They are taught of the life and example of the Prophet Mohammed, his travails, the virtues, discipline, and duties of the religion of Islam, its Way and obligations of its followers. They study the Hadiths – this being the collection of the sayings of the Prophet Mohammed as transmitted and interpreted by Islamic clerics, some of which form the foundation of Islamic Law. They learn to recognise what is halal – that is, what is considered right, and thus permitted and encouraged for practicing Muslims, and what is haram – that is – forbidden.[...]

@ARD_alpha
Science can be a bridge between cultures – better than politics: ard-alpha.de/lindau-nobel #LiNo15
ARD-alpha, German national public service educational TV channel

@jalees_rehman
Soyinka: "The fanatic lives on submission even as the lung requires oxygen." #LiNo15
Jalees Rehman, University of Illinois at Chicago, USA

"Humanity extends beyond our physical containment. [...] We must eradicate all ideologies that can only come to fulfilment on a truncated self-seizure of the whole of humanity."

Wole Soyinka, Nobel Literature Laureate 1986

The young pupil of the madrassa learns one thing early – absolute obedience to the slightest instruction of his teacher. In turn he is made to feel secure, protected.[...] There is a strong bond between pupil and teacher – which is difficult for outsiders to appreciate. During those vulnerable years, the pupil can conceive of no other existential reality than what is poured into his head by the mullah.[...] I grew up as a child next to one of these schools. I recall responding to the chants of these children of my age, with an envious tinge – something lulling and near-hypnotic about them, as the chanting rose to resonate through a sultry afternoon. Hearing some of them so repeatedly became addictive and I would sometimes join in echoing the tonalities, although without any understanding of what was being chanted.

Now, let it be understood that the madrassa is different in practice from a koranic school. For instance, I grew up in a Christian missionary school, in company of Muslim pupils. In the evenings and/or weekends however, they would attend the koranic schools just to study the Koran, so they were exposed to other subjects and educational principles. The madrassa is a study in contrast. Whether this was the purpose or not, the pupils of the madrassa emerge mentally enslaved. Their apprehension of learning, of education remained narrow, totally circumscribed. It is largely the products of that learning environment – a fact belatedly acknowledged by ministries of education even in Islamic nations that constitute the majority of foot soldiers – but also militant proselytisers – for the most devastating scourge that afflicts various parts of the world today. It is that educational structure – if we may misapply that word "education" just for convenience – yes, it is on such a foundation that the currently rampaging Islamic fundamentalism has been implanted, one that becomes increasingly near impossible for the world to eradicate.

Mired in the most uncompromising sense of duty to the propagation of their faith, the products of these schools have no doubts, no sense of restraint, no recognition of, or concession to the existence of others. There is only one Path – the rest is Haram. It adapts only for the purpose of self-entrenchment and – spreading the word by whatever means. Wherever it meets an obstacle, the means to the neutralisation of that check must be pursued, no matter the cost, no matter the exaction in human lives. It is a divinely ordered duty. The world is thus beset by this contradiction, where arguably the most primitive expression of spirituality in the world today proves adept at manipulating the latest development in modern technology such as – Internet. Internet has been converted to serve as the virtual madrassa of the twenty-first century, leaving sociologists bereft of an answer as to why so many recruits, raised in the liberal thought systems of so many societies, are flocking to the flag of the so-called ISIS, easily the most vicious of the jihadist strain. Only in recent years, perhaps even months, have governments come to terms with the fact that Internet has been a sometime and successful facilitator for such retrogression. Such, alas, are the ironies of progress.

The name BOKO HARAM has become a dread pronouncement, not only in Nigeria, but globally. Its very naming is of immense significance, since it is a corruption of "The Book is Haram" – all books except one – The Koran. And the book itself is only a figure of speech, since it is only a part of much else – knowledge, culture, heritage, social practices, the sciences and technology, the Arts – any engagement of the human mind, outside its corrupted religious testament. Hence, when Boko Haram chose to unleash its presence on the Nigerian nation, the primary targets were schools, all the way down from tertiary institutions to primary. The order went out: Close down the schools. Parents must not send their children to schools. Teachers must no longer teach. The Boko Haram and its affiliates attacked universities and members. These included colleges of agriculture which, one would have thought, were deserving of exception, since they are dedicated to a basic and universal necessity – food.[...] But it was not even the tertiary institutions that constituted the greatest offence in the eyes of the religious butchers. The warning shots and the earliest skirmishes were directed at primary schools. Then the invaders came at night when pupils and teachers had gone home, and set the school buildings on fire. That was in the beginning, some five or six years ago. The incidents were then isolated, sporadic. As the butchers gathered strength, grew bolder, the open interdiction of learning became terminal, designed to serve as example to others. Teachers and pupils were waylaid, their hands tied together and their throats slit. All these, in the North-eastern part of Nigeria, but also in Al-Shabbab's Somalia.

Churches and other non-Islamic places of worship had always been, needless to remark, primary targets for such fanatics. Churches, for this breed, represent the repository of that most hated rival in the territory of the Book. Later, mosques also joined the repertory of victims, since the history of Islam is also one of rival contest for the custody of spiritual power, including even the mere rituals, such as the order of worship. However, it was institutions of learning that have borne the most vicious brunt of the onslaught. Learning, intolerance of the power that the very mystique of the book confers. Suspicion that the contents of this unknown repository might explode the claims of Revelation as received by those whose very existence requires the control the minds of others. The fanatic lives on submission even as the lung requires oxygen.

But the book is where it begins. Then its extensions such as the laboratory. The workshop. The seminar room. And when those structures diminish in numbers, when there are no more schools to burn down, when it becomes increasingly difficult to separate teachers from the rest of the community, the known professional victims having relocated for their safety, when, for teacher and pupil, mere survival had become learning enough – then the indiscriminate slaughter began, since human beings are not only the creators, but vectors of the book. The logic was inexorable – even those who merely farmed, or traded in markets, or mere wage earners, every non-submissive human is regarded as a contaminated object, qualified for purification through fire and blood. [...]

I began with an incursion into some typical scenarios of educational modes under which many of such youths obtain their mental malformation. Many of these recruits come from the madrassa mould – not necessarily physical, but media enabled, the internet increasingly. They are primed and ready, often without being aware of it. Some are first or second generation immigrants within new societies whose values they often barely tolerate. They consider such societies over-permissive, decadent, even blasphemous. They believe that their souls are imperilled and become increasingly alienated from that host society. Through indoctrination, they are ready to tear up that society. That is all understood. My claim is that sometimes, society facilitates that task. [...] And so, back to the question: What's in a name? Why, for instance, the name – Boko Haram?

That is not the name our own movement of religious irredentists chose for themselves. Muhammed Yusuf and the founding cohorts of that movement had settled for the grandiloquent name of "Jama'atu Ahlis Sunna Lidda'awati wal-Jihad" – People Committed to the Propagation of the Prophet's Teachings and Jihad. Even if Nigerians found themselves ill prepared and ill equipped to cope with this sudden and brutal affliction, they understood and held on to the psychological weapon of denial – you deny an enemy whatever it appears to value most. And so, the local populace refused to concede even a shortened version of a name they so badly craved – They have never referred to them as "Committed People", "The Prophet's Jihadists", "Holy Warriors" or whatever – "No", Boko Haram is what you are – philistines and iconoclasts. Boko Haram is what your actions attest. Language is also an instrument of war. [...]

[We] can profitably take a cue from the battered humanity of Nigeria: Never concede a thing to the enemy, certainly not in the accessible currency of language. ISIS is not a state! Nor is it Islamic. Belatedly, a number of global leaders now accept what we have advocated from the very beginning, astonished that supposedly discerning journals like the New York Times of the US, Le Monde of France and others should set an example of simple-minded acquiescence in the self-glorification of a bunch of psychopaths, albeit cloaked in religious fervour. [...]

This is what was denied Boko Haram by their compatriots – you are neither a state, nor a caliphate. You are enemies of enlightenment whose first charge is the destruction of all that spells knowledge and creativity – symbolised by the book, hence the name – Boko Haram – the book is evil, damned, anathemised. Call yourselves what you will, their fellow Nigerians insist – you are Boko Haram. That name has stuck, so, alas, have the bearers of the name. However, a combative psychological condition has been implanted in the minds of the populace, and that is not a negligible factor in dictating what the rest of society must do, whenever the opportunity presents itself.[...]

I am saying nothing original when I call attention to the fact that this war will not be won by aerial bombardment or military prowess alone not even by the most precise technology that strikes at the Hydra headed monster which, in any case, no sooner loses a head than it grows ten in its place. [...] However, the mind remains the primary target, and quite frankly, I have not seen that receptor being seriously, constructively and imaginatively addressed. Since the first-line object of hate for these irredentists is the book, I continue to advocate aerial bombardments of those enemy held spaces with books, including the Koran, edited, annotated, bombardment with images of the benign avatars the world has known, to challenge their killing gods. There are of course a hundred other approaches – they are not mutually exclusive. The weapon of ridicule, the deflation of their divine afflatus, cartoons rained down on their strongholds depicting them as morbid narcissists in thrall with death. Make nonsense of those photo-op postures they assume before setting out to deface the scroll of the real martyrs of human history... All these are legitimate weapons – both to demoralise the enemy and to empower their victims.

To sum up, the question that stares humanity in the face should read thus: Is mere survival now learning enough for our youth? For the generation we have brought into being? Perhaps we should simply forget about the Humanities, the Sciences, Technology and the Arts, forget the ancient libraries of Timbuktu and simply open academies that cater exclusively for the survival of our individual selves? For insisting on knowledge, we are declared enemies of God, fit only for beheading on the altar of death-fixated believers. It is time, I propose, that we respond by moving beyond merely denouncing their crimes against humanity and boldly perceive and declare their perpetrators, collectively and without ambiguity – enemies of humanity. [...] Humanity extends beyond our physical containment. Humanity is defined by the statue of Buddha pulverised so gleefully by the neo-barbarians called the Taliban. It is defined by the timeless heritage of the ancient city of Nimrod. It is lodged in the musty manuscripts of Mali, the African city of Learning.

@jonWturney
Still mulling over trenchant, brave, eloquent lecture from Wole Soyinka last night on opposing Islamic education as ideology #LiNo15
Jon Turney, UK science writer and author

@TendaiGadzikwa
Standing ovation for Soyinka #LiNo15
Tendai Gadzikwa, University of Zimbabwe

Wole Soyinka at a public reading for Lindau citizens, interviewed by Christoph Plate, Deputy Editor-in-Chief of Schwäbische Zeitung, media partner of the Lindau Meetings.

Humanity subsists in raising monuments that honour their creators, thrives in the bronze statues of Benin kingdom, and the classic busts of the Yoruba. All these instruct the future of the steps along which Humanity ascended to plough the skies today to reach other planets. They remain a critical segment of our learning environment. Without them, we remain truncated, incomplete. We must eradicate all ideologies that can only come to fulfilment on a truncated self-seizure of the whole of humanity.

Wole Soyinka

Nigerian born playwright, novelist, poet and essayist Akinwande Oluwole "Wole" Babatunde Soyinka, "who in a wide cultural perspective and with poetic overtones fashions the drama of existence" (Nobel Committee for Literature), was the first African to be awarded the Nobel Prize in Literature, 1986. He underwent imprisonment and exile for his criticism of political abuse in his home country. A video of his lecture is available in the mediatheque.

“And it was all to be so terribly solemn and so academic and so on, but I said no, people, let’s just relax and have a nice, friendly meeting!”

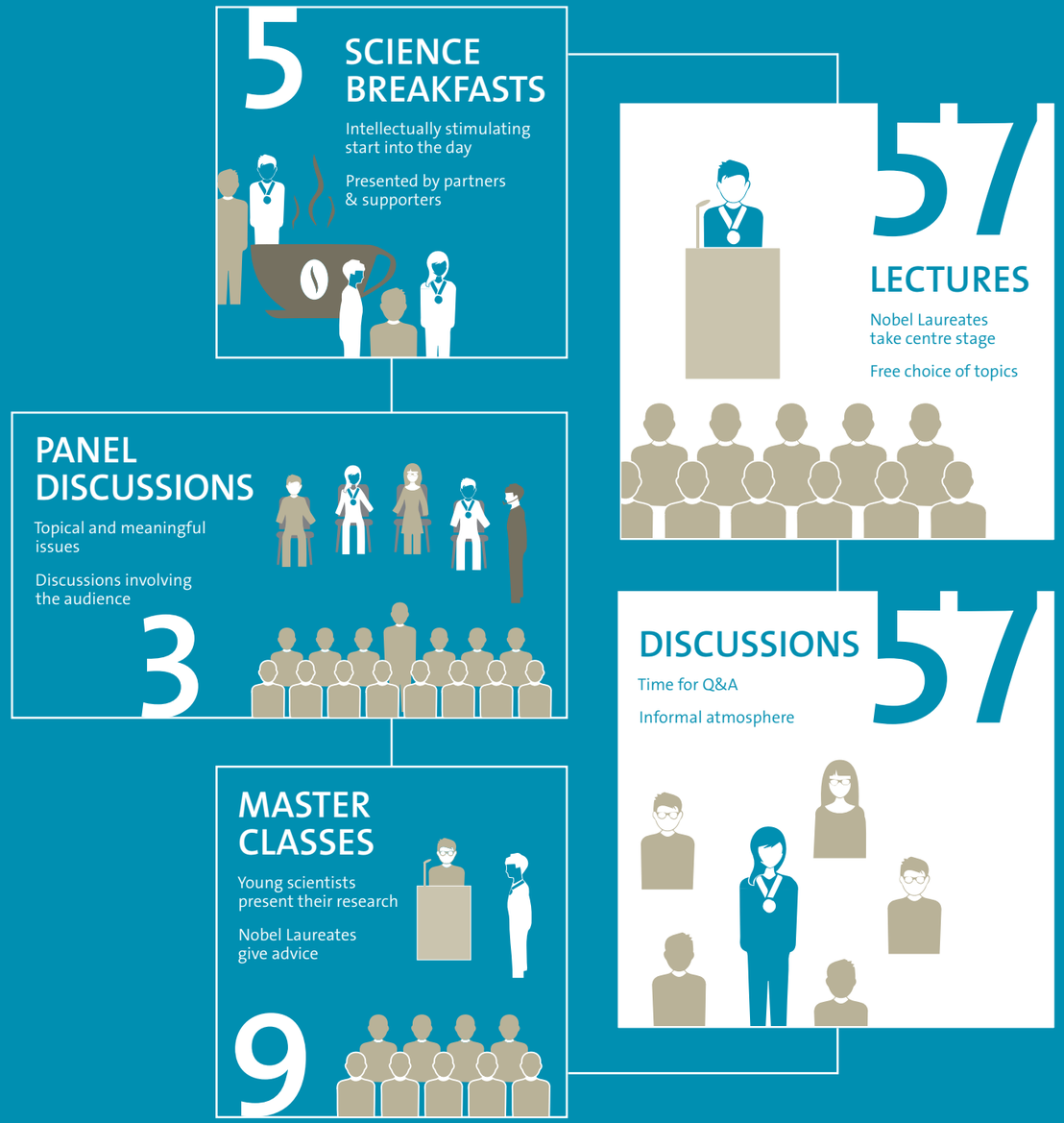
Count Lennart Bernadotte, 1951

Scientific Programme

» Lectures

	LECTURE TITLE
Peter Agre	Aquaporin Water Channels – From Atomic Structure to Malaria
Werner Arber	Insight into the Laws of Nature for Biological Evolution
Françoise Barré-Sinoussi	Translational Science on Viral Infectious Diseases: From Louis Pasteur to Today
Eric Betzig	Working Where Others Aren't
Bruce A. Beutler	Finding Mutations that Affect Immunity
J. Michael Bishop	A Virus, a Gene and Cancer: An Anatomy of Discovery
Elizabeth H. Blackburn	Telomeres: Telling Tails
Martin Chalfie	Tickling Worms: Suprises from Basic Research
Steven Chu	A Random Walk in Science
Aaron Ciechanover	The Revolution of Personalised Medicine: Are We Going to Cure All Diseases and at What Price?
Claude Cohen-Tannoudji	The Adventure of Cold Atoms. From Optical Pumping to Quantum Gases
Peter C. Doherty	The Killer Defence
François Englert	The Origin of Elementary Particle Masses
Gerhard Ertl	Catalysis at Surfaces: From Atoms to Complexity
Edmond H. Fischer	The Origin of Reversible Protein Phosphorylation as a Regulatory Mechanism
Ivar Giaever	Global Warming Revisited
Roy J. Glauber	Light Quanta, and Their Idiosyncrasies
David J. Gross	The Future of Particle Physics
John L. Hall	What About Redefining Time Using a Stable Laser?
Theodor W. Hänsch	Science with Combs of Light
Serge Haroche	The International Year of Light: Celebrating Fifty Years of Laser Revolution in Physics
Harald zur Hausen	Colon- and Breast Cancers and Specific Neurological Disorders as Zoonoses?

The Meeting Programme Sessions



	LECTURE TITLE
Stefan Hell	Optical Microscopy: The Resolution Revolution
Avram Hershko	Roles of the Ubiquitin System in Health and Disease
Robert Huber	Structural Aspects of Protease Control in Health and Disease and my Experience with Translation into Practice and Business
Harold W. Kroto	After Nearly 100 Years the Hunt May Be Up for the Carrier of the Diffuse Interstellar Bands
Jean-Marie Lehn	Towards Adaptive Chemistry
Rudolph A. Marcus	Electron Transfer Theory in Single Molecule Studies of Intermittent Fluorescence of Quantum Dots and in Initial Steps in Dye Sensitised Solar Cells
Hartmut Michel	Membrane Proteins: Importance, Functions, Mechanisms
William E. Moerner	Fun with Light and Single Molecules
Ferid Murad	Role of Nitric Oxide and Cyclic GMP in Cell Signalling and Drug Development
Ei-ichi Negishi	How to Synthesise a Wide Variety of Optically Active Organic and Bioorganic Compounds of >99% Optical Purity
Erwin Neher	Ion Channels: Their Discovery, their Function and their Role in Diseases
Ryoji Noyori	Where Am I From? Where Are You Going?
Saul Perlmutter	What We Learn When We Learn that the Universe is Accelerating
William D. Phillips	Quantum Information: A Scientific and Technological Revolution for the 21st Century

Saul Perlmutter

Along with approximately 500 videos from the 65-year history, all lectures from the 65th Lindau Meeting can be watched in the mediatheque.

	LECTURE TITLE
Venkatraman Ramakrishnan	Seeing is Believing – A Hundred Years of Visualising Molecules
Sir Richard J. Roberts	A Crime Against Humanity
Carlo Rubbia	Future Accelerators for Astro-Particle Physics
Kailash Satyarthi	Education Needs to be Equitable and Inclusive for All
Brian P. Schmidt	The State of the Universe
Dan Shechtman	Quasi-Periodic Crystals, a Paradigm Shift in Crystallography
Hamilton O. Smith	Minimising a Bacterial Genome by Global Design and Synthesis
Oliver Smithies	Ideas Come from Many Places
George F. Smoot	Gamma Ray Bursts: Windows on the Universe
Wole Soyinka	When Survival Seems Learning Enough
Jack W. Szostak	The Origins of Cellular Life
Susumu Tonegawa	Memory Engram Cells Have Come of Age
Roger Y. Tsien	Molecules Against Cancer or for Long-Term Memory Storage
Harold E. Varmus	From Proto-oncogenes to Precision Oncology
Martinus J.G. Veltman	Discovery of the Higgs Particle
Klaus von Klitzing	A New Kilogram in 2018: The Biggest Revolution in Metrology Since the French Revolution
J. Robin Warren	The Discovery of Helicobacter
Arieh Warshel	How to Model the Action of Complex Biological Systems on a Molecular Level
Robert W. Wilson	Cosmic Microwave Background Radiation and its Role in Cosmology
Kurt Wüthrich	NMR in Biology, Chemistry and Medicine
Ada Yonath	Species-Specific Antibiotics and the Microbiome

Panel Discussions

"THE QUEST FOR INTERDISCIPLINARITY: INSPIRATION OR DISTRACTION?"

Panellists
– Eric Betzig, Nobel Laureate in Chemistry 2014, Janelia Research Campus, Howard Hughes Medical Institute, United States
– Martin Chalfie, Nobel Laureate in Chemistry 2008, Department of Biological Sciences, Columbia University, United States
– Steven Chu, Nobel Laureate in Physics 1997, Physics Department, Stanford University, United States
– Stefan W. Hell, Nobel Laureate in Chemistry 2014, Max Planck Institute for Biophysical Chemistry, Germany
– William E. Moerner, Nobel Laureate in Chemistry 2014, Department of Chemistry, Stanford University, United States

Moderator
Sibylle Anderl, Institut de Planétologie et d'Astrophysique de Grenoble, France

"THE QUEST FOR INTERDISCIPLINARITY: INSPIRATION OR DISTRACTION?"

Panellists
– Lucia Prieto Godino, Postdoctoral researcher, Center for Integrative Genomics, University of Lausanne, Switzerland
– Harold W. Kroto, Nobel Laureate in Chemistry 1996, Department of Chemistry and Biochemistry, The Florida State University, United States
– Kailash Satyarthi, Nobel Peace Laureate 2014, India
– Georg Schütte, State Secretary, German Federal Ministry of Education and Research, Germany

Moderator
Alok Jha, ITV News, United Kingdom

Lucia Prieto Godino and Kailash Satyarthi

Alok Jha, Lucia Prieto Godino, Kailash Satyarthi, Georg Schütte and Harry Kroto at the panel discussion on science education

"COMMUNICATION OVERKILL?"

Panellists
– Mallory Paige Ladd, Energy Science and Engineering, University of Tennessee, United States
– Marcia McNutt, Editor-in-Chief, Science family of journals, American Association for the Advancement of Science
– Jalees Rehman, Associate Professor of Medicine and Pharmacology, University of Illinois at Chicago
– Brian P. Schmidt, Nobel Laureate in Physics 2011, The Research School of Astronomy and Astrophysics, The Australian National University, Australia
– Harold E. Varmus, Nobel Laureate in Physiology or Medicine 1989, Lewis Thomas University, Weill Cornell Medical College, United States

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

Eric Betzig and Stefan Hell

Panel discussion on interdisciplinarity: Sybille Anderl, Eric Betzig, Stefan Hell, William Moerner, Martin Chalfie and Steven Chu

"CELLULAR QUALITY CONTROL – MECHANISMS AND CLINICAL IMPLICATIONS"
chaired by Aaron Ciechanover

Speakers
– J.Changjiang Hu, Third Military Medical University, Xinqiao Hospital, China
– Rishika Kundra, Department of Chemistry, University of Cambridge, United Kingdom
– Peter Reinhardt, Center for Regenerative Therapies (CRTD), Technical University, Dresden, Germany

"HOW THE IMMUNE SYSTEM WORKS"
chaired by Peter C. Doherty

Speakers
– Olesja Bondarenko, National Institute of Chemical Physics and Biophysics, Estonia
– Carina Dehner, Institute of Anatomy and Cell Biology, Ludwig-Maximilians-Universität, Germany
– Stephen Rubino, Harvard Medical School and Brigham and Women's Hospital, USA
– Ondřej Štěpánek, Department of Biomedicine, University and University Hospital Basel, Switzerland
– Bonnie L. van Wilgenburg, University of Oxford, United Kingdom

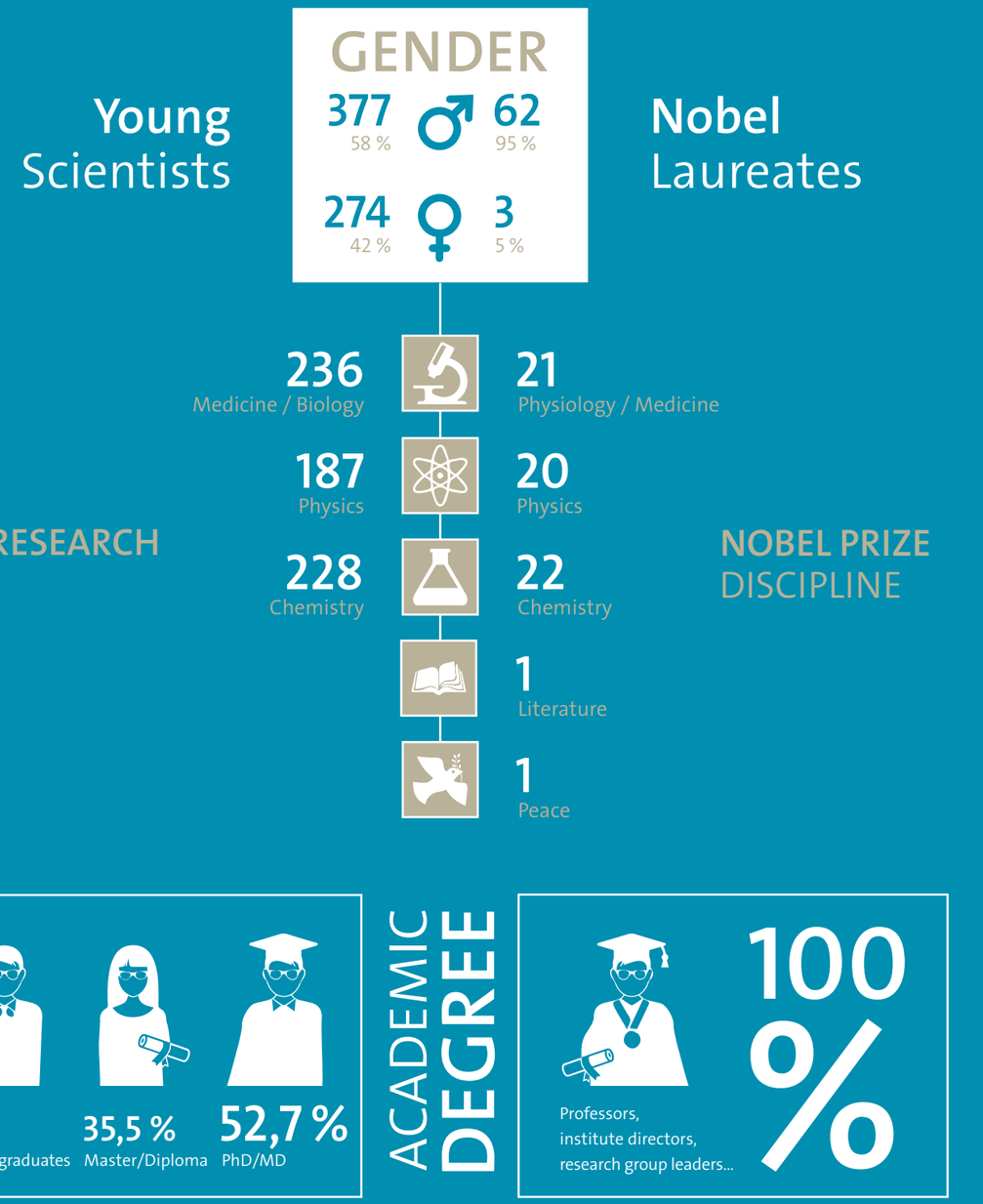
"SPINTRONICS, NANOMAGNETISM AND MAGNETIC SKYRMIONS"
chaired by Albert Fert

Speakers
– Sándor Bordács, Department of Physics, Budapest University of Technology and Economics, Hungary
– Prosper Ngabonziza, Faculty of Science and Technology, University of Twente, Netherlands

Master class chaired by Aaron Ciechanover

Master class chaired by Peter Doherty

Participants: Personal and Scientific Background



Master Classes

"ANTIMICROBIAL DEFENSES"
chaired by Jules Hoffmann, co-chaired by Bruce Beutler

Speakers
– Pedro Alves, Immunology, Max Planck Institute for Infection Biology, Germany
– Claudia Günther, Medical Department, Universitätsklinikum Erlangen-Nürnberg, Germany
– Izumi Mashima, Department of Oral Microbiology, Health Sciences University of Hokkaido, Japan
– Moran Shalev Ben-Ami, Structural Biology, Weizmann Institute of Science, Israel
– Christoph Thaiss, Department of Immunology, Weizmann Institute of Science, Israel

"SUPRAMOLECULAR AND ADAPTIVE CHEMISTRY: FROM MATERIALS SCIENCE TO MEDICINE"
chaired by Jean-Marie Lehn

Speakers
– Renata Balgley, Organic Chemistry, Weizmann Institute of Science, Israel
– Wei Cao, Department of Chemistry, Tsinghua University, China
– Benjamin Doistau, Université Pierre et Marie Curie, France
– Angel Luis Fuentes de Arriba, Department of Organic Chemistry, University of Salamanca, Spain
– Jenifer Rubio Magnieto, Laboratory for Chemistry of Novel Materials, University of Mons, Belgium
– Jochen Niemeyer, Institute of Organic Chemistry, University of Duisburg-Essen, Germany

"APPLICATIONS OF THE MECHANICAL EFFECTS OF LIGHT"
chaired by William D. Phillips

Speakers
– Laura Corman, Chaire Atome et Rayonnement, Collège de France, France
– Aaron Buikema, Department of Physics, Massachusetts Institute of Technology, United States
– Alexander Yutong Zhu, Data Storage Institute, Agency for Science, Technology and Research, Singapore

Master class chaired by
Jules Hoffmann and Bruce Beutler

Master class chaired by
William Phillips

"A 21ST CENTURY CAREER IN RESEARCH: A DISCUSSION ABOUT THRIVING IN THE FACE OF CAREER UNCERTAINTY"
chaired by Brian P. Schmidt, co-chaired by Elizabeth Blackburn

Speakers
– Uta Allenstein, Department for Experimental Physics, University of Leipzig, Germany
– Hemant P. Borase, Department of Biochemistry, North Maharashtra University, India
– Daniel Häufle, University Stuttgart, Germany
– Else Starkenburg, Leibniz-Institut für Astrophysik Potsdam, Germany

"WHAT ARE THE BIG QUESTIONS IN CANCER RESEARCH AND WHICH SCIENTIFIC DISCIPLINES ARE NEEDED TO ANSWER THEM?"
chaired by Harold E. Varmus, co-chaired by Michael J. Bishop & Steven Chu

Speakers
– Uri Ben-David, The Broad Institute of MIT and Harvard, United States
– Volker Hovestadt, Molecular Genetics, German Cancer Research Center, Germany
– Lian Chye Winston Koh, Stanford University, United States
– Amelia Parker, Children's Cancer Institute, Australia
– Christina Schindler, Physics Department, Technische Universität München, Germany

"NMR SPECTROSCOPY AND MAGNETIC RESONANCE IMAGING, FROM PHYSICS TO MEDICAL DIAGNOSIS"
chaired by Kurt Wüthrich

Speakers
– Serge Alain Fobofou, Department of Bioorganic Chemistry, Leibniz Institute of Plant Biochemistry, Germany
– Michael A. Klatt, Department of Physics, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany
– Lauren E. Marbella, Department of Chemistry, University of Pittsburgh, United States
– Nicole Marinsek, Dynamical Neuroscience, University of California, Santa Barbara, United States
– Robert J. Messinger, CNRS, France

Master class chaired by
Brian Schmidt and Elizabeth Blackburn

Master class chaired by
Harold Varmus, Michael Bishop
and Steven Chu (not in picture)

Science Breakfasts

"SCIENCE AND ETHICS"
upon invitation of the Ministry of Education, Higher Education and Research, France

Panellists
– Sophie Carenco, Laboratoire Chimie de la Matière Condensée de Paris, Collège de France
– Jules Hoffmann, Nobel Laureate in Physiology or Medicine 2011, Molecular and Cellular Biology Institute, Université de Strasbourg, France
– Denis Le Bihan, Director of Neurospin, CEA Saclay, France

Moderator
Michele Leduc, Emeritus Research Director at CNRS, President of CNRS Ethics Committee, France

"FEEDING THE 9.6 BILLION"
hosted by Mars, Incorporated

Panellists
– Steven Chu, Nobel Laureate in Physics 1997, Physics Department, Stanford University, United States
– Howard-Yana Shapiro, Chief Agricultural Officer, Mars, Incorporated, Department of Plant Sciences, University of California, Davis, United States
– Emma Beckett, University of Newcastle, Australia

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

Jules Hoffmann and Denis Le Bihan

"DECODING SCIENCE LEADERSHIP: WHAT MATTERS IN LEADING INNOVATIVE LABS, LEADING GREAT PEOPLE, LEADING SELF"
hosted by McKinsey & Company, Inc.

Panellists
– Elizabeth H. Blackburn, Nobel Laureate in Physiology or Medicine 2009, Department of Biochemistry and Biophysics, University of California, San Francisco, United States
– Simon Elsässer, MRC Laboratory of Molecular Biology, Centre for Chemical and Synthetic Biology, United Kingdom
– Frank Mattern, Director, McKinsey & Company, Inc., Germany
– Bonnie L. van Wilgenburg, University of Oxford, United Kingdom

Moderator
Matthias Evers, Principal, McKinsey & Company, Inc., Germany

Science breakfast hosted by Mars, Incorporated

"GENES, NUTRITION AND THE ENVIRONMENT"
hosted by the Federal Ministry of Science, Research and Economy, Austria

Panellists
– Aaron Ciechanover, Nobel Laureate in Chemistry 2014, The Rappaport Faculty of Medicine and Research Institute, Technion – Israel Institute of Technology, Israel
– Petra Paul, Experimental Immunology, University of Zurich, Switzerland
– Jack W. Szostak, Nobel Laureate in Physiology or Medicine 2009, Department of Molecular Biology, Massachusetts General Hospital, United States

Moderator
Giulio Superti-Furga, CEO and Scientific Director, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences, Austria

Frank Mattern, McKinsey & Company, Inc.

"THE MAZE OF SCIENCE: WHICH PATH SHOULD RESEARCH FOLLOW?"
hosted by the Else Kröner-Fresenius-Stiftung

Panellists
– Alice Accorroni, Institute of Life Sciences, Scuola Superiore Sant'Anna, Italy
– Nicholas Chilton, School of Chemistry, The University of Manchester, United Kingdom
– Pierre Karam, American University of Beirut, Lebanon
– Linda J. Miller, Executive Editor, Cancer Immunology Research, American Association for Cancer Research (AACR), United States
– Brian P. Schmidt, Nobel Laureate in Physics 2011, The Research School of Astronomy and Astrophysics, The Australian National University

Moderator
Susanne Schultz-Hector, Member of the Board, Else Kröner-Fresenius-Stiftung, Germany

Giulio Superti-Furga, Aaron Ciechanover, Petra Paul and Jack Szostak

Science Breakfast hosted by the Else Kröner-Fresenius-Stiftung

Innovation Forum

Light & Light Technology

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

The Innovation Forum 2015 – the seventh of its kind – provided an exclusive platform for exchange between representatives of research-driven companies and Nobel Laureates. The choice of topic this year was based on the "International Year of Light", and discussions centered on three key areas:

Stefan Hell outlined the surprising and unpredictable process behind the invention of STED microscopy and its development to market readiness, and described the challenges facing the optics industry in the years and decades to come. Michael Kaschke presented the perspective and experience of the industry regarding the shift from predominantly optical technology to computer-controlled and biophysics-oriented imaging processes.

The second key area was laser additive manufacturing in the field of medicine or, putting it more simply, new processes for the 3D printing of organs. A lively and controversial discussion was triggered by the question as to whether these printing processes or the breeding of organs in genetically modified animals offer greater medical and economic potential – without a doubt a "hot topic" from the ethical perspective as well.

Against the background of the new developments in the field of photovoltaics, the third key area tackled a topic that has featured in the Lindau Meetings for many years: the future of energy supply and storage. Among the issues hotly debated by this panel was whether increasing the efficiency of photovoltaic cells, something that can only be achieved with high investments, should remain the primary research objective, when organic photovoltaics promise the harnessing of energy "everywhere", a development that renders maximum efficiency per area less important.

Chairmen

– Martin Chalfie, Nobel Laureate in Chemistry 2008, Columbia University, USA
– Steven Chu, Nobel Laureate in Physics 1997, Stanford University, USA
– Stefan Hell, Nobel Laureate in Chemistry 2014, Max Planck Institute for Biophysical Chemistry, Germany
– Michael Kaschke, Chairman of the Board, Carl Zeiss AG, Germany

Wolfgang Lubitz, Vice-President of the Council, at a presentation by the Carl Zeiss AG

Keynotes

"GFP: Surprises from a Jellyfish"
Martin Chalfie

"From Bench to Bedside: Examples of Transfer from Basic Science to Commercial Application – A Case Study in Optics and Photonics"
Michael Kaschke

"Scientific Revolution in Microscopy and its Impact on the Optical Industry"
Stefan W. Hell

"Laser Cell Printing for Tissue Engineering"
Lothar Koch, Head of Biofabrication Group, Laser Zentrum Hannover e.V., Germany

"Sun, Wind, and the Challenges of Transmission & Distribution Systems for Renewable Energies"
Steven Chu

"Decentralised Energy Generation: The Key Role of Organic Photovoltaic"
Thibaud Le Séguillon, Chief Executive Officer, Heliatek GmbH, Germany

Keynote by Steven Chu

Harold Kroto, Stefan Hell and Michael Kaschke

Social Programme

» Summer Festival of Science

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

Boat trip from Lindau to Langenargen

Reception
Welcome Address
Johanna Wanka, Federal Minister of Education and Research

Dinner at Schloss Montfort

» International Day

hosted by France

SCIENCE BREAKFAST: "SCIENCE AND ETHICS"
hosted by the Ministry of Education, Higher Education and Research, France (see p. 70)

INTERNATIONAL GET-TOGETHER
hosted by the Ministry of Education, Higher Education and Research, France

Welcome Address
Thierry Mandon, State Secretary, Ministry of Education, Higher Education and Research, France

Presentation
"A Look at Water Singing and Dancing in the Brain"
Denis Le Bihan, Director of Neurospin, CEA Saclay, France

Master of Ceremony
Alex Taylor, European journalist, France

Music
La Gâpette

Johanna Wanka and Wolfgang Schürer

Feedback by the Participants

EXPECTATIONS?
EXCEEDED
58 %
MET 41 %

SCIENTIFIC PROGRAMME?
GOOD 36 %
EXCELLENT
63 %

CHANCE TO INTERACT PERSONALLY WITH NOBEL LAUREATES OF CHOICE?
95 %

FAVOURITE SOCIAL EVENT?
BADEN-WÜRTTEMBERG BOAT TRIP

FAVOURITE TOPIC?
"Life and research experience of Nobel Laureates"
VERY IMPORTANT

1,4				
very important	important	medium	not very important	unimportant

OVERALL ORGANISATION?
EXCELLENT
74 %
GOOD 24 %

FAVOURITE LECTURE?
HARRY KROTO:
"After Nearly 100 Years the Hunt May Be Up for the Carrier of the Diffuse Interstellar Bands."

DIALOGUE AMONG YOUNG SCIENTISTS FOSTERED?
VERY MUCH

1,2				
very much	Rather yes	Moderately	Rather no	not at all

Grill & Chill

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

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

The proceeds and donations benefitted the childhood education initiative "Haus der kleinen Forscher" (Little Scientists' House) and the Nobel Peace Prize-winning organisation Médecins Sans Frontières (MSF) – the latter upon recommendation by the Lindau Meeting alumnus Khagendra Acharya from Nepal, for their support of victims of the latest severe earthquakes in his country.

Support
Continental AG
IHK Schwaben

Dinner Invitations

LICHTENSTEIN EVENING
hosted by the Government of the Principality of Liechtenstein
represented by Adrian Hasler, Prime Minister

ACADEMIC DINNERS

Hosts
Alexander von Humboldt Stiftung
Australian Academy of Science
Elite Network of Bavaria
Federal Ministry of Science, Research and Economy, Austria
German Academic Exchange Service (DAAD)
Helmholtz-Stiftung
Lockheed Martin
Max Planck Society
Nobel Foundation
Oakridge Associated Universities
Wilhelm und Else Heraeus Stiftung

Bavarian Evening

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

Welcome Address
Ludwig Spaenle, Bavarian State Minister of Education, Science and the Arts

Presentations
"Bavaria – Land of Science and Research"
Klaus von Klitzing, Nobel Laureate in Physics 1985, Max Planck Institute for Solid State Research, Germany

"Current Research Projects in the Elite Network of Bavaria"
Vanessa Jane Bukas and Michael Klatt, Fellows of the Elite Network of Bavaria

Music

Baden-Württemberg Boat Trip

hosted by the State of Baden-Württemberg

Welcome and Farewell Address
Theresia Bauer, Minister of Science, Research and the Arts of Baden-Württemberg

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

Science Picnic

Cheque handover at the Grill & Chill:
Karlheinz Haupt, Continental AG, Gerhard Ecker, Johann Zeh, County of Lindau, Countess Bettina Berndadotte, Thomas Holderried, IHK Schwaben, Henrik Jörnvall, Médecins Sans Frontières

Hereditary Prince Alois of Liechtenstein (right) with Roy Glauber and Atholie Rosett

Academic Dinner by the Max Planck Society

Ludwig Spaenle

Theresia Bauer

Impressions

Baden-Württemberg Boat Trip with host Minister Theresia Bauer (centre)

Science Picnic on Mainau Island

Klaus von Klitzing and Monika Schürer

Bavarian Evening: traditional costumes welcome

Grill & Chill: young scientists and a local host family

Liechtenstein Evening:
Adrian Hasler, Prime Minister of Liechtenstein,
Countess Bettina Bernadotte,
and Gerhard Ecker, Lord Mayor of Lindau

“Be the Voices of Children”

Nobel Peace Prize Laureate Kailash Satyarthi delivered a moving lecture at the 65th Lindau Meeting, demanding that education needs to be equitable and inclusive for all. In an interview with Harini Barath for the official blog, Satyarthi outlined how scientists could help further this cause.

“Ours should be the last generation to say with pride that we have seen and made the end of child slavery, of the exclusion of children and of illiteracy of children.”

Kailash Satyarthi, Nobel Peace Prize Laureate 2014

@k_satyarthi
Selfie with my new friends at a high school in Lindau, Germany. They promised to join #Childhoodfreedom @lindaunobel
Kailash Satyarthi

Harini Barath: What is the most significant impact that the Nobel Prize has made to your efforts?

Kailash Satyarthi: Some difference is visible, but I won’t call it a big difference unless I see things changing on the ground, and at the higher levels of policy. I can give you one instance of change: I have been campaigning for the inclusion of explicit language in the sustainable development goals, which are going to be rolled out soon. People were listening, but not at the highest levels. After the Nobel Prize, I have been able to take it to the UN Secretary General and many Heads of States. And I see lots of support. So hopefully it will be done by September. [...]

HB: Did you have any expectations coming to the 65th Lindau Nobel Laureate Meeting? What will you take away from your time here?

KS: My expectation was simple and clear. Scientists – both Laureates and young scientists whose voice, knowledge and presence mattersa lot in the world – should not remain alienated from some of the harsh realities of the world. They are very busy in their laboratories pushing the frontiers of knowledge, and the world is using that knowledge. Especially after I got the Nobel Prize, I have come to realise that the moral power that Laureates enjoy is largely going unharnessed, especially in the betterment of children’s life – since that is my personal mission. I hope to convince these people to speak up and help raise awareness. But first they have to be sensitised. I’m sure that many people who I spoke to here were sensitised about these issues. For some it was shocking. I wanted to challenge their conscience.

HB: What is the most striking difference between speaking to school children and addressing adults, like the scientists at the Lindau Meeting?

KS: I’m always better connected with children and young people. Their hearts are pure, their minds are still open, and they are more unbiased and have fewer inhibitions. [...] They are full of potential, idealism and energy. They are hungry to do something. If we are not able to give them anything worthwhile, frustration is bound to ensue. I’m quite pleased to interact with them, and I could see a great response from them.

HB: Nobel Laureates have a bigger reach and platform. What about the average scientist who wants to make a difference, how can they help?

KS: They can help in many ways. One is by spreading their knowledge of fundamental sciences to others. There’s a big gap between scientists and the non-scientists. I like to call it democratising science. They can also take out a little bit of time to visit schools, however occasionally, to teach children. The most fundamental thing they should strive to inculcate in young minds is that science must not be misused by vested interests. There are also other problems on the horizon like climate change, where they can play a huge role. Scientists need to come together to solve such issues.

A video of Kailash Satyarthi’s lecture at the 65th Lindau Nobel Laureate Meeting is available in the mediatheque.

KAILASH SATYARTHI AT BODENSEE-GYMNASIUM LINDAU

Dressed in a crisp white kurta, the awardee of the 2014 Nobel Peace Prize cut quite an imposing figure on stage at the Bodensee-Gymnasium high school in Lindau. He addressed a roomful of 11th grade students, breaking the ice with big, booming hellos and a joke. Over the course of the next hour, he told them about his work – a narrative peppered with illuminating anecdotes and a lot of inspiration.

Satyarthi walked the young people through his now storied struggle against child labour and child trafficking in India, the national and international campaigns he has led to further the cause, the successes and the work that remains to be done. He inspired a new movement in India for liberating child slaves – 84,000 children have been rescued thus far. He has led social campaigns that have culminated in policy changes at the highest levels: the Indian Constitution has been amended to make education a child right, and new international laws against child labour have been passed.

An exuberant Satyarthi then shared his plans to launch his largest, most ambitious campaign yet, for which he hoped to recruit 100 million young people across the world, who would unite to rescue 100 million less fortunate children. He repeatedly emphasised that no problem in the world is isolated. “People can’t live in islands of prosperity anymore,” he said. He urged the students to start thinking globally and warned that no one was truly safe as long as there were poor or underprivileged people anywhere in the world.

Being aware and spreading awareness is one way to contribute to change, he summarised. “I want to ignite the change in you,” he declared in conclusion and enjoined them to act: “Don’t stand on the fence and cheer. Jump in the ring.”

@TheresiaBauer

Just arrived on Mainau Island, now listening to an interesting panel discussion about scientific education. #LiNo15

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

@YourekaScience

Great discussion with Nobel laureates, students, and editors to discuss ways to change how science is communicated #LiNo15

Youreka Science, USA

@pjberkman

At dinner with Peter Doherty. He advises against taking a Crocodile Dundee knife to the Bavarian dinner. Suggests lederhosen instead. #LiNo15

Paul J. Berkman, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia

@MinuDTizabi

Peter #Agre: At earlier meetings, Iranians were only expats. Now for first time we have students from #Iran universities! Science without borders! #LiNo15

Minu D. Tizabi, University of Heidelberg, Germany

@Stephalizzle

My first high-profile panel discussion where all questions from the audience came from women! Progress :) #LiNo15 #womeninscience

Stephanie Wohlgemuth, participant at #LiNo15, Germany

@ClareDubh

Personalised medicine for cancer discussed by H. Varmus at #LiNo15, great talk by the man that literally wrote the textbook on cancer.

Clare McFadden, University of Edinburgh, United Kingdom

@j_c_schell

Edmond Fischer is one of the most exceptionally kind, patient, and humble people I've ever had the privilege of meeting! #LiNo15

John Schell, University of Utah, USA

@sandeeprtweets

Kailash Satyarthi: "We must be the voice of children." Need political will and social momentum to ensure education for all children. #LiNo15

Sandeep Ravindran, Science Writer, USA

@veroniquetienne

#LiNo15 is 4th in the twitter trends for Germany! Congrats!

Véronique Etienne, CNRS Le Journal, France

@mjward1985

Just back from #LiNo15: One of the best weeks of my science career! Thanks very much to the Vallee Foundation for funding me.

Melissa Ward, University of Edinburgh, United Kingdom

@kilokilok9

O. Smithies on where ideas come from, lauding the impact of good, inspiring #teachers throughout the school career. #LiNo15

Kenda Knowles, University of KwaZulu-Natal, South Africa

@AgChaigne

Between B Schmidt and S Perlmutter I feel I am finally understanding something about cosmology! #LiNo15

Agathe Chaigne, Collège de France, France

@k_satyarthi

Reached Lindau for one of the world's most esteemed knowledge meetings. With 65 fellow Nobel Laureates, 650 young scientists #LiNo15

Kailash Satyarthi, Nobel Peace Laureate 2014

@Luz0r616

Sad that it's over now. I met so many interesting people and maybe also friends for a lifetime! #LiNo15

Lucien Caspers, University of Tübingen, Germany

@ungaakademin

Sometimes it is the simplest messages that work best – fight fear with knowledge, Oliver Smithies. Right on! #LiNo15

Young Academy of Sweden

@Science_Academy

Best of luck to all the delegates off to Germany for #LiNo15, hope you have a great time!

Australian Academy of Science

@Moedas

Honoured to address #LiNo15 on Openness in Science!

Carlos Moedas, European Commissioner for Research, Science and Innovation

@SusanMacMillan

36 Nobel laureates make historic #climatechange commitment/declaration aimed at Paris.

Susan MacMillan, International Livestock Research Institute, Namibia

@MattGunther87

'We need more science in politics and less politics in science,' concludes Roberts. #LiNo15

Matthew Gunther, Science Correspondent, Chemistry World, United Kingdom

@umairfan

Brian Schmidt @cosmicpinot says climate change is a threat comparable in magnitude to nuclear war #MainauDeclaration2015 #LiNo15

Umair Irfan, Reporter E&E Publishing, USA

@GICAfrica

Far more young African scientists in Lindau for the Nobel Laureate Meeting! #LiNo15 @DAAD_Bonn

German Information Center Africa

@NeuRoman_cer

The French taking over tonight for the international day. #LiNo15 Nice food, wine and music guaranteed!

Roman Stilling, University College Cork, Ireland

@synapse101

Career advice from Laureate Martin Chalfie – include a small proposal in all post-doc applications, whether they asked for it or not. #LiNo15

Emma Beckett, University of Newcastle, Australia

@maxplanckpress

#MainauDeclaration2015 on climate change signed: Nobel Laureates and young scientists say it is time to act! #LiNo15

Max Planck Society

@ECRPubConnect

"United passion for #ECR education: @ElsevierConnect joins @lindaunobel with our new Publishing Campus!

Elsevier Publishing Campus

@Foundation_AU

African Union Foundation will collaborate with the Lindau Foundation to bring African Student scientists to Nobel Laureate Meetings #Agenda2063 @_AfricanUnion

The African Union Foundation

@DietDrNepper

We need global science literacy. #LiNo15

Julia Nepper, University of Wisconsin-Madison, USA

@DrLouisWang

Feeling privileged to have witnessed @cosmicpinot announcing the #MainauDeclaration2015.

Louis Wang, University of New South Wales, Australia

@cosmicpinot

Off to meet 650 of the world's brightest young minds (and 65 fellow laureates) at 65th @lindaunobel meeting – I do have a good job!

Brian Schmidt, Nobel Laureate in Physics 2011

@Phil_Baty

EU Commissioner Moedas at #LiNo15: Key to scientific excellence is openness. Need to look seriously to open research results & data.

Phil Baty, Editor, THE World University Rankings

@TReNDinAfrica

Our founders @neuroluci and @ToodleNoodleTom have been invited as panelist at #LiNo15 Looking forward!

TReND in Africa, Science NGO

@KAUST_News

Young KAUST scientists to attend Lindau Nobel Laureate Meeting from June 28 – July 3, 2015.

King Abdullah University of Science and Technology, Saudi Arabia

@lucatbarone

"Scientists are citizens of the world, we have to discuss openly results of science" says Denis Le Bihan, Director of Neurospin. #LiNo15

Luca Tancredi Barone, Italian science journalist

Voices of the Science Community – #LiNo15 on Twitter

Ingenious Encounters: World Tour to Nobel Laureates

"NOBELS – Nobel Laureates photographed by Peter Badge" – for this project, German photographer Peter Badge has been traveling around the world since 2000. His recently published book provides insights into his numerous encounters with Nobel Laureates – here an excerpt.

Professor Edmond Fischer was "only" 80 years old when, as he sat in front of my camera waiting for my instructions, he insisted that I stop addressing him formally as "Professor" and politely requesting that he "please be so kind" as to do this or that; he asked me instead simply to call him "Eddy." Thanks to him, I became fired up with enthusiasm. That's what happens when you have expectations, prejudices, and opinions and then realise that you were completely and utterly mistaken. You become curious. It was no longer about "taking pictures of old men" but rather learning something about those people who have been officially rewarded for being of the greatest benefit to mankind. Through my photographs, I wanted to try and pass on at least something of their unique personalities. I could never have imagined what lay in store for me: I cooked roast lamb with Eddy Fischer; John F. Nash Jr. sent me via e-mail his calculation of the probability that we would sit opposite each other in the train we both intended to take; and I was given the opportunity of a potential photo session with Aleksandr Solzhenitsyn in Moscow even though I had neither an appointment nor a valid visa. I helped the neurophysiologist Linda Buck choose a wedding gown; accompanied José Ramos-Horta, the President of Timor-Leste, on a state visit to Cuba; and travelled to the holy places of Israel with the biochemist Aaron Ciechanover. Sometimes, even today, I am amazed that this incredible wealth of experience belongs to me. [...]

Buzz, clack. Buzz, clack. Buzz... What the hell...? I race back to the office from the kitchen. The printer is spitting out page after page. [...] Did I set it to print 100 copies of the mail attachment? Buzz, clack. Buzz, clack. I pick sheets of paper up off the floor. No, they are not copies. Just one document, with 54 pages of text annotations, 320 in total, and all containing the exact same information: "DELETED – Edmond Fischer – 03.25.2014".

It's a few days since I emailed my 94-year-old friend Eddy a draft of the preface to this book to read. [...] I suspect he will be resistant to an elevated role, and so I factor in enough time to persuade him that there is no option: I have to tell it the way it is, and he was, after all, "my first time" – my first photo shoot with a Nobel Laureate and the reason for the best decision of my life. And now Eddy has proofread the whole preface, or rather pulverised it. Every paragraph has red, blue, and green comments.

"This is a pain in the ass," Eddy puts it succinctly, though he means the computer's change tracking function rather than the preface text per se, despite all his deletions. Eddy sends version after version, and eventually what is allegedly a "final version in red and blue." [...] If it was about an enzyme, rather than switching the change tracking function on and off, Eddy would definitely have worked out how to activate and deactivate it. Computers, however, don't conduct reversible protein phosphorylation. [...]

Although I have known "my first Nobel Laureate" for over a decade now, he leaves me gobsmacked yet again. I expected him to read carefully through what I sent him, but not to take such great pains with the text. [...] What do I do now?

I did not send another line from the book in advance to Eddy Fischer, "computer expert" from Seattle. Eddy cooked for me, Eddy played Wagner on the piano for me, Eddy showed me the best swimming coves on Lopez Island, Eddy picked me up from the airport in the middle of the night, chauffeured me all round Seattle, set up contacts for me, and arranged photo shoots. But the door is now firmly shut on editing any text. Edmond Fischer is simply too good for this world. In every sense.

We will both have to live with my story about a photographer and his "Nobel Laureates Project." I had set forth into an unknown world full of mysteries that can never be revealed to me, and which I'm unable to convey to others. Yet, for me, Eddy represents what I would like to convey. Like no other. It all began with him. Under his wing, I had dared to enter this small circle of great men and women. And they themselves had emphasised, time and again, what Isaac Newton described using a metaphor borrowed from Ovid: "If I have seen further, it is by standing on the shoulders of giants."

Peter Badge & Sandra Zarrinbal

"Peter Badge shows us the wonderful gifts that make Nobel Laureates unique – and how they help us connect our interesting differences to our common humanity."

Bill Clinton, former President of the United States of America

Edmond Fischer and Peter Badge

"INGENIOUS ENCOUNTERS" is much more than a mere "making of" of the long-term photographic project that Peter Badge continues to pursue for the Lindau Nobel Laureate Meetings with support by the Klaus Tschira Stiftung. The book reflects on the personalities, achievements, and lives of the laureates from a unique perspective which is both unusual and fascinating. Peter Badge has gained incomparable insight into the world of those who "have conferred the greatest benefit on mankind" — as Alfred Nobel described it in his last will and testament. Badge's memories have been compiled and penned by Sandra Zarrinbal to create a captivating book that defies categorisation: as authentic as a diary, as informative as a work of popular science, as thrilling as an adventure documentary, as touching as a novel of personal development, as amusing as a celebrity biography, and as poetic as Nobel himself preferred to approach the world.

The German edition of the book was presented at the following occasions and venues:

- Berlin: Embassy of Sweden
- Johannesburg: FNB Joburg Art Fair
- Leipzig: Leipzig Book Fair
- Munich: DLD15 Conference, Hubert Burda Media
- Washington: German American Business Council

Book cover depicting the late Nobel Laureate in Economic Sciences John F. Nash Jr.

Ingenious Encounters: World Tour to Nobel Laureates, by Peter Badge & Sandra Zarrinbal

English edition available soon.

Sketches of Science

Why not ask Nobel Laureates to make a sketch of the discovery for which they received the Nobel Prize – and then ask them to present their artwork to the camera? This is exactly what German photographer Volker Steger did to create the exhibition "Sketches of Science".

In his photos, Volker Steger captures the spontaneity and creativity of Nobel Laureates; the pictures express the enthusiasm of scientists and researchers for their work. 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 – also throughout 2015.

Olov Amelin, Director of the Nobel Museum, Brian J. Kobilka, Volker Steger, Bruce Beutler, Nikolaus Turner, Harold H. Schmitz, Chief Science Officer of Mars, Incorporated, and Ralph J. Hexter, Provost and Executive Vice Chancellor of UC Davis

Exhibitions 2015
USA, Davis
University of California
5–28 January

USA, Washington D.C.,
House of Sweden
6–29 March

Germany, Hannover
Hannover Messe
13–17 April

Russia, Moscow
GUM Trading House
in cooperation with
All-Russia Science Festival
20–30 October

Project partner
Nobel Museum, Stockholm

Principal funder
Klaus Tschira Stiftung

House of Sweden, Washington, D.C.

GUM, Moscow

Hannover Messe

Hannover Messe

Innovative technology requires cutting-edge research – this was the guiding principle for the stand of the Lindau Nobel Laureate Meetings at Hannover Messe 2015. Visitors of the world's most important industrial trade fair were attracted by the photo exhibition "Sketches of Science" focussing on the people responsible for extraordinary accomplishments in science and research. The aim of the presentation was to showcase the significance and impact of intergenerational and intercultural exchange among excellent scientists, as facilitated by the annual Lindau Meetings.

With "Integrated Industry – Join the Network" as its keynote theme and India as partner country, Hannover Messe soared to new heights in 2015, striking an inspirational note among exhibitors and attendees from industry, business and government. More than 220,000 trade visitors – 70,000 of whom came from outside Germany – used Hannover Messe to catch up on the latest technologies and make key investment decisions. Some 6,500 companies from 70 countries showcased technologies for tomorrow's production plants and energy systems.

It was thanks to the special commitment of Festo AG and Deutsche Messe AG that the Lindau Nobel Laureate Meetings could be presented at Hannover Messe 2015.

Exhibition catalogue presented by Wilfried Stoll, Managing Director of Festo Holding, Volker Steger, Olov Amelin, Countess Bettina Bernadotte, Wolfgang Huang, Ulrich Stoll, Vice-Chairman of the Supervisory Board of Festo, Nikolaus Turner

Exhibition stand of the Lindau Meetings at Hannover Messe 2015

Visit by Johanna Wanka, German Federal Minister of Education and Research

Laboratory-style refreshments provided at the "Night of Innovations"

Sketches of Science

The Mediatheque

With unique content dating back to 1952, the mediatheque of the Lindau Nobel Laureate Meetings maps their rich history of scientific dialogue. The mediatheque is gradually being developed further to provide a learning platform and research resource for scientists and those fascinated by science, particularly teachers and students.

Lectures
More than half of the approximately 1,000 lectures held by Nobel Laureates at the Lindau Meetings thus far have been documented in the mediatheque: It contains 500 videos or picture slide shows, many of which are subtitled and annotated, as well as abstracts and full transcripts.

Research Profiles
The mediatheque contains biographical profiles of all Nobel Laureates who have thus far participated in the Lindau Meetings. They are gradually being supplemented with explanatory information on the scientific accomplishments of the laureates, relating their research to the historical as well as to the contemporary scientific context.

Topic Clusters
By clustering and contextualising related mediatheque contents, a team of editors continuously compiles comprehensible introductions to major scientific fields and topics, like cancer, proteins, or subatomic particles.

Mini Lectures
Following a contemporary didactic approach, the mediatheque is complemented with short animated videos outlining key issues of science and research in a both educative and entertaining fashion.

Nobel Labs 360°
So far, 13 Nobel Laureates have made their workplaces accessible virtually in the mediatheque: The 360° panoramic photos taken by German photographer Volker Steger depict their labs in great detail; embedded video and audio recordings add to the entertaining and educational experience of a virtual lab tour. Nobel Labs 360° can be displayed in web applications, on personal tablet computers, or on large touch screens in exhibitions.

Cooperation with educational content providers
With intent to impart and further disseminate scientific information by and about Nobel Laureates, the Council and the Foundation embarked on a strategy to collaborate with non-profit providers of digital educational content, mainly public providers of didactic material for teachers.

Partners
– mebis – Landesmedienzentrum Bayern des Bayerischen Staatsministeriums für Unterricht und Kultus
– SESAM – Landesmedienzentrum Baden-Württemberg
– Landesmedienzentrum Rheinland-Pfalz
– Schulmedienzentrum Vorarlberg
– TES, the world's largest online network of teachers
– Leibniz Institute for Science and Mathematics Education
– Lehramtsausbildung der FU Berlin
– AK Schulförderung des Verbandes der Chemischen Industrie (VCI)

Life Paths
Starting 2015, the mediatheque provides a new application to vividly display and compare the life and career paths of Nobel Laureates on a rotatable globe. The data from their biographies was compiled and processed in cooperation with the Max Planck Institute for the History of Science. The more life paths tracked, the more convenient it becomes to identify parallels and differences in researchers' careers. Life Paths is based on an idea by Nobel Laureate Arno Penzias.

Support
The ongoing enhancement of the mediatheque is generously supported by the German Federal Ministry of Education and Research, the Carl Zeiss Stiftung, the Gerda Henkel Stiftung and the International Lake Constance Conference (IBK).

mediatheque.lindau-nobel.org

Brian Kobilka in Nobel Labs 360°

Life paths of Nobel Laureates

Nature Video Lindau Collection 2015

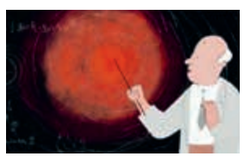
"Are you sitting comfortably? Then let me tell you about my Nobel prize-winning science." – in a series of four animations, Nobel Laureates talk about work, life and discoveries that change the world. Together with three documentary films, they form part of the 2015 collection of videos produced by Nature Video, with support of Mars, Incorporated, and in association with Scientific American.

Every year since 2008, Nature Video have produced a series of films that focus on select topics and participants of the Lindau Meetings. These educative and entertaining films showcase what "Lindau" is all about: sharing knowledge and ideas, seeking inspiration and motivation, finding companions and friends, and forging networks.

"ALL CREATURES GREAT AND SMALL, WITH ELIZABETH BLACKBURN"
From jellyfish to ants, all life is beautiful in the eyes of Elizabeth Blackburn, co-laureate of the 2009 Nobel Prize in Physiology or Medicine. She talks about her fascination with living things and the discovery of telomerase and telomeres.

"FLUORESCENCE IS A STATE OF MIND, WITH STEFAN HELL"
How to break a fundamental law of physics and win a Nobel Prize to boot? Stefan Hell explains super-resolved fluorescence microscopy for which he shared the 2014 Nobel Prize in Chemistry.

"ONE PHOTON'S JOURNEY, WITH SAUL PERLMUTTER"
The story of the evolution of life on earth during one photon's journey across the universe – told by Saul Perlmutter who shared the 2011 Nobel Prize in Physics for the discovery of the accelerating expansion of the universe.



"THE PIGEON, THE ANTENNA AND ME, WITH ROBERT WILSON"
Radio astronomer Robert Wilson recalls a pair of pigeons who almost thwarted the discovery of cosmic background radiation. Wilson's discovery of cosmic background radiation, "the echo of the big bang", earned him a share of the 1978 Nobel Prize in Physics.

The animations and the documentary films of the Nature Video Lindau Collection 2015 are available in the mediatheque.

Teaching Spirit

Children and young people usually become enthusiastic about science at school, and this is where they acquire the basic knowledge and skills for a research career, so teachers play a significant part in the fundamental training of future scientists. As part of the overall mission to support and promote initiatives towards more and better education, Teaching Spirit is a programme that rewards teachers who have shown extraordinary dedication in teaching science at school.

With support of Internationale Bodenseekonferenz (IBK, International Lake Constance Conference), 38 teachers from Austria, Germany and Switzerland were invited to attend one day of the 65th Lindau Nobel Laureate Meeting to gain inspiration and new ideas for creative and motivating teaching. This year's programme consisted of lectures, a lunch with Nobel Laureates, and a workshop held in cooperation with the Leibniz Institute for Science and Mathematics Education (IPN).

End-Game Winner

Elizabeth Blackburn received the 2009 Nobel Prize in Physiology or Medicine for her work on telomeres and for identifying the enzyme telomerase, which maintains telomere length. For the 2015 Nature Outlook "Science Masterclass", Blackburn offered young scientist Elena Tucker an insight into her life inside and outside academia.

Elena Tucker: Why did you choose to study the ends of chromosomes?

Elizabeth Blackburn: The driver for me was wanting to understand how life works, rather than solving a particular problem that afflicts humans. When I was finishing my doctoral work at Fred Sanger´s lab in Cambridge, UK, DNA-sequencing methods were embryonic. At the time, in the early 1970s, it was hard to sequence DNA except at the ends of relatively short DNA molecules. That was just what was possible. Researchers had looked at the DNA of viruses such as bacteriophages, but I wanted to know what goes on inside the nuclei of cells with real chromosomes. I heard that Joe Gall at Yale University in New Haven, Connecticut, had discovered very short, linear chromosomes in the cell nucleus of the eukaryotic protozoan Tetrahymena, and I thought I might be able to sequence the ends of those with the limited technology available at the time.

ET: How did your research get off the ground?

EB: Once at Yale I started analysing the ends of the short Tetrahymena chromosomes. What I found was really odd. I had expected to see something similar to the single-strand overhanging DNA observed at the ends of bacteriophage linear DNA, but telomeres were different. They consisted of tandem repeats of a short sequence, and the numbers of these repeats varied between molecules and over time. This changeability was a really strong clue of enzyme involvement in maintaining them. Once I had my own lab at the University of California, Berkeley, I extended the telomere research to yeast, collaborating with Jack Szostak at Harvard Medical School in Boston, Massachusetts. We demonstrated that this changeability is not unique to one kind of organism, and that it might be universal to eukaryotes. So I started searching for a new kind of enzyme. That was when my then-graduate student Carol Greider and I discovered telomerase. We also found that we could make cells quite miserable if we disrupted their telomeres. The molecular puzzles became more and more intriguing. Moving to the University of California San Francisco with its medical school has led me towards all sorts of systems-wide questions around human health and telomeres. I started collaborations to study how chronic stress can affect physiology, which I would never have dreamed of asking on my own. [...]

ET: What are the main unanswered questions involving telomeres?

EB: I would like to know how a telomere really works. We have a parts list, so we know what it does in a static sense. But in live cells, telomeres are extraordinarily dynamic. They are complex little ecosystems that constantly have proteins arriving and leaving every second. I think we could learn a huge amount by studying telomeres in action, rather like researchers do by watching active ribosomes assemble proteins, in addition to knowing their structure. The second unanswered question is how we might be able to modify telomere maintenance to make human bodies more resilient, given the correlation between having long telomeres and living healthily and for a long time. I would love to see humanity achieve a situation in which, although we get old and decrepit and things go wrong, we can improve health in the elderly far more than is achieved today. [...]

ET: Apart from your Nobel prize, you've received a UNESCO L'Oreal for Women in Science Award and been one of Time magazine's 100 most influential people. What achievement are you most proud of?

EB: What I'm truly proud of is having done the science and I'm proud of the people who work with me — I'm proud that we've done these things together. The awards are really just symbols. But in the sense that symbols influence people in subtle ways, they matter. If I'm photographed receiving an award, the picture makes the point that there's a woman winning a science prize — that aspect of an award is important to me.

ET: How has your experience of motherhood influenced your career and vice versa?

"If I'm photographed receiving an award, the picture makes the point that there's a woman winning a science prize — that aspect of an award is important to me."

Elizabeth Blackburn, Nobel Laureate in Physiology or Medicine 2009

EB: For years I honestly didn't think much about having children. People would often say "you'd better have a baby soon if you're turning 30", but I didn't listen. I became pregnant in my late thirties when my career was very much underway — I found out I was pregnant in the same week that I was promoted to full professor at Berkeley! I feel very lucky, but I don't think my path is necessarily a recipe for happiness that others should follow. Children can happen at any time, and the challenges will be different depending on where you are in your career.

ET: When you were a child, did your interest in science make you feel different from your peers?

EB: I always felt like a fish out of water. I had good friends growing up and we would do stuff that was normal in Tasmania, Australia, like swim after school and then eat disgustingly delicious meat pies slathered with tomato sauce. But I wouldn't yap to my friends about science. I would talk about Beatles songs. I wasn't afraid of being thought weird, though talking science seemed to come across as pretentious. No one was overtly nasty, but I did sometimes feel pushed away, and that was hurtful. Self-preservation is a useful life lesson. I suppose I always knew that I was different. I was thrilled with the idea that I could go and do a PhD, and do it outside Australia to really expand my horizons.

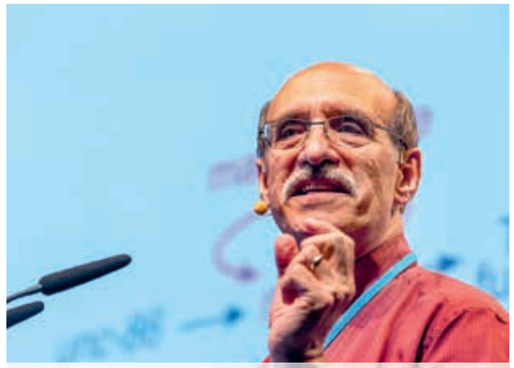
Nature, Vol. 526, No. 7574 (22 October 2015)

Since 2010, the Lindau Nobel Laureate Meetings have each been featured in a separate Outlook supplement in Nature. With their content mix of full-length features and Q&A articles, these publications serve as high-quality, enduring records of the vivid exchange among laureates and young scientists. The supplements could be produced thanks to the support by Mars, Incorporated.

The Blog of the Lindau Meetings

Over the past year, the official blog has evolved into the central online community platform and content hub of the Lindau Nobel Laureate Meetings. Contributors range from professional science writers to young scientists and even Nobel Laureates. Among the featured posts are science and research news, articles on science history, background stories about the meetings and interviews with various participants.

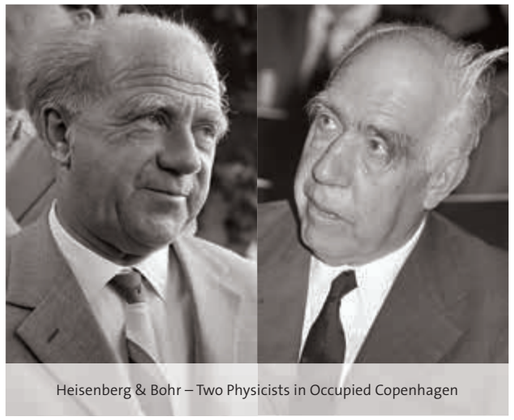
These and more than 500 other blog posts can be read at lindau-nobel.org/blog



Forced Multidisciplinarity

Women in Science – Some Global Perspectives

Open Access and No End



Heisenberg & Bohr – Two Physicists in Occupied Copenhagen

What Happened With Cosmic Inflation?

Webinar "Persevering in Science"

Succeeding in a career in science begins with talent and hard work, but can be greatly facilitated with wise guidance for how to avoid some of the career limiting (or ending!) pitfalls and how to take advantage of some of the career accelerating strategies that are not necessarily part of the typical graduate curriculum.

The webinar "Persevering in Science: Advice from Nobel Laureates" produced by AAAS Science this year was customised for the numerous young scientists who were not fortunate enough to participate in the Lindau Meeting and personally seek the advice from Nobel Laureates. Moderated by the editor-in-chief of Science, a panel of Nobel Laureates was on hand to share their wisdom on how to get ahead and to answer questions on how to succeed in science.

The one-hour discussion was streamed live on the internet and attracted a global audience: Approximately 4,000 early-career researchers from more than 60 countries signed up for online participation and submitted over 250 questions during the session.

Panellists
- Elizabeth Blackburn, Nobel Laureate in Physiology or Medicine 2009, University of California, San Francisco, USA
- Dan Shechtman, Nobel Laureate in Chemistry 2011, Technion, Israel Institute of Technology
- Jack Szostak, Nobel Laureate in Physiology or Medicine 2009, Massachusetts General Hospital, Boston, USA

Moderator
Marcia McNutt, Editor-in-Chief of the Science family of journals

The webinar is available as video on demand in the mediatheque.

Marcia McNutt

Jack Szostak

Marcia McNutt, Dan Shechtman, Elizabeth Blackburn, Jack Szostak

Communications

Media Coverage & Partnerships

Approximately 130 journalists and communicators from 20 countries attended the 65th Lindau Nobel Laureate Meeting to visit the lectures and panel discussions, conduct interviews and take part in special press events. This joint effort resulted in varied international media coverage.

Special media partners played a leading role in covering the 65th Lindau Meeting:

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

Elizabeth Blackburn being interviewed by Emily Corona, journalist for the Mexican newspaper Reforma and participant of the DAAD press tour

Zulfikar Abbany (right) of Deutsche Welle interviewing Wolfgang Schürer

Science Journalist Networks

The close cooperation with influential networks of science journalists has contributed significantly to the media coverage of the 65th Lindau Meeting:

– European Union of Science Journalists' Associations (EUSJA)
– International Journalists' Programmes (IJP)
– National Association of Science Writers (NASW, USA)
– German Academic Exchange Service DAAD – Press Tour

TV talk "alpha-Forum extra" featuring Nobel Laureate Hartmut Michel (right), broadcasted by ARD-alpha

Press Talk on "Human Genetic Alteration: Does the Pause Have a Purpose?"

Press Talks

Accredited journalists were invited to join three press talks: topical panel discussions with Nobel Laureates and young scientists, moderated by Jon Turney, science writer from the UK.

"HUMAN GENETIC ALTERATION: DOES THE PAUSE HAVE A PURPOSE?"
Novel DNA-editing techniques, most prominently the CRISPR/Cas 9 system, offer new and more precise routes to genetic modification, including changing human DNA. There has been a call for a moratorium on use of the techniques in human embryos – and the US National Institutes of Health have blocked funding for such studies. Is the moratorium needed? Can it work? And how should we decide which research in this area is permissible, which best left alone?

Panellists
– J. Michael Bishop, Nobel Laureate in Physiology or Medicine 1989, University of California, San Francisco, USA
– Elizabeth Blackburn, Nobel Laureate in Physiology or Medicine 2009, University of California, San Francisco, USA
– Simon Elsässer, Karolinska Institutet, Stockholm, Sweden
– Richard J. Roberts, Nobel Laureate in Physiology or Medicine 1993, New England Biolabs, Ipswich, USA

Editorial supplement in the German broadsheet Süddeutsche Zeitung

"AFRICAN SCIENCE: TODAY AND TOMORROW"
How will Africa take its place in a global knowledge economy? Scientific development is crucial for this vast continent. Young scientists from diverse African countries are attending the Lindau Meeting. Some of them will join senior researchers with experience on the ground to give us a view of scientific prospects there. What are Africa's scientific strengths and weaknesses? How can research in African countries be enhanced, and exploited for local benefit? What role may pan-African initiatives like the recent launch of the Alliance for Accelerating Excellence in Science in Africa (AESA) have?

Panellists
– Peter Agre, Nobel Laureate in Chemistry 2003, Director at the Johns Hopkins Malaria Research Institute, Baltimore, USA
– Melinda Barkhuizen, NorthWest University, Potchefstroom, South Africa
– Françoise Barré-Sinoussi, Nobel Laureate in Physiology or Medicine 2008, Département de Virologie, Institut Pasteur, France
– Serge Fobofou, Leibniz Institute of Plant Biochemistry, Halle, Germany
– Prosper Ngabonziza, University of Twente, Netherlands

"LIFE SCIENCES IN THE NEXT 50 YEARS: THE BIG QUESTIONS"
The Nobel Laureates featured in this panel have had sparkling scientific careers. But suppose they were starting over: What question do they cherish, which do they think can be answered in fifty years? How could it be tackled? And, while the details are unknowable, what is their personal best guess about the answer? Journalists were invited for an hour of informed speculation about the future of science, raising questions that the young scientists could decide to tackle in the future.

Panellists
– Venkatraman Ramakrishnan, Nobel Laureate in Chemistry 2009, MRC Laboratory of Molecular Biology, Cambridge, United Kingdom
– John Schell, University of Utah, Salt Lake City, USA
– Jack Szostak, Nobel Laureate in Physiology or Medicine 2009, Harvard Medical School, Boston, USA
– Arieh Warshel, Nobel Laureate in Chemistry 2013, University of Southern California, Los Angeles, USA

Press Talk on „Life Sciences in the Next 50 Years: the Big Questions"

Inspiring Lindau

Exhibition at the City Museum

It was the two city councillors from Lindau, Franz Karl Hein and Gustav Wilhelm Parade who approached Count Lennart Bernadotte of nearby Mainau Island – a grandson of King Gustav V of Sweden – to jointly develop and implement the idea that marked the beginning of a long and continuing history of the Lindau Nobel Laureate Meetings. Due to Count Lennart's efforts and networking in Stockholm, seven Nobel Laureates agreed to participate in the first "European Meeting of Nobel Laureates in Medicine", held at Lindau in 1951. This extraordinary meeting was conceived as a European initiative of post-war reconciliation among scientists.

The initial success led to the establishment of periodic meetings of Nobel Laureates in Lindau, dedicated alternately to the Nobel Prize disciplines physiology or medicine, physics, and chemistry. Already in 1953, the decision was made to have students, doctoral candidates and post-doc researchers join the dialogue.

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

The city museum of Lindau hosts a permanent exhibition on the history of the meetings: "The Lindau Nobel Laureate Meetings – Now and Then". It covers more than 60 years of intergenerational exchange, depicted in original documents, photos, videos and exhibits.

The exhibition is comprehensively displayed in text and pictures in the mediatheque.

Exhibition "The Lindau Nobel Laureate Meetings – Now and Then"

Explaining the Nobel Prizes

It has become a tradition at the beginning of a new year that the Council invites Lindau citizens to the old town hall of Lindau for a lecture programme and an ensuing reception to celebrate the awarding of the latest Nobel Prizes. Again in January 2015, Council members and alumni of the Lindau Nobel Laureate Meetings gave comprehensible and entertaining presentations to explain the research findings of the Nobel Laureates bestowed in December 2014.

Presentations

"THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL: JEAN TIROLE"
Wolfgang Schürer, Chairman of the Board of Directors of the Foundation, Professor emeritus for Public Affairs, University of St. Gallen

"THE NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE: JOHN O'KEEFE, MAY-BRITT AND EDVARD MOSER"
Përparim Limani, participant in the 64th Lindau Meeting 2014, consultant surgeon, Swiss Hepatopancreatobiliary (HPB) Laboratory, University Hospital Zurich

"THE NOBEL PRIZE IN CHEMISTRY: ERIC BETZIG, STEFAN W. HELL AND WILLIAM E. MOERNER"
Mehtap Özaslan, participant in the 63rd Lindau Meeting 2013, Junior-Professor for Electrochemistry, Carl von Ossietzky University of Oldenburg

"THE NOBEL PRIZE IN PHYSICS: ISAMU AKASAKI, HIROSHI AMANO UND SHUJI NAKAMURA"
Burkhard Fricke, former Vice-President of the Council, Professor emeritus for Theoretical Physics, University of Kassel

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

Support
City of Lindau and Schwäbische Zeitung/Lindauer Zeitung

Mehtap Özaslan

Përparim Limani

Conference Venue Inselhalle

The long-awaited modernisation of the ageing conference venue Inselhalle has finally begun. The dismantling of larger parts of the existing building started only weeks after this year's Lindau Nobel Laureate Meeting. Since then, the construction work on site has been progressing on schedule. Plans see the 67th Lindau Nobel Laureate Meeting (Chemistry) as well as the 6th Lindau Meeting on Economic Sciences take place in the modernised Inselhalle in summer 2017. The 2016 Lindau Meeting will have the city theatre as its main venue.

Thanks to the strong support by the Free State of Bavaria, the City of Lindau is able to realise this major project with great dedication and substantial financial commitment.

Starting signal for the Inselhalle modernisation:
Ludwig Spaenle, Bavarian State Minister of Education, Science and the Arts (right), Elmar Stegmann, Head of the District Authority (fourth from right), (succeeding from right) Nikolaus Turner, Wolfgang Schürer, Gerhard Ecker, Lord Mayor of the City of Lindau, Countess Bettina Bernadotte, Nobel Laureate Klaus von Klitzing, Council member Rainer Blatt, Carsten Holz, Director of Lindau Tourismus und Kongress GmbH, participants of the 65th Lindau Meeting

Visualisation of the new congress venue Inselhalle

Reflections and Memories

The recently published book "Science at First Hand – 65 Years Lindau Nobel Laureate Meetings" highlights the milestones of the meetings' history and preserves a whole array of personal anecdotes – like the memories and impressions of Beate Hein Bennett, daughter of co-founder Franz Karl Hein.

Boat Trip to Mainau Island on 15 July 1954: Otto Hahn gives Beate Hein his signed cigar box as a souvenir.

The Lindau Nobel Laureate Meetings in my hometown Lindau always evoke in me the spiritual legacy of my father, Dr. Franz Karl Hein (1899–1966), the co-founder of the meetings. Since 1964 I have lived in the United States, where I was able to study [...] I remained in the US teaching literature and theatre. For the past fifty years, my family as well as the Lindau Meetings have been the reason for my yearly return to Lindau.

In 2000, for the 50th anniversary, my brother Piet Hein and I mounted an exhibit of documents from our father's professional archive (1949–57) that showed the inception, implementation, and reception of the initial meetings. Some of these objects are integrated into the permanent exhibition at the city museum of Lindau that shows in graphic detail the development of this unique meeting from original idea to its present dimension.
In order to contextualise my father's legacy and my experiences of the meeting, I will first outline my father's scientific background. From 1931–35 he was gynecological resident at the University Women's Clinic in Munich and worked at the affiliated Radiation Institute in cancer research and radiation therapy under the supervision of Prof. Dr. Albert Döderlein, Director of the University Women's Clinic and the Institute. In mid-1934 Prof. Döderlein retired; his successor, a staunch National Socialist, "cleansed" the Institute of all "political undesirables," among them my father.

In August 1939, shortly before the war, my family moved from Munich to Lindau. Only at the end of the war could my father establish his practice of gynecology and obstetrics in Lindau. He threw himself into his medical work with tremendous commitment and hope, and into the local political and cultural life which had to be rebuilt from scratch and was, at that time, sanctioned by the French occupation force. In late 1949, my father and Prof. Dr. Gustav Parade, who had come to Lindau from the University of Innsbruck after the war, began to draft plans for the first Nobel Laureate Meeting. [...]

A special memory: on a spring day in 1950 my parents drove to Mainau Island to meet Count Lennart Bernadotte in person and present the idea of the meeting. I was brought along. We sat by the warm red southern castle wall amidst aromatic lemon and orange espaliers. The ambience, the friendly Count, and the lively conversation of my parents with the Count and Countess Karin are early sensory memories of mine, linking the islands of Lindau and Mainau in my mind. Count Lennart and my father became partners through their tireless commitment and courageous vision to surmount all obstacles.

Today intercontinental contact and travel is taken as given; especially students and scientists expect to conduct their work and studies internationally. English is the lingua franca of science, commerce, politics, and even art. These structures did not exist in the 1950s [...]. At the first meeting in 1951, my father spoke in his inaugural speech of the need to connect and be inspired to learn from the best as essential to any scientific progress for all humanity. He pointed out that, "for the first time since 1933, scientists of most diverse nations come again together sine ira et studio to exchange ideas, that scientists of world renown present the results of their research to all. May this success of two years of intense work contribute to a new understanding among the peoples of Europe and inaugurate an era of common peaceful work." [My English translation] The laureates have enthusiastically endorsed the effort ever since by returning year after year. [...]

This tradition of intellectual exchange on a profoundly human level continues to be cultivated by the Bernadotte family as a lasting spiritual legacy, now with Countess Bettina, whose natural charm and light touch remind me of her father.
My early childhood memories of the meetings are mostly social: the Sunday welcome in the lobby of the Hotel Bad Schachen where my parents met the arriving laureates for tea; the exclusive reception in the White Hall of Mainau Castle where once Mrs. Yukawa, dressed in kimono and Japanese platform shoes, performed a traditional fan dance to the delight of the scientists. [...] I developed a special friendship with "Uncle" Otto Hahn who came between 1952-65 every year; our "serious" conversations full of his humour and his soft Frankfurt accent are still in my ear – and he even gave me his signed (empty) cigar box. [...]

Through the years I have attended many lectures that not only introduced me to the personalities and history behind scientific discoveries but also to the philosophical, spiritual dimension of science. In the late 50s and early 60s, I met many German students; now I meet young researchers from all corners of the globe. Then and now I note an appreciation of such meta-scientific topics. The small island of Lindau is an ideal location – everybody has to stay closely together!

For the past 65 years the Lindau Nobel Laureate Meetings provide a forum for a peaceful, free exchange of ideas. Any changes during the recent decades have simply enhanced the profile of the meeting without altering the unique character of the "Lindau Idea." I think my father would be profoundly gratified by these developments! And I am grateful for the privilege to have benefited from this inspiration for so many years!

Beate Hein Bennett

@DrLouisWang
If there was a #heaven for #science on Earth, then it would be found in #Bavaria in beautiful #Lindau. #LiNo15
Louis Wang, University of New South Wales, Australia

@kitkwok6
History made! A truly inspiring #LiNo15. My turn as a young scientist to spread the Lindau spirit around! Long live #Lindau and #science!
Chun Kit Kwok, University of Cambridge, United Kingdom

On the occasion of the 65th anniversary of the Lindau Meetings, Ralph Burmester, historian and research associate of Deutsches Museum Bonn, outlined the history of the meetings from 1951 to 2015. In his book „Science at First Hand – 65 Years Lindau Nobel Laureate Meetings", he gives a historically accurate presentation based on archive material and interviews, complemented by several first-hand impressions and many historical pictures.

Science at First Hand – 65 Years Lindau Nobel Laureate Meetings
Published by Ralph Burmester and Andrea Niehaus

ISBN 978-3-940396-50-1

"The very nice and fruitful exchanges I had with young scientists from all around the world truly enriched my own vision on the actual evolution of science in the context of a globalised world."

Françoise Barré-Sinoussi, Nobel Laureate in Physiology or Medicine 2008

The Council and the Foundation

The Council

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

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

The Council will ensure that eligible and qualified young scientists get the chance to participate in the Lindau Meetings. The Council also contributes to securing the financial basis for the meetings – in close collaboration with the Foundation. The Council maintains an executive secretariat at Lindau.

Honorary President
Count Lennart Bernadotte †

Board
Countess Bettina Bernadotte af Wisborg
President

Wolfgang Lubitz
Vice-President

Helga Nowotny
Vice-President

Nikolaus Turner
Treasurer

Members
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Thomas Ellerbeck (Spokesman)
Burkhard Fricke (until 10/2015)
Astrid Gräslund
Martin F. Hellwig
Klas Kärre
Stefan H.E. Kaufmann
Hartmut Michel
Torsten Persson
Wolfgang Schürer (until 12/2015)

Corresponding Members
Lars Bergström
Hans Jörnvall
Jürgen Kluge (from 10/2015; full member as of 01/2016)
Sten Orrenius
Reinhard Pöllath (from 10/2015; full member as of 01/2016)

Permanent Guests
Gabriela Dür
Gerhard Ecker
Walter Schön

Burkhard Fricke, Astrid Gräslund, Reinhard Pöllath, Wolfgang Lubitz, Wolfgang Schürer, Countess Bettina Bernadotte, Jürgen Kluge, Torsten Persson, Lars Bergström, Nikolaus Turner, Gabriela Dür, Klas Kärre, Rainer Blatt, Thomas Ellerbeck

The Foundation

The Foundation Lindau Nobel Laureate Meetings was established in the year 2000 upon the initiative of fifty Nobel Laureates. Ever since, Wolfgang Schürer has been the chairman of the board of directors. In this function, he will be succeeded in 2016 by Jürgen Kluge.

In general, the Foundation's 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. To ensure a close cooperation with the Council, the office of the Foundation is also based at Lindau.

Honorary Presidents
Count Lennart Bernadotte †
Roman Herzog

Board of Directors
Wolfgang Schürer
Chairman (until 12/2015)

Jürgen Kluge
Chairman (as of 01/2016)

Nikolaus Turner
Managing Director

Countess Bettina Bernadotte af Wisborg
Thomas Ellerbeck
Reinhard Pöllath
(as of 01/2016)

Nikolaus Turner, Reinhard Pöllath, Wolfgang Schürer, Jürgen Kluge, Countess Bettina Bernadotte, Thomas Ellerbeck

Founders Assembly

Through their membership in the Founders Assembly, Nobel Laureates demonstrate their strong support of the Lindau Meetings and entrust the foundation with the consistent further development of Lindau's intergenerational dialogue. By November 2015, 296 Nobel Laureates constitute the assembly.

Alexei Abrikosov
Peter Agre
Martti Ahtisaari
Isamu Akasaki
George A. Akerlof
Zhores Alferov
Maurice Allais
Sidney Altman
Hiroshi Amano
Philip W. Anderson
Werner Arber
Kenneth J. Arrow
Robert J. Aumann
Richard Axel
Julius Axelrod
David Baltimore
Francoise Barré-Sinoussi
Gary S. Becker
Johannes Georg Bednorz
Baruj Benacerraf
Paul Berg
Hans A. Bethe
Eric Betzig
Bruce A. Beutler
J. Michael Bishop
Sir James Black
Elizabeth H. Blackburn
Günter Blobel
Nicolaas Bloembergen
Baruch S. Blumberg
Paul D. Boyer
James M. Buchanan
Linda Buck
Mario R. Capecchi
Jimmy Carter
Thomas R. Cech
Martin Chalfie
Georges Charpak
Yves Chauvin
Steven Chu
Aaron Ciechanover
Ronald H. Coase
Stanley Cohen
Claude Cohen-Tannoudji
Leon Cooper
Elias J. Corey
John Warcup Cornforth
Mairead Corrigan Maguire
James W. Cronin
Paul J. Crutzen
Robert F. Curl jr.
Hans G. Dehmelt
Johann Deisenhofer
Peter A. Diamond
Peter C. Doherty
Renato Dulbecco
Christian de Duve
Gerald Edelman
Manfred Eigen
Robert Engle
François Englert
Richard R. Ernst
Gerhard Ertl
Leo Esaki
Martin Evans
John B. Fenn
Albert Fert
Edmond Fischer
Ernst Otto Fischer
Robert W. Fogel
Jerome Friedman
Milton Friedman
Robert F. Furchgott
D. Caleton Gajdusek
Andre Geim
Murray Gell-Mann
Riccardo Giacconi
Ivar Giaever
Walter Gilbert
Alfred G. Gilman
Vitaly L. Ginzburg
Donald Glaser
Sheldon L. Glashow
Roy J. Glauber
Joseph L. Goldstein
Michail Gorbachov
Clive Granger
Paul Greengard
David J. Gross
Robert H. Grubbs
Peter Grünberg
Roger Guillemin
John B. Gurdon
John L. Hall
Theodor W. Hänsch
Lars Peter Hansen
Serge Haroche
Lee Hartwell
Herbert A. Hauptman
Harald zur Hausen
Richard F. Heck
Alan C. Heeger
Stefan W. Hell
Dudley R. Herschbach
Avram Hershko
Antony Hewish
Peter Higgs
Jules A. Hoffmann
Roald Hoffmann
Gerardus 't Hooft
H. Robert Horvitz
David H. Hubel
Robert Huber
Russel Hulse
Timothy Hunt
Leonid Hurwicz
Andrew F. Huxley
Louis Ignarro
Brian Josephson
Daniel Kahneman
Eric R. Kandel
Charles K. Kao
Jerome Karle
Tawakkol Karman
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
Edwin Krebs
Herbert Kroemer
Harold W. Kroto
Finn Kydland
Willis E. Lamb
Robert Laughlin
Paul C. Lauterbur
Leon M. Lederman
David M. Lee
Tsung-Dao Lee
Yuan Tseh Lee
Robert J. Lefkowitz
Jean-Marie Lehn
Rita Levi-Montalcini
Michael Levitt
Edward B. Lewis
William N. Lipscomb
Robert E. Lucas Jr.
Alan G. MacDiarmid
Roderick MacKinnon
Peter Mansfield
Rudolph A. Marcus
Harry M. Markowitz
Barry Marshall
Toshihide Maskawa
Eric S. Maskin
John C. Mather
Daniel L. McFadden
Simon van der Meer
Craig C. Mello
Bruce Merrifield
Robert C. Merton
Hartmut Michel
James A. Mirrlees
Mo Yan
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
George A. Olah
Douglas Osheroff
Arno Allen Penzias
Saul Perlmutter
Edmund S. Phelps
William D. Phillips
Christopher A. Pissarides
John Polanyi
John Pople
Lord George Porter
Edward C. Prescott
Ilja Prigogine
Venkatraman Ramakrishnan
José Ramos-Horta
Norman F. Ramsey
Robert Richardson
Burton Richter
Richard J. Roberts
Heinrich Rohrer
Joseph Rotblat
Alvin Roth
James E. Rothman
F. Sherwood Rowland
Carlo Rubbia
Bert Sakmann
Paul A. Samuelson
Bengt Samuelsson
Frederick Sanger
Thomas J. Sargent
Kailash Satyarthi
Andrew V. Schally
Randy W. Schekman
Thomas C. Schelling
Brian Schmidt
Myron S. Scholes
John Robert Schrieffer
Richard R. Schrock
Melvin Schwartz
Reinhard Selten
Amartya Sen
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
Hamilton O. Smith
Michael Smith
Vernon L. Smith
Oliver Smithies
George F. Smoot
Robert M. Solow
Wole Soyinka
Jack Steinberger
Ralph M. Steinman
Thomas A. Steitz
Joseph E. Stiglitz
Thomas C. Südhof
John Sulston
Akira Suzuki
Jack W. Szostak
Henry Taube
Joseph Taylor
Samuel C. C. Ting
Jean Tirole
Susumu Tonegawa
Charles H. Townes
Tomas Tranströmer
Roger Y. Tsien
Daniel C. Tsui
Desmond Mpilo Tutu
Mario Vargas Llosa
Harold E. Varmus
Martinus Veltman
John E. Walker
J. Robin Warren
Arieh Warshel
James D. Watson
Thomas H. Weller
Eric F. Wieschaus
Elie Wiesel
Torsten N. Wiesel
Frank Wilczek
Maurice H.F. Wilkins
Jody Williams
Robert Wilson
David J. Wineland
Kurt Wüthrich
Rosalyn Yalow
Chen Ning Yang
Ada Yonath
Muhammad Yunus
Ahmed Zewail
Rolf Zinkernagel

Joined the Founders Assembly in 2015:
Desmond Mpilo Tutu, Nobel Peace Laureate in 1984.
Portrait by Peter Badge for the photo series
"NOBELS – Nobel Laureates photographed by Peter Badge"

Honorary Senate

In recognition of their ongoing support for the Lindau Meetings, Rolex Chairman Bertrand Gros and Bayerischer Rundfunk Director General Ulrich Wilhelm were inducted into the Honorary Senate – the most prestigious honour by the Foundation.

During the last 65 years more than 30,000 young scientists from around 90 countries have had the opportunity to meet, learn from and interact with Nobel Laureates. This would not have been accomplished without the support of science-promoting institutions, companies and foundations – as well as private philanthropists, such as this year's inductees to the Honorary Senate. Both share the values and goals of Lindau's "Mission Education" and are dedicated to further advance it. They have become valued advisers to the board and distinguished ambassadors for the cause of the Lindau Meetings.

"Maître Bertrand Gros stays true to the principles established by company founder Hans Wilsdorf more than a century ago. His passion for greatness, his entrepreneurial spirit and his strategic vision enable Rolex to establish philanthropic initiatives serving society at large. For more than a decade, he has led the way in breaking new ground in health, the environment, technology, exploration and cultural heritage. [...]

Ulrich Wilhelm is a pioneer. He has proactively addressed challenges affecting not just the media sector, but society as a whole. First and foremost, he has realised that in our times, science literacy has become increasingly important, not only for decision-makers, but also in everyday life. He has been the driving force behind the implementation of educational and science-related programmes."

Wolfgang Schürer

Bertrand Gros and Wolfgang Schürer

Bertrand Gros

"Perpetual research' was the obsessed value of our German founder Hans Wilsdorf who was never satisfied with any of his accomplishments or only briefly content until a new dream came along. Go through life with passion and do what you like, and you will never have the impression to be working. Also remember what the wise Confucius once said more than 2,000 years ago: 'If you want to have a real, a clear vision of the future, you have to look back and learn from the past."

Bertrand Gros

Ulrich Wilhelm

"Researchers need publicity to hone the judgement skills of citizens on relevant topics. And it can only be welcomed that the relationship between the science community and the media is becoming increasingly closer. Knowledge and education are among the core competencies of public service broadcasters, in fact, they are part of our social mandate. And thus we count on scientists who can communicate even complicated ideas in understandable terms to the public, scientists who also ignite enthusiasm for their cause. Speaking not just on behalf of the media but also as a citizen: Supporting the scientific initiatives that originate here is a matter that is very close to my heart.

In brief I would like to throw a spotlight on the Lindau Mediatheque which has evolved into a comprehensive online knowledge platform and it's really worthwhile to pay many visits to this mediatheque: Enriching, forward-looking and presented in a contemporary way, the mediatheque preserves the knowledge of today for researchers of tomorrow. It is nothing less than the memory of Lindau to which a wide audience can gain access, free of charge."

Ulrich Wilhelm

HONORARY SENATE

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

“I now feel as if I were part of the Lindau family.”

For Edmond H. Fischer, the 2015 Lindau Meeting was the 11th meeting he ever visited since he was awarded the 1992 Nobel Prize in Physiology or Medicine. Ralph Burmester, author of the book “Science at First Hand – 65 Years Lindau Nobel Laureate Meetings” asked him for his personal review and outlook.

Ralph Burmester: What did you expect when you first came to Lindau in 1993?

Edmond Fischer: I remember well the first time I ever heard of Lindau. It must have been forty-fifty years ago; I was flying to Europe on TWA and, seated behind me, was George Wald. While we were chatting together, he told me he was going to a place called Lindau, on Lake Constance, where Nobel Laureates would be giving lectures to many students. And I thought: what an incredible experience it must be for young researchers to hear some of the foremost scientists discussing their work in such an informal setting. What a rewarding experience it must be for the Laureates to have this opportunity to communicate with very bright students from all over the world. So it’s no wonder that, when I was in Stockholm in 1992 for the Nobel Award Ceremony, I was invited by Count Lennart and Countess Sonja to attend the Lindau Meeting, I accepted with enthusiasm.

RB: How did you perceive the Lindau Nobel Laureate Meetings personally?

EF: We went to Lindau for the first time with my wife Bev in 1993 and the meeting was all that we had expected, and more. We were overwhelmed by the gracious and friendly way we were received. We were all lodged at the stylish and charming old Hotel Bad Schachen with its lovely lakeside garden, and we often walked together along the lake to the Inselhalle were the meetings were held. There were several friends of us and we met many other Laureates whom we knew only by name. The opening ceremony was both solemn and whimsical, with the display of extravagant hats by Countess Sonja, and the talks and other events including the Friday trip to Mainau were outstanding.

RB: Which elements of these meetings do you hold so dear that they make you return every once in a while?

EF: Meeting many friends, both from Lindau and fellow laureates. Having an opportunity of encountering recent laureates whom I didn’t know, and listening to their superb presentations. And, of course, the prospect of meeting and speaking with students from all over the world. The meetings have been planned for them, for the students, not for the laureates.

RB: In your opinion, which dimension of these meetings is more beneficial, the scientific or the social one?

EF: Undoubtedly, their scientific contribution. Social occasions are obviously very pleasant, because they allow one to interact with people and provide some needed relaxation amid very intense activities, but they are secondary to the mission of the Lindau Meetings which is to inspire, motivate and connect.

RB: What kind of topics are you discussing with young researchers?

EF: Obviously topics related to one´s field of expertise. The students come to you after having heard your talk and realise that some of the material you covered is relevant to their own research project. And those already involved in scientific research are eager to tell you what they are doing.

RB: Have you ever been given the impression that the Lindau Meetings needed changing or were you content with its composition back then?

EF: Yes, indeed, the meetings have changed a lot since the early 1990s when I first came, and they have changed in many ways. First, the meetings used to be much smaller, attended by about 200 students and perhaps two dozen Nobel Laureates. Which means that there were only six lectures in the morning and smaller group discussions with the students in the afternoon. Now, there are about 600 students, eight lectures every morning (coming after a science breakfast) plus additional lectures scheduled in different venues throughout town. The morning lectures are supposed to end at 13:30 but, more often than not, they are late. And since the afternoon lectures/group discussions start at 15:30, one has barely the time to have lunch and relax with friends. All the more that there are interviews, photo ops, etc. [...]

“Edmond Fischer is one of the most exceptionally kind, patient, and humble people I've ever had the privilege of meeting!”

John Schell, participant in the 65th Lindau Meeting, University of Utah, USA

RB: How do you like the interdisciplinary meetings have taken place every five years since the year 2000?

EF: Very much. It is an occasion to learn what is going on and what is new in different fields of science, and to meet the friends we have in those other disciplines. In fact, those are my preferred meetings.

RB: What are your hopes and expectations for the future of the Lindau Nobel Laureate Meetings?

EF: They can only increase. It’s like an opera: it takes years before everything runs to perfection. In my opinion, under the guidance of Sonja and Bettina, and with the huge contribution of the Lindau team, the meetings are now running flawlessly and with enormous efficiency. They run like a very well-oiled machine. Furthermore, the quality and dedication of the students is unprecedented.

For more information on “Science at First Hand – 65 Years Lindau Nobel Laureate Meetings” by Ralph Burmester, see p. 103.

Edmond Fischer giving a farewell address at the 43rd Lindau Meeting (1993), together with then Council President Countess Sonja Bernadotte

Impressions

Countess Bettina Bernadotte and José Manuel Barroso, former President of the European Commission, on Mainau Island

Wolfgang Huang, director of the executive secretariat of the Lindau Meetings, at the "THE World Academic Summit" 2015 in Melbourne, organised by Times Higher Education, a new partner of the Lindau Meetings

Thierry Mandon, State Secretary, French Ministry of Education, Higher Education and Research

Countess Bettina Bernadotte, Andreas Stoch, Minister of Education, Youth and Sports, Baden-Württemberg, and Wolfgang Kraft, Landesmedienzentrum Baden-Württemberg

Victor Sadovnichy (right), Rector of the Lomonosov Moscow State University, President of the Russian Rectors Union, and Nikolaus Turner

Georg Schütte (right), State Secretary, German Federal Ministry of Education and Research, and Kailash Satyarthi

Special Partnerships

Klaus Tschira Stiftung

Klaus Tschira, one of the most committed maecenas of the Lindau Meetings, died unexpectedly on 31 March 2015. The Council and the Foundation deeply mourn this severe loss. In his address on the occasion of the memorial ceremony, Nikolaus Turner expressed profound gratitude, "We will never forget our mentor and friend." A co-founder of SAP AG in 1972, nowadays Europe's largest software manufacturer, Tschira established the foundation Klaus Tschira Stiftung (KTS) in 1995 to promote the natural sciences, mathematics and computer science. Matters close to his heart were the comprehensible communication of scientific results to the general public as well as the fostering of science among the younger generation.

Klaus Tschira attended the Lindau Meetings regularly since 2003 and became a dear and trusted advisor to the boards of the Council and the Foundation. As a valuable ambassador of Lindau's "Mission Education", he was inducted into the Honorary Senate of the Foundation in 2013. Many outreach projects by the Lindau Meetings were substantially funded by the Klaus Tschira Stiftung: Two of the most visible projects are the photo portrait series NOBELS by Peter Badge and the exhibition Sketches of Science photographed by Volker Steger.

Lennart-Bernadotte-Haus
Besides funding a variety of outreach projects of the Lindau Meetings, the Klaus Tschira Stiftung also benefited the renovation and expansion of the offices at Lindau. Having already supported the refurbishment of the "Lennart-Bernadotte-Haus" in 2008, the KTS enabled the Foundation with a significant donation to its endowment to purchase the whole building from the City of Lindau in 2015.

Heidelberg Laureate Forum

Inspired by the Lindau Nobel Laureate Meetings and their model of promoting exchange among top researchers and bright young scientists, Klaus Tschira founded the Heidelberg Laureate Forum (HLF) in 2013. Since then, the HLF has become the annual meeting of prize-winning and aspiring young mathematicians and computer scientists. Its protagonists are the winners of the most prestigious awards in mathematics and computer science: the Abel Prize, the Fields Medal (including the Nevanlinna Prize for contributions in "Mathematical Aspects of Information Science"), and the ACM A.M. Turing Award. The HLF is organised by the Heidelberg Laureate Forum Foundation and is closely affiliated with the Lindau Meetings.

Lindau and Heidelberg Lectures
With the first "Lindau Lecture" held in Heidelberg on the occasion of the 3rd Heidelberg Laureate Forum in 2015, a special form of exchange between the Lindau Meetings and the HLF has been established to underline the outstanding partnership.

Stefan Hell, 2014 Nobel Laureate in Chemistry, delivered a fascinating presentation at Heidelberg, much lauded by the participants for its divergence from traditional subject matter related to computer science and mathematics. Each year, the meetings will host a fellow laureate to give a speech at the respective events. At the 66th Lindau Meeting in 2016, Vinton G. Cerf, who is recognised as a pioneer of the internet and was awarded the 2004 Turing Award, will give his "Heidelberg Lecture" at Lindau.

Klaus Tschira

Lennart-Berndadotte-Haus, office premises of the executive secretariat of the Lindau Nobel Laureate Meetings

Order of Merit for Wolfgang Schürer

On the occasion of his participation in the 65th Lindau Nobel Laureate Meeting, German Federal President Joachim Gauck awarded Wolfgang Schürer, Chairman of the Board of Directors of the Foundation, with the Order of Merit of the Federal Republic of Germany. Joachim Gauck paid tribute to the outstanding philanthropic commitment of Wolfgang Schürer and in particular to his dedication to intercultural and intergenerational dialogue among scientists. Being presented the Order of Merit by the Federal President in person is an exceptional honour.

The Order of Merit of the Federal Republic of Germany is the only honour that may be awarded in all fields of endeavour and is the highest tribute the Federal Republic of Germany can pay to individuals for services to the nation. Wolfgang Schürer received the Knight Commander's Cross. He had already been awarded the Commander's Cross in 1999 by then Federal President Roman Herzog.

The awarding of the Order of Merit is also to be perceived as an acknowledgement of Wolfgang Schürer's outstanding achievements for the Lindau Meetings. He served as chairman of the board of the Foundation ever since its establishment in 2000 and holds this office until the end of 2015.
An official leave-taking ceremony for Wolfgang Schürer will be held during the 66th Lindau Nobel Laureate Meeting in 2016.

Federal President Joachim Gauck and Wolfgang Schürer with the Order of Merit

HRH Princess Maha Chakri Sirindhorn and Wolfgang Schürer

Wolfgang Schürer with meeting participants from Malaysia 2013

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The team of the executive secretariat of the Lindau Nobel Laureate Meetings with Nikolaus Turner (right) in front of the Lennart-Bernadotte-Haus in Lindau

Preliminary Account 2015: Expenditures

	(in Euro)
TRAVEL	
Nobel Laureates	325,764.74
Young Scientists	31,641.70
Media	20,626.39
Others	53,117.67
LODGING	
Nobel Laureates	149,240.00
Young Scientists	280,666.97
Media	17,585.50
Others	56,665.03
BOARDING	
Nobel Laureates	42,925.78
Young Scientists	145,753.11
Media	8,504.90
Others	42,756.75
MEETING ORGANISATION	
Scientific Programme & Selection of Young Scientists	45,208.49
Rental Fees of Locations incl. Tents	99,346.83
Technical Equipment	279,629.81
Utilities & Services	33,540.78
On-Site Staff	82,550.55
Transfers	12,812.45
Social Programme	23,977.66
Printed Matters	70,743.77
Expendable Items	6,193.66
Audio, Video & Web Productions	159,374.82
Science & Media Consulting	63,764.58
Website	18,959.03
Brand & Trademarks	18,503.88
Telecommunications, Postage	22,667.24
IT Services, Hardware, Software	99,982.90
Accounting, Legal Advice, Insurances	23,102.81
EXECUTIVE SECRETARIAT	
Staff	711,062.06
Office Operating Costs	72,771.75
Office Supplies & Equipment	20,945.58
ASSOCIATED PROJECTS	735,596.85
Including mediatheque, Sketches of Science, Nobel Labs 360°, NOBELS (Nobel Laureate portraits), Hannover Messe, Innovation Forum, Teaching Spirit, publications, alumni activities, as well as further Foundation activities.	
EXPECTED TOTAL EXPENDITURES	3,775,984.04

The above expenditure calculation includes 406,359.99 € of expected costs for October – December 2015.

Preliminary Account 2015: Revenues

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TOTAL REVENUES	**3,775,984.04 €**

Note:
The calculated revenues refer to the meetings and selected outreach projects. Deficits have been covered by the Foundation Lindau Nobel Laureate Meetings as guaranteed to the Council for the Lindau Nobel Laureate Meetings.

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26 June–1 July

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25–30 June

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22–26 August

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