



SWEDISH FOUNDATION *for*
STRATEGIC RESEARCH

Annual Report **2020**

SSF REPORT NO 37

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in 2020

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Message from the CEO

“We are maximising the impact of research through scientific excellence and societal relevance”

During 2020, the Foundation spent SEK 799 million on 331 ongoing strategic research projects carried out at universities, often in collaboration with industry. 62 new projects were granted funding totalling SEK 744 million.

My aim is for the Foundation to operate strategically on several levels and over time. This is achieved through the careful selection of research areas and innovative forms of grants. Now, the Swedish Foundation for Strategic Research (SSF) is raising the bar for scientific excellence and for the movement of researchers between different sectors as well as different countries. Inter- and multidisciplinary research constellations are being rewarded. In addition, we are targeting enabling technologies and the development of research infrastructure. Researchers are also encouraged to utilise their results. Career support is provided to individuals interested in exercising a leadership role in such directions.

The programme Adjunct Professor (A-Pro) is a current example of how the research portfolio is being rejuvenated. The programme offers individuals within industry, authorities and the health-care sector to build bridges to academia in order to jointly tackle major research problems.

In the Foundation's portfolio of bilateral collaborations, Taiwan, South Korea and Japan are being



PHOTO: GONZALO IRIGOYEN

joined by Israel. We are promoting collaboration between our nations' researchers with a view to achieving technological and medical breakthroughs for sustainable development.

Together with the Foundation's Secretariat, I am proud of the many researchers, supported by SSF, who contribute to the provision of knowledge and competence in Sweden. You leave great imprints within the natural sciences and medicine, as well as within technologies for digitalisation and communication, energy, biotech, and materials, etc.

Thank you!

Lars Hultman



Message from the Chair

The Swedish Foundation for Strategic Research (SSF) plays an important role in the Swedish research landscape. We shall support strategic research, which includes both basic research and more applied activities within the strategic areas we have identified. The areas we shall cover include scientific, technological and medical research.

2020 has been an especially challenging year with the pandemic resulting in digital meetings and new working methods for the Board, Committee and Secretariat. These can be further developed also after the pandemic.

During 2020, we initiated work on our next strategic period covering 2021–2026. In September 2020, we decided to strengthen SSF's financial stability. According to the new strategy, the framework for grants will initially shrink slightly in order to build a stabilising buffer of capital.

The goal is to have an annual framework for grants worth SEK 500 million. Such long-sightedness will improve the prerequisites for increased returns on the Foundation's capital. Due to favourable capital returns since the start in 1994, SSF has invested SEK 15.7 billion in Swedish strategic research.

“SSF has never been more relevant than today.”



PHOTO: JENNY HALLENGREN

In the new research strategy, we will prioritise first-rate research through multidisciplinary collaboration, movement of individuals, career development for young researchers, and infrastructure efforts.

Circumstances in Sweden mean the government does not fund research projects of an explicitly strategic nature. Hence, SSF plays a unique role in bridging the funding gap between curiosity driven basic research and research based on innovation or need, which is often partly funded by industry.

SSF has never been more relevant than today, and the new financial strategy emphasises that we are here to stay.

Dr. Björn O. Nilsson



January 2020

Funding call is ended for grants within SSF Agenda 2030 Research Centres on Future Advanced Technology for Sustainability (SSF-ARC). The aim is to link research to the objectives of the UN Agenda 2030, and four areas are selected: The next generation of antibiotics and the prevention of pandemics, Plant biology including GMO and CRISPR/Cas9, Future nuclear power, and Hydrogen and fuel cells. 31 grant applications are submitted.

Henryk Wos, Scientific Secretary for among other things individual programmes, utilisation and entrepreneurship, retires.



The UN Agenda 2030 sets out 17 global goals for sustainable development.



February 2020

The Foundation for Strategic Research announces the seventh generation of **Future Research Leaders (FFL 7)**. From 227 submissions 20 successful applicants are chosen, half of them men and half women.

SEK 30 million are spent on PhD students in industry through **SSF Industry PhD student 2020**.

SSF supports a Swedish initiative to lead the large-scale EU programme **Battery 2030+** aimed at developing the next generation of sustainable, highly efficient and safe batteries. In February, the EU approves the research programme, handing the coordinating role to Kristina Edström, professor in inorganic chemistry at Uppsala University.



PHOTO: PIXABAY

The SSF flagship Future Research Leaders helps young, successful researchers to establish independent and innovative research groups.



March 2020

PHOTO: KIT



The KIT "Framsteg" films present scientific research in a popular and easily accessible manner.

Funding call comes to a close for SSF Computing Power and Hardware for ICT infrastructures (CHI). 43 grant applications are submitted, most of them from Chalmers, followed by Uppsala University, and KTH Royal Institute of Technology.

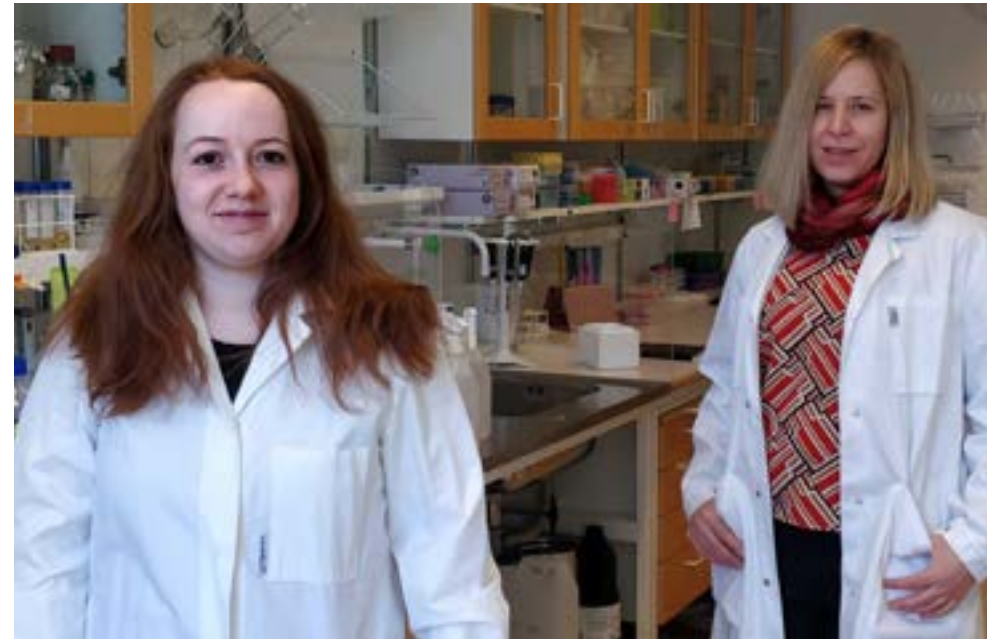
It is three years since SSF together with KIT launched "Framsteg" – science news on social media such as Youtube, Facebook, LinkedIn and Twitter. With over three million "views", the news films have attracted a broad audience, including many young people and women who normally show less interest in science news. As from 2020, the Swedish National Space Agency has also joined the collaboration, leading to more space news. Watch the film [here](#)!



April 2020

At the height of the pandemic, SSF enables researchers to help fight COVID-19 by accessing funding set aside for utilisation or by changing the direction of their research projects. One of the projects being redirected is Ylva Ivarsson's project "Systems biological study of human-viral protein interactions". Initially targeted at viral diseases such as Ebola, HIV, seasonal flu and HPV, the project now turns its focus towards COVID-19. The aim is to understand how the virus takes over host cells in order to find new potential drugs.

Annual funding call for Strategic Mobility is announced.



Caroline Benz, PhD student, and Ylva Ivarsson, professor, both from Uppsala University, Section of Chemistry.



May 2020

PHOTO: MARKUS JORDÖ



One of SSF's films, made into a short film by Forskning & Framsteg, features the mucus that protects the body from virus and bacteria. Thomas Crouzier and his colleagues at KTH are looking for methods to make mucus more efficient.

Become an Adjunct Professor! SSF introduces a new programme to increase inter-sectoral mobility, knowledge transfer and other cross-fertilising activities. The funding call is aimed at individuals from industry, authorities or the healthcare sector with sufficient merits to be eligible for the position of adjunct professor at a Swedish university.

SSF collaborates with the popular science journal Forskning & Framsteg in order to reach out to a wider audience. Together, we make popular science short films about exciting, new research. Watch the film **here!**



June 2020

Within the funding call Agenda 2030 Research Centre (ARC19), four areas are chosen: “Very quick assessment of antibiotics resistance”, “Design of photosynthesis for future food production”, “Sustainable nuclear technology in Sweden (SUNRISE)” and “Production, utilisation and storage of hydrogen gas (PUSH)”.

The supplement “Framtidens Forskning” is distributed together with Dagens Industri. The newspaper includes articles featuring researchers with funding from SSF, industry, research institutes and other foundations.

SSF spends SEK 60 million on a Swedish-Taiwanese research collaboration to complement collaborations with Japan and South Korea. Six projects are each awarded SEK 10 million.



PHOTO: ELIN BERGE

Åsa Strand's project “Design of photosynthesis for future food production” is one of four research areas in ARC 19.

Jan Fahleson, Scientific Secretary for life sciences and bioengineering, retires and is succeeded by Åsa Jansson, from Ragnar Söderberg Foundation.



July 2020

PHOTO: MARKUS JUNGHARD



SSF has previously contributed to the preservation of Sweden's heritage through the project "Support Vasa", which is now continuing by weighing the ship. Watch the film **here!**

The timber in the nearly 400 years old ship Vasa is becoming increasingly fragile and is decomposing. Hence, a new supporting cradle is needed. For this to have maximum effect, the ship's weight needs to be determined, and SSF is contributing to the cost of weighing the Vasa, which attracts a lot of media attention.

A trailer is released for next autumn's forthcoming films featuring researchers in the Ingvar Carlsson Award 7 (ICA-7) programme. Watch the film **here!**



August 2020

The first film featuring the participants from ICA-7 is being released. The first one features Erik Holmqvist from Uppsala University. The aim of his research is to control the genes that cause infection, and to try to make bacteria commit suicide.

Discussions are initiated with the Nobel Prize Museum and the Nobel Centre Foundation regarding an extension to the **Forskarhjälp** (Help a Scientist) programme, which by the autumn is granted SSF funding for another three years. Thousands of secondary school students are offered a taste of real research and learning about its impact. At the same time, researchers from universities get help to collect data on a large scale.

Watch the film **here!**



PHOTO: MARKUS JORDÖ

Erik Holmqvist, at the Department of Cell and Molecular Biology, Uppsala University, is studying how gene control can be developed into a substitute for antibiotics.



September 2020

SSF decides to improve its financial stability in order to allow for future spending increases and to improve dividend predictability. This makes up part of the Foundation's strategy for the next five years, 2021–2026. The objective is to achieve an annual spending of SEK 500 million. Because of previous decisions, the spending will remain at the current level of around SEK 700 million during the next few years, but then the annual spending on research grants will shrink to SEK 300 million to enable the Foundation to build up a buffer of capital.

Inger Florin, Scientific Secretary for life sciences, retires and is succeeded by Johan Nilsson, from the Swedish Research Council.



PHOTO: PIXABAY

SSF is improving its financial stability in order to allow for future spending increases and to improve dividend predictability.



October 2020

PHOTO: PIXABAY



SSF spends SEK 120 million on grants for **Bioengineering and Plant Breeding – Food, Fodder and Forestry products** in order to increase Sweden's self-sufficiency and export of food, whilst also reducing the climate impact.

The Royal Swedish Academy of Sciences establishes a panel of COVID-19 experts with grants from SSF. The aim is to make an inventory of what is known, to gather new knowledge, and to provide advice ahead of future pandemics. The experts recommend the use of face masks in order to reduce airborne spread of infection.

SSF participates in Forum for Research Communication, this year organised digitally.

Six projects share nearly SEK 200 million within the research programme **SSF-CHI**. Targets for these grants are the hardware for next generation of wireless communication (6G), accelerated computing power, and more energy efficient ICT.

The Board appoints Claes Wohlin as a new member, succeeding Jörgen Hansson.



November 2020

Funding call for Adjunct Professor closes, and 27 applications are submitted. The applications are evenly distributed within SSF's main areas – ICT, life sciences and materials science.

Yet again, there is opportunity for researchers to participate in the exchange programme jointly run by SSF and the **Japan Society for the Promotion of Science (JSPS)**, aimed at attracting young researchers to take up post-doc positions within leading Japanese research groups.

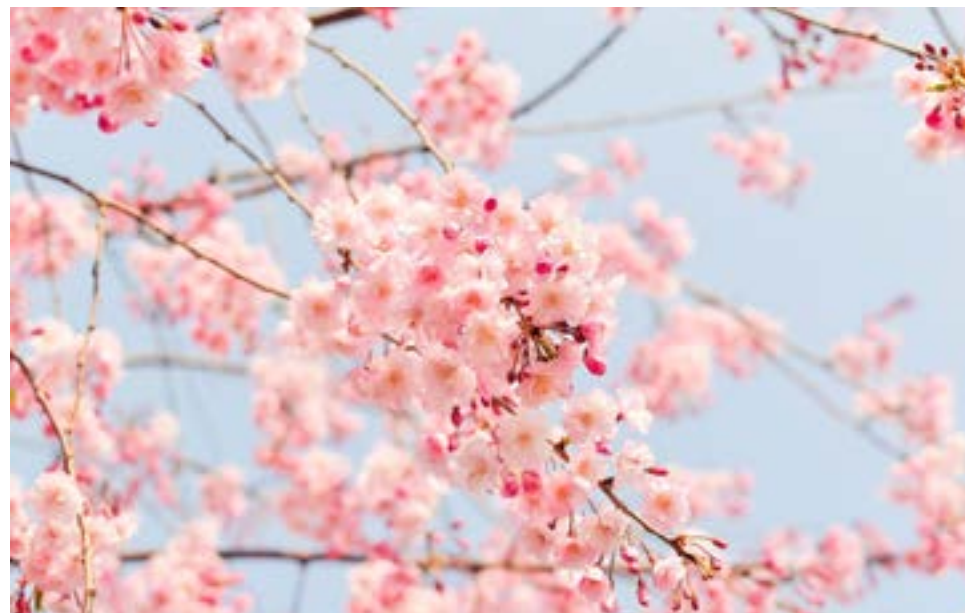


PHOTO: PIXABAY



December 2020

SSF signs a research agreement with Israel and MOST – Israel’s Ministry for Science, Technology and Space. The aim is to promote collaboration between researchers from both countries, targeting technological and medical breakthroughs for sustainable development. Together, SSF and

PHOTO: ISTOCK



Evening in Tel Aviv.

MOST spend up to SEK 60 million on setting up about ten joint projects.

The government presents its new white paper for research, which approaches the view of the Foundation regarding the value of strategic research, movement and collaboration both between sectors and internationally, which contributes to strengthening Sweden’s competitiveness and solving societal challenges. However, policies are not being steered in the direction SSF wishes to see for research excellence.

At the start of 2021, Sofie Pehrsson takes up the post of Communications Manager, succeeding Eva Regårdh. Sofie will also continue her work as the Foundation’s Science Editor.



Funding Calls and Decisions 2020

New calls for proposals

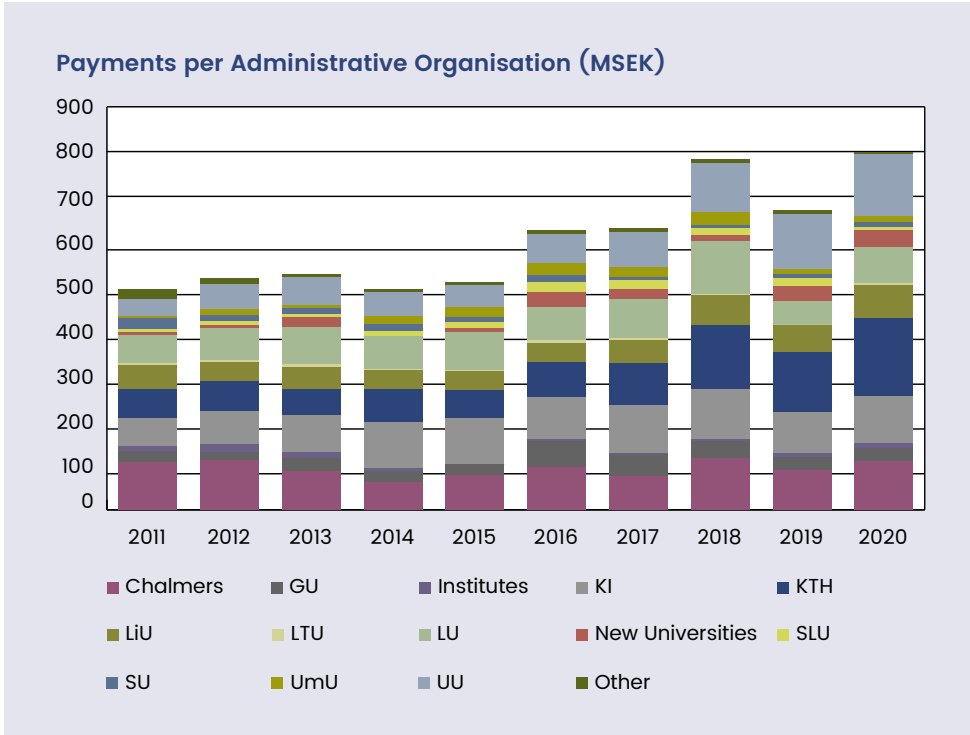
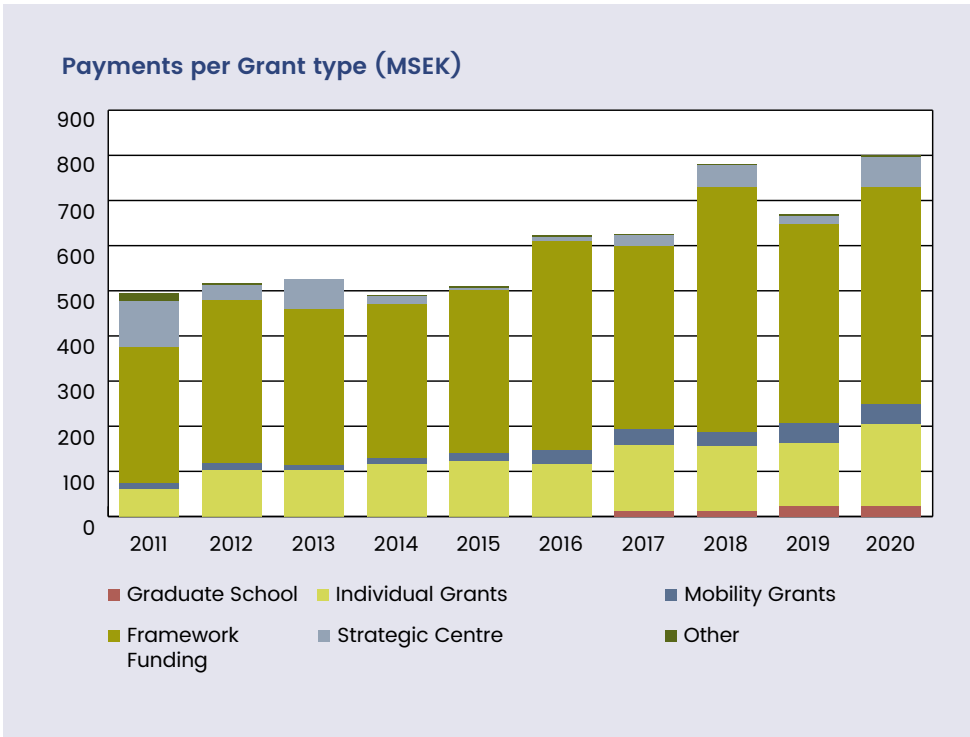
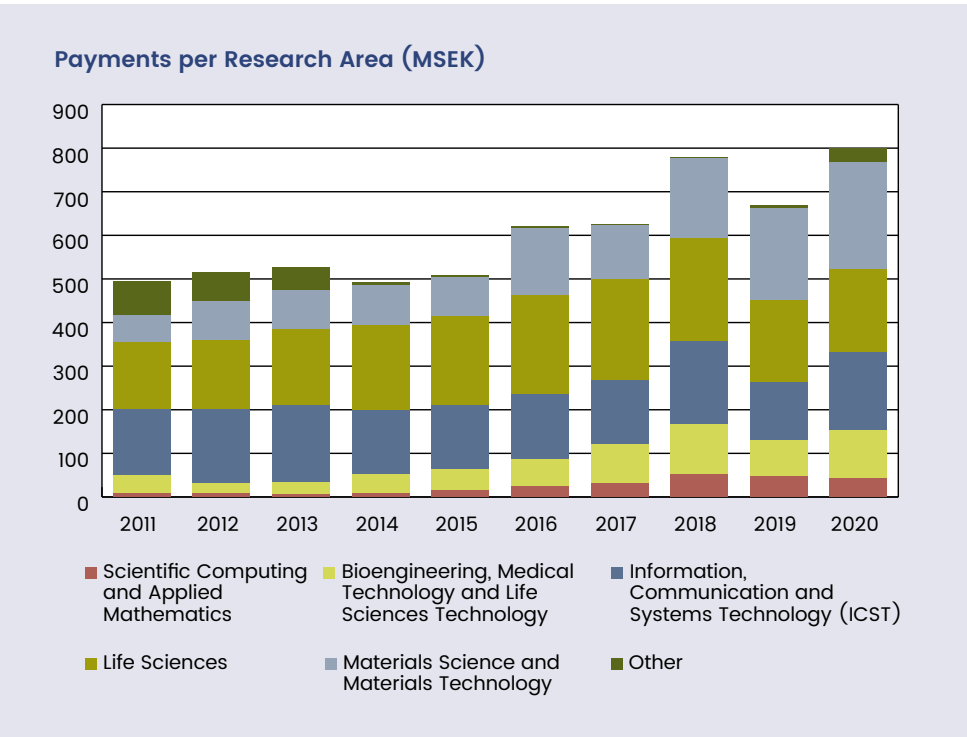
February	Industry PhD students 2020 (ID20)
April	Strategic Mobility 2020 (SM20)
	Adjunct Professor 2020 (APR20)
October	Bioengineering and Plant Breeding – Food, Fodder and Forestry products (FFF20)
December	Research Institute PhD students 2020 (FID20)

Funding Decisions

February	Future Research Leaders (FRL-7)
June	Agenda 2030 Research Centres (ARC19)
	Research collaboration with Taiwan (STP19)
October	Forskarhjälp (Help a Scientist) (IA20)
	Computing power and hardware for ICT infrastructures (CHI19)
	Industry PhD students 2020 (ID20)
December	Strategic Mobility 2020 (SM20)

Distribution of Grants

The graphs show grants by SSF during the past ten years according to type of grant, research area and university.



2020 Research Films

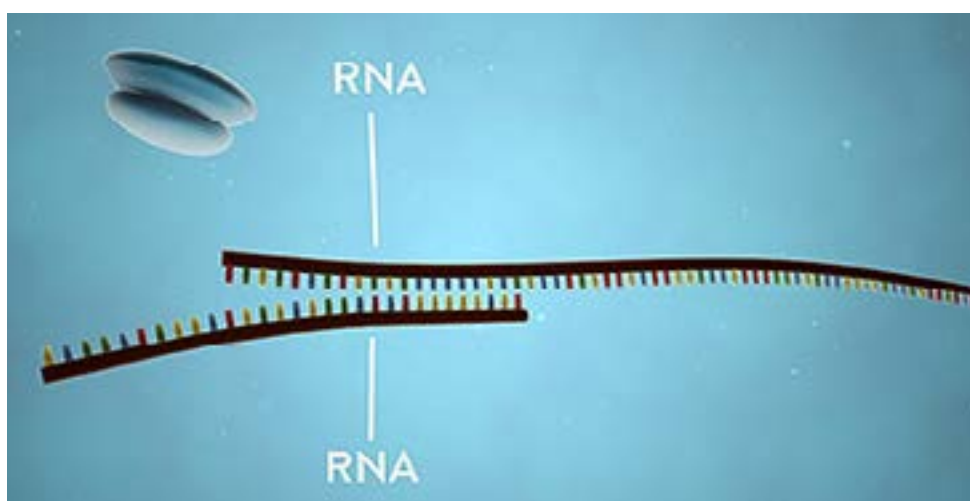
During 2020, films are being released featuring researchers from the programme Ingvar Carlson Award (ICA-7). The collaboration with KIT continues, resulting in 22 short films in the series “KIT Framsteg”. In collaboration with Forskning & Framsteg (F&F), last year’s films featuring Future Research Leaders are re-edited into short films and added to respective media channels. SSF also gains publishing rights to some of F&F’s films.



They disarm the enemies of the gut. Using gene technology, Mikael Sellin and his research group at Uppsala University disarm salmonella bacteria. Watch the film [here!](#)



Transition metal oxides make for future energy efficient electronics components. Oscar Grånäs and his research team at the Ångström Laboratory are developing new semiconductor technology. Watch the film [here!](#)



Gene regulation can provide future antibiotics. Erik Holmqvist and his team of researchers at Uppsala University plan to regulate the genes that cause infections. Watch the film [here!](#)

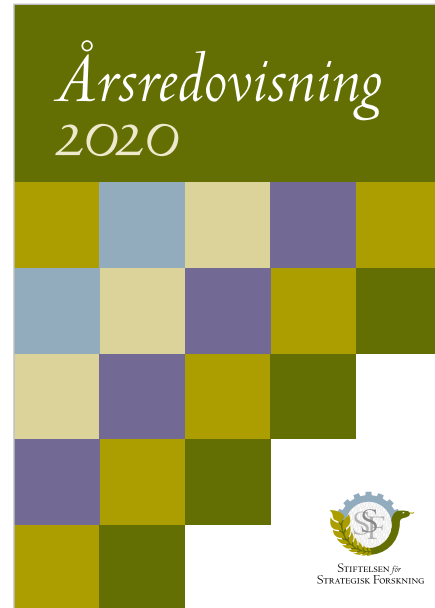


They want to make electronics smarter and more efficient. Mattias Borg and his research group at Lund University create efficient electronics with so called III-V semiconductors. Watch the film [here!](#)

[View more films featuring SSF research projects here!](#)



Annual Accounts 2020



The Foundation's capital is made up of funds transferred to the Foundation in 1994 following a decision by the Swedish government. By careful management of these funds over the years, the Foundation had funds totalling SEK 11.3 billion on 31 December 2020, after the distribution of research grants worth SEK 15.7 billion during the period 1994–2020.

Read the full Annual Report (in Swedish) [here](#).



Message from the Chair of the Asset Management Committee

2020 undeniably turned out to be a very different year, in many ways affected by the pandemic. The financial markets started the year in a positive mood, only to plunge in March as the pandemic became a reality, quickly spreading shock waves all over the world. Whilst the pandemic has continued to affect everyday life for us all since then, confidence was soon restored in the financial markets. The stock markets recovered at a pace that many find difficult to understand, given that the world economy contracted by as much as 3.5 percent, historically a very large figure. At the same time, we saw an explosion of digitalisation as e-commerce, digital meetings and other technology-based services enjoyed enormous growth. All the world's central banks reduced their rates and launched enormous support programmes, whilst politicians used all kinds of available funding to stimulate their economies, all in order to counteract the negative effects of lockdowns. This quickly led to an increase in venture capital in the financial markets and many stock markets hit new highs during the latter part of the year.

This also contributed to the continued growth of the Foundation's portfolio, which at the start of 2021



was worth more than SEK 11.3 billion. The annual return in 2020 was 6.7 percent, primarily driven by holdings in shares and property. The past five years have seen an average return of 6.5 percent in real terms, well in excess of the historic target of 2.5–3.0 percent. During 2020, a strategic change in the asset management mandate has resulted in a wider horizon for investments, enabling the target for annual returns to increase to 3.5–4.5 percent. In 1994, the original capital was SEK 6 billion. Since then, the Foundation has had an average annual return of 7.8 percent and has distributed SEK 16.3 billion.

Ann Grevelius



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During 2020, Eva Regårdh left SSF, and Jan Fahleson,
Inger Florin and Henryk Wos retired.



SSF's Governing Board



First row from left: Björn O. Nilsson, Chair, Ursus Innovation AB; Björn Ottersten, KTH; Cecilia Holm Wallenberg, Lund University; Charlotte Brogren, Alimak Group AB; Gösta Lemne, Ericsson.

Second row from left: Hans Rydstad, Carnegie; Katarina Gårdfeldt, Swedish Polar Research Secretariat; Kerstin Johannesson, Gothenburg University; Magnus Berggren, Linköping University; Claes Wohlin, Blekinge Institute of Technology.

For information regarding the function of board memberships and other interests of the members of the Board, the CEO and the members of the Asset Management Committee, please contact SSF's Secretariat.



The Foundation for Strategic Research

- Supports research and research training in engineering, medicine and natural sciences in order to strengthen Sweden's future competitiveness.
- Promotes the establishment of a greater number of Swedish research centres of the highest international class.
- Builds bridges between basic research and the utilisation of research results.
- Funds several hundred research projects at universities – typically in collaboration with industry and research institutes.
- Distributes career grants to prominent research leaders, with emphasis on younger talents.
- Focuses on targeted areas such as Information and Communication Technology, Materials Development and Life Sciences and their associated technologies.
- Promotes interdisciplinary collaboration, the utilisation of research results and the infrastructure of research, and mobility between academia and industry, nationally as well as internationally.
- Annually distributes grants worth around SEK 700 million.

