



THE
NOBEL
PRIZE

THE NOBEL
FOUNDATION
ANNUAL REVIEW

·
2018



1901

WILHELM CONRAD
RÖNTGEN

The first Nobel Prize in Physics was awarded to Wilhelm Conrad Röntgen for his discovery of X-radiation. The X-ray tube pictured on the cover is on display at the Nobel Prize Museum.

Photo: Alexander Mahmoud

2018

BERNICE A. KING

"I wish to commend the Nobel Museum for (...) this new exhibition. I believe that my parents' message of social justice and equality is as important today as ever before."

The exhibition A Right to Freedom - Martin Luther King, Jr. was inaugurated by King's daughter Bernice A. King at the Nobel Prize Museum on 28 September 2018.

Photo: Alexander Mahmoud





For the greatest
benefit to
humankind

ALFRED NOBEL



Lars Heikensten, Executive Director of the Nobel Foundation since 2011. Photo: Kari Kohvakka

“I can tell you how. It is very easy. The first thing you must do is to have great teachers.”

Paul A. Samuelson, 1970 Laureate in Economic Sciences, on how to earn a Nobel Prize.

Nobel Laureates often attest to how crucial their teachers have been. Teachers, researchers and others who contribute to increased knowledge are the heroes and heroines of our age. When the very idea of science is being questioned, our school systems are being allowed to decay, children are even being prevented from attending school and many people are still being denied fundamental human rights, the forces of open, tolerant and democratic societies need to defend education, research and enlightenment – proactively and passionately.

Denial of facts, nationalism and protectionism are diametrically opposed to the vision of Alfred Nobel. He was convinced of the advantages of an open world and the ability of science to make the world even better. The Nobel Prize recognizes no boundaries of nationality, and each year it rewards important contributions and discoveries for the greatest benefit to humankind.

Among our biggest challenges today are human rights and climate change. The 2018 Peace Prize was awarded to Denis Mukwege and Nadia Murad “for their efforts to end the use of sexual violence as a weapon of war and armed conflict”. Last year also marked the 70th anniversary of the United Nations Universal Declaration of Human Rights and the 50th anniversary of the assassination of Martin Luther King, Jr. We observed these anniversaries with the year’s big exhibition at the Nobel Prize Museum in Stockholm, *A Right to Freedom – Martin*

Luther King, Jr., and with a Nobel Prize Teacher Summit on the theme *Teach Love and Understanding*, with 350 teachers from 15 countries attending.

Al Gore, the 2007 Peace Prize Laureate, addressed *How to Solve the Climate Crisis* when he spoke at the 2018 Nobel Peace Prize Forum in Oslo. During the coming year, many of our outreach activities will focus on the climate crisis. It will be a central issue at both the Nobel Week Dialogue in Gothenburg and the Nobel Prize Teacher Summit in Stockholm. We are also planning a major conference on the climate change issue in Washington D.C. during the spring of 2020.

Activities of this kind, in the spirit of the Nobel Prize, are what we want to carry out at a future Nobel Center in Stockholm. This is why many of us were disappointed last autumn when the new political majority in the City of Stockholm halted the Nobel Center project. But we have not given up, and we are continuing our dialogue with the City. The heavily attended activities of this past year are an eloquent testimony to the need for a new and larger home for the Nobel Prize.

Alfred Nobel’s vision is perhaps more important today than ever before. We will therefore continue to develop our activities, both digitally and in various places around the world. This Annual Review provides a picture of what is happening and of our 2018 activities.

I wish you enjoyable reading!

THE
NOBEL
PRIZE

Which
discovery
will be awarded
the Nobel Prize
this year?

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THE 2018 NOBEL LAUREATES

In October each year new Nobel Laureates are presented, who all contributed to the greatest benefit of humankind with their work. The Nobel Prize Award Ceremonies then take place in Stockholm and Oslo on 10 December.



Arthur Ashkin

THE NOBEL PRIZE IN PHYSICS 2018

“for groundbreaking inventions in the field of laser physics”

ARTHUR ASHKIN

“for the optical tweezers and their application to biological systems”



Gérard Mourou

GÉRARD MOUROU AND
DONNA STRICKLAND

“for their method of generating high-intensity, ultra-short optical pulses”



Donna Strickland

The sharp beams of laser light have given us new opportunities for deepening our knowledge about the world and shaping it. Arthur Ashkin invented optical tweezers that grab particles, atoms, molecules, and living cells with their laser beam fingers. The tweezers use laser light to push small particles towards the center of the beam and to hold them there. In 1987, Ashkin succeeded in capturing living bacteria without harming them. Optical tweezers are now widely used to investigate biological systems.

In 1985, Gérard Mourou and Donna Strickland succeeded in creating ultrashort high-intensity laser pulses without destroying the amplifying material. First they stretched the laser pulses in time to reduce their peak power, then amplified them, and finally compressed them. The intensity of the pulse then increases dramatically. This technique, called chirped pulse amplification, CPA, has many uses, including corrective eye surgeries.



Frances H. Arnold

THE NOBEL PRIZE IN CHEMISTRY 2018

FRANCES H. ARNOLD
“for the directed evolution of enzymes”

GEORGE P. SMITH AND SIR GREGORY P. WINTER

“for the phage display of peptides and antibodies”



George P. Smith

Evolution - the adaption of species to different Environments - has created an enormous diversity of life. Frances Arnold, George Smith, and Gregory Winter have used the same principles – genetic change and selection – to develop proteins that solve humankind’s chemical problems.

In 1993, Arnold conducted the first directed evolution of enzymes, which are proteins that catalyze chemical reactions. The uses of her results include more environmentally friendly manufacturing of chemical substances, such as pharmaceuticals, and the production of renewable fuels. In 1985, George Smith developed an elegant method known as phage display, where a bacteriophage – a virus that infects bacteria with its genes – can be used to evolve new proteins.

Gregory Winter used phage display for the directed evolution of antibodies. Since 2002 this has led to new pharmaceuticals, such as medications to counteract autoimmune diseases like rheumatoid arthritis.



Sir Gregory P. Winter



James P. Allison

THE NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE 2018

JAMES P. ALLISON AND TASUKU HONJO

“for their discovery of cancer therapy by inhibition of negative immune regulation”



Tasuku Honjo

Cancer kills millions of people every year and is one of humanity’s greatest health challenges. By stimulating the inherent ability of our immune system to attack tumor cells James P. Allison and Tasuku Honjo have established an entirely new principle for cancer therapy. In 1994–1995, Allison studied a known protein that functions as a brake on the immune system. He realized the potential of releasing the brake and thereby unleashing our immune cells to attack tumors. He then developed this concept into a brand-new approach for treating patients.

In 1992, Honjo discovered a protein on immune cells and, after careful exploration of its function, eventually revealed that it also operates as a brake, but with a different mechanism of action. Therapies based on his discovery proved to be strikingly effective in the fight against cancer.

Allison and Honjo showed how different strategies for inhibiting the brakes on the immune system can be used in the treatment of cancer.

Ashkin, photo: Nokia Bell Labs
Murad, photo: Ken Opprann
All other portraits: Alexander Mahmoud



Denis Mukwege

THE NOBEL PEACE PRIZE 2018

DENIS MUKWEGE AND NADIA MURAD

“for their efforts to end the use of sexual violence as a weapon of war and armed conflict”



Nadia Murad

Sexual violence as a weapon of war and armed conflict constitutes both a war crime and a threat to peace and security. A more peaceful world can only be achieved if women and their fundamental rights and security are recognised and protected. As a surgeon Denis Mukwege has helped thousands of victims of sexual violence in armed conflicts in the Democratic Republic of Congo. Both on a national and an international level he has repeatedly condemned impunity for mass rape and criticized the Congolese government and other countries for not doing enough to stop the use of sexual violence against women as a strategy and weapon of war.

Nadia Murad is herself a victim of war crimes. She is a member of the Yazidi minority in northern Iraq, and in 2014 the Islamic State (IS) launched a brutal, systematic attack on her home village. Several hundred people were massacred, and girls and young women were abducted and held as sex slaves. While a captive of the IS, Nadia Murad was repeatedly subjected to rape and other abuses. After three months she managed to flee and spoke openly about what she had suffered. She now works to help women and children who are victims of abuse and human trafficking.

Footnote: on 4 May the Swedish Academy decided not to award a Nobel Prize in Literature in 2018.



William D. Nordhaus

THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL 2018

WILLIAM D. NORDHAUS

“for integrating climate change into long-run macroeconomic analysis”



Paul M. Romer

PAUL M. ROMER

“for integrating technological innovations into long-run macroeconomic analysis”

At its heart, economics deals with the management of scarce resources. Nature dictates the main constraints on economic growth and our knowledge determines how well we deal with these constraints. Paul Romer has demonstrated how knowledge can function as a driver of long-term economic growth. He showed how economic forces govern the willingness of firms to produce new ideas and innovations. Romer’s central theory, which was published in 1990, explains how ideas are different to other goods and require specific conditions to thrive in a market.

William Nordhaus’ findings deal with interactions between society, the economy and climate change. In the mid-1990s, he built the first integrated assessment model, i.e. a quantitative model that describes the global interplay between the economy and the climate. His model integrates theories and empirical results from physics, chemistry, and economics. Nordhaus’ model is used to examine the consequences of climate policy interventions, for example carbon taxes. The discoveries by Romer and Nordhaus have brought us considerably closer to answering the question of how we can achieve sustained and sustainable global economic growth.




Frances H. Arnold at the Nobel Prize Award Ceremony in Stockholm 10 December.

Photo: Alexander Mahmoud



When I was in grad school working on the project for which Gérard and I are being honoured, Cyndi Lauper had a big hit: Girls Just Want to Have Fun. But they wanted to wait until the working day is done. As for me, I want to have fun while I'm working. Now not everyone thinks physics is fun, but I do.

Donna Strickland in her Nobel Banquet speech on 10 December 2018.

A close-up portrait of William D. Nordhaus, an older man with white hair, wearing a dark blue suit jacket, a light blue shirt, and a patterned orange and blue tie. He is looking directly at the camera with a slight smile. The background is dark.

Over the last half-century, the full implications of climate change and its impacts have been illuminated by the intensive research of scientists in different fields. (...) The science is clear. The economics is clear. Now, it is up to those who represent us, our elected leaders, to act responsibly to implement durable and effective solutions.

William D. Nordhaus in his Nobel Banquet speech on 10 December 2018.

Photo: Alexander Mahmoud



CELEBRATE AND UNDERSTAND

Under the name Nobel Calling, a number of activities were arranged in Stockholm in conjunction with the announcements of the 2018 Nobel Prizes in October. These events were a festival of knowledge and humanism, aimed at celebrating and understanding the year's advances. A total of about forty such activities took place during Nobel Calling.

Curious Stockholm residents could attend a crash course at Hotel Rival to learn more about the year's scientific Nobel Prizes, presented by members from the committees that selected the Laureates. Comedian and author Fredrik Lindström spiced up the evening by talking about the human factor, identity and cinnamon buns.

Another of the week's highlights was the Nobel Prize Teacher Summit, a yearly international conference with the theme

Teach love & understanding. Hundreds of teachers from all over the world participated, spending the day closely examining common challenges related to democracy, non-violence and sustainable development.

Three Nobel Laureates took part in the week's activities. Literature Laureate Wole Soyinka visited the Stockholm Public Library, among other venues. Peace Prize Laureate Leymah Gbowee and Chemistry Laureate Martin Chalfie

talked about science and human rights during a lunch lecture at the Nobel Prize Museum. During the week, an extensive programme was also offered to school classes and other Museum visitors, and international university-level students attended a pub evening. Several universities and colleges in the Stockholm area participated in Nobel Calling during the week, opening their doors for lunchtime lectures, doctoral dissertation presentations and lab tours.



During the entire week visitors at the Nobel Prize Museum could post their own greetings to the new Nobel Laureates at the museum walls.

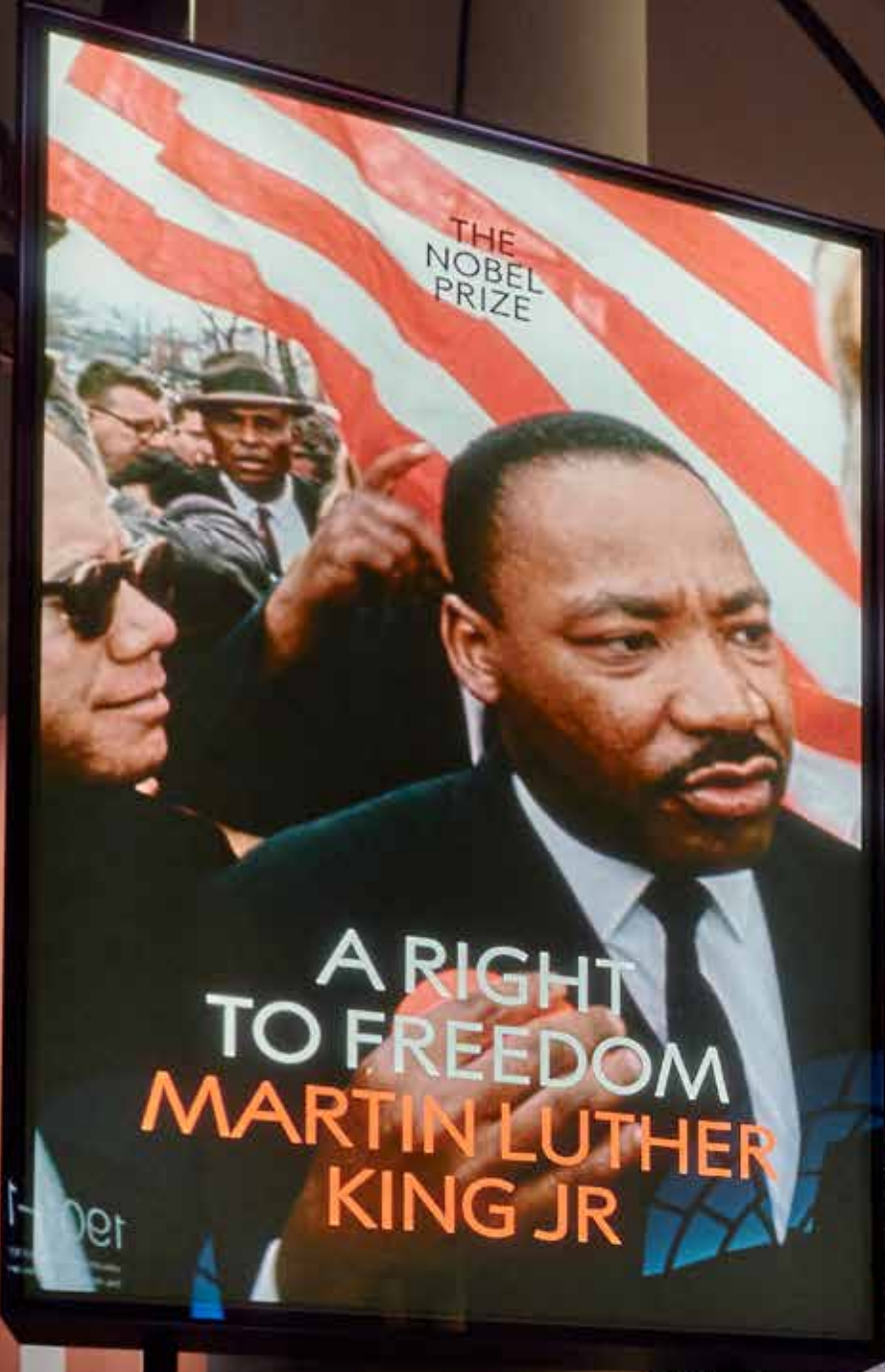


Joseph Amukusana from Zambia was one of the many teachers who travelled to Stockholm to participate in the Nobel Prize Teacher Summit.

All photos: Alexander Mahmoud

“We want to improve our education. All the teachers here have great ideas, I want to learn from them. It is a great exchange.”

Miaolung Shih from Great Britain, participant in the Nobel Prize Teacher Summit.



The Nobel Museum, in cooperation with The King Center, presents

A Right to Freedom Martin Luther King, Jr.

"There is dream that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character."

The words of Martin Luther King, Jr. have gained almost 50 years. Throughout his life as a community preacher, he became the leader of a united movement, bringing tens of millions of people to support African Americans' right to freedom.

King saw the world as interconnected. "We are caught in an inescapable network of mutuality, tied into a single garment of destiny. Whatever affects one directly, affects all indirectly," he wrote. His ideas extended far beyond his own time and community in which he lived. Fundamentally, King sought the equal rights of all people and universal human rights.

This exhibition aims to shed light on King's struggle and achievements. It also evokes questions about our fundamental rights. It inspires to encourage thoughts, discussions and actions.

Medlemmarna presenterar
i samarbete med The King Center

Rätten till frihet Martin Luther King

"Det finns ett dröm som våra fyra små barn en dag ska leva i en nation där de inte blir bedömda efter sin hudfärg utan efter deras inre karaktär."

Martin Luther King och den stora 68-talaren. Under 1960-talet led han försvaret för afroamerikanska rättigheter och blev en av de mest respekterade och älskade ledarna för rörelsen för afroamerikansk rätt till frihet.

King såg världen som sammankopplad. "Vi är fångade i ett uteslöjligt nätverk av ömsesidighet, knutna i ett enda klädnad med oss människor alla. Det som direkt påverkar en, påverkar alla indirekt," skrev han. Hans idéer sträckte sig långt utöver sin egen tid och sin egen gemenskap. Fundamentellt sökte han lika rättigheter för alla människor och universella mänskliga rättigheter.

Utställningen syftar till att belysa King's kamp och uppnåelser. Den väcker också frågor om våra grundläggande rättigheter. Utställningen vill inspirera till tankar, diskussioner och handlingar.



- Introduction
- Growing up in the South
- When Young Preacher Vision Got Real
- Why We Can't Wait
- The Nobel Prize
- Time to Stand Silence
- Building the Movement
- Pulling the Dream
- All America's Dream

Photo: Jonas Lindkvist

A RIGHT TO FREEDOM

The exhibition *A Right to Freedom - Martin Luther King, Jr.* at the Nobel Prize Museum highlights the importance and necessity of fundamental human rights and promotes the 1964 Peace Prize Laureate's vision of equality and justice for all through non-violence.

Few people, if anyone, have so strongly personified a political movement as Martin Luther King, Jr. His rhetorical talent has left a mark on many of us. The life and contributions of Dr King are a fascinating part of an important period in 20th century history. His dreams, ideas and ability to express them appear immortal.

Of all the Nobel Laureates, King is the one most often searched for on the Nobelprize.org website. The year 2018 marked both the 70th anniversary of the United Nations Universal Declaration of Human Rights and the 50th anniversary of the assassination of Martin Luther King, Jr. Creating an exhibition about this champion of the civil rights struggle was therefore a natural choice for the Nobel Prize Museum.

Thanks to donated items and archival material from the King Center, the Hendon Home Museum and Morehouse College – all in Atlanta – the exhibition is extensive and detailed. Bernice A. King, the youngest child of Martin Luther King and Coretta Scott King, is CEO of the King Center, whose primary mission is to advance the legacy of non-violence. Before inaugurating the exhibition in Stockholm, she said:

“I wish to commend the Nobel Museum for its decision to dedicate a new exhibition to his life's work, and I am equally pleased that my mother Coretta Scott King's role and contribution as an activist in her own right are also highlighted. I believe that my parents' message of social justice and equality is as important today as ever before.”

The 1950s and 60s were turbulent decades in the United States. The civil

rights movement grew strong and fought against segregation laws and discrimination. The 1964 Nobel Peace Prize was an important source of recognition for King and the civil rights movement.

One of King's closest associates, the Reverend Jesse Jackson, visited the exhibition and made a series of public appearances in Stockholm, including a much-appreciated conversation at Södra Teatern with journalist Jenny Strömstedt, an interview on the Skavlan television show and an on-stage conversation before a capacity crowd at Kärrtorp Upper Secondary School.

At the Museum's King exhibition, school classes have made up a sizeable share of visitors. They have had an opportunity to deliver impassioned speeches to each other in a purpose-built auditorium, based on the central concepts in the exhibition. Students have especially appreciated being able to talk about their dreams, which are often about a more equitable society, free of racism and prejudice.

“Their visit engages the students, who share their thoughts and opinions on these topics, and it is inspiring and instructive for us educators to view the exhibition and discuss its contents together with young people. It is heartening to hear them stand up for the equal worth of everyone,” says Åsa Sundelin, the Museum's head of exhibitions and education.

After the assassination of Martin Luther King, Jr. on 4 April, 1968, events took a somewhat different turn, but King's ideas and struggle for the equal worth of all people have lived on.





VITAL LEARNING

Each year, a number of meetings take place around the world in which the Nobel Prize serves as a starting point for bringing science and society closer together. Students, researchers, opinion leaders, teachers and an interested general public can meet Nobel Laureates and other leading experts – attending lectures, panel discussions and conversations about the major issues of our time. Through these meetings, people are inspired to ask questions, challenge the status quo and want to understand and improve the world.

The year began in India with a five-day series of events in Goa, Mumbai and New Delhi about how science affects our lives. Four Nobel Laureates gave lectures and participated in round table discussions together with other experts and students from several universities. The travelling exhibition *The Nobel Prize: Ideas Changing the World* was inaugurated and shown for a month in Goa, and a conference for teachers was organized for the first time in India.

In Tokyo, Japan, the focus was on the issue of what we should eat in the future.

This topic was explored through inspiring lectures and panel discussions in front of a capacity crowd. The day's discussion themes included how we can feed a growing population, what we can eat to improve our health, how we can create sustainable food production and how far science has come in terms of innovation, technology and food.

Water is essential to human survival, and every drop is precious. This year's big full-day conference in Stockholm, the Nobel Week Dialogue, turned its gaze on the challenges that exist in relation to



water. Issues discussed during the day included: How does humanity impact the oceans? Where does water get wasted, and can we change patterns of water use? Among the speakers were eight Nobel Laureates as well as other researchers and water activists from all over the world. Internationally famous artist Marina Abramović highlighted the issue of water by presenting a Performance Lecture.

In 2018, meetings were held in countries such as Japan, India, Sweden, the United States and Spain.

“I like looking at the world from a scientific point of view”

Anugraha and Aishwarya are students at the India Institute of Science Education and Research Mohali in Punjab. “Science makes you think about things in a different way and see the world in a different perspective,” says Anugraha.

Photo: Alexander Mahmoud

THE YEAR IN NUMBERS

4M

Nobelprize.org and social media

A successful project premiering last year, the Nobel Prize Lessons, were published again in 2018 on Nobelprize.org as the Nobel Prizes were announced. The lessons were distributed mainly through social media. Material from the lessons were downloaded 13,500 times, with the US and India at the top of the list of nations. If each teacher displayed the material to at least one class, it was estimated to have reached 100,000 students.

- The number of followers on Facebook and Twitter increased by 7% from 2017 to 2018
- Facebook crossed 4,000,000 likes
- Twitter hit 400,000 followers
- The Instagram follower count tripled during 2018
- The reach on Twitter increased 87% from 2017 to 2018

International Women's Day

On International Women's Day, over 13 million individuals were reached on Facebook alone.

The announcements

Over 11 million people were reached on average for each announcement day. The highest was physics, when over 14 million people were reached.



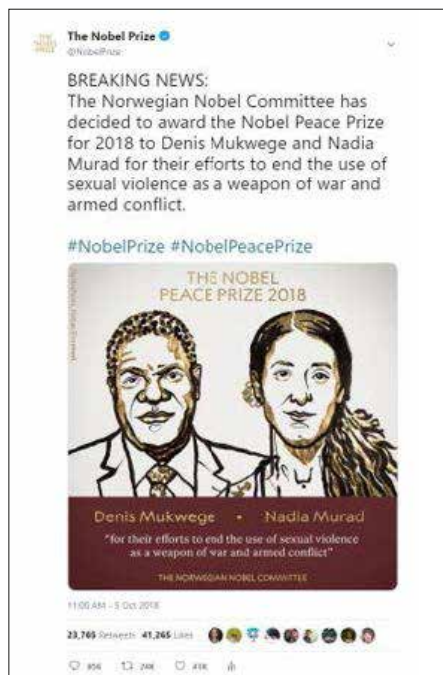
The Nobel Prize in Chemistry has been awarded to 181 persons and Sir Gregory P. Winter is one of them.

935

Nobel Laureates

908 Laureates and 27 organizations have been awarded the Nobel Prize between 1901. A small number of individuals and organizations have been honoured more than once, which means that 904 individuals and 24 unique organizations have received a Nobel Prize in total.

- Laureates: 935
- Prize categories: 6
- Awarded women: 51
- Awarded organisations: 24
- Youngest Laureate: 17
- Oldest Laureate: 96



With nearly 7 million impressions, this became the best-performing tweet ever.



The more than 60 tables at the Nobel Banquet at the Stockholm City Hall was covered with some 500 metres of linen cloth, and the meticulous table setting comprised no fewer than some 9,540 porcelain pieces, 5,400 glasses and 9,450 items of cutlery. Those who worked with the banquet meal during the evening included a total of more than 40 chefs and 190 servers.

- 1,250 persons visited the Nobel Week Dialogue in Stockholm on December 9. More than half of them were students and scientists.
- During Nobel Prize Series Indina 7,200 persons participated in 14 different activities. More than 50,000 persons visited the exhibition *The Nobel Prize: Ideas Changing the World* which was on display for a month in Goa.
- After Nobel Prize Dialogue in Tokyo a survey was made among the visitors and 95% of those who participated in the survey would like to visit a similar event again.



“Creativity is combining facts no one else has connected before”

Christiane Nüsslein-Volhard, Nobel Prize in Physiology or Medicine 1995, participating in the Nobel Prize Series India 2018.

262,409 Nobel Prize Museum

During 2018 the Nobel Prize Museum had 262,409 visitors which was a record.

239,385 Nobel Peace Center

The Nobel Peace Center in Oslo had 239,385 visitors during 2018.

The Nobel Banquet, photo: Dan Lepp
Other two photos: Alexander Mahmoud

AN EVENTFUL YEAR OF STOCKHOLM ACTIVITIES

The Nobel Prize related activities in Stockholm were extensive during 2018. The year's highlights included the eventful Nobel Calling series in October, a record number of visitors at the Nobel Prize Museum and intensive activities during the Nobel Week in December.

In addition to spreading knowledge, science and humanism for the greatest benefit to humankind – in the spirit of the Nobel Prize – the goal of the Nobel Prize Museum in 2018 was to attract more Stockholm residents and to make Nobel Prize-related activities more easily accessible.

Today, the Nobel Prize Museum is the base of Nobel Prize public activities in Stockholm and one of the most well-visited museums in town. Here, the Nobel Laureates leave a lasting impression when they visit the museum in December – by donating personal artefacts and by signing the chairs in Bistro Nobel. The large number of museum visitors is evidence of how important the pioneering achievements of the Laureates are, and a visit to the Museum is a source of pride; this is clear from posts on social media. During the summer season, there is a crush of visitors and it gets crowded inside this undersized historically listed building on the main square of the Old Town. Because of overcrowding, the Museum unfortunately had to turn 78 classes down that wanted to participate in its school programmes during the autumn. Aside from tourists, school pupils are the largest visitor category.

At the Museum, 2018 began with the Literary Rebellion exhibition, featuring images of Nobel Laureates in Literature by Spanish photographer Kim Manresa. 28 September marked the opening of this

year's major project, *A Right to Freedom – Martin Luther King, Jr.*, an extensive and in-depth exhibition designed to mark the 50th anniversary of the American civil rights leader's assassination (read the article about the exhibition on page 14).

A new set of artistically designed book bindings, inspired by the works of Literature Laureates Bob Dylan and Kazuo Ishiguro, were the focus of an exhibition featuring book binders from Sweden and the Baltic countries.

The museum shop provided a wide range of souvenirs and gift items based on the Nobel Prize, and the Bistro Nobel restaurant continued to deliver excellent lunches and hosted countless events.

Forskarhjälp (Helping Researchers), in which the Nobel Prize Museum collaborates with Swedish scientific researchers and schools, carried out a successful project called The Spider Chase, where school pupils from all over the country collected spiders near bodies of water for further analysis by researchers at Umeå University and the Swedish University of Agricultural Sciences.

The task of providing teachers with both educational materials and organising inspirational meetings continued during the year. As the year before, a Nobel Prize Lesson was published online within 24 hours after each Prize announcement.

The cooperation with the City of Stockholm, and several other institutions, expanded during 2018 to be able to >





Activities for families remained an important part of the Museum's activities: Sunday and school holiday workshops, a Children's Nobel Club, and a much-appreciated Summer Camp programme in June.



Medicine Laureate Tasuku Honjo visited the museum shop during the Nobel Week.

› present a broad and exciting programme under the tagline Nobel Calling! during 1–8 October. This included lectures and conversations with Nobel Laureates, an international teachers’ conference, initiatives such as Stockholm Explorative Talks, a Crash Course on the year’s scientific Nobel Prizes, a Nobel Walk at Stockholm University and more.

The Museum began a collaboration with Stockholm’s Royal Dramatic Theatre aimed at developing Performance Lectures based on science and enhanced using the tools of theatre. The outcome was successful both in terms of content

and attendance, showing how important it is to use fresh thinking to present science and facts to a broader audience.

Under the Talk about... concept, linked with afterwork gatherings at the Museum on Fridays, various experts were invited to take part in conversations about such topics as the brain, the universe, in vitro fertilisation and behavioural economics.

In April the Nobel Prize Museum greeted visitors until the wee hours, since it was one of numerous venues for events during the Stockholm Culture Night. Specially invited authors and actors took part in conversations and performed

readings on the theme of resistance.

Another collaboration was initiated with the #hurvetdudet? (“#how-doyouknowthat?”) campaign, whose approach to facts and science is exactly the same as that of the Nobel Prize. A conversation was organised at Stockholm’s municipal cultural centre (Kulturhuset) with prominent researchers in such fields as exercise, future technology and space research – yet another highly appreciated and heavily attended event in the spirit of Alfred Nobel.

The past year clearly shows the need for a new home for the Nobel Prize.



Although plans for a Nobel Center on the Blasieholmen peninsula in central Stockholm have now been shelved, we are continuing to work on find a new site and a new home where we can gather and further develop our activities.

The main task of the Nobel Prize Museum is to inspire and engage people with the stories of the Laureates' lives, discoveries and works and to connect with the core of the Nobel Prize and highlight the courage, creativity and perseverance of the Nobel Laureates. To illustrate how ideas can change the world.



The Nobel Prize Museum is the base of the Nobel Prize public activities in Stockholm.



Ice cream at Bistro Nobel created by the pastry chef at the Banquet, Daniel Roos.



Denis Mukwege and Ulf Larsson of the Nobel Prize Museum. Mukwege had Ulf's aunt as a teacher at a school in Bukavu in the early 1970s.

Ice cream, photo: Dan Lepp
 Honjo, photo: Nanaka Adachi
 All other photos: Alexander Mahmoud



Photo: Alexander Mahmoud



RESEARCH FOR THE GREATEST BENEFIT TO HUMANKIND

During the Nobel Week in Stockholm, James P. Allison and Tasuku Honjo – the 2018 Laureates in Physiology or Medicine – met cancer patients who have been treated using the Nobel Prize-awarded immunotherapy.

During the Nobel Week, a meeting took place between this year's Laureates in Physiology or Medicine and cancer patients who have been treated using immunotherapy. Many people wanted to thank Allison and Honjo personally, since the two Laureates' research has had a crucial impact on their lives. It was a very emotional encounter arranged by the Swedish Melanoma Association, whose chairman Magnus Norin said the following in his opening remarks:

"You have done exactly what Alfred Nobel intended in his will, by contributing research for the greatest benefit to humankind."

By stimulating the inherent ability of our immune system to attack tumour cells, this year's Nobel Laureates have established an entirely new principle for cancer therapy. James P. Allison studied a known protein that functions as a brake on the immune system. He realised the potential of releasing the brake and thereby unleashing our immune cells to attack tumours. He then developed this concept into a brand new approach for treating patients. In parallel, Tasuku Honjo discovered a protein on immune cells and, after careful exploration of its function, revealed that it also operates as a brake, but with a different mechanism of action. These discoveries laid the

foundation for the development of very effective cancer therapies. Allison's and Honjo's research has opened the door to testing and combining various methods for inhibiting the immune system's brakes in order to treat cancer. Their seminal discoveries constitute a landmark in our fight against cancer.

Cancer is a collective term for several diseases that are all characterised by uncontrolled proliferation of abnormal cells capable of spreading to healthy organs and tissues. A number of therapeutic approaches are available, including surgery and radiation as well as other strategies that have been awarded earlier Nobel Prizes. They include hormone treatment for prostate cancer (Huggins, 1966), chemotherapy (Elion and Hitchings, 1988) and bone marrow transplantation for leukaemia (Thomas, 1990).

"I have met patients before, but never like this. It feels good and it gives me hope."

James P. Allison

THE BODY AS A BATTLEFIELD

This year's Nobel Peace Prize Exhibition at the Nobel Peace Center presents the two Laureates Denis Mukwege and Nadia Murad, awarded for their efforts to end the use of sexual violence as a weapon of war and armed conflict.

The 2018 Nobel Peace Prize exhibition, *The Body as a Battlefield*, depicts how sexual violence has been, and still is, used as a weapon of war worldwide through photographs taken by Cristina de Middel. She spent time with both Denis Mukwege, the Congolese surgeon who has helped reconstruct the shattered bodies of thousands of victims of sexual violence, and Nadia Murad, a member of Iraq's Yazidi minority and a survivor of sexual violence and slavery. Held captive by ISIS, she managed to escape after three months of enslavement.

Mukwege was photographed in the hospital he runs in DR Congo, along with some of the thousands of women he has treated. Nadia was photographed in Paris, France, between meetings with government officials and world leaders. Since her escape from Iraq, she has devoted her life to telling her story in the hope helping those still in captivity.

The stories in the exhibition are told by women, children and men; all victims of sexual violence in wars and conflicts around the world. Sexual violence has been used as a weapon of war since the dawn of time. Systematic rape, violent sexual assault and sexual slavery are used to spread fear, reward soldiers or exterminate entire religious and ethnic minorities.

"The violence itself is in many cases so overwhelming that it's hard to convey sufficiently through the documentary genre", explains photographer Cristina de Middel. therefore, she also portrays the topic of sexual violence in conflict and war in a series of staged photographs taken in Nigeria in 2018 using local volunteers.



Denis Mukwege
Both photos: Cristina de Middel/
Magnum Photos for the Nobel Peace Center.

FACTS

The Nobel Peace Center in Oslo, Norway is the museum about the Nobel Peace Prize. The Nobel Peace Prize Laureates and their work are presented as well as the story of Alfred Nobel and the Nobel Peace Prize. The Nobel Peace Center has achieved international recognition for the use of documentary photography.

Some of the exhibitions shown during 2018 was:

- The exhibition *Shifting Boundaries* an exhibition showing how boundaries are challenged in a Europe that is undergoing changes, displayed in collaboration with the organisation Fritt Ord.
- The photo exhibition *Generation Wealth* created by Lauren Greenfield, depicted today's all-consuming pursuit of status, beauty and wealth.
- The photo exhibition *Tell the World About Us* created in cooperation with Amnesty International and created by Rune Eraker, deals with issues of human rights such as imprisonment and opened 70 years after the adoption of the Universal Declaration of Human Rights.
- The 2018 Nobel Peace Prize exhibition *Ban the Bomb*, presenting ICAN, was on display until November 2018.



"Every time I tell my story,
I feel I'm taking a little bit
of power away from the
terrorists."

Nadia Murad

2019 PROGRAMME



INTERNATIONAL EVENTS

- Nobel Prize Dialogue Santiago (Chile), January 2019
- Nobel Prize Dialogue Tokyo (Japan), March 2019
- Nobel Prize Dialogue Madrid (Spain), March 2019
- Nobel Prize Dialogue Berlin (Germany), November 2019
- Nobel Prize Inspiration Initiative, Brazil, Austria and Canada

NOBEL PRIZE MUSEUM, STOCKHOLM

Monday 14 January

- Jesse Jackson visits the exhibition about Martin Luther King, Jr.

Friday 22 February

- Talk about gravitational waves. Maria Gunther Axelsson, science journalist at Dagens Nyheter, interviews Christian Forssén, Professor of Theoretical Physics at Chalmers University of Technology.

26 February – 3 March

- Winter holiday workshop for the whole family about sports, medicine and chemistry.

Thursday 7 March

- Teachers' evening focusing on gender equality and diversity – one of ten teachers' evenings on various themes during the year.

Friday 8 March

- Scandal - a performance by Besatta Teatern, and a conversation with Thomas Perlmann, Secretary of the Nobel Committee for Physiology or Medicine at Karolinska Institutet, on efforts to increase gender equality in selecting future Nobel Laureates.

Friday 22 March

- Talk about: Bob Dylan's poetry. Writer/actor Ludvig Josephson in conversation with novelist/critic Elise Karlsson and singer/songwriter Amanda Bergman.

Tuesday 26 March

- Panel discussion on climate change and other environmental factors: how our future adjustments to these factors will look. Radio personality Fritte Fritzson moderates a panel of researchers who answer audience questions.

Friday 29 March – Saturday 6 April

- Green Week with Talk about sessions, conversations and clothing swap day.

15–18 April

- Easter break workshops for children, including sessions targeted to recreation centres in socio-economically vulnerable neighbourhoods.

Saturday 27 April

- Stockholm Culture Night, A Right to Freedom – Martin Luther King, Jr. The Civil Rights Movement and Music. A conversation between radio journalist Mats Nileskär and the newspaper Dagens Nyheter's Måns Mosesson. Workshops, puzzles, guided tours.

Friday 10 May

- Talk about: Alva Myrdal. A talk between Yvonne Hirdman and Gustav Källstrand.

20 September

- Talk about.

4 October

- Inauguration of the exhibition For the Greatest Benefit to Humankind.

7 – 14 October

- Nobel Calling (events both at the Nobel Prize Museum and other Stockholm venues)
- Live broadcasts of the Prize announcements at the Museum, with commentary by experts.
- Wednesday 9 October, Crash Course on the 2019 scientific Nobel Prizes at Södra Teatern.
- Thursday-Saturday 10–12 October, Nobel Prize Teacher Summit at Münchenbryggeriet, as part of a three-day programme for international participants.
- Saturday 12 October, meeting with Nobel Laureates (external venue).
- Sunday 13 October, pub evening for international university students.
- Monday 14 October, Economics Prize programme at Sveriges Riksbank (Sweden's central bank) preliminary

25 October

- Talk about

28 October – 1 November

- Autumn Leaves Workshop

22 November

- "Talk about".

6 December

- Get Together at the Museum for the year's Laureates and their families.

7 December

- Closing conference of Forskarhjälp (Helping Researchers), a project in which 30 lower secondary school classes from all over Sweden provide assistance to researchers for one year.

10 December

- Nobel Day

Christmas break

- Family workshop

NOBEL PRIZE MUSEUM'S OTHER EVENTS

Tuesday 15 January

- Ideas changing the world : Jesse Jackson about Martin Luther King and the civil rights movement. A talk with Jesse Jackson and Jenny Strömstedt at Södra Teatern.

Tuesday 29 January

- Performance Lecture On Fear featuring Armita Golkar. Royal Dramatic Theatre, Small Stage (Dramaten, Lilla scenen).

Tuesday 5 February

- Performance Lecture On Fear featuring Armita Golkar. Dramaten, Lilla scenen.

Tuesday 9 April

- Performance Lecture On Happiness featuring Micael Dahlen. Dramaten, Lilla scenen.

14–15, 23 and 31 May

- Performance Lecture On Happiness featuring Micael Dahlen. Dramaten, Lilla scenen.

1 and 4 June

- Performance Lecture On Happiness featuring Micael Dahlen. Dramaten, Lilla scenen.

Monday 17 June– Thursday 20 June.

- Research camp for children who have completed 5th and 6th grade.

New Performance Lecture during the autumn.

In December, a seminar will be held at the Riksdag (Swedish Parliament). Date and speakers to be announced.



NOBEL PEACE CENTER, OSLO

January – November

- Peace Prize exhibition, The Body as a Battlefield, April – December.

April 2019 – January 2020

- KlimaLab, a climate exhibition, part of Oslo European Green Capital 2019.

28 April

- Tourist in Your Own City. Free entry.

13 September

- Oslo Culture Night. Open all evening and free entry.

11 October

- Announcement of the 2019 Nobel Peace Prize.

12 October

- Open House to celebrate the new Peace Prize.

11 December

- Inauguration of an exhibition about the 2019 Nobel Peace Prize.

NORWEGIAN NOBEL INSTITUTE/NOBEL PEACE PRIZE – RESEARCH & INFORMATION AS, OSLO

13 February

- 2019 Climate Conference: Ideas that will shape the energy transition.

12–14 March

- Norwegian Nobel Institute Teachers' Course, number 72: The Conditions of Peace in 2019.

28 May

- High-Level Conference: Camp David at Forty – the legacy of the Israeli-Egyptian peace treaty.

5–12 December

- Oslo Peace Days.

11 December

- Nobel Peace Prize Forum.

11 December

- Nobel Peace Prize Concert.

A number of lectures and academic seminars are being organised during the year.

THE NOBEL WEEK

6–12 December

- The Nobel Week includes the Nobel Prize Concert at the Stockholm Concert Hall on 8 December and the Nobel Lectures, as well as the Nobel Day on 10 December with the Nobel Prize Award Ceremony and the Nobel Banquet. Also the Nobel Week Dialogue, a full-day seminar in Gothenburg on 9 December.

Armita Golkar at the Royal Dramatic Theatre.

Photo: Sören Vilks

Nobel Peace Center, photo: Johannes Granseth / Nobel Peace Center

Other photos:

Alexander Mahmoud

For further information, see:

www.nobelprize.org

www.nobelprizemuseum.se

www.nobelpeaceprize.org/Research

www.nobelpeacecenter.org

THE INSTITUTIONS THAT SELECT THE NOBEL LAUREATES

In his will, Alfred Nobel stipulated which institutions should select Nobel Laureates in each prize category. Presumably, he chose the academic institutions that he considered to be best suited to the task. Nobel was less specific regarding the organisation that was to manage his assets. What would later become the Nobel Foundation was only mentioned in his will as a fund. The Nobel Prize's internationally unique position is largely due to the century-long independence of the prize-awarding institutions in selecting Nobel Laureates. The fact that these organisations have engaged exceptionally knowledgeable individuals within their own organisations as well as extensive international expertise has played a vital role in achieving this standing.

The Royal Swedish Academy of Sciences selects the Nobel Laureates in Physics and Chemistry. It also selects the recipients of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, established in 1968 on the occasion of the Riksbank's (Sweden's central bank) 300th anniversary. The Academy has about 450 Swedish and about 175 foreign members. The Nobel Assembly at Karolinska Institutet selects the Nobel Laureates in Physiology or Medicine. The Assembly has 50 members. The Swedish Academy selects the Nobel Laureates in Literature. The Academy has 18 members. All of these institutions appoint special Nobel Committees of three to ten members, a secretary and, in some cases, also deputies. Members are, in general, elected for a term of three years and may serve for a maximum of three consecutive terms. The Nobel Committees evaluate nominations for the respective Nobel Prizes and extensively examine a selection of the

nominees. They subsequently present their proposals for Nobel Laureates to the respective prize-awarding institution. The actual decision as to who will be awarded Nobel Prizes is made not by the respective Nobel Committees, but by all members of the prize-awarding institution. For the Peace Prize, Alfred Nobel referred to the Storting (national parliament) in Norway in his will. The Storting appoints the five members of the Norwegian Nobel Committee. The Norwegian Nobel Committee differs from the other prize-awarding institutions in the sense that it is responsible both for evaluating the nominees and selecting the recipient.

In September of each year the respective Nobel Committees send out individual invitations to thousands of members of academies, university professors and other scientists in numerous countries, previous Laureates, members of parliamentary assemblies and others. The invitation recipients are chosen so to ensure that as many countries and universities as possible are represented over time. A much broader group can make nominations for the Nobel Peace Prize without receiving an invitation from the Norwegian Nobel Committee compared to the other prizes. This nomination procedure for the Nobel Prize differs from many other prizes where it is the responsible committee which appoints both the nominees and the recipients. Those who have been invited are able to nominate candidates for the coming year. Nominations, which are confidential, must be received by the Committees no later than 31 January of the year in which the prize will be awarded. The procedures may vary somewhat between the Nobel Committees, but the selection process is largely the same

across all prize categories. The Committees first confirm that the nominations were submitted by individuals who have the right to nominate. Since a nomination is only valid for the current year, it is common for some candidates to be nominated several times. Some candidates may also be nominated by more than one nominator in the same year. Nominations are recorded and compiled in a list.

The list is processed in a series of phases during the spring. Initially, it consists of a large selection of names, which is then narrowed down to a smaller number of candidates. Remaining candidates are then evaluated in depth with the assistance of domestic and foreign experts. During the summer the Nobel Committee members produce a comprehensive report detailing the candidate or candidates proposed as the recipient(s) of the year's Nobel Prize. The proposal is presented to the members of the prize-awarding institution in September. The final selection of Nobel Laureates takes place by a vote. The decisions are announced by the respective prize-awarding institutions immediately after the vote, usually during the first half of October. All documents related to the nomination process and evaluations remain confidential for 50 years.

More information about the prize-awarding institutions is available on their respective websites:
www.kva.se
www.nobelprizemedicine.org
www.svenskaakademien.se
www.nobelpeaceprize.org



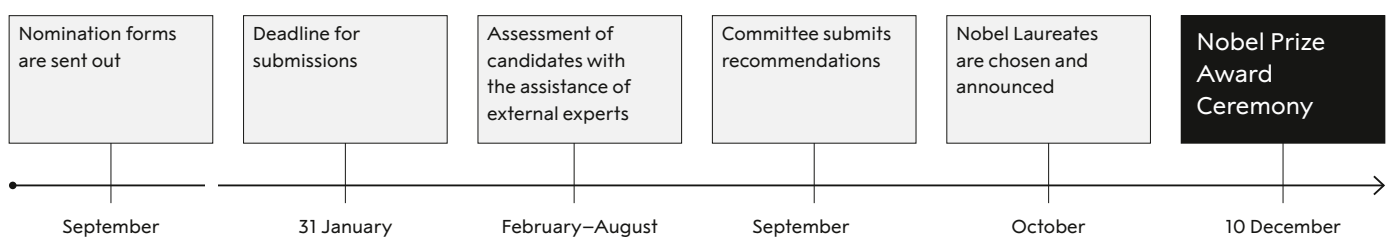
The presentation speech for the Nobel Prize in Physiology or Medicine at the Nobel Prize Award Ceremony was delivered by Klas Kärre, member of the medicine committee.



In October each year, the new Nobel Prizes are announced and there is much interest from media all over the world. Olga Botner, chair of the physics committee, participated in many interviews concerning the 2018 Nobel Prize in Physics.

Photo: Alexander Mahmoud

Selecting Nobel Laureates



ALFRED NOBEL

Alfred Nobel was an inventor, entrepreneur and a very successful businessman who continually travelled between his factories. Nobel built up an enormous fortune that he chose in his will to dedicate to those who had contributed to the greatest benefit to mankind. The Prize would reward outstanding efforts within the different fields that he was most involved in during his lifetime.

Alfred Nobel was born in Stockholm in 1833. His father, Immanuel, was an inventor and engineer who had varying success. His mother, Andriette, was described as energetic and intelligent, and when Immanuel went to Russia after a bankruptcy, she was forced to support the family. When Immanuel established a company in the war industry in 1842, the family could finally reunite.

The Nobel brothers were given a first class education by private tutors, and at the age of 17 Alfred spoke five languages: Swedish, Russian, English, French and German. At the time, he was interested in poetry and even wrote his own works. But his father disliked Alfred's interest in literature and sent him abroad for studies that focused more on the natural sciences. He visited a number of countries and finally ended up in Paris, where he studied chemistry under Professor T. J. Pelouze. It was there that Alfred first came into contact with nitroglycerine, which was invented by the Italian Ascanio Sobrero. Nitroglycerine was a highly explosive liquid considered too dangerous to be useful. Alfred Nobel returned to Sweden and soon began experimenting with nitroglycerine, both in its production and in making the substance reliable enough to use in industry. The work was dangerous and an accident killed several people, including his younger brother Emil.

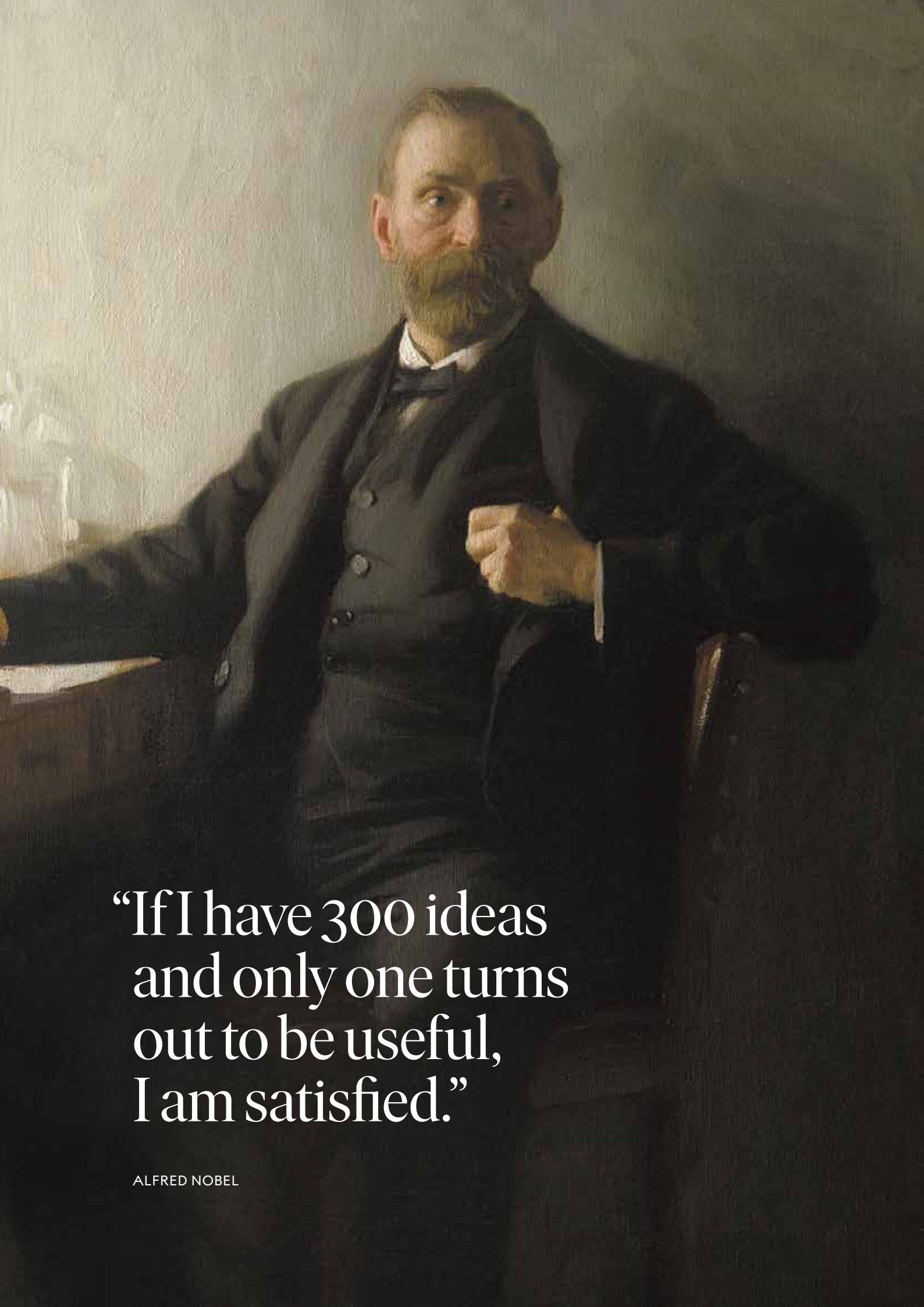
Alfred Nobel was finally able to solve

the problem of the substance's volatility by mixing nitroglycerine with a type of sand, kieselguhr. The result was a mouldable mass that was easy to package and that could be shipped and handled safely. It was patented in 1867 under the name dynamite. With the patenting of different forms of dynamite together with detonators, which he had invented previously, Alfred Nobel achieved his major technical and industrial breakthroughs.

Alfred Nobel led the rapid exploitation of his inventions and built factories and laboratories around the world — Vinterviken in Sweden, Krümmel in Germany and Ardeer in Scotland were some of the first. He eventually built just over 90 factories in 20 countries. At his death, he had 355 patents and left behind an enormous fortune. Nobel was a man of his time, embodying many of the Enlightenment's central ideas, both in his practical work and in his philosophy. He combined his religious doubt with a belief in the natural sciences and was a true optimist about technology and an entrepreneur who actively took part in industrialisation.

Alfred Nobel died on 10 December 1896 in his home in San Remo, Italy, and his will attracted significant attention when it was published. He had allocated most of his fortune to rewarding outstanding efforts within physics, chemistry, physiology or medicine, literature and peace. The will was challenged by relatives, authorities in several countries and by Swedish King Oscar II. Thus began a long process on the road to realising Alfred Nobel's vision. After a few years of complicated legal processes led by the executors of the will, Ragnar Sohlman and Rudolf Lilljequist, the Nobel Foundation was established in 1900 and the first Nobel Prizes were awarded the following year.





“If I have 300 ideas
and only one turns
out to be useful,
I am satisfied.”

ALFRED NOBEL

NEW VISUAL IDENTITY

The Nobel Prize is a unique concept encouraging human development – about respect for knowledge and science, about a belief in international fellowship and the possibility of change. But the Nobel Prize can also be viewed as a powerful brand, based on a historical legacy and a solid reputation that has been built up over more than a century. Selecting Laureates year after year in keeping with Alfred Nobel's instructions, and rewarding them with a beautiful medal and an artistically decorated diploma as part of an award ceremony that follows a clear tradition can of course be viewed as a form of persistent brand-building.

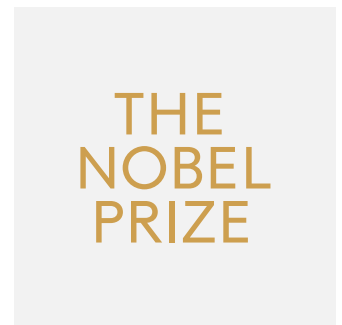
The work of building public outreach activities, for almost twenty years, can be seen in the same way.

When the Nobel Foundation conducted its own international brand survey, a few years ago, it confirmed the strong position and reputation of the Nobel Prize, but it also showed that the image of the Prize actually varies quite a lot between different countries. In Sweden, people associate the Nobel Prize with award ceremonies and TV broadcasts of the Nobel Banquet. Elsewhere in Europe and in the United States, people associate the Prize with the Laureates themselves and their achievements, while people in South American and Asian countries view the Nobel Prize as visionary, progressive and socially responsible. The greater the geographical distance, the closer its image comes to

Alfred Nobel's intention. The importance of always basing informational efforts on the core of the Nobel Prize, and always communicating this core, became clear and also served as a starting point in the task of revising the visual identity of the Prize.

Together with Stockholm Design Lab, the Nobel Foundation implemented a comprehensive visual identity project. In 2018 it launched a new, coherent graphic expression of the activities connected to the Nobel Prize. It is based on Erik Lindberg's medal from 1901 and its timeless typography. A word mark emerged from Alfred Nobel's name – The Nobel Prize – and with it a unique font, which has been named Alfred Sans.

Along with gold and a colour scale that has drawn its inspiration from the era when the Prize was established, the typography creates a graphic framework with great scope for variation. The Nobel Prize should be able to operate on different platforms and meet a variety of audiences with completely different needs, but at the same time be clear and consistent. At the core of all public activities are Alfred Nobel's vision, the Nobel Laureates and their contributions for the greatest benefit to humanity. But equally important is the everyday effort to generate a commitment to education, research, literature and peace efforts. This is an important task, and now the graphical tools are in place to reach out even better with the concept of the Nobel Prize and turn it into a reality.



The new wordmark.



A timeless colour scale.

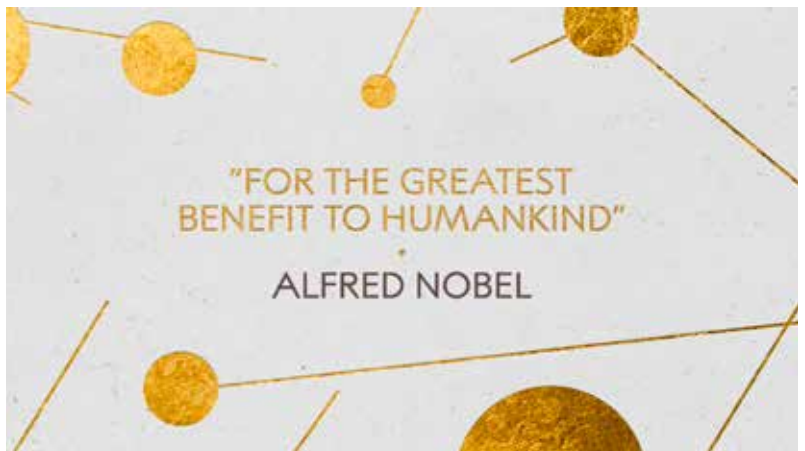
ALFRED SANS

ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖ.

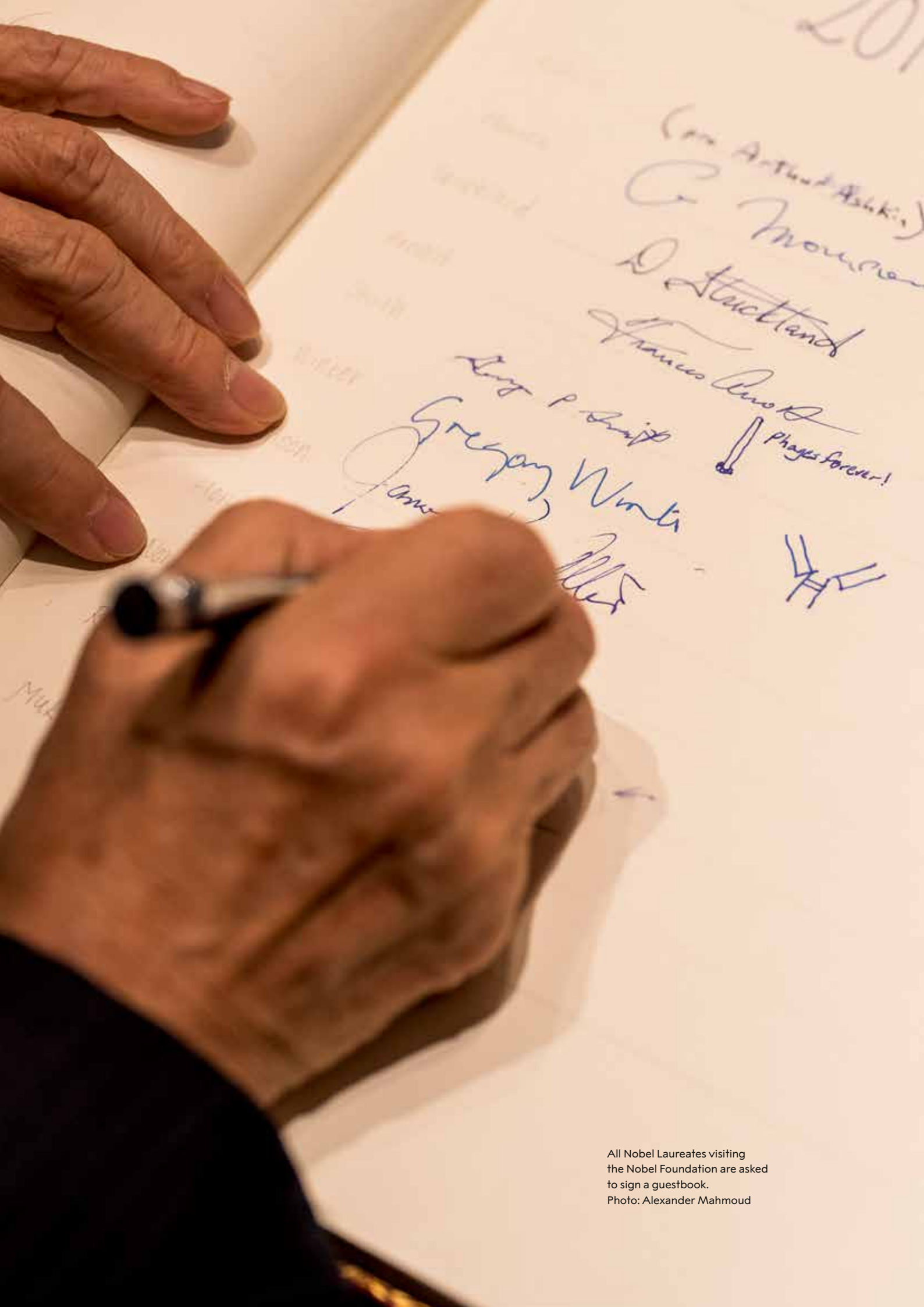
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A unique font created with inspiration from the medal.



The Nobel Foundation Executive Director Lars Heikensten at the 2018 Nobel Week Dialogue.



(on Arthur Ashkin)
C. Mourou

D. Stuckland

Francis Arnold
Plays forever!

Scott P. Smith

Gregory Winter

James



All Nobel Laureates visiting the Nobel Foundation are asked to sign a guestbook.
Photo: Alexander Mahmoud

THE NOBEL FOUNDATION

The Nobel Foundation, a private institution established in 1900, has ultimate responsibility for fulfilling the intentions in Alfred Nobel's will. The main mission of the Nobel Foundation is to manage Alfred Nobel's fortune in a manner that ensures a secure financial standing for the Nobel Prize over the long term and that the prize-awarding institutions are guaranteed independence in their work of selecting recipients.

The Foundation is also tasked with strengthening the Nobel Prize's position by administering and developing the brands and intangible assets that have been built up during the Nobel Prize's history, which spans more than 100 years. The Nobel Foundation also strives to safeguard the prize-awarding institutions' common interests and to represent the Nobel sphere. In the past two decades a number of public operations have been developed with the aim of inspiring and disseminating knowledge about the Nobel Prize. The Nobel Foundation has overall responsibility for the Nobel Week that takes place in Stockholm in December. This week has a busy schedule for the Nobel Laureates, culminating in the Nobel Prize Award Ceremony and the Nobel Banquet held on 10 December. Both of these events are planned and run by the Foundation.

The Norwegian Nobel Institute was established in 1904 and acts as the Norwegian Nobel Committee's secretariat and the Nobel Foundation's branch office in Oslo. The Institute administers the activities connected with the awarding of the Nobel Peace Prize, including press conferences, the Award Ceremony and the Banquet.

The market value of the Nobel Foundation's total invested capital amounted to SEK 4,338 m (4,496) at the end of 2018. Portfolio capital was allocated among 44 (50) per cent equity funds and stock index futures, 9 (7) per cent property funds, 15 (17) per cent fixed income assets, 33 (25) per cent alternative assets and -1.5 (1) per cent accrued currency hedging income. The year's return on portfolio capital was -2.1 (8.7) per cent.

During 2018 the overall sum of all Nobel Prizes and operating expenses was SEK 89.6 m (102.6). This was divided among four main categories: the Prizes, SEK 36 m, compensation to the Prize Committees, SEK 27.4 m, the Nobel Week in Stockholm and Oslo, SEK 14.2 m, plus administration etc., SEK

12.0 m. Additional information about the Nobel Foundation's financial management is available in the Foundation's 2018 Annual Report, which is available at Nobelprize.org.

The Nobel Foundation's symposium activities were initiated in 1965. Over the years they have achieved a high international standing. The symposia are devoted to areas of science where breakthroughs are occurring or deal with topics of primary cultural or social significance.

During 2017 it was decided that the Nobel Symposia will no longer be administered by the Nobel Foundation. Starting in 2019, the responsibility for funding and administering the symposia is being licensed out to the Royal Swedish Academy of Sciences and the Norwegian Nobel Committee.

Symposium activities as well as other large interdisciplinary meetings in the Nobel sphere are prepared by the Nobel Foundation's Programme Committee, which includes representatives of the prize-awarding institutions and the Nobel Foundation.

During 2018 the following Nobel Symposia took place: NS 164, Nuclear Disarmament, organiser Professor Olav Njølstad, Solstrand Hotel, Bergen, Norway, June 13-16, 2018 and NS 165 Money and Banking, organiser: Professor Bo Becker, Clarion Hotel Sign, Stockholm, Sweden, May 26-28, 2018.

The Nobel prize-awarding institutions; the Royal Swedish Academy of Sciences, the Nobel Assembly at Karolinska Institutet, the Swedish Academy and the Norwegian Nobel Committee, appoint 15 trustees to the Nobel Foundation, for two calendar years at a time. Six representatives are appointed by the Academy of Sciences and the other prize-awarding institutions appoint three each. The Academy of Sciences also appoints four deputies and the other institutions appoint two deputies each. The trustees elect a chairman from their own number. The most important task of the trustees is to appoint the Nobel Foundation's Board and to audit the Nobel Foundation's accounts.

The Nobel Foundation's board, which is based in Stockholm, consists of seven members and two deputy members. Board members and deputies are appointed for a term of two years each. From among its own members, the Board chooses a Chairperson, a Vice-Chairperson and an Executive Director.

TO ENGAGE, INSPIRE AND SPREAD KNOWLEDGE

The Nobel Prize rewards science, humanism and peace efforts. This is one of the central concepts in the will of Alfred Nobel, and it also permeates the broad outreach activities that have been developed for the purpose of engaging, inspiring and spreading knowledge to a wide general public based on the Nobel Prize as well as the discoveries and achievements of the Laureates.

BOARDS OF DIRECTORS, 2018

THE NOBEL FOUNDATION

The Nobel Foundation is a private foundation established in 1900 on the basis of the will of Alfred Nobel and the founding statutes promulgated in connection with the will. Its primary purpose is to ensure that the intentions of the will of Alfred Nobel are fulfilled.

- Carl-Henrik Heldin, Professor, Chairman
- Göran K. Hansson, Professor, Vice Chairman, Secretary General of the Royal Swedish Academy of Sciences
- Lars Heikensten, Dr, Executive Director of the Nobel Foundation
- Sara Danius, Professor
- Berit Reiss-Andersen, Attorney, Chair of the Norwegian Nobel Committee
- Tomas Nicolin, MSc
- Thomas Perlmann, Professor, Secretary General of the Nobel Assembly at Karolinska Institutet and the Nobel Committee for Physiology or Medicine

Deputy members

- Gunnar von Heijne, Professor, Secretary of the Nobel Committee for Chemistry
- Gunnar Ingelman, Professor, Secretary of the Nobel Committee for Physics

ALFRED NOBEL MEMORIAL FOUNDATION

The purpose of the Alfred Nobel Memorial Foundation is to promote education, culture, peace and scientific research, in part by financially or otherwise contributing to the activities and objectives of the Nobel Foundation.

- Carl-Henrik Heldin, Chairman
- Sara Danius
- Göran K. Hansson
- Lars Heikensten
- Tomas Nicolin
- Thomas Perlmann
- Berit Reiss-Andersen

NOBEL GROUP INTERESTS AB

The aim of the company is to own and actively manage shares and participation within the sphere of interest of the Nobel organisations. Another task of the company is to facilitate financial and administrative coordination between the companies in the Nobel sphere.

- Carl-Henrik Heldin, Chairman
- Sara Danius
- Göran K. Hansson
- Gunnar von Heijne
- Lars Heikensten
- Gunnar Ingelman
- Tomas Nicolin
- Thomas Perlmann
- Berit Reiss-Andersen

NOBEL MEDIA AB

Nobel Media AB spreads knowledge about Nobel Prize-awarded achievements and stimulates interest in science, literature and peace efforts through digital channels and inspiring events. The company is also responsible for the international work of the Nobel Sphere and partner relations.

- Lars Heikensten, Dr, Executive Director of the Nobel Foundation, Chairman
- Daniel Birnbaum, Dr, Director of Moderna Museet in Stockholm (during 2018)
- Karin Hedensjö Pettersson, Director of Public Policy, Schibsted
- Mia Horn af Rantzien, Dr, CEO of the Center for Business and Policy Studies (SNS)
- Erika Lanner, during 2018 General Counsel, the Nobel Foundation
- Sara Mazur, Vice President and Head of Ericsson Research
- Marie Nilsson, CEO of Mediavision
- Olav Njølstad, Professor, Director of the Norwegian Nobel Institute
- Juleen Zierath, Professor, member of the Nobel Assembly at Karolinska Institutet and associate member of the Nobel Committee for Physiology or Medicine

NOBELHUSET AB

Nobelhuset AB is the company that has been entrusted with planning, building, owning, administering and developing a future Nobel Center in Stockholm.

- Lars Heikensten, Dr, Executive Director of the Nobel Foundation, Chairman
- Lars Anell, former Chairman of the Swedish Research Council
- Birgitta Ed, founding partner of Six Year Plan
- Gunnar von Heijne, Professor, Secretary of the Nobel Committee for Chemistry
- Anders Nylander, former CEO of Atrium Ljungberg
- Eva Nygren, Architect
- Stefan Ränk, CEO, Einar Mattson AB
- Erika Lanner, during 2018 General Counsel, the Nobel Foundation, Deputy Member

NOBELMUSEET AB

NobelMuseet AB is in liquidation, since as of January 1, 2019 the Nobel Center Foundation (Stiftelsen Nobel Center) acquired the operations carried out by the Nobel Prize Museum – formerly the Nobel Museum – in Stockholm's Old Town.

- Lars Heikensten, Dr, Executive Director of the Nobel Foundation, Chairman
- Ulf Danielsson, Professor, Uppsala University
- Peje Emilsson, Founder and Chairman of Kream
- Marika Hedin, Dr, Honorary Doctor of Technology, Director of Museum Gustavianum (Uppsala University Museum)
- Klas Kärre, Professor, member of the Nobel Assembly at Karolinska Institutet
- Erika Lanner, during 2018 General Counsel, the Nobel Foundation
- Nina Wormbs, Associate Professor, Royal Institute of Technology (KTH)
- Sara Öhrvall, Chief Digital, Customer Experience and Communications Officer at SEB

THE NOBEL CENTER FOUNDATION

The Nobel Center Foundation (Stiftelsen Nobel Center) is responsible for the public operations carried out by the Nobel Prize Museum.

- Lars Heikensten, Dr, Executive Director of the Nobel Foundation, Chairman
- Helene Andersson Svahn, Professor, Royal Institute of Technology (KTH)
- Märten Castenfors, Director of Liljevalchs konsthall (art museum)
- Bente Erichsen, film director, author
- Cecilia Gunne, Attorney, Lindskog Malmström Advokatbyrå KB
- Göran K. Hansson, Professor, Secretary General of the Royal Swedish Academy of Sciences
- Gunnar von Heijne, Professor, Secretary of the Nobel Committee for Chemistry
- Staffan Normark, Professor, Karolinska Institutet
- Per Wästberg, writer, member of the Swedish Academy

NOBEL PEACE PRIZE – RESEARCH & INFORMATION AS

Nobel Peace Prize – Research & Information AS (Nobels Fredspris – Forskning og Informasjon AS) is the research arm of the Norwegian Nobel Institute.

- Anne Enger, former Storting member, Minister of Culture and County Governor
- Bente Erichsen, film director, author
- Olav Njølstad, Director of the Norwegian Nobel Institute, Chairman
- Jon Ola Sand, Executive Supervisor, The European Broadcasting Union
- Henrik Syse, Professor, Peace Research Institute Oslo
- Lotta Wristel, CFO of the Nobel Foundation

NOBEL PEACE CENTER FOUNDATION

The Nobel Peace Center in Oslo is a museum that showcases the Peace Prize Laureates and their work, information about Alfred Nobel and exhibitions with a focus on documentary photography.

- Olav Njølstad, Director of the Norwegian Nobel Institute, Chair
- Siri Hatlen, business owner, Deputy Cahir
- Olav Aaraas, Director, Norwegian Museum of Cultural History
- Jessica Barlindhaug Angstreich, Board member elected by the employees
- Anne Enger, former Storting member, Minister of Culture and County Governor
- Lotta Wristel, CFO of the Nobel Foundation

COMPANY INFORMATION

THE NOBEL FOUNDATION

- Executive Director: Dr Lars Heikensten
- Swedish registration number: 802002-4462
- Number of employees: 12
- Established: 1900
- Address: Sturegatan 14, Stockholm, Sweden
- Website: nobelprize.org

NOBEL MEDIA AB

- CEO: Mattias Fyrenius
- Swedish registration number: 556667-5194
- Sales: SEK 75,779 K
- Employees: 20
- Established: 2004
- Address: Sturegatan 14, Stockholm, Sweden
- Website: nobelprize.org

NOBELMUSEET AB

- (Nobel Prize Museum)
- CEO: Dr Olov Amelin
 - Swedish registration number: 556667-5210
 - Sales: SEK 77,436 K
 - Employees: 43
 - Established in 2004 (operations were previously carried out as part of the Nobel Foundation Rights Association)
 - Address: Stortorget 2, Stockholm, Sweden
 - Website: nobelprizemuseum.se

NOBEL PEACE CENTER FOUNDATION

(Nobel Peace Center)

- CEO: Liv Torres
- Norwegian registration number: 985226237
- Sales: NOK 56,031 K
- Number of employees: 42 (25 full-time)
- Established: 2005
- Address: Brynjulf Bulls Plass 1, Rådhusplassen, Oslo, Norway
- Website: nobelpeacecenter.org

NOBEL PEACE PRIZE – RESEARCH & INFORMATION AS

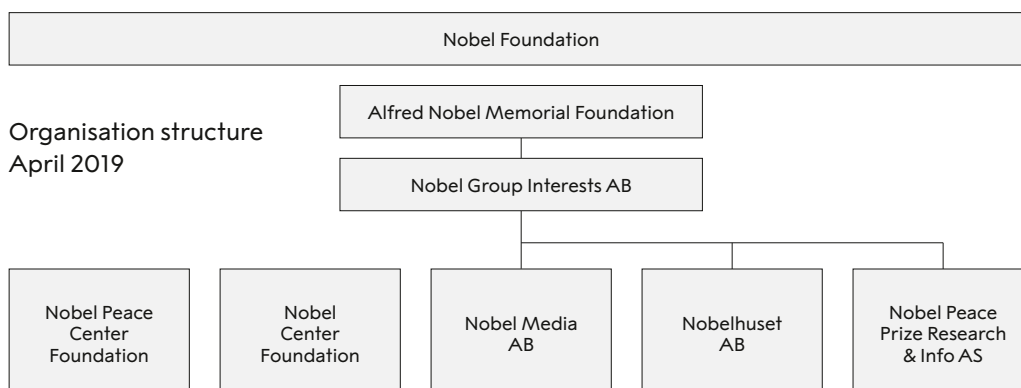
- Norwegian registration number: 996179397
- Sales: NOK 4,830 K
- Number of employees: 3 (1 full-time)
- Established: 2010
- Address: Henrik Ibsens Gate 51, Oslo, Norway
- Website: nobelpeaceprize.org/research

Effective from January 1, 2019, the Nobel Center Foundation (Stiftelsen Nobel Center) acquired the operations carried out by the Nobel Prize Museum, formerly Nobelmuseet AB (the Nobel Museum), in Stockholm's Old Town.



Erika Lanner, new Director of the Nobel Prize Museum:

“The Nobel Prize has an outstanding international reputation. All over the world, the prize is associated with fresh thinking, innovation and creativity. It draws a large number of international visitors to our Museum every year. One important focus in 2019 is to reach out even better to people living in the Stockholm region, among other things through a growing range of programme activities, expanded contacts with schools and new institutional partnerships. We are the museum of the Nobel Laureates and view it as our task to inspire and engage people with the stories of the Laureates’ lives, discoveries and works. With our new name, the Nobel Prize Museum, we want to emphasise our connection with the core of the Nobel Prize and highlight the courage, creativity and perseverance of the Nobel Laureates. Ideas can change the world. This becomes clear when we learn how the Nobel Laureates – who number more than 900 since 1901 – have asked questions, sought answers and overturned old truths.”



HIGHLIGHTS IN DECEMBER





Donna Strickland's Nobel Prize-awarded work involves creating extremely short and intense laser pulses. She used this laser rod in her experiments, which was donated to the Nobel Prize Museum. It consists of glass treated with neodymium and used to create infrared laser light. Strickland did her work when she was still a doctoral student at the University of Rochester.

Photo: Nanaka Adachi

HIGHLIGHTS IN DECEMBER

The Nobel Prize Museum is well visited during the Nobel Day 10 December. Åsa Husberg, dressed in national costume, was one of many staff at the museum welcoming visitors.



The Nobel Week Dialogue takes place in Stockholm or Gothenburg on 9 December each year. The event aims to stimulate discussion on a topical science-related theme by bringing together Nobel Laureates, the world's leading thinkers and experts within one area of expertise, policy makers and the general public, online as well as on site. By bridging science and society, it's an opportunity to excite imagination and inspire greatness. The 2018 theme was water.



Chef Tom Sjöstedt and pastry chef Daniel Roos (photo), both of them celebrated Swedish culinary innovators, created the 2018 Nobel Banquet Menu. The dessert served was a medley of apples with caramelised Frida apples from Österlen, apple sorbet, vanilla custard, caramel sauce and oat crumbs.



Gérard Mourou and his wife Marcelle Mourou in a warm embrace on stage after the Nobel Prize Award Ceremony in the Stockholm Concert Hall.





Towards the end of the Nobel Banquet at the Stockholm City Hall, students will assemble with massed standards on the grand stairway and the balustrade above the Blue Hall. Colleges and universities from all parts of Sweden will be represented among the standards. The evening's toastmaster was Sara Tabari.

Violinist Lisa Batiashvili was the soloist in the 2018 Nobel Prize Concert. The Royal Stockholm Philharmonic Orchestra was led by American conductor Karina Canellakis.

During the Nobel Days in Oslo, the Nobel Peace Prize Laureates visit the Norwegian Nobel Institute and sign the guestbook, as many Laureates have before them.

Oslo, photo: Ken Opprann
 Roos, photo: Dan Lepp
 Others, photo: Alexander Mahmoud

DIPLOMA

Arthur Ashkin's Nobel Diploma. Artist Berndt Wennström, calligrapher Marie A. Györi. The Diploma also has a monogram on the cover which is designed by Marianne Pettersson Söld. Book binder Leonard Gustafssons Bokbinderi AB. Photo Lovisa Engblom.



Kungl. Vetenskapsakademien
har den 2 oktober 2018
beslutat att med det

NOBELPRIS

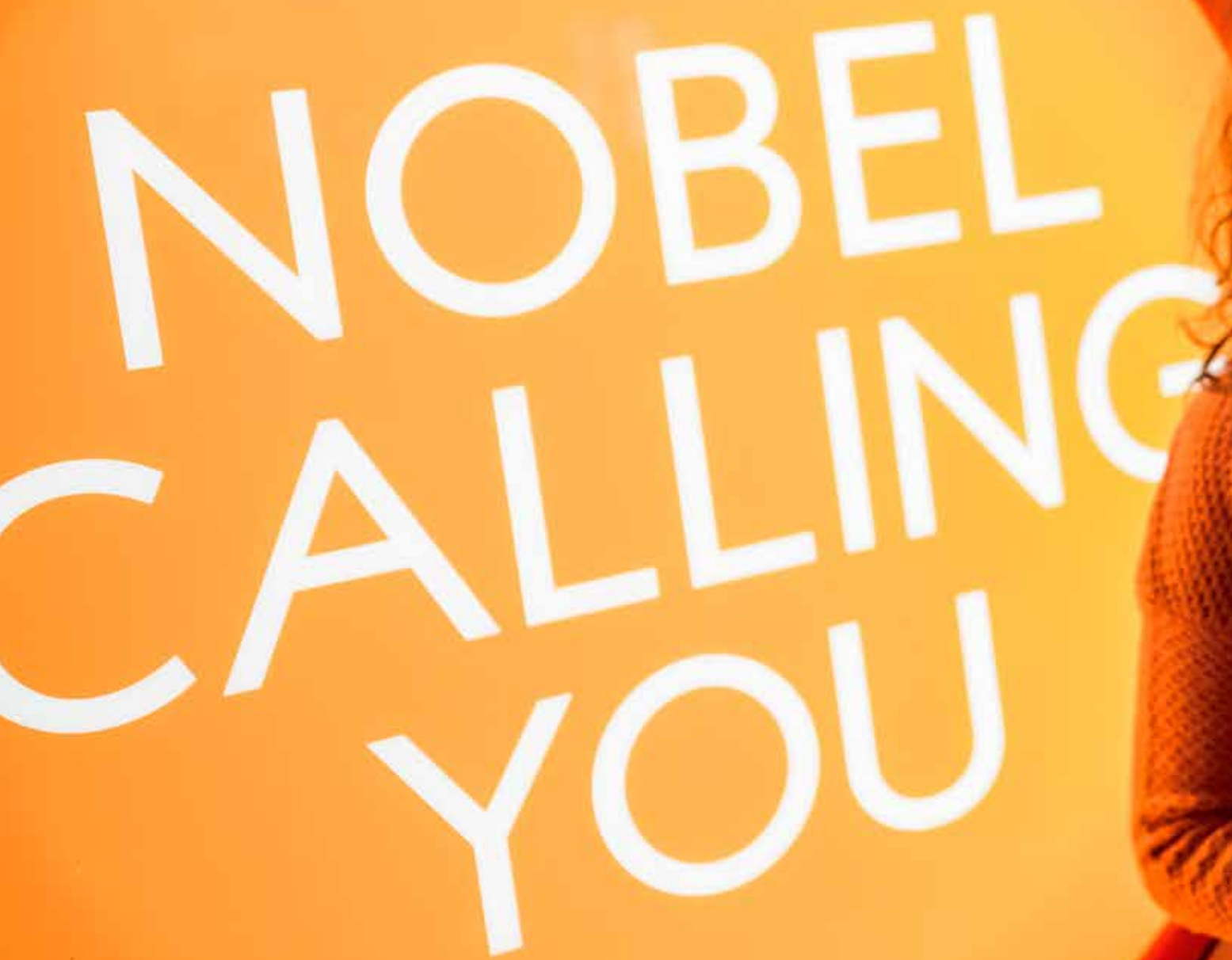
som detta år tillerkännes den
som inom fysikens område gjort
den viktigaste upptäckten
eller uppfinningen med
ena hälften belöna

ARTHUR ASHKIN

för den optiska pincetten
och dess tillämpning på
biologiska system

STOCKHOLM DEN 10 DECEMBER 2018



A close-up photograph of a person's hand holding a large, circular, illuminated sign. The sign has a warm, orange-yellow glow and a dark red border. The text "NOBEL CALLING YOU" is written in large, white, sans-serif capital letters across the center of the sign. The background is softly blurred, showing a wooden chair and a warm, indoor setting.

NOBEL
CALLING
YOU

Photo: Alexander Mahmoud



Editors: Annika Pontikis,
Director of Communications
and Jonna Petterson,
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The text *The Body as a Battlefield*
by Ingvill Bryn Rambøl.

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