Activity Report 2019 & 2020

Geneva Science and Diplomacy Anticipator
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15 February 2021

gesda

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Contents

1. Forewords

By Chairman Peter Brabeck-Letmathe & Vice Chairman Patrick Aebischer

"Develop an instrument of anticipation and action based on large-scale international partnerships": this is the goal set by our founders when they drafted and approved the GESDA Foundation's bylaws on 20 February 2019.

This first activity report shows how far we had come by the end of 2020, initially "under the radar", now in full view.

With the accelerating pace of scientific advancement, we need to speed up the ways we make something positive out of it for as many people as possible. Achieving this requires:

- Anticipating what will come out of R&D laboratories in the coming decades, along with the attendant opportunities and risks;
- Sharing this knowledge with the widest possible range of communities in Geneva and throughout the world;
- Developing, in association with those communities, new solutions for global challenges and financing them.

GESDA is doing this by focusing on three key questions about people, society and the planet, that are fundamental to the future of the world population:

- **Who are we, as humans?** What does it mean to be human in the era of robots, gene editing and augmented reality?
- **How can we all live together?** Which technology deployments can help reduce inequality and foster inclusive development and well- being?
- **How can we ensure the well-being of humankind and the sustainable future of our planet?** How can we supply the world population with the necessary food and energy while regenerating our planet?

By setting up our headquarters at Campus Biotech Geneva, in the heart of International Geneva and a stone's throw from the Peace Campus and the headquarters of the UN's global operational hub, we are continuing Geneva's long tradition of science diplomacy.

This tradition began in 1863 with the Red Cross and continued in 1954 with the opening of CERN – both of these are today cornerstone organizations in their fields. They have greatly contributed to making the Swiss city of Geneva the operational hub of the UN and the host city of more than 41 international organizations, 180 embassies and 700 NGOs.

The creation of GESDA marks a new step in the development of this unique ecosystem where all stakeholders are working to prepare the future of multilateralism.

By Secretary General Stéphane Decoutère

Our Board of Directors, the Chairs of our Academic and Diplomacy Fora, and the members of our Executive Team are proud to present GESDA Foundation's achievements in 2019 and 2020.

The work we performed in the 22 months after the creation of the Foundation was divided into three periods.

- The first six months, from March to August 2019, were used to finalize the establishment of the Foundation at the political and then legal levels;
- Over four months, from September to December 2019, we assembled the first Foundation Board of Directors and drafted the 2020–2022 Roadmap;
- The following 12 months, from January to December 2020, served to bring together "from scratch" – and despite the pandemic preventing us from holding face-to-face meetings – an initial panel of more than 100 Swiss and international leading figures interested in working with GESDA.

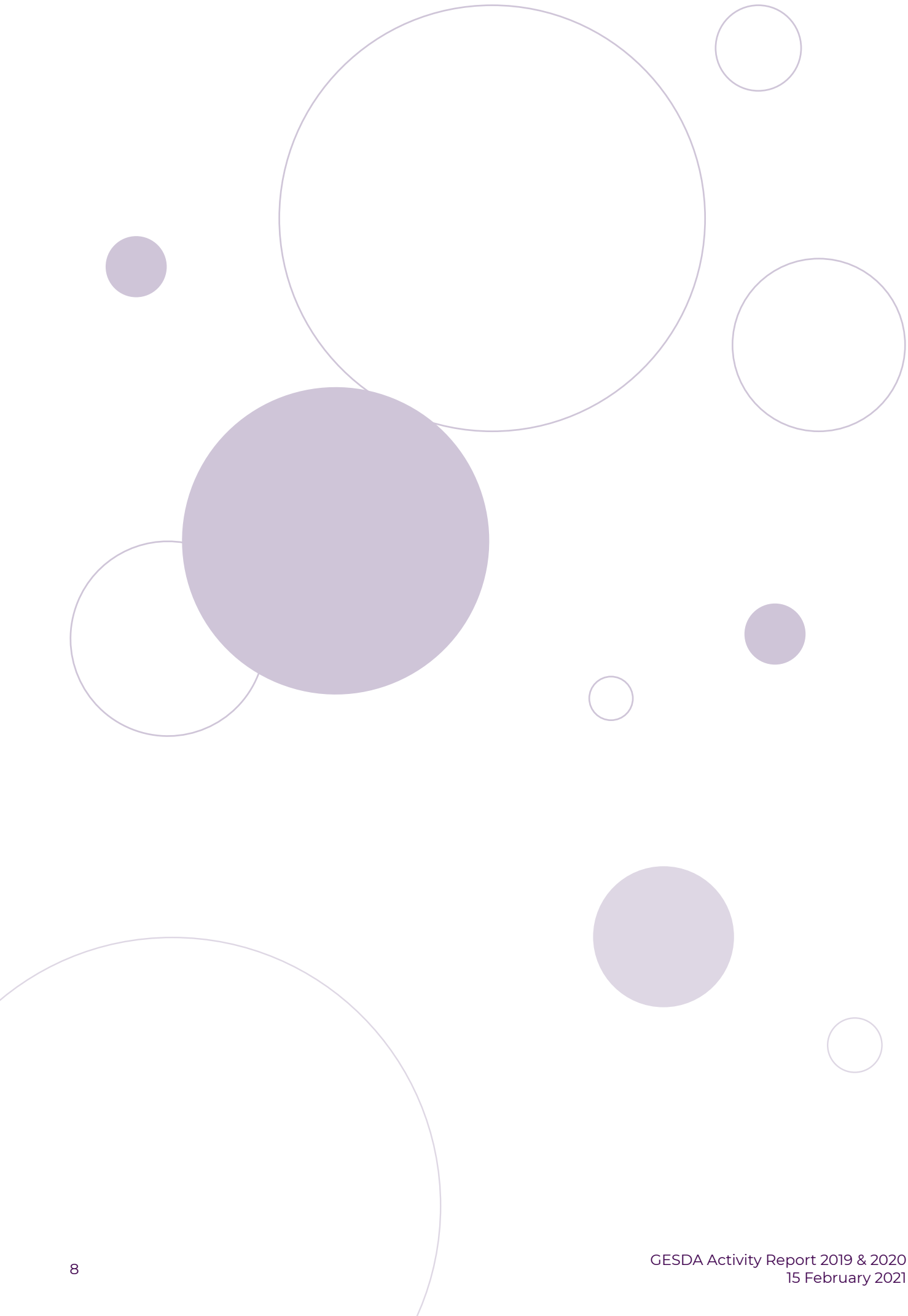
This global panel developed GESDA's first 12 Scientific Anticipatory Briefs in October 2020, describing the scientific breakthroughs currently being developed in R&D laboratories and that should come to light in 5, 10 and 25 years. These breakthroughs relate to four frontier issues in the natural and human sciences:

- The quantum revolution and advanced artificial intelligence
- The augmented human
- Eco-regeneration and geoengineering
- Science diplomacy

On 18 December 2020, this work served as the basis for an initial discussion with 61 representatives of the academic, diplomatic, impact and citizen communities, focusing on the potential of these scientific disruptions to accelerate the implementation of the UN 2030 Sustainable Development Goals and meet the challenges of development, well-being and peace throughout the world.

The meeting also generated a strong interest from the media.

On the basis of the results of this first GESDA Science and Diplomacy plenary meeting, the Foundation will draw up a pipeline of concrete projects during the first half of 2021 and propose them to our various audiences at the very beginning of autumn 2021.



2. Key facts and figures

Science Anticipation	Diplomacy Acceleration	Practical Translation into Action & Impact Fund	Global Visibility
68 Academic Moderators and global scientific experts **1 Anticipatory Breakthrough Report**, anticipating what science will deliver to the world in 5, 10 and 25 years **12 Scientific Anticipatory Briefs** **Preparatory work for the Right to Science Symposium** that will be held at the Brocher Foundation (postponed from December 2020 to December 2021 due to COVID-19)	**17 Diplomacy Moderators** **35 international organizations met with one-to-one** • 20 contacts appointed to closely follow our activities **Extensive awareness-building through over 50 diplomatic missions in Geneva** via online sessions **Over 80 informal contacts with other key International Geneva stakeholders** **First Science & Diplomacy Plenary Meeting with participants taking part in 20 breakout sessions** **Scoring of the Scientific Anticipatory Briefs'** impact on people, society and the planet, and pertinence to the UN SDGs **Initial list of potential solutions** that we will explore further	**CHF 3m in private philanthropic funding raised since June 2019**, matching the public-sector seed funding Ongoing advanced contacts for **additional philanthropic funding** **Context analysis** that identified 80 potential partners **Initial discussions with selected** potential partners following a more detailed context analysis **Initial partnership with Fondation Botnar** on AI and health (I-DAIR)	**1,000 followers** on our various communication channels **Best Reads** • 19 editions since August 2020 (weekly publication) • 230 subscribers **Social media** • Twitter, LinkedIn, Facebook: 678 posts since these accounts were opened (Sept. 2020) • ≈ 700 followers **One content partnership with the Geneva Solutions digital news platform** **Contributions to three reports and three events related to International Geneva** • 100th Anniversary of the League of Nations (16 September 2019) • Geneva Day at WEF 2020 • IHEID/ EPFL Data Summit 2025 • Fondation pour Genève reports on health and the internet • Geneva Digital Atlas **One website** • Landing page launched on 9 December 2019 • Enhanced website online since 9 December 2020 **One press conference** 20 February 2019 **One progress report** 15 July 2020 **Two press releases** • 9 December 2019 • 17 December 2020

3. How it all started

Our commitment to advancing the human right to science, as stated in our bylaws, reflects International Geneva's long history as a city of peace, human rights and well-being, and as a centre of governance for new technology through dedicated platforms such as the Geneva Internet Platform – which recently issued its first Geneva Digital Atlas – the Geneva Science Policy Interface, the Cyberpeace Institute, the Swiss Digital Initiative and last but not least the SDG Lab.

The idea of creating a Geneva Science and Diplomacy Anticipator has been maturing since 2015.

In spring 2015, the then Swiss Minister of Foreign Affairs Didier Burkhalter assembled a group of thought leaders, called Geneva+, to outline plans for the future of International Geneva.

In 2018, the group presented its conclusions to the new Swiss Minister of Foreign Affairs, Ignazio Cassis, who endorsed their goal to create a science-driven anticipatory instrument for multilateralism.

He tasked the group specifically with leveraging Geneva's know-how in science diplomacy (through the ICRC, CERN, UN agencies, etc.) and building on that know-how in order to meet emerging global challenges and to attract new stakeholders to work with the Geneva ecosystem.

The first two decades of the 21st century saw science diplomacy gain traction on the global agenda as both a practice in international policy and a discipline of human science. A 2010 report by the Royal Society and the American Association for the Advancement of Science (AAAS), titled *New Frontiers in Science Diplomacy*, gave science diplomacy its first formal definition and established a widely accepted three-pillar taxonomy:

1. **Science for diplomacy**, or using science as a soft power tool to improve international relations;

2. **Science in diplomacy**, or using scientific evidence to inform foreign policy;

3. **Diplomacy for science**, or using the diplomatic apparatus to support and promote international scientific collaboration.[1]

Science diplomacy is now facing a new challenge that GESDA must help to tackle. Science diplomacy efforts need to adapt to both the speed of scientific progress and the shifts in international relations, working at the crossroads of scientific advancement and diplomacy while balancing the following three factors:

1. **The unprecedented pace** of scientific and technological progress;

2. **The urgency** with which global challenges must be addressed;

3. **The complexity** of global geopolitics.

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1 New Frontiers in Science Diplomacy, The Royal Society and AAAS

Consequently, the vocations of our Foundation are to strengthen the anticipatory power of multilateral stakeholders working for world progress from Geneva or from other places, and to adapt science diplomacy in general to the accelerating pace of technological development in the 21st century.

To this end, our bylaws (Article 3) establish GESDA an independent foundation and "an instrument of anticipation and action, giving priority to public-private partnerships on an international scale and to projects capable of providing solutions to current and future technological challenges, turning them into opportunities and broadening the circle of beneficiaries of scientific and technological advances".

Whilst fundamentally global, GESDA capitalizes on four distinctive assets of Geneva and Switzerland as a whole:

- A long tradition of disruptive research in science and technology;
- Switzerland's renowned neutrality-driven diplomacy, shaped by a vibrant direct democracy;
- The presence of innovative global companies in Geneva and elsewhere in Switzerland;
- Citizens interested and involved in world affairs.

The political decision to create GESDA as an independent foundation was made by the Swiss government and the Republic and Canton of Geneva on 20 February 2019.

GESDA was legally established on 9 September 2019.

We officially launched our 30-month start-up phase on 1 January 2020.

4. 2019 & 2020 highlights

4.1. Main milestones

2019

20 February 2019

- Independent foundation created by the Swiss and Geneva governments
- Approval of GESDA bylaws
- Appointment by the Swiss government of GESDA's Chairman and Vice Chairman
- Press conference in Bern

2 September 2019

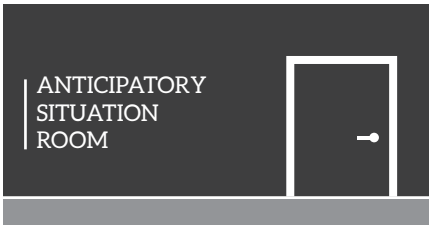
- First meeting of GESDA founders in Bern, following the Swiss and Geneva parliamentary sessions in May, June and August 2019 and the designation of two founder representatives on the Board of Directors
- Successful first fund-raising round (CHF 3m) already allowing us to match the federal financial contribution
- Appointment of the Fora Chairs
- First Executive Team hires in June
- GESDA legally established, and entered into the Geneva Commercial Registry on 9 September

7-8-9 December 2019

- Inaugural meeting of GESDA's Board of Directors at Campus Biotech
- GESDA 2020–2022 Roadmap developed and approved
- First press release
- Launch of GESDA website: www.gesda.global (landing page)

2020

First quarter 2020

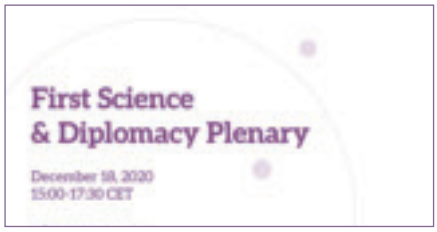


- **Official start of operations** on 1 January
- **Executive Team fully formed**
- **Swiss WEF event on 21 January on "How to govern digital interdependence,"** with our founders, Peter Brabeck-Letmathe, Brad Smith (CyberPeace Institute), and Doris Leuthard (Swiss Digital Initiative)
- **GESDA presented to the diplomatic community** in Geneva, New York, Vienna, Rome and Nairobi
- **Two projects accompanied** (Fondation Botnar's I-DAIR initiative and the ETHZ-UNIGE Initiative on Science in Diplomacy)
- **GESDA methodology developed** for science-driven diplomacy acceleration (through the Anticipatory Situation Room involving communities with different mindsets and responsibilities)
- **Context analysis** to identify potential partners and related theories of change
- **Committee meeting** on 14 February to specifically discuss science and diplomacy

Second and third quarter 2020

- **GESDA Academic Forum established to bring together the academic community**; this was followed by four preparatory meetings with the first nine Academic Moderators, on 29 May and 4 June, and two plenary meetings, on 20 June and 11 September
- **Meetings with the WEF Chairman** on 5 and 18 June
- **Two projects accompanied** (Fondation Botnar's I-DAIR initiative and the ETHZ-UNIGE Initiative on Science in Diplomacy)
- **GESDA Best Reads introduced**, taking the pulse of the world in our four scientific frontier issues
- **Second Board of Directors meeting** on 7 July
- **Release of the first Progress Report** on our activities on 15 July
- **Committee meetings** on 19 May, 20 June and 11 September

Fourth quarter 2020



- **Internal release of our 12 Scientific Anticipatory Briefs** on 16 October
- **GESDA Diplomacy Forum established** in October 2020 (bringing together leading figures from the diplomatic, impact and citizen communities)
- **First Science & Diplomacy Plenary Meeting** on 18 December
- **Two projects accompanied** (Fondation Botnar's I-DAIR initiative and the ETHZ-UNIGE Initiative on Science in Diplomacy)
- **Meetings with our founders** on 5 November, 26 November and 10 December
- **Third Board of Directors meeting** on 6 November
- **Committee meetings** on 23 October and 18 December
- **Launch of our final website** on 9 December, 12 months after the inaugural Board meeting
- **Second press release** on 17 December

4.2. Key results

Key result 1.

Adopting an ambitious Roadmap outlined by our Board of Directors on 8 December 2019

At its meetings at Campus Biotech Geneva on 7 and 8 December 2019, the newly established GESDA Board of Directors agreed on a six-point Roadmap for our Foundation for the next three years (2020–2021–2022), spelling out how we will achieve the goals that our bylaws have set for our start-up phase.

The six points are:

1. **Vision**: use the future to build the present
2. **Mission**: anticipate, accelerate, translate
3. **Topics**: focus on three questions fundamental for the world population and four scientific frontier issues
4. **Methodology**: build creative coalitions to enhance inclusive growth and well-being
5. **Timeline**: 30 months (until 31 August 2022) to become a respected, multilateral science diplomacy do tank
6. **Location**: Campus Biotech Geneva, Switzerland

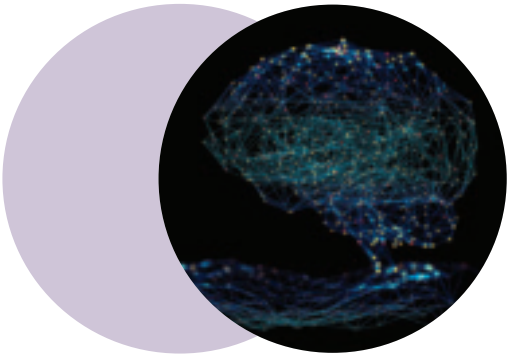
The Roadmap describes the rationale behind the creation of GESDA, which is based on the following two facts:

- One, the world is experiencing scientific and technological breakthroughs at an unprecedented speed; they will reshape how we view ourselves as humans, how we relate to each other in society and how we care for our environment.
- Two, humanity, especially people living in emerging countries, cannot afford to miss out on the potential of those breakthroughs to improve global well-being and inclusive development.

Consequently, our vision is to **"Use the future to build the present"** and our mission is three-fold: **Anticipate, Accelerate, Translate**.

Anticipate	Accelerate	Translate
Anticipate the scientific breakthroughs that will be made in the next 5, 10 and 25 years by working with the best R&D labs in the world.	Accelerate diplomacy by bringing various communities with different mindsets together in Geneva, to align efforts on emerging challenges and the potential of future scientific breakthroughs.	Translate these breakthroughs into impactful solutions for the greatest benefit of humanity.

The Roadmap also calls on us to work at the convergence of digitalization, medicine, ecology, policy, diplomacy and the natural and human sciences. It identifies the following **four scientific frontier issues and related emerging challenges** as a starting point:



Quantum Revolution & Advanced Artificial Intelligence

Human Augmentation

Eco-regeneration & Geoengineering

Science & Diplomacy

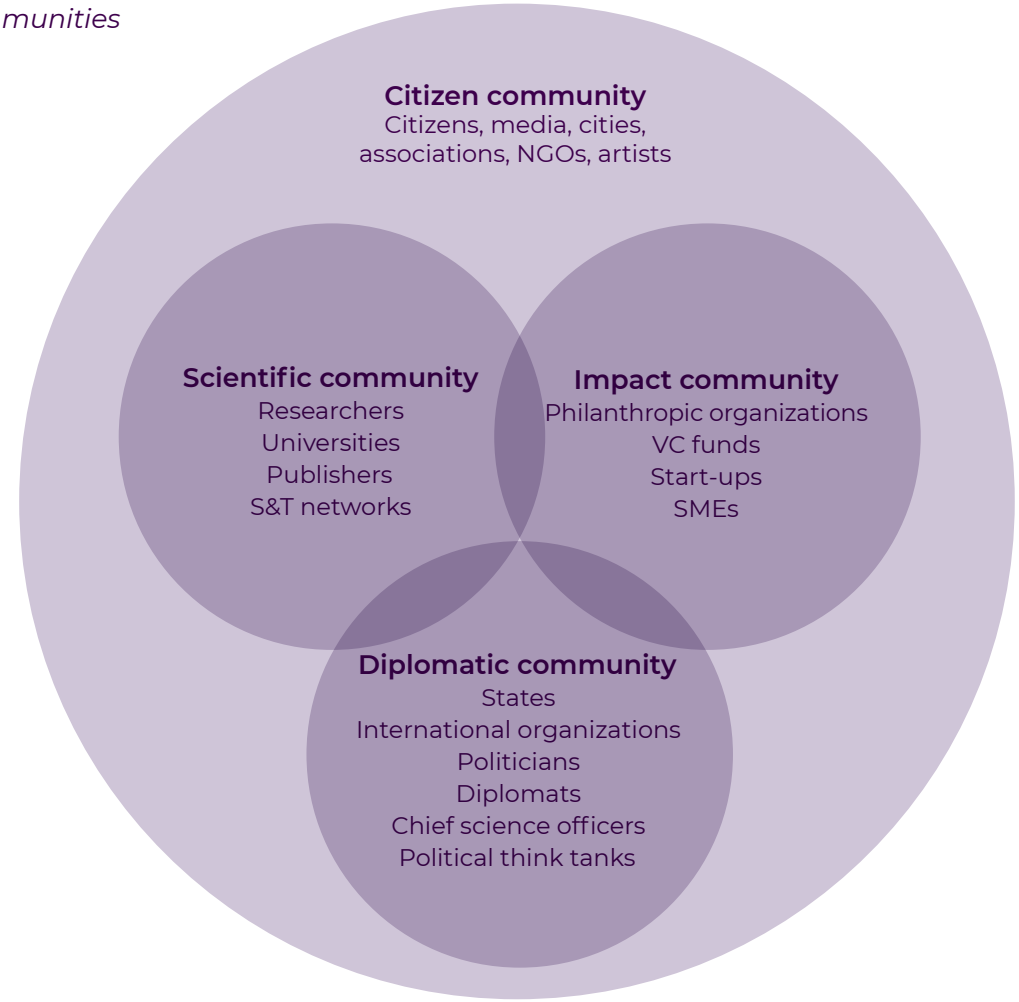
Key result 2.

Devising an ad-hoc methodological framework to foster anticipatory science and diplomacy

We began operating on 1 January 2020 based on the 2020–2022 Roadmap established by our Board of Directors.

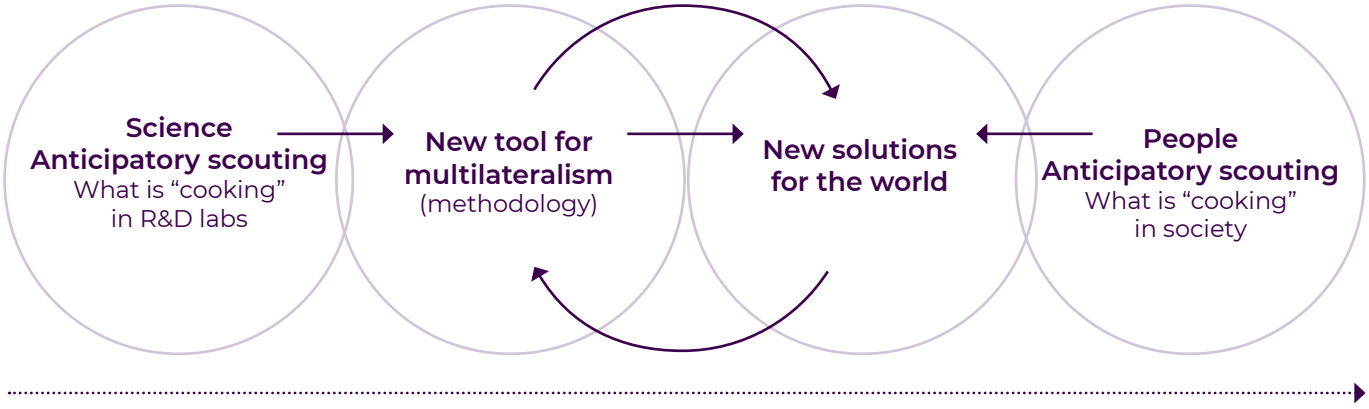
The instrument we use to implement the Roadmap is the Anticipatory Situation Room, which is both a place – Campus Biotech Geneva – and a method. It brings together representatives of different communities with different mindsets and responsibilities to develop solutions based on anticipated scientific breakthroughs, in order to help societies more quickly tackle current and emerging global challenges.

GESDA communities at a glance



Our methodology aims to make the interface between anticipatory science and diplomacy an instrument of an effective, efficient multilateralism despite the complexity of current and emerging global challenges, including shifting geopolitics. This was underscored by the Chair of our Diplomacy Forum, Michael Møller, in an op-ed published on the Geneva Solutions digital news platform on 10 October 2020, called "The imperative of a new multilateralism – enhanced by science".

The GESDA Anticipatory Situation Room: rationale



The key challenges addressed by our Anticipatory Situation Room are:

- **Mapping frontier science topics as well as emerging challenges.**
  The Science of tomorrow is already in preparation in the world R&D laboratories. Mapping it is a first step. However, our anticipatory efforts are not just about science; they are also one of the key concerns of our Diplomacy Forum, to foresee how societies and global governance systems will evolve in the future.

- **Bridging different communities with different mindsets and responsibilities.**
  GESDA acts as a translator among communities with different languages, logics and speeds. Our Anticipatory Situation Room is a multi-step engagement plan that values the input of each stakeholder and recognizes the priorities and sensitivities of each community.

- **Maintaining our agility, which is specific to GESDA as an independent foundation.**
  As an independent foundation, we are not constrained by any agenda. We can nimbly tap into any of the pools of competence required to achieve our mission and can pivot swiftly when necessary. Our Anticipatory Situation Room underscores our status as a budding organization, conscious that the systemic nature of today's issues requires breaking down sector-based silos.

Most importantly, our Anticipatory Situation Room was carefully designed to actively engage people around our cause for the long term. Our experience in 2020 showed that a key success factor in this regard is making our whole process action-oriented, or turning GESDA **from a think tank into a do tank.**

GESDA communities brought together in our Anticipatory Situation Room

Community	Constituents	GESDA'S Objectives	GESDA's Commissions
Academic	• Researchers • Universities • Publishers • Science & technology networks	• Identify the most relevant scientific frontier issues and next-generation technology that can have a major impact on humanity by mobilizing the best global scientists with authority in these fields and recognized by their peers. • For each issue-specific platform, produce ground-breaking reports reflecting scientific emerging topics and their possible implications for the future of people, society and the planet.	• Academic Forum, co-chaired by Prof. Mesot, President of ETH Zurich, and Prof. Vetterli, President of EPFL
Diplomatic	• States • International organizations • Politicians • Diplomats • Chief science officers • Political think tanks	• Facilitate the multilateral development of science-based solutions as effective tools for humanity by mobilizing and bringing together governments, international organizations, other diplomacy stakeholders and scientists (accelerating progress towards the SDGs). • Facilitate the transition to a new form of multilateralism by testing the effectiveness of active collaboration between science and diplomacy to develop solutions to global challenges.	• Diplomacy Forum, chaired by Michael Møller, former Director of the UN Office in Geneva and former Under-Secretary-General of the UN
Impact	• Big philanthropy (including venture philanthropy) • Incubators and accelerators • VC funds • Finance sector (asset managers, banks, etc.) • Multinational companies (deep-tech-based or applying deep-tech) • Business platforms • Start-ups and SMEs	• Ensure that sustainable, impactful solutions are enabled at scale by facilitating the deployment of institutional, intellectual and financial capital from philanthropy and the private sector across our methodology. • Create a sustainable funding stream and business model for GESDA and our solutions.	
Citizens	• Citizens • Artists • Media • Global decentralized networks • Civil society • NGOs	• Detect weak and strong “signals” from citizens around the world – i.e. their expectations of and experience with the scientific advancements and solutions (to emerging challenges) that we are addressing. • Develop a “pulse of society” online – an interactive platform to inform and guide the selection of solutions. • Draw on global communities to assist in the design, adoption and implementation of solutions.	

Key result 3.

Establishing the international GESDA community

As an instrument for anticipation and action, GESDA relies on an international community of academic and diplomacy experts to make sure our activities are guided by scientific relevance at the leading edge and are anchored in the realities of the world today.

In less than nine months, we have established an enthusiastic community of over 100 Swiss and international figures who are active on our Foundation Board, Academic Forum and Diplomacy Forum.

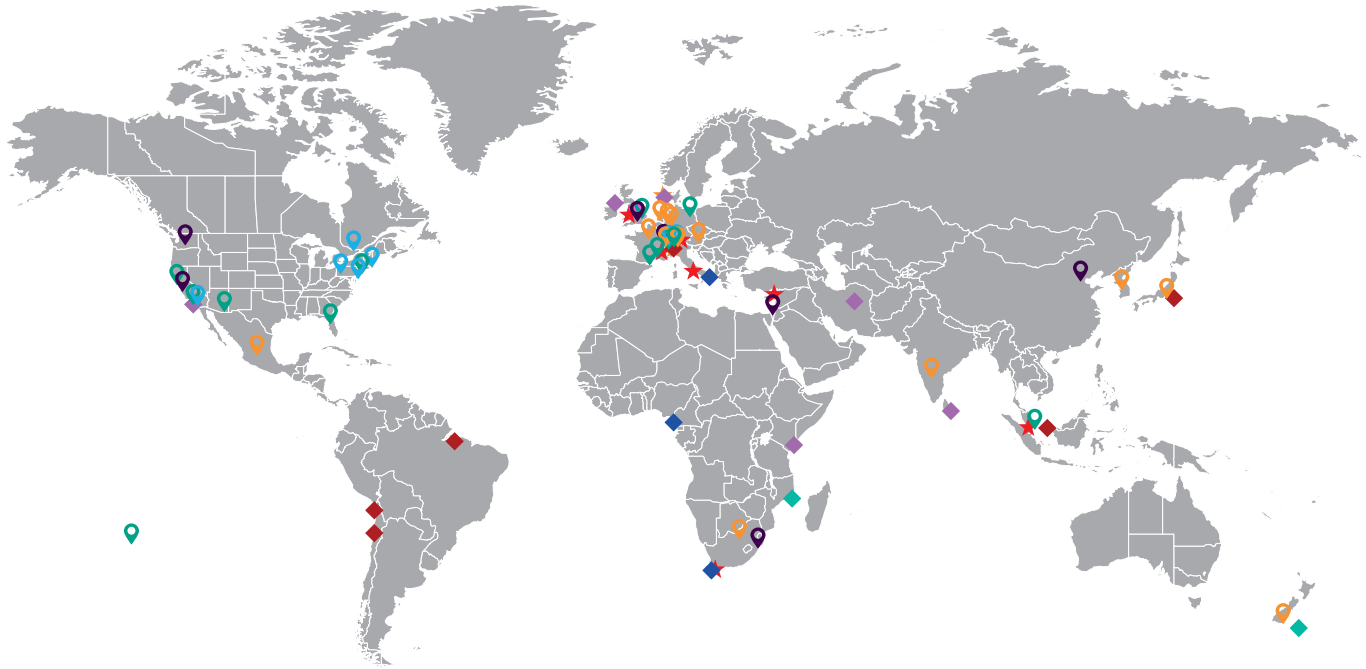
These stakeholders already help us to build bridges between science and diplomacy and to create a pipeline of initiatives that we can implement in the coming years.

In 2021, we will rely on this international community and expand it further in order to:

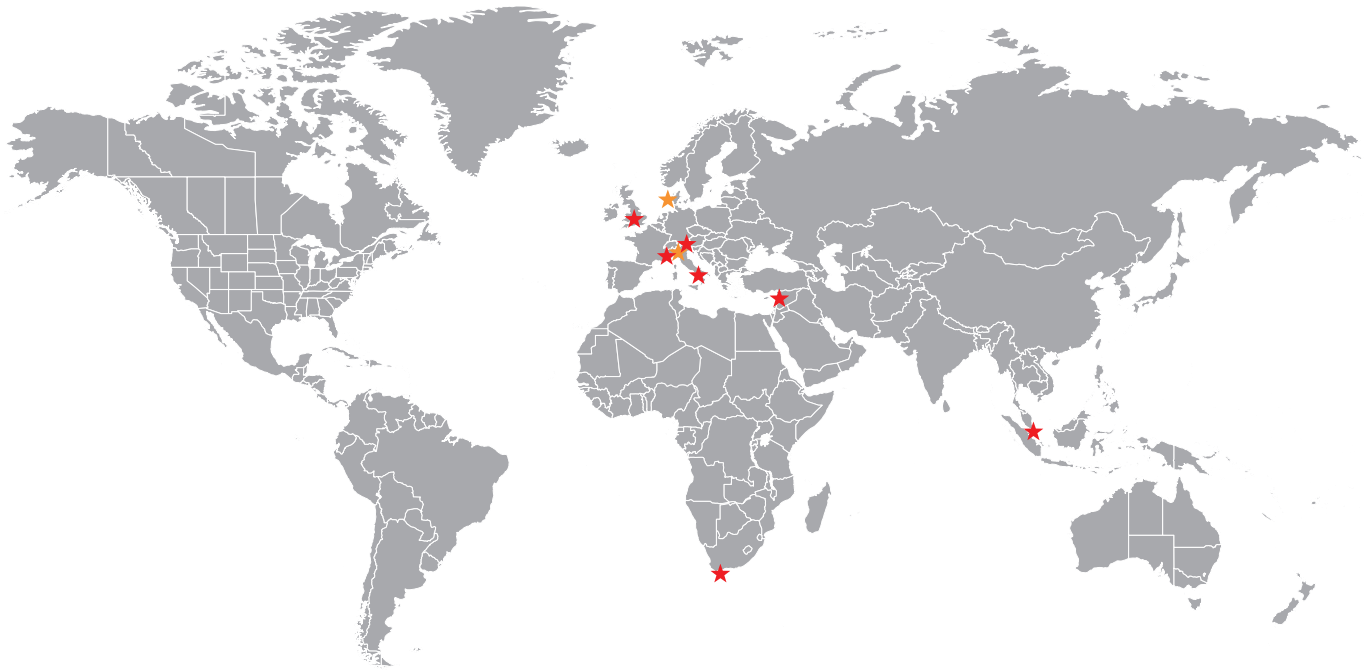
- Design and implement actual solutions through a reiterative learning process, which will draw on input from this initial set of global partners as we move towards a wider, more inclusive international network. This will allow us to frame challenges and develop solutions that respond to the different cultural contexts in different countries – an integral part of our science anticipation, acceleration and translation processes.

- Develop and scale solutions that meet the expectations of and are accepted by the general public at the individual, group and societal level. Hence the importance of the social and behavioural sciences, whose role we will strive to enhance.

Our global community as of December 2020



Members of our Board of Directors, and Chairs of our Fora

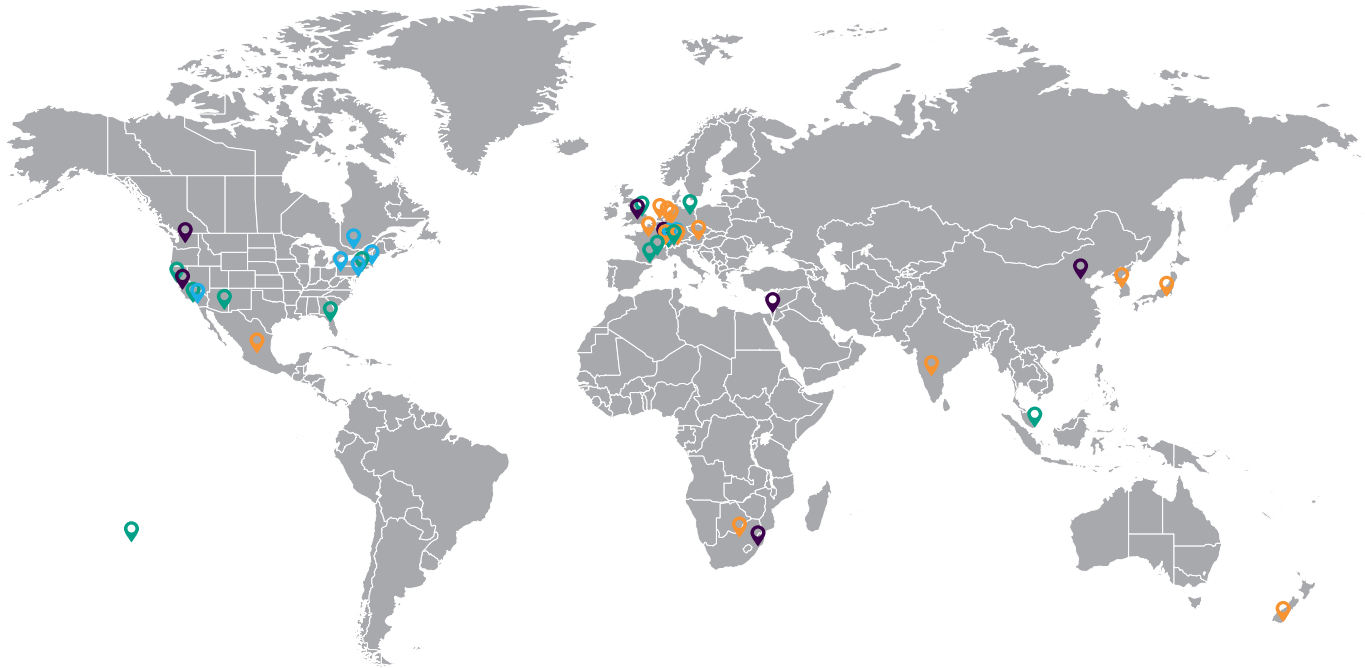


Board of Directors and Fora Chairs

★ Board of Directors

★ Academic and Diplomacy Fora Chairs

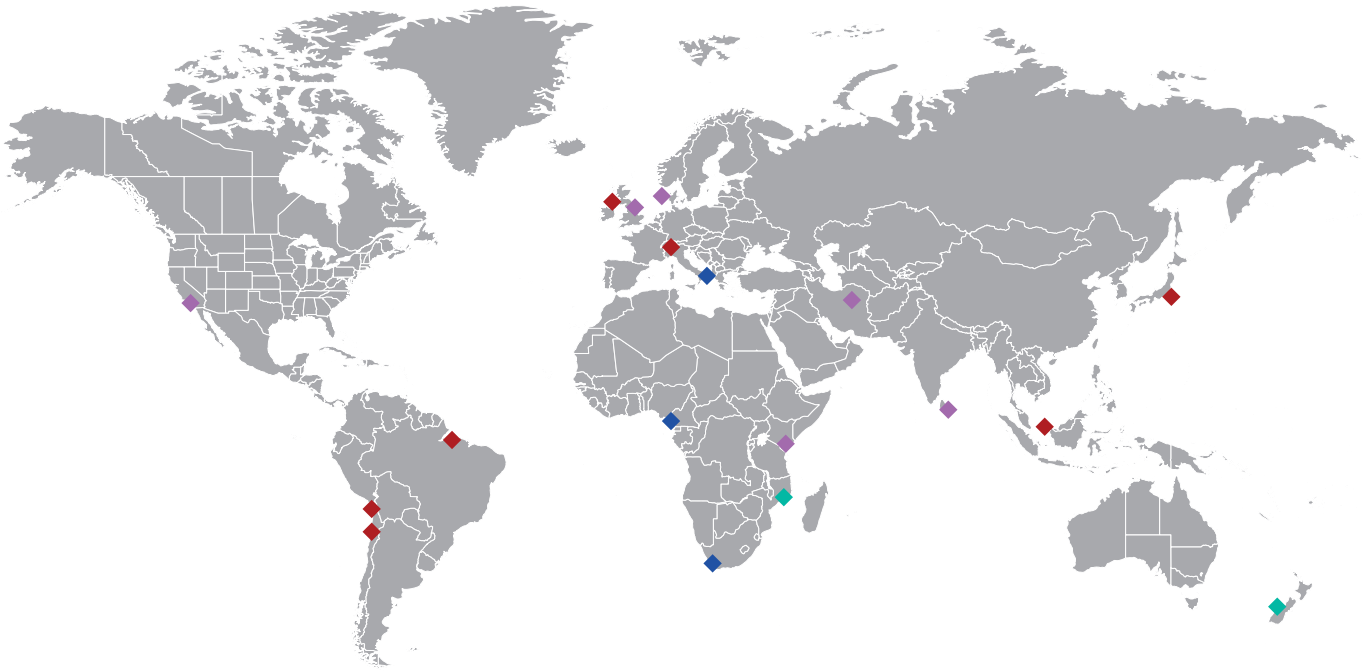
Academic Forum Moderators and experts



Global Academic Moderators and experts

- P1: Quantum Revolution & Advanced Artificial Intelligence
- P2: Human Augmentation
- P3: Eco-regeneration & Geoengineering
- P4: Science & Diplomacy

Members of our diplomacy community



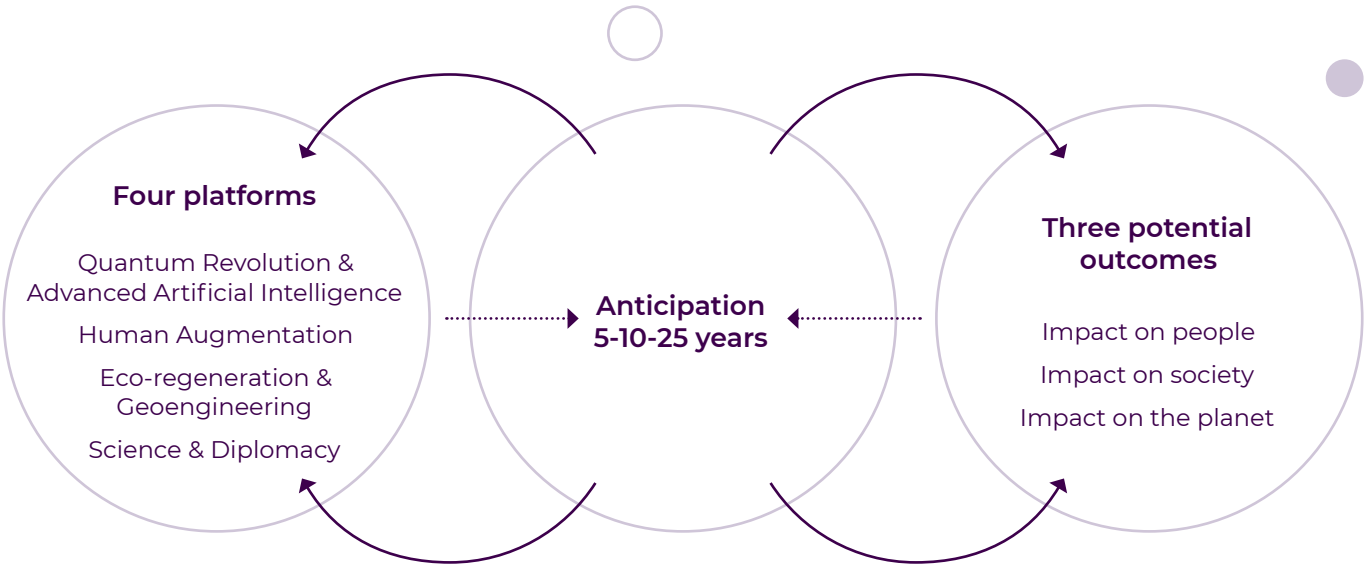
Global Diplomacy Moderators

- Politicians, geopoliticians, diplomats
- International and UN organizations
- Chief science officers
- Impact and citizen communities

Key result 4.

Anticipating scientific breakthroughs that will transform people, society and the planet

Anticipating scientific breakthroughs is our core driver. We aim to identify as precisely as possible what science will deliver to the world in 5, 10 and 25 years. This goal has been an essential starting point for our Foundation, and has been equally crucial to characterizing the potential impact of these breakthroughs on people, society and the planet.



Our Academic Forum identified 30 initial breakthroughs that are currently being developed in R&D labs around the world and that are highly relevant to the future of humanity, within the four scientific frontier issues that we have identified: Quantum Revolution & Advanced Artificial Intelligence, Human Augmentation, Eco-regeneration & Geoengineering, and Science & Diplomacy.

Twelve of these scientific emerging topics were further detailed in 12 Scientific Anticipatory Briefs that will soon be published.

Overview of our current Scientific Anticipatory Briefs (SABs)

Platform 1. Quantum Revolution & Advanced Artificial Intelligence

SABs:

1. Future of machine learning and artificial intelligence
2. Future quantum technology

Platform 2. Human Augmentation

SABs:

3. Memory enhancement and cognitive engineering
4. The future of human genome editing: from the current state of the art to 25 years from now

Platform 3. Eco-regeneration & Geoengineering

SABs:

5. Decarbonizing the global economy and society
6. Socio-ecological foresight: Integrated Digital Ecosystem Avatars (IDEAs)
7. Planetary health and global resources: the most cross-cutting challenge of all

Platform 4. Science & Diplomacy

SABs:

8. Societal enhancement: insights from computational social science, complex system theory and global systems science
9. An economic compass for a resilient, sustainable and inclusive local – and global – multilateral world
10. Negotiation engineering and computational diplomacy
11. The future of science diplomacy
12. Ethics of science anticipation

“From a purely scientific point of view, long-term anticipation – at 25 years – is an amazing task that we do not do often enough, or almost avoid, in our daily work. It’s conceptually and scientifically interesting, extremely important, but also very difficult – or should I say impossible? In my opinion, it’s completely lacking in science today and should be a new field of academia.”

Olaf Blanke, holder of the Bertarelli Foundation Chair in cognitive neuroprosthetics at EPFL and author of the SAB on memory enhancement and cognitive engineering

“More and more scientific and technological breakthroughs will come from the private sector and will make it harder for policymakers to put regulations in place without slowing innovation. We need to find a balance, and have an anticipatory mechanism in place.”

Marga Gual Soler, WEF Young Global Leader, Visiting Professor in Science Diplomacy at the Universidad Nacional Autónoma de México, and former High-Level Advisor to former European Commissioner Carlos Moedas. She authored the SAB on the future of science diplomacy.

“We wrote the Scientific Anticipatory Briefs to create clarity on these topics. Now, following the Science & Diplomacy Plenary Meeting in December 2020, we need to think creatively outside the box with global leaders, to identify how we can have an impact.”

Matthias Troyer, Distinguished Scientist and Quantum Systems Architect, Microsoft, Seattle. He authored the SABs on future quantum technology and socio-ecological foresight.

“Anticipation is absolutely critical, and it’s something that, as scientists, we don’t think about as much.”

Samira Kiani, Associate Professor, University of Pittsburgh School of Medicine. She authored the SAB on the future of human genome editing.

Key result 5.

Launching the diplomacy acceleration process

We began presenting GESDA to the diplomatic community at the beginning of 2020, and these stakeholders rapidly showed eagerness to engage with us. We held our first Science & Diplomacy Plenary Meeting on 18 December 2020. It effectively kick-started efforts to identify what multilateral initiatives are needed to ensure that the anticipated scientific breakthroughs are used for the greatest benefit to humanity. Sixty-three personalities took part and helped prioritize initiatives that we will explore and implement from 2021 onwards.

"Scientific advice should not be used just as facts for decision, but also to change the process of decision-making. That's where it becomes transformational!"

Lidia Brito, Director of UNESCO's Regional Bureau for Sciences in Latin America and the Caribbean in Montevideo and former First Minister for Higher Education, Science and Technology of Mozambique

"Institutions are always a step behind; science and scientists have an essential role to play in a renewed multilateralism. The worlds of science and diplomacy must establish a sustained dialogue. The main obstacle is to understand each other with the language difference (social sciences vs science, technology, engineering and mathematics). The future will be different as students will be trained in both languages."

Enrico Letta, former Prime Minister of Italy, now Dean of the Paris School of International Affairs

"Science anticipation is very important, but how can we best govern it so that it takes the global community to where we should be going? We should target tangible outcomes on solutions. We can talk a lot about challenges – and opportunities – but in the end, we want to know how to solve them."

Mami Mizutori,
Special Representative of the UN Secretary-General for Disaster Risk Reduction

“In this ‘Age of Emergence’, we need to include new perspectives from communities that have not been at the forefront, to draw on more diverse forces.”

Nanjira Sambuli, Policy Analyst, Advocacy Strategist, Kenya

“The critical question is: where can we best use our convening power to make a difference?”

Sir Peter Gluckman, Chair of the International Network for Government Science Advice, President-elect of the International Science Council, Former Chief Science Officer to the Prime Minister of New Zealand

“Decisions are often made by politicians. But the voices of the people, especially young people who will live with the results of those decisions, and the voices of scientists, also need to be taken into consideration.”

Jayathma Wickramanayake, UN Secretary-General’s Envoy on Youth, Sri Lanka, ad personam

Key result 6.

Preparing the practical translation of the solutions and initiatives designed in our Anticipatory Situation Room

Our bylaws task us with being both a science-driven anticipatory think tank and a do tank.

This requires us to set up an Impact Fund and seek partners to help us to implement the solutions and initiatives that our Academic and the Diplomacy Fora will ideate jointly in 2021, in association with like-minded organizations.

As far as funding is concerned, we took a decisive first step in June 2019 when we successfully sought and mobilized philanthropic financial support, effectively making us a public-private partnership with 50% of our funding coming from philanthropic sources.

Going forward, we will further increase the share of private funding in our Impact Fund.

We performed a thorough context analysis in spring 2019 to identify suitable organizations and to form our first financial and substantive partnerships.

This led to a partnership with Fondation Botnar in Basel to collaborate on the International Digital Health & AI Research Collaborative (I-DAIR) initiative, and it resulted in preliminary contacts with other potential partner organizations, including the World Economic Forum.

Key result 7.

Setting a base for dynamic interactions with the broader public

Decrypting the broader public's perceptions, expectations and concrete awareness of scientific developments is one of our key aims. To that end, we started issuing the GESDA Best Reads in August 2020, to provide a robust base for dynamic dialog and collect signals from society through a comprehensive, trusted media watch, a first step in an effort to take the pulse of society throughout the world.

Since November 2020, when we launched our website and began our press relations activities, we have been accelerating our external outreach efforts and have gotten significant interest from relevant parties. This approach, focused on delivering a substantial amount of trusted content, will be expanded in 2021 and our social media activities will be enhanced to encourage contributions from the general public, disruptors and non-conventional innovators.

Strong media interest in the announcement of our Diplomacy Forum members – 17 December 2020

The announcement of our first Science & Diplomacy Plenary Meeting, which took place on 18 December 2020, garnered strong interest from the media with 24 articles and interviews published in Swiss news outlets. In conjunction with the event, we unveiled the full list of our 17 Diplomacy Moderators in a press release the day before. This list includes Michelle Bachelet, former President of Chile, Enrico Letta, former Prime Minister of Italy, and Daren Tang, Director General of the World Intellectual Property Organization.

During the event, 63 high-level figures from the academic and diplomacy communities around the world took part in dynamic discussions and breakout sessions, which underscored how important our activities are in order to anticipate scientific breakthroughs and plan collectively with representatives from all communities of society, so that technological development can deliver the greatest benefit to all people on the planet.

Interviewed by *Le Temps*, Sir Jeremy Farrar, Director of the Wellcome Trust in London and GESDA Board Member, explains: "Science plays a crucial part in society. Yet it is sometimes left out because it is difficult to understand. At times, science has moved so fast that society could not keep up. It is now time to reconnect and to speak a language that is accessible to the average citizen. All of the 21st century's challenges are transnational. It is essential that scientists come down from their ivory tower and get involved in diplomatic and political processes. With innovation, the idea of standards will be increasingly important."

Noces royales entre science et diplomatie

GENÈVE INTERNATIONALE Fondé par la Confédération, le canton et la ville de Genève en 2019, le Geneva Science and Diplomacy Anticipator (Gesda) prend son envol. Et se fixe pour mission d'identifier les innovations scientifiques de demain et d'en anticiper l'impact sur nos sociétés

Le Temps, 18 December 2020

Our goal of having scientists, politicians, and diplomats – "who usually ignore each other at best", notes *La Liberté* – work together, is indeed ambitious. But, according to *Le Temps*, "one year later, it is clear that GESDA [...] managed to attract high-level scientists and renowned former diplomats who, without any remuneration, intend to help build a major multilateral tool for the future of humanity."

As *The Geneva Observer* puts it, "it is the joining of science and diplomacy which is undoubtedly one of the most forward-thinking conceptual breakthroughs represented by GESDA. Science and technology are now the defining forces of the human condition." *Swissinfo* points to the "frantic pace of scientific and technological breakthroughs and their disruptive impacts on people and societies."

Going further, "GESDA stresses that humanity, especially those living in emerging and developing countries, cannot afford to miss out on the potential of these breakthroughs for global well-being and inclusive development, at a time when populations must adapt faster than ever to the brisk pace of technological development."

Scientists now also have a social responsibility, adds *Le Temps*, quoting GESDA Vice Chairman Patrick Aebischer. A quote from GESDA Chairman Peter Brabeck-Letmathe goes on to explain: "Scientists are thrilled at this initiative. Indeed, it is the first time a list of innovations being developed in laboratories worldwide is drawn up in order to anticipate their impact at 5, 10 and 25 years."

Also interviewed by *Le Temps*, Mamokgethi Phakeng, Vice Chancellor of the University of Cape Town and GESDA Board Member, says: "Science cannot go it alone. It must be supported by politicians. Personally, I foresee that scientific innovations will enable even poor countries of Africa to progress. Being a Board Member of GESDA is a way to make African voices heard and achieve more inclusive development. Our perception of scientists is also shaped by the place where we grew up. GESDA is established in a trusted organization and place."

And where else than International Geneva could serve as the ideal hub for developing this new form of science multilateralism? *Geneva Solutions* interviewed Swiss Federal Councillor Ignazio Cassis at length. Minister Cassis is one of the driving forces behind GESDA and is confident that "as a well-established hub, Geneva favours a coordinated response to global challenges and allows advanced technology to be put at the service of inclusive development, enabling us to help realize the full social and economic potential of all segments of the population."

Genève Vision, a newsletter on International Geneva that is issued by Swiss broadcaster RTS, even celebrates Geneva as the "capital of the new world" and wonders "how will artificial intelligence, quantum technology, genetics and human augmentation revolutionize our world?" These questions have been around for a long time and "GESDA aims to address them before everyone else. It relies on an impressive network of experts and decision-makers to meet this challenge, with two major objectives: making sure science is used ethically and wisely in the future, and ensuring that new technology is distributed fairly. Science diplomacy is destined to develop in Geneva, of course."

Speaking on *RTS' prime-time news show* at 7:30pm on Sunday, 27 December 2020, Michael Møller, Chair of our Diplomacy Forum, stated: "We must change the way we have been working together so far. Society is facing huge challenges and we will not make it without scientists' expertise."

Most news outlets pointed out that we still have 18 months to prove our worth to the world, but we're sure that we're on the right track.

Comprehensive coverage of our first Science & Diplomacy Plenary Meeting and of our Foundation in general can be found on the *GESDA in the news* page.

Press review by
Laurianne Trimoulla,
Office and Communication Manager

Key result 8.

Establishing our Foundation's governance and walking the talk

As a private, independent non-profit foundation, our purpose, structure and operations are governed by our bylaws. They were drafted by the Swiss Ministry of Foreign Affairs, with the support of the Swiss Federal Supervisory Authority for Foundations, and then approved by our founders (i.e., both the Swiss and Geneva governments) on 20 February 2019.

Our Foundation is run by:

- A Board of Directors of nine people
- A Committee of the Board of Directors (Chairman, Vice Chairman, Chairs of the Commissions and Secretary General)
- Three Commissions: the Academic Forum, the Diplomacy Forum and the Impact Fund
- An Executive Team

Our Board has held the following meetings since 20 February 2019:

- **26 June 2019**: first preparatory pre-board meeting in Geneva (once our founders designated the first four Board members)
- **2 September 2019**: second preparatory pre-board meeting and first official discussion with our founders in Bern
- **2–4 October 2019**: written online consultation of the first four Board members to finalize the list of further potential Board members
- **7–8 December 2019**: inaugural Board meeting at Campus Biotech Geneva; drafting and approval of our 2020–2022 Roadmap; approval of our organizational rules and procedures; confirmation of the first Executive Team appointments; finalization of our three-year financial plan
- **7 July 2020**: second official Board meeting (online)
- **5 November 2020**: second discussion with our founders in Geneva
- **6 November 2020**: third official Board meeting (online)
- **26 November and 10 December 2020**: third discussion with our founders – one in Bern with the managing board of the Federal Department of Foreign Affairs (November) and another in Geneva with the Geneva government (December)

The Committee has held the following meetings since our Foundation was legally established on 9 September 2019:

- **20 November 2019** in Zurich
- **14 February 2020** in Bern
- **19 May 2020** online
- **20 June 2020** in Bern
- **11 September 2020** in Bern
- **23 October 2020** online
- **18 December 2020** online

The **Academic Forum** has held several meetings since May 2020 (see details in the next chapter).

The **Diplomacy Forum** held its first meeting along with the Academic Forum in an event held online on 18 December 2020 (see details in the next chapter).

The **Impact Fund** is still being formed (see details in the next chapter).

Our **Executive Team** consisted of eight people at the end of 2020 (see details in Chapter 6) who were hired between June 2019 and August 2020. In 2020, it held regular meetings on Tuesdays (one hour of operational planning and reporting) and Thursdays (two to three hours of brainstorming on priority projects to implement the 2020–2022 Roadmap outlined by our Board of Directors).

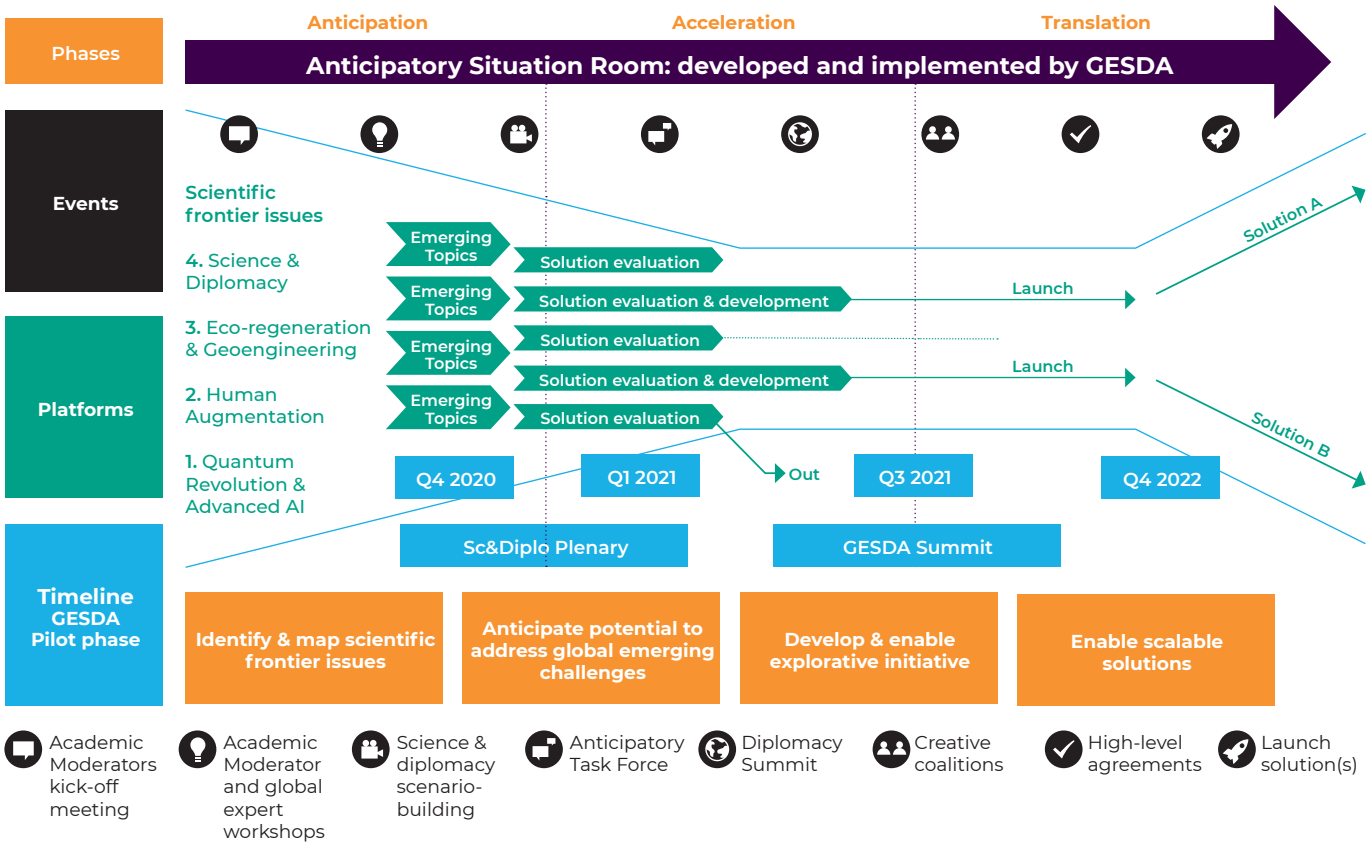
5. Focus on GESDA's operations

Overview

- **14 February 2020** – Academic Moderators chosen.
- **1 March to 30 June** – First presentation of GESDA's intentions to the diplomatic community (35 organizations, GESDA presented to over 150 people).
- **29 May and 4 June** – Four preliminary meetings of Academic Forum platforms (1. Quantum Revolution & Advanced AI, 2. Human Augmentation, 3. Eco-regeneration & Geoengineering, 4. Science & Diplomacy).
- **20 June** – First Academic Forum plenary meeting.
- **20 June to 9 September** – Over 50 one-to-one interviews conducted with international scientists.
- **15 July** – First Progress Report.
- **29 August** – Official online release of the first GESDA Best Reads (which take the pulse of the world media on our priority topics, as a first step towards involving citizens in our daily work). Start of content partnership with the Geneva Solutions digital news platform and of our presence on social media.
- **11 September** – Second Academic Forum plenary meeting.
- **18 September** – Diplomacy Moderators chosen and start of contacts with them.
- **6 October to 12 December** – Over 40 one-to-one briefings conducted with science and diplomacy stakeholders planning to participate in the December Plenary Meeting.
- **16 October** – Academic Forum submits its Anticipatory Breakthrough Report to the Board of Directors.
- **1 October to 31 October** – Second round of presentations of our initiative to ambassadors working in International Geneva.
- **2 November** – Final members appointed to the Diplomacy Forum.
- **5 November** – First public event with Club Diplomatique de Genève postponed due to COVID-19.
- **18 November** – First Science & Diplomacy Plenary Meeting documents sent to participants.
- **9 December** – New website launched to replace the landing page put up on 9 December 2019. Abstracts of Scientific Anticipatory Briefs are published.
- **17 December** – Second GESDA press release issued (after the first one on 9 December 2019).
- **18 December** – First GESDA Science & Diplomacy Plenary Meeting (first GESDA event).

We began operations on 1 January 2020, based on the 2020–2022 Roadmap established by our Board in December 2019.

Our operations follow the GESDA Anticipatory Situation Room process – a sequential process described in the following diagram.



This sequential process includes four kinds of activities carried out in parallel, which are presented in detail in this chapter:

- **Science Anticipation**: characterizing the scientific emerging topics being explored in the world's R&D laboratories, at 5-, 10- and 25-year horizons.
- **Diplomacy Acceleration**: determining the potential future impact of these emerging breakthroughs on people, society and the planet, and identifying the conditions necessary for their accelerated deployment for the greatest benefit to humanity.
- **Practical Translation and Impact Fund**: developing solutions that enable breakthroughs to be implemented optimally, in order to meet global challenges through ad hoc partnerships.
- **Global visibility**: getting the public involved in our work and communicating regularly about what we do, with the aim of strengthening the assets and position of International Geneva by reaching new audiences, such as the scientific community.

5.1. Science Anticipation

Foreword by Academic Forum Co-Chairs Joël Mesot and Martin Vetterli

Joël Mesot
Co-Chair, Academic Forum
President of ETH Zurich

Martin Vetterli
Co-Chair, Academic Forum
President of EPFL

The COVID-19 pandemic has given science a platform unseen for several decades, and the importance of the interplay between science, politics and society has never been so central to the public debate. Events in 2020 clearly underscored the relevance of our mission at GESDA – to bring together science and diplomacy.

We were especially struck by the academic community's engagement with GESDA. Our collaboration with scientists has been extremely impactful and has led to remarkably concrete outcomes, with a publishable paper delivered in less than three months. The collective effort has been very intense and productive.

A decisive driver for scientists to work so enthusiastically with GESDA is their conviction that we can accelerate the application of their intellectual discoveries to the real world. In addition, we offer a unique connection with the diplomatic community. Having access to this outstanding forum is a highly motivating factor for all those who aim to make an impact.

GESDA is an innovative instrument for scientists to better explain their work and describe to the general public what their discoveries will look like in 10 to 25 years. When we first brought the academic and diplomatic communities together at the end of 2020, it was fascinating to see them jointly evaluate how the world population may best benefit from the potential impact of these upcoming scientific breakthroughs.

It's our duty at GESDA to continue these efforts by thinking about how science can be communicated in a factual, transparent and honest way to the general public. This will involve acknowledging uncertainties when they exist and recognizing that the practice of science – especially of anticipatory, disruptive science – is sharpened through debate. We need to help the public understand that, without oversimplifying.

2019 & 2020 in a nutshell

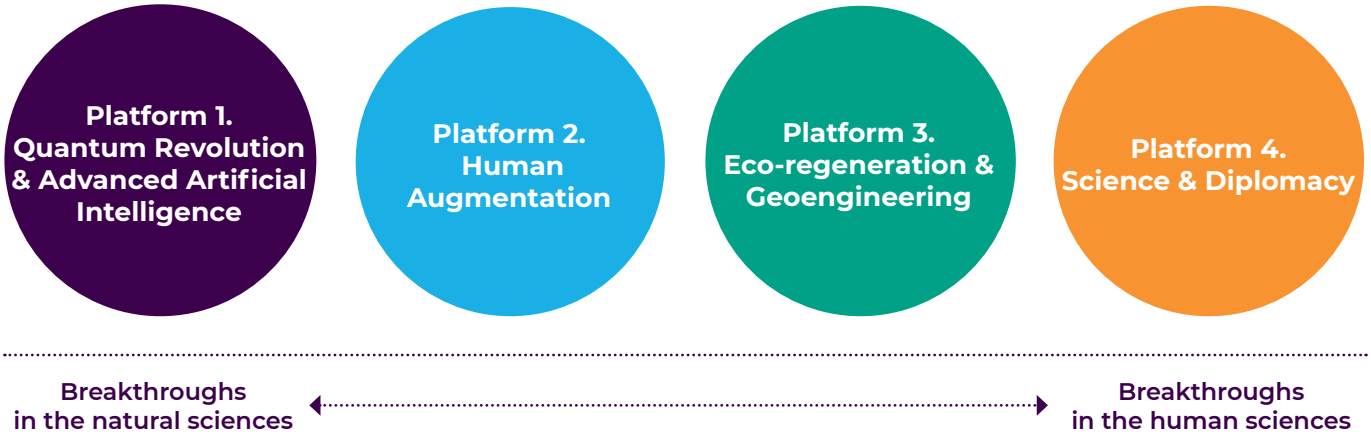
GESDA first brought together an academic community of 68 international experts in June 2020. The efforts of this community are coordinated by 26 Academic Moderators and global experts from leading research institutions and focus on the four scientific frontier issues chosen in December 2019 (Quantum Revolution & Advanced Artificial Intelligence, Human Augmentation, Eco-regeneration & Geoengineering, and Science & Diplomacy). These experts developed an initial map of the anticipated scientific breakthroughs at 5, 10 and 25 years in each of these four issues, along with the corresponding stakes and potential benefits. This map was sent out to the diplomatic, impact and citizen communities. Among the 30 breakthroughs that the academic community identified, 12 became the subject of detailed briefs and ten of them already inform discussions with the Diplomacy Forum on 18 December 2020.

Step 1.

Gathering the academic community

One of our core principles is that the anticipatory work we do should be objective, scientifically robust and evidence backed. The first step was achieved as early as 26 November 2019 with a seminar gathering ETH faculty in Zurich.

Based on this preliminary discussion, the Co-Chairs of the Academic Forum – Joël Mesot, President of ETH Zurich, and Martin Vetterli, President of EPFL – asked nine high-level scientists to lead our Academic Forum, serving as "Academic Moderators" and focusing on the four scientific frontier issues set out in our Roadmap.



The primary tasks of this core group of Academic Moderators were two-fold.

- First, to expand the panel of scientists we work with by reaching out to their peers. This objective was largely achieved, as a total of 68 high-level scientists were actively engaged by the end of 2020.
- Second, to establish an initial list of the scientific topics anticipated to emerge in the next 5, 10, and 25 years in each of the four scientific frontier issues. They identified approximately 30 such topics through five meetings that took place between May and June.

The GESDA Academic Forum as of 31 December 2020

Platform 1. Quantum Revolution & Advanced Artificial Intelligence

Moderators and SAB lead authors

Matthias Troyer, Distinguished Scientist and Quantum Systems Architect, Microsoft, Seattle
Rüdiger Urbanke, Professor of Communication Theory, EPFL

Global experts

Robert Thew, Senior Researcher in Quantum Technologies, University of Geneva
Nicolas Gisin, Professor of Quantum Information and Communication, University of Geneva
Francesco Petruccione, Pro Vice-Chancellor, Big Data and Informatics, University of KwaZulu-Natal
Sir Peter Knight, Emeritus Professor, Faculty of Natural Sciences, Department of Physics, Imperial College London
Philipp Treutlein, Professor, Quantum Optics Lab, University of Basel
Emmanuel Abbe, Professor, Chair of Mathematical Data Science, EPFL
Samy Bengio, Research Scientist, Google Brain, California
Antoine Bosselut, Post-Doctoral Researcher, University of Washington, Washington
Jennifer Chayes, Associate Provost, Division of Computing, Data Science and Society, University of California Berkeley
John C. Platt, Distinguished Scientist, Google Research, New York
Shai Shalev-Shwartz, Professor, School of Computer Science and Engineering, Hebrew University of Jerusalem
Bin Yu, Chancellor's Distinguished Professor, Departments of Statistics and Electrical Engineering and Computer Sciences, University of California, Berkeley
Yi Zeng, Professor, Institute of Automation, Chinese Academy of Sciences

Platform 2. Human Augmentation

Moderators and SAB lead authors

Olaf Blanke, Bertarelli Chair in Cognitive Neuroprosthetics, EPFL, Geneva
Samira Kiani, Associate Professor, University of Pittsburgh School of Medicine
Effy Vayena, Professor of Bioethics, ETHZ

Global Experts

George Church, Professor of Genetics, Harvard Medical School
David Liu, Professor of Chemistry and Chemical Biology, Vice-Chair of the Faculty, Broad Institute, Harvard and MIT
Baptiste Gauthier, Senior Researcher, EPFL
Andrew Hessel, Fellow, Institute for Science, Society and Policy, University of Ottawa
Itzhak Fried, Professor, Brain Research Institute, University of California Los Angeles
Bryan Johnson, CEO, Kernel
Michael Kahana, Professor of Computational Memory, University of Pennsylvania
Johannes Gräff, Professor of Neuroepigenetics, EPFL

Platform 3. Eco-regeneration & Geoengineering

Moderators and SAB lead authors

Gerald Haug, President of the German Academy of Sciences Leopoldina and Professor of Climate Geochemistry, ETHZ
Berend Smit, Professor of Chemical Engineering, EPFL

Global experts

Ottmar Edenhofer, Potsdam Institute for Climate Impact Research
Neil Davies, Gump South Pacific Research Station, University of California Berkeley
Ioan Negrutiu, Director, Michel Serres Institute for Resources and Public Goods and Professor, ENS Lyon
Wendy Queen, Assistant Professor of Functional Inorganic Materials, EPFL, Valais Wallis
Jonas Knapp, Energy and Climate Policy Expert, Potsdam Institute for Climate Impact Research
Peter Schlosser, Vice-President and Vice-Provost, Julie Ann Wrigley Global Futures Laboratory, Arizona State University
Sally J. Holbrook, Professor of Ecology, Department of Ecology, Evolution and Marine Biology, University of California Santa Barbara

Gerhard Schmitt, Professor of Information Architecture, ETHZ, Director of the Singapore-ETH Centre in Singapore, Future Cities Lab Steering Committee Member
Russell J. Schmitt, Professor, Department of Ecology, Evolution and Marine Biology, University of California Santa Barbara
Cherie Briggs, Professor of Ecology, Evolution and Marine Biology, University of California Santa Barbara
Joachim Claudet, Director of Research, Centre for Island Research and Environmental Observatory, CNRS (CNRS Unit, École Pratique des Hautes Études, University of Perpignan)
Juliana Freire, Professor, Department of Computer Science and Engineering, New York University
Nicolas Gruber, Professor of Environmental Physics, Department of Environmental Sciences, ETHZ
Armin Grün, Professor of Photogrammetry, Institute of Geodesy and Photogrammetry, ETHZ
Mike Harfoot, Ecologist and Conservation Scientist, United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) Cambridge, UK
Andrew Rassweiler, Professor, Biology Department, Florida State University
Christoph Schaer, Professor, Institute for Atmospheric and Climate Science, ETHZ
Claudio Silva, Professor of Computer Science and Engineering and Data Science, New York University

Platform 4. Science & Diplomacy

Moderators and SAB lead authors

Dirk Helbing, Professor of Computational Social Science, ETHZ
Jean-Pierre Danthine, Professor, EPFL, Managing Director of E4; President of PSE – Ecole d'économie de Paris

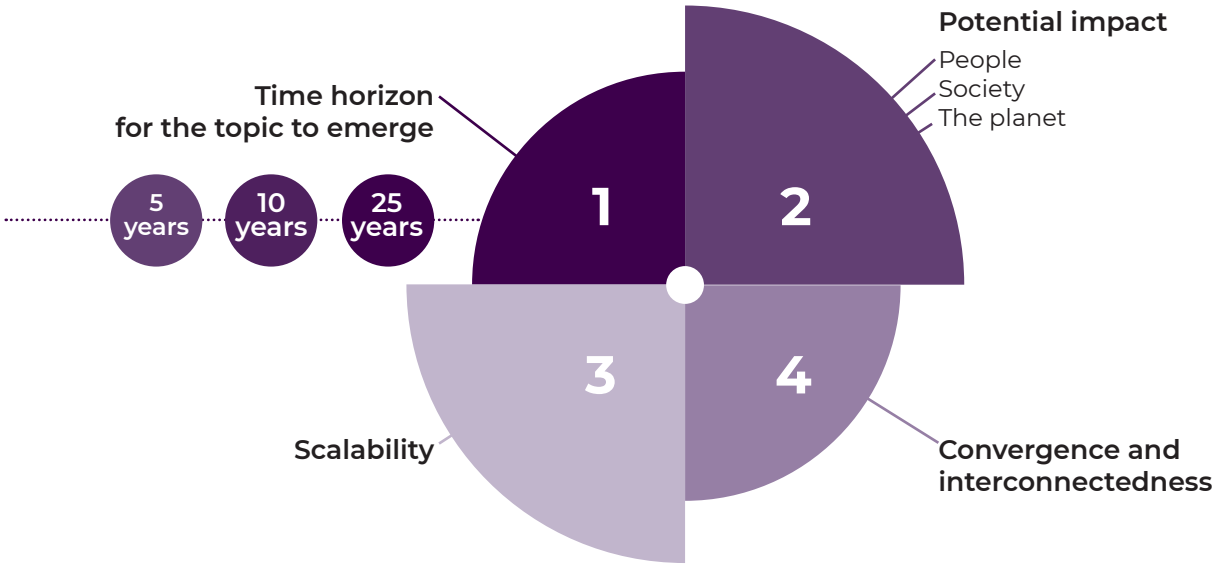
Global experts

Marga Gual Soler, Young Global Leader, World Economic Forum, Visiting Professor in Science Diplomacy, Universidad Nacional Autónoma de México, former High-Level Advisor to the European Commissioner for Science, Research and Innovation, and former Senior Project Director, AAAS Center for Science Diplomacy
Nicolas Levrat, Director, Global Studies Institute, University of Geneva
Jérôme Lacour, Dean, Faculty of Sciences, University of Geneva
Bastien Chopard, Professor of Computer Science, University of Geneva
Philip Grech, Senior Researcher, Chair of Negotiation and Conflict Management, ETHZ
Johan Rochel, Co-Founder and Co-Director, ethix - Lab for Innovation Ethics, Zurich
Jean-Daniel Strub, ethix - Lab for Innovation Ethics, Zurich
Yvonne Hofstetter, Honorary Professor of Digitalization and Society, Bonn-Rhein-Sieg University of Applied Sciences
Sarah Spiekermann, Professor, Vienna University of Business and Economics
Jeroen Van den Hoven, Professor of Moral Philosophy, Delft University of Technology
Isamu Okada, Professor, Soka University, Department of Business, Tokyo
Chang-Won Ahn, Daumsoft, Seoul
Lorenzo Fioramonti, Professor of Political Economy, University of Pretoria
Hans J. Herrmann, Professor, Theoretical Physicist, ESPCI Paris-PSL
Jose Jacob Kalayil, Founder & CEO, INTEGRO Infotech & Consulting, Bangalore
Indra Spiecker, Chair in Public Law, Information Law, Environmental Law, Legal Theory, Goethe University of Frankfurt am Main
Ranga Yogeshwar, Physicist and Science Journalist, Germany
Sanjana Hattotuwa, National Centre for Peace and Conflict Studies, University of Otago, New Zealand
Didier Wernli, Global Studies Institute, University of Geneva
Stephan Davidshofer, Global Studies Institute, University of Geneva

Step 2.

Prioritizing topics for further characterization by GESDA

Our Academic Moderators, together with our Board of Directors, prioritized an initial list of 30 scientific emerging topics in July 2020 based on four criteria.



1. Time horizon for the scientific topic to emerge
Since our focus is on anticipation, priority was given to topics expected to mature in 5, 10 or 25 years.

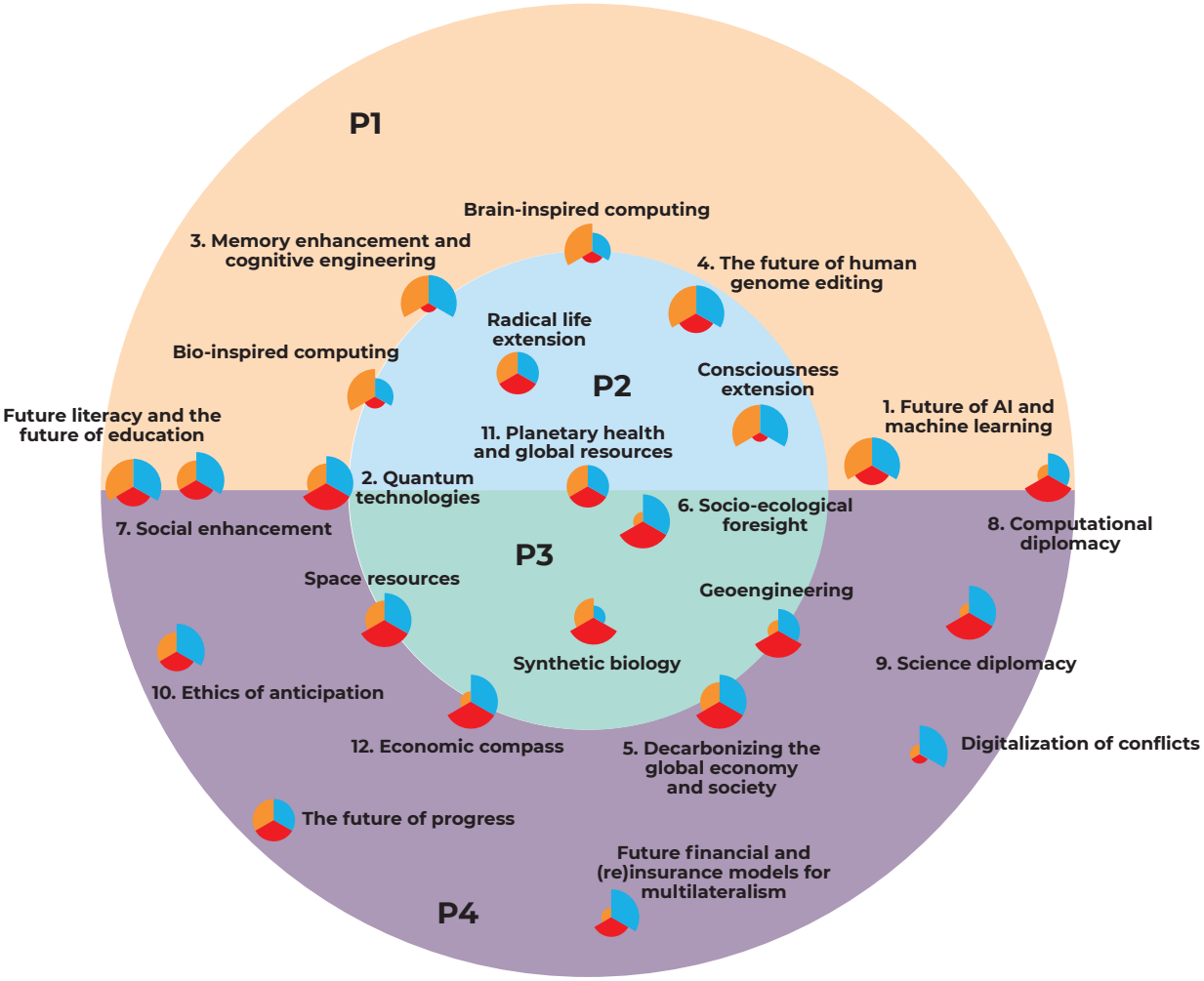
2. Potential impact on people, society and the planet
Priority was given to topics with the most transformative potential to speed progress towards the UN SDGs (5-year horizon) and answer our three fundamental questions: "Who are we, as humans?", "How can we all live together?", and "How can we ensure the sustainable future of our planet?" (10- and 25-year horizon).

3. Expected convergence and interconnectedness with other identified topics
We believe that topics which systematically interface with others will have the greatest impact on humanity. For instance, the convergence among the bio-, nano-, and cogno-sciences has advanced research in these fields at an extraordinary pace, and sped the application of this research to the benefit of humanity. In the same vein, the convergence among breakthroughs in the natural and human sciences is another core topic for us.

4. Scalability issues
For shorter-horizon topics, the Moderators also examined whether we could overcome the obstacles to deploying them at scale.

This stimulating exercise resulted in a short-list of 12 priority topics. The Academic Forum scientists then conducted an intense, thorough research effort over the summer of 2020 to produce 12 Scientific Anticipatory Briefs (SABs), which constituted the basis for our diplomacy acceleration activities.

The topics not selected in this first round will remain in our pipeline for further exploration during our start-up phase and beyond.



Relevance to our platforms

P1: Quantum Revolution & Advanced Artificial Intelligence
P2: Human Augmentation
P3: Eco-regeneration & Geoengineering
P4: Science & Diplomacy

Relevance to our three fundamental questions

- Who are we, as humans?
- How can we all live together?
- How can we ensure the well-being of humankind and the sustainable future of our planet?

Step 3.

Shaping the Scientific Anticipatory Briefs

The 12 Scientific Anticipatory Briefs (SABs) were designed by the Academic Forum with several objectives in mind.

- They are intended to foster constructive, reinvigorated dialog among scientists. They should help overcome the current tendency of most funding agencies to be very short-term oriented and stochastic. The SABs will inspire researchers to think beyond the three- to five-year cycle of grant applications and provide a pool of robust scientific papers at the same level as those intended for publication in scientific journals like *Frontier* and *Nature* for instance.

- The SABs will guide discussions between scientists and the Diplomacy Forum. To be able to perform meaningful, multilateral work, the diplomatic community first needs to be informed – early and thoroughly – of the opportunities and challenges that scientific breakthroughs are bringing to the world. Only this will allow the diplomatic community to evaluate how the world population could best benefit from the potential impact of these breakthroughs. The SABs will therefore provide digestible, practical and understandable summaries, in order to create a framework for the ideation of initiatives for us to pursue.

- The SABs will inform and introduce scientific breakthroughs to the general public. At GESDA, we believe that the general public has a right to know where science is going, so that citizens can contribute to the debate and help develop solutions. The SABs will be relayed to science journalists who will play a key role in educating and interacting with the public.

- To serve all of the above purposes, the SABs are issued in a variety of formats at different levels of detail. All formats include the following three chapters:

    - » Current state-of-the-art of the selected scientific emerging topics;
    - » The trends and expected breakthroughs at 5, 10 and 25 years;
    - » The initial considerations of the potential impacts on people, society and the planet.

We started the process to get our SABs published in key scientific journals in November 2020. They should therefore gradually start appearing in spring 2021.

Step 4.

Producing the first GESDA's Anticipatory Breakthrough Report (v.0)

Our first Anticipatory Breakthrough Report compiles the SABs and all the deliverables that the Academic Forum produced in 2020. It was shared with our founders and the members of the Diplomacy and Academic Fora. The table below provides an overview of the topics covered in the Report.

P1. Quantum Revolution & Advanced Artificial Intelligence	P2. Human Augmentation	P3. Eco-regeneration & Geoengineering	P4. Science & Diplomacy
Current SABs (completed or well advanced): abstracts available on the GESDA website			
1. Future of AI and machine learning	**3**. Memory enhancement and cognitive engineering	**5**. Decarbonization of the economy and society	**7**. Social enhancement
2. Future quantum technologies	**4**. The future of human genome editing	**6**. Social-ecological foresight – Integrated Digital Ecosystem Avatars (IDEAs)	**8**. Computational diplomacy & negotiation engineering
		11. Planetary health and global resources, the cross-cutting challenge of all	**9**. The future of science diplomacy
			10. Ethics of anticipation
Potential future SABs, including those already in preparation: based on Board recommendations, Academic Forum proposals & GESDA Best Reads			
Brain-inspired computing	Radical life extension	Synthetic biology & gene editing for plants and crops	An economic compass for a resilient, sustainable and inclusive local – and global – multilateral world – **in preparation**
Bio-computing	Consciousness extension	Space resources & space mining	Future financial and (re) insurance models for multilateralism
		Geoengineering (linked to the International Risk Governance Council report)	Future literacy and the future of education
			Digitalization of conflicts
			The future of progress

The Anticipatory Breakthrough Report will be issued annually. It will notably include fresh insights from additional scientists, providing a dynamic yearly assessment of anticipated scientific and technological breakthroughs. Diplomacy Forum members will also contribute to the Report with thoughts on the potential impact on people, society, and the planet.

The 2021 report will be issued and discussed during the first GESDA International Science & Diplomacy Summit, scheduled for the second half of 2021.

An example of SAB summary

Future of machine learning and artificial intelligence

*By Rüdiger **Urbanke** (Professor of Communication Theory, EPFL) with contributions from Emmanuel **Abbe** (Professor of Mathematical Data Science, EPFL), Samy **Bengio** (Google Research), Antoine **Bosselut** (Stanford AI Laboratory), Jennifer **Chayes** (Associate Provost of the Division of Computing, Data Science, and Society, Dean of the School of Information, Berkeley), John **Platt** (Google Research), Shai **Shalev-Shwartz** (Hebrew University of Jerusalem), Bin **Yu** (Professor of Statics and Computer Science, Berkeley), and Yi **Zeng** (Institute of Automation, Chinese Academy of Sciences), and edited by Daniel **Saraga.***

Key Concepts

Artificial Intelligence (AI) aims to build machines that are able to behave in ways we associate with humans: perceiving and analyzing our environment, taking decisions, communicating, learning, etc. Machine Learning (ML) is one approach to AI, developing algorithms that are able to learn autonomously from data. ML uses statistical models, as well as deep neural-network architectures loosely inspired by simple brain models. There are other possible approaches to AI (e.g. in the second half of the 20th century, AI was based mostly on expert systems, using rules defined by hand).

Machine-learning algorithms autonomously learn to accomplish tasks by following three broad methods:

- In **supervised learning**, algorithms learn to make the correct associations between a given input and the desired output. They do so by learning on training sets that comprise many correct input/output pairs. A typical example is image **classification**, where algorithms have to put each image in the appropriate category, e.g. cars, trucks, bikes and pedestrians.

- In **unsupervised learning**, algorithms train only on input data. Their task is to uncover patterns in given datasets. A typical example is **clustering**, where algorithms sort a set of inputs into groups that share some similarity, such as different groups of customers.

- In **reinforcement learning**, the algorithm repeatedly chooses from a given set of actions in order to maximize a reward function that should lead it to the desired result. Each choice of action enables the **exploration** of the environment (for the long-term reward), as well as its **exploitation** (for short-term reward). A typical example is learning to play games such as Go or chess, or video games, where the reward function increases the score or wins the game. Reinforcement learning is considered to be a promising strategy for addressing complex real-world problems.

These methods use various statistical techniques. Perhaps the most important is based on **artificial neural-networks** that are inspired by rudimentary models of the brain. **Deep learning** refers to models with many layers of neurons.

The concepts of **Artificial General Intelligence (AGI)**, Human-Level Artificial Intelligence and Strong AI refer to systems that would exhibit the broad range of human intelligence. They would be able to deal with complex, dynamic, and open environments, which comprise interacting entities, and to perform tasks that are complex and diverse. These systems would be able to learn autonomously in order to perform new tasks.

An example of SAB summary

Scientific Anticipatory Brief abstract
Current status of research

Artificial intelligence (AI) has seen impressive recent progress. This so-called "second wave" of AI is made possible by breakthroughs in machine learning, in particular deep neural architectures, as well as an exponential increase in available computational power and access to massive data sets. This trend is expected to continue in the next five years, bringing benefits to more and more specialized application areas.

While the progress is impressive, current machine learning systems have significant limitations. **Training the algorithms requires substantial computational power and access to vast datasets, thus allowing only a few organizations to pursue the most ambitious developments**. Machine learning algorithms do not work well for categorical (rather than continuous) variables, or when inputs are heterogeneous. The output of the algorithms is brittle by nature and can easily be fooled by specially engineered inputs. **Successful models are nearly impossible to interpret or understand, making their certification a challenge**. The transfer of "acquired knowledge" to other problems is difficult, limiting our ability to attack the "long tail of everyday tasks". Finally, the current machine learning paradigm is not well positioned to deal with the many types of problems encountered in everyday life, where the environment is highly dynamic and unpredictable, with multiple objectives that might be ambiguous or contradictory, and are embedded in an implicit system of human and social values.

Trends at ten years - integrating contextual Information and common-sense knowledge

Looking into the future, the **"third wave" of AI will consist of integrating contextual information, common sense knowledge and high-order reasoning**. This will enable machines to learn from much smaller datasets than is currently possible, substantially increasing their applicability to a much larger and more diversified set of real-world problems. They will understand and perceive the world on their own and will be able to perform basic forms of reasoning. **They will be deployed much more broadly, increasing the number and depth of human-machine collaborations**. The field of AI should benefit from neuromorphic chips that directly implement neural networks in the hardware and, possibly, from advances in biocomputing and quantum computing.

Trends at 25 years - towards human-level artificial intelligence

The "fourth wave" will involve the development of truly intelligent machines and, possibly, reach Artificial General Intelligence (AGI) where **machines have the capacity to learn any task as well as or better than humans.** AGI will have fundamental implications ranging from our understanding of basic science questions to new applications in virtually all areas of human activity. A survey conducted by the Future of Humanity Institute in 2013 revealed that experts working in the field estimated that AGI had a 10% chance to happen before 2022, and 50% before 2040.

Potential consequences on people, society and the planet

Powered by machine learning and digitization, AI has the potential to impact most human activities and societal issues. It will be deeply embedded in our surroundings, changing the way we live and work. It will transform most industries, such as healthcare, energy, transport and infrastructure, and will support lifelong education, accelerate scientific discoveries, and impact defence. It will also play a major role in addressing significant challenges such as climate change and a sustainable economy. Human-machine collaborations enabled by AI will become more widespread, impacting a large number of jobs and blurring the difference between humans and machines.

With such huge potential to impact all areas of society, AI is increasingly considered a strategic sovereign technology. Due to the substantial resources required to pursue cutting edge developments in AI, its advances are mainly driven by large private- and public-sector organizations. For these two reasons, AI raises fundamental issues about democratic control and is becoming a global geopolitical issue.

Step 5.

Two important, complementary work areas:

- **The Human Right to Science Initiative**
- **The ETHZ-UNIGE Initiative on Science in Diplomacy in partnership with GESDA**

The Human Right to Science Initiative

Our Board member Samantha Besson is spearheading GESDA's Initiative on the Human Right to Science, in keeping with our mission to anticipate the potential benefits and risks of scientific breakthroughs. Gérard Escher, Senior Advisor to our Board of Directors, is coordinating this initiative.

Our goal with this initiative is to help specify the duties and responsibilities that States, international organizations and other public- and private-sector organizations have under the "human right to science". The aim is to flesh out the implications of those duties and responsibilities with respect to the anticipation of the risks and benefits of scientific discoveries.

This initiative is a way to further implement the International Covenant on Economic, Social and Cultural Rights (1966), which states: "The States Parties to the present Covenant recognize the right of everyone: (...)(b) To enjoy the benefits of scientific progress and its applications".

The initiative includes a symposium planned for 1–3 December 2021 at the Brocher Foundation in Geneva. It will be organized jointly by Samantha Besson, Bartha Knoppers and Gérard Escher.

Samantha Besson

Bartha Knoppers

Gérard Escher

"Decisions concerning the development of powerful, impactful technology should be taken within the human-rights framework, which entails accessibility, inclusiveness, non-discrimination, benevolence, academic freedom, unboundedness of science, and the obligation to create a governance system for the risks, benefits and opportunities brought by scientific progress."

Gérard Escher, Senior Advisor to the GESDA Board of Directors

The ETHZ-UNIGE Initiative on Science in Diplomacy, in partnership with GESDA

This Initiative on Science in Diplomacy was initiated jointly by ETH Zurich and UNIGE at end-2019. Both of these are leading academic institutions with distinctive expertise and a shared objective of anticipating future global challenges in order to formulate actionable, science-based solutions. The ultimate aim of this initiative is to jointly contribute to a "scientification of diplomacy". It involves collaboration on both research and continuing education, and will entail incorporating scientific insights and methods into diplomatic, multi-lateral conflict resolution mechanisms and into international negotiation processes in general.

ETHZ and UNIGE reached out to GESDA in late 2019 to discuss a potential partnership. Our Academic Moderator Jean-Pierre Danthine thoroughly reviewed the proposal and introduced it into our Anticipatory Situation Room Process in July 2020. This led to the publication of a Scientific Anticipatory Brief titled *Negotiation engineering and computational diplomacy*, co-signed by Philip D. Grech, Bastien Chopard, Didier Wernli, Stephan Davidshofer and Nicolas Levrat.

Further discussions were held during the Science and Diplomacy Plenary Meeting on 18 December 2020 and confirmed the considerable potential of negotiation engineering for renewing and strengthening the multilateral system. Participants highlighted the potential for big data to help predict negotiation outcomes and their effects, and to create a global capacity-building platform for science and diplomacy in Geneva. The expected efficiency gains for the diplomatic process were also stressed, as well as hopes that evidence-based policies could consequently be more widely devised and implemented.

We intend to step up our participation in this initiative from 2021 onward.

MARTIN MÜLLER

Executive Director of the Academic Forum

How were you able to convince 68 high-level scientists to join the GESDA initiative?

It was surprisingly easy to convince them to participate in our endeavour thanks to our Moderators. These scientists work at the outer boundaries of science. They are experiencing the rapid pace of novel scientific breakthroughs and are aware of their transforming potential. They all are very concerned about the impact those discoveries might have on people, society and the planet: they feel that GESDA, with its focus on science anticipation and its bridging between science, diplomacy and impact, is the right initiative at the right time and in the right place.

I was impressed as well by their engagement in our discussions. You can imagine that thinking 25 years ahead is a demanding exercise, given the pace of change we all experience today. I would like to thank all the scientists who have been involved, in particular the core set of Academic Moderators who linked us up with the relevant experts at a global level.

How, concretely, did you gather their opinions and insights?

We relied here on the expert knowledge of those working at the leading edge of science, in some of the most advanced laboratories worldwide. Based on the advice of a core set of Academic Moderators, we conducted a series of one-to-one interviews and roundtable discussions focusing on precisely this question: What trends do you see for your scientific emerging topics at 5, 10 and 25 years, and why does it matter? This clearly pushed everyone out of their comfort zone. Here the Academic Moderators played a pivotal role to curate the content and ensure the overall direction and scientific quality of the material. We then worked hard internally at GESDA, with the support of science writers, and in close cooperation with the lead scientific authors to produce 12 Scientific Anticipatory Briefs in time for our first joint discussion with the diplomacy community in December. These papers will be released in scientific journals in 2021.

5.2. Diplomacy Acceleration

Foreword by Diplomacy Forum Chair Michael Møller

Michael Møller
Chair of the Diplomacy Forum

*The three key words in our organization's name are science, diplomacy and anticipation. **Science** is what drives us and is the very foundation of our work. **Anticipation** is what we do, in terms of both scanning the technologies of the future and assessing and mapping the challenges to – and needs of – humanity over the coming decades. **Diplomacy** is understood in its broadest sense to describe the many stakeholders (diplomats, politicians, government officials, international organizations, NGOs, etc.) that will work with us to accelerate and translate cutting-edge science into the most appropriate tools for humanity. They are also the potential end-users of the solutions that our collective efforts will produce. This inclusivity is a reflection of the modern multilateralism that we need – and that is central to GESDA's work ethics and inclusive action-oriented methodology.*

Throughout 2020, we met with as many of these stakeholders as possible to clarify our mission and discuss our common goals and objectives. We also engaged with representatives of civil society, youth, the business community and the media. We created the Diplomacy Forum, which currently has 17 members from the diplomatic, impact and citizen communities. This outreach will be broadened and reinforced in 2021.

My colleagues and I are delighted and energized by the strong engagement and commitment of all our partners to anticipate the future, to build a common understanding of what science can bring to the world, to collaborate on solutions for humanity and to create the needed political momentum around them.

We at GESDA – along with our science and diplomacy communities – are unanimously determined to ensure that ethics and human rights are placed at the centre of all our initiatives.

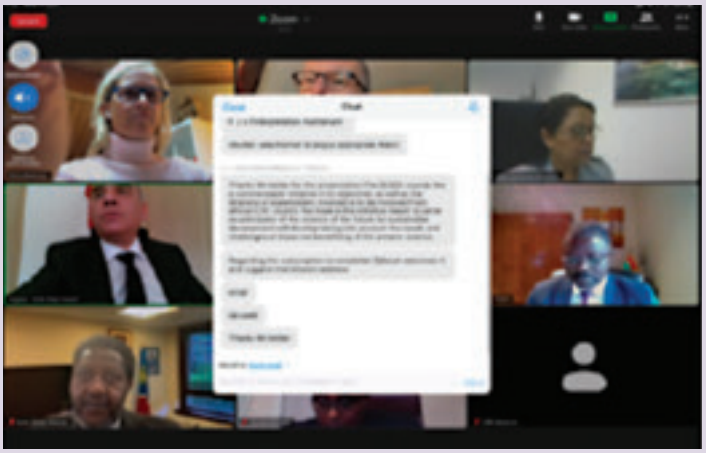
The UN Sustainable Development Goals provide us with a globally accepted framework to guide our work, which will always be underpinned by three core questions: Who are we, as humans? How can we all live together? And how can we ensure the well-being of humankind and the sustainable future of our planet?

GESDA was created to help ensure that the technologies of the future will be designed to maximize their benefits to humanity. In doing so, our aim is to provide tangible proof that truly collaborative, multilateral approaches to problem-solving have the best chances of success. GESDA is also a response to the imperative need for a renewed and more effective multilateral system. Because we simply have no choice but to strengthen international cooperation and solidarity if we want to ensure a healthy future for our planet.

2019 & 2020 in a nutshell

In parallel to our work on science anticipation, we contacted and raised awareness among 35 international organizations and missions in Geneva, New York, Vienna and Rome, as well as among ambassadors working in Geneva and Switzerland – i.e. more than 150 people to date and personalities of the civil society. These stakeholders proved very receptive and keen to contribute to our efforts. As a result, our Diplomacy Forum already includes 17 leading figures from all continents. In addition, 20 director generals of international organizations have also appointed one or more contacts to interact operationally with us. The first Science & Diplomacy Plenary Meeting on 18 December 2020 brought together our Diplomacy and Academic Moderators with the following two objectives:

- To prioritize the SABs according to the corresponding breakthroughs expected, the 5-, 10-, and 25-year impact on people, society and the planet, including their usefulness in accelerating progress towards the UN's 2030 Sustainable Development Goals;
- To draw up an exploratory list of solutions and initiatives that we could implement starting in 2022.



Meeting with the African Group of Ambassadors based in Geneva on 14 October 2020, led by Michael Møller and Daria Robinson.

Step 1.

Raising awareness among the multilateral organizations in Geneva

Our focus in 2020 was on presenting our vision and mission to a large audience of multilateral organizations located in Geneva and throughout the world.

In the first half of the year, we prioritized UN agencies as well as other international organizations, especially those based in International Geneva. More than 100 such organizations were informed of our intentions.

This was followed in the second half of the year by an initial series of presentations to approximately 100 ambassadors working in Geneva.

Outreach to the international community

GESDA diplomacy consultations (DGs & experts)

International and UN organizations

Group presentations

- African ambassadors (54 countries)
- Eastern European ambassadors (23 countries)
- Western European ambassadors (29 countries)

Individual presentations (upon request)

- Peru
- Pakistan
- Slovenia
- Estonia

Step 2.

Assessing how the identified scientific breakthroughs could impact emerging global challenges

In order to lay the groundwork for our Diplomacy Forum, we first had to link the scientific breakthroughs identified by the Academic Forum with the emerging challenges that will be faced by the world and by multilateralism.

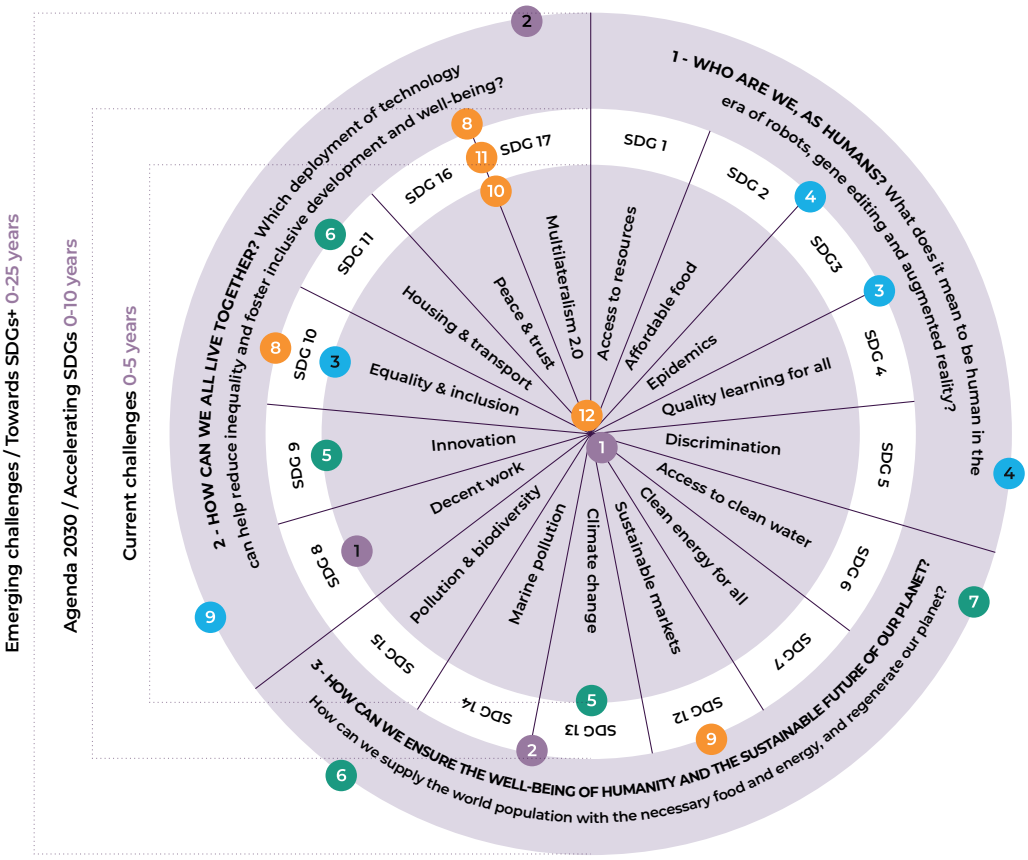
Two frameworks were used for this exercise – the SDGs (for the 10-year horizon) and our three fundamental questions (for the 25-year horizon).

Initial assessment of how the 12 SABs can help accelerate progress towards the UN SDGs by 2030 and beyond

Scanning of emerging global challenges

At 10 years
Accelerate progress towards the 2030 SDGs

At 25 years
Provide answers to our fundamental questions about people, society and the planet



Sustainable Development Goals (SDGs)

SDG 1: No Poverty
SDG 2: Zero Hunger
SDG 3: Good Health& Well-being
SDG 4: Quality Education
SDG 5: Gender Equality
SDG 6: Clean Water & Sanitation
SDG 7: Affordable & Clean Energy
SDG 8: Decent Work & Economic Growth
SDG 9: Industry, Innovation & Infrastructure
SDG 10: Reduced Inequalities
SDG 11: Sustainable Cities & Communities
SDG 12: Responsible Consumption & Production
SDG 13: Climate Action
SDG 14: Life Below Water
SDG 15: Life on Land
SDG 16: Peace, Justice and Strong Institutions
SDG 17: Partnerships for the Goals

Scientific Anticipatory Briefs (SABs)

1 Future of AI
2 Future of quantum
3 Cognitive enhancement
4 Gene editing
5 Decarbonization
6 Earth avatar
7 Global resources
8 Social enhancement
9 Economic compass
10 Science diplomacy
11 Computational diplomacy
12 Ethics of anticipation

Relation SAB - Challenge

4 Positive relation
4 Negative relation

Step 3.

Establishing the Diplomacy Forum

We were able to set up the Diplomacy Forum very rapidly, thanks to our efforts to actively mobilize the diplomatic community starting in spring 2020. It took less than a month to confirm the initial 17 Diplomacy Forum Moderators, demonstrating the considerable interest that diplomacy stakeholders have in our mission.

The Diplomacy Forum is made up of three communities, as described in the chart below.

Diplomacy Forum		
Diplomatic community	**Impact community**	**Citizen community**
State officials, representatives of international and regional organizations, politicians, diplomats, geopoliticians, chief science officers, members of geopolitical think tanks	Philanthropic entities, business incubators and accelerators, venture capital and investment firms, business platforms, multinationals, start-ups	Individuals, media, artists, city representatives, global decentralized networks, NGOs

We strived to finely balance this initial group of Diplomacy Moderators, taking into consideration their specific expertise, current and previous official functions, gender, age, and geographic location. These Diplomacy Moderators are seconded by diplomacy experts (17 by end-2020), mirroring the structure of the Academic Forum.

We will gradually expand the Diplomacy Forum throughout the proof-of-concept phase and give it a broader stakeholder representation.

The Diplomacy Forum

Representatives of political, geopolitical and diplomatic circles
Martin Chungong (Cameroon), Secretary General, Inter- Parliamentary Union (IPU), Geneva
Sean Cleary (South Africa), Executive Vice-Chair, FutureWorld Foundation, Cape Town
Jürg Lauber (Switzerland), Ambassador, Permanent Representative of Switzerland to the UN and other International Organizations, Geneva
Enrico Letta (Italy), Dean, Paris School of International Affairs, Sciences Po; former Prime Minister of Italy; President, Jacques Delors Institute, Paris

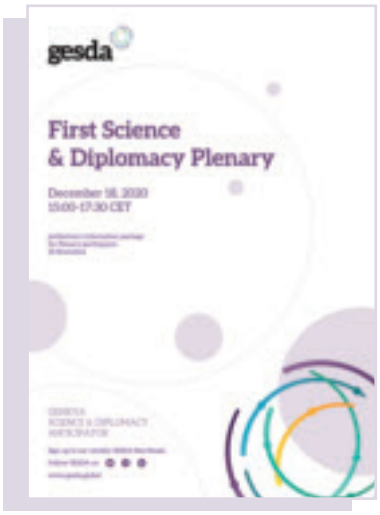
Representatives of transversal international organizations
Michelle Bachelet (Chile), United Nations High Commissioner for Human Rights (OHCHR), Geneva; former President of Chile
Peter Maurer (Switzerland), President, International Committee of the Red Cross (ICRC), Geneva
Mami Mizutori (Japan), Special Representative of the UN Secretary-General for Disaster Risk Reduction (UNDRR), Geneva
Sergio Mujica (Chile), Secretary-General, International Organization for Standardization (ISO), Geneva
Guy Ryder (United Kingdom), Director-General, International Labour Organization (ILO), Geneva
Daren Tang (Singapore), Director General, World Intellectual Property Organization (WIPO), Geneva

Representatives of the community of chief scientists
Lidia Brito (Mozambique), Director of UNESCO's Regional Bureau for Sciences in Latin America and the Caribbean, Montevideo; former first Minister for Higher Education, Science and Technology of Mozambique
Sir Peter Gluckman (New Zealand), Chair, International Network for Government Science Advice, President-elect of the International Science Council; former Chief Science Officer to the Prime Minister of New Zealand

Representatives of the impact and citizen communities
Anousheh Ansari (United States & Iran), CEO, XPRIZE Foundation, Los Angeles; co-founder and former CEO of Prodea Systems; Astronaut (private)
Jim Hagemann Snabe (Denmark), Chairman, Siemens AG and A.P. Møller Mærsk; Vice Chairman Allianz SE, Copenhagen
David Goodhart (United Kingdom), Journalist, Author and Think Tanker, London
Jayathma Wickramanayake (Sri Lanka), UN Secretary General's Envoy on Youth, New York, ad personam.
Nanjira Sambuli (Kenya), Policy Analyst, Advocacy Strategist, Nairobi

Step 4.

Holding the first GESDA Science & Diplomacy Plenary Meeting, on 18 December 2020



The first GESDA Science & Diplomacy Plenary Meeting took place on 18 December 2020 and was a key milestone for our Foundation and the implementation of our Anticipatory Situation Room.

This was the first time that our Diplomacy Moderators and Academic Moderators gathered together. These 45 leading figures, along with 18 observers, assessed the relevancy of anticipated scientific breakthroughs for multilateral action. They examined how the breakthroughs could be used to achieve the greatest beneficial impact for humanity, and proposed corresponding initiatives and solutions.

The Meeting was held online, as COVID-related restrictions were in full force, and required careful planning and one-to-one pre-briefings of all participants.

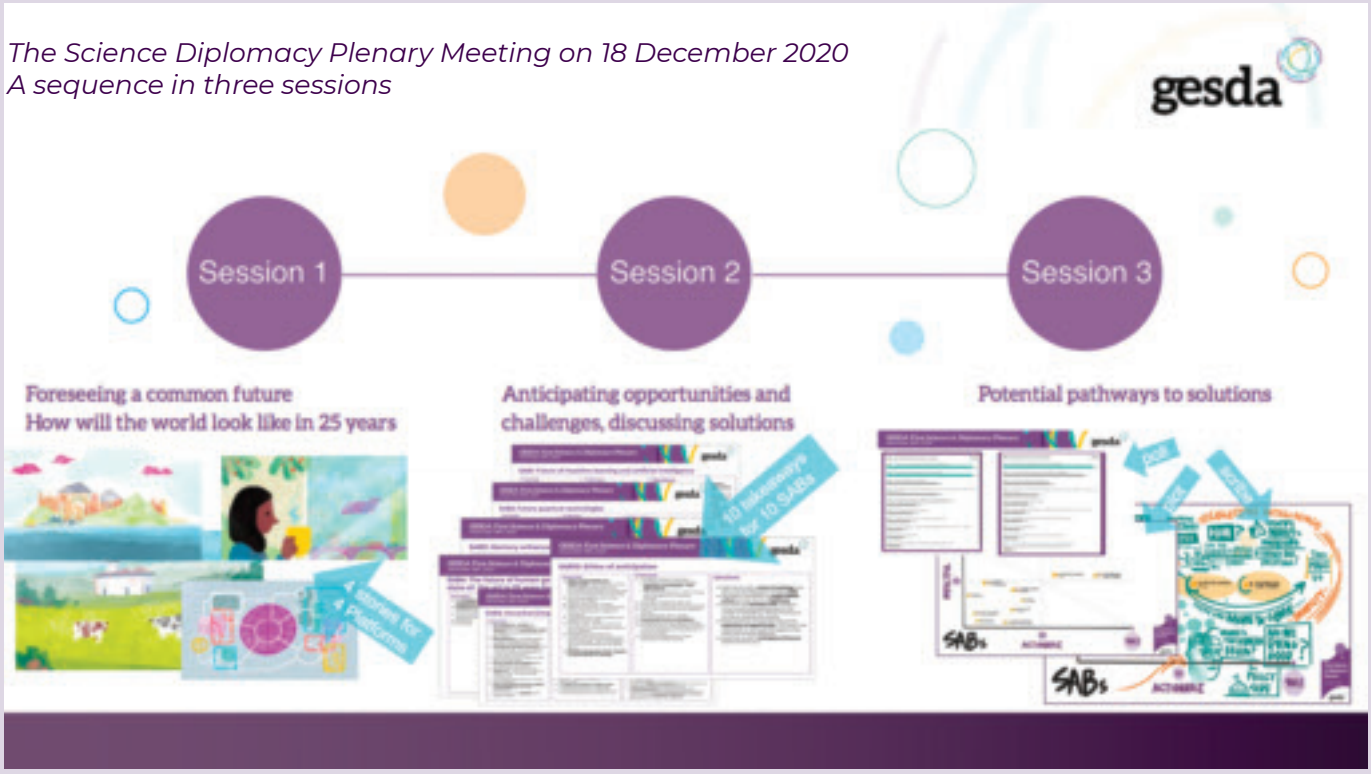
At the start of the Meeting, we made a considerable effort to project participants into a realistic future, with the input of two foresight experts: Radha Mistry, Practice Leader for Foresight at Autodesk; and Chris Lübkeman, Head of Strategic Foresight at ETH Zurich.

Twenty breakout sessions were then held using the Scientific Anticipatory Briefs (SABs) as a structuring framework. Each session included two academics and two diplomacy participants who identified opportunities and challenges linked to the SAB, and jointly sketched out solutions to be further assessed by GESDA.

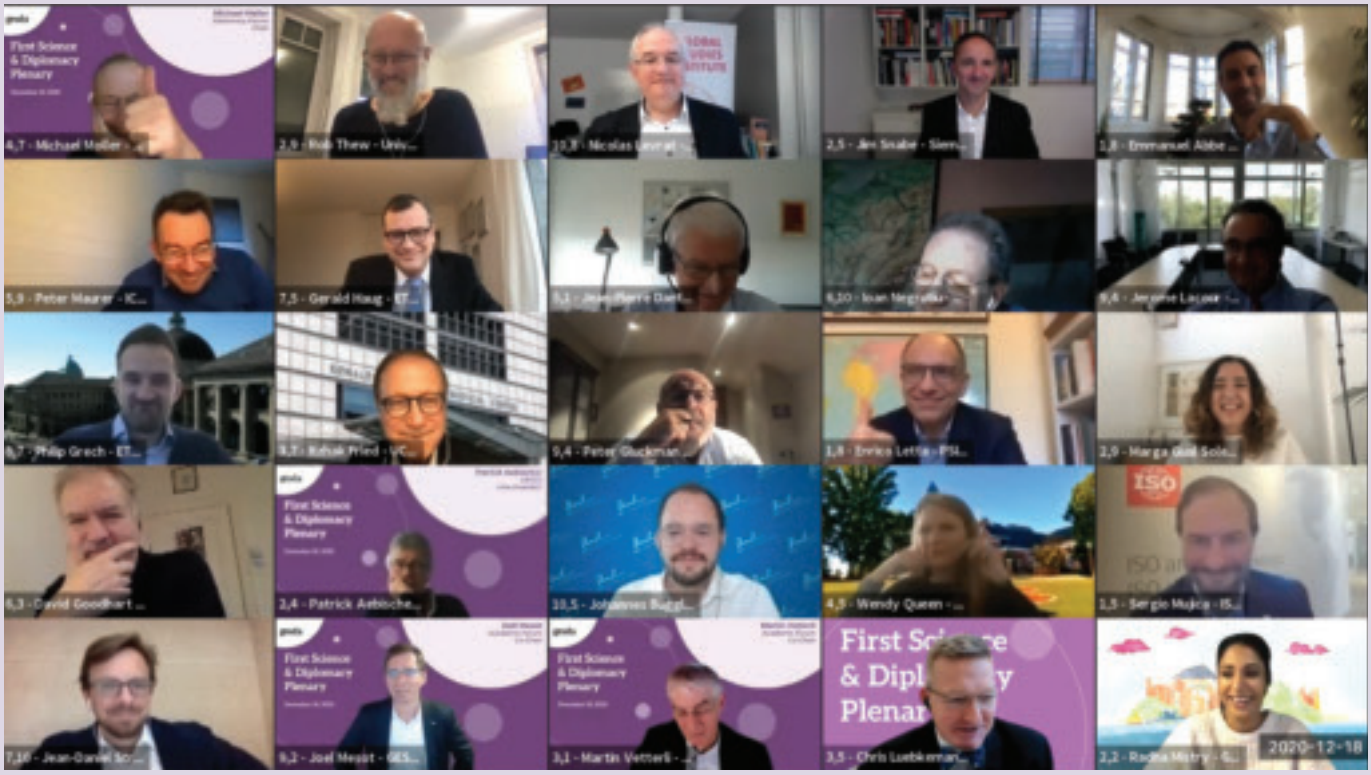
Each breakout group then presented the highlights of its discussion to the other participants, along with a list of the SABs they felt were the most relevant for GESDA to tackle. Finally, Sean Cleary, Executive Vice-Chair of the FutureWorld Foundation, moderated a panel discussion that outlined the constructive convergences among the discussed scientific breakthroughs, and confirmed the need for collective action.

Considering the number and complexity of the topics to cover, and the little time available, the intriguing discussions and high level of engagement of all participants – the Academic and Diplomacy Moderators and the experts – exceeded our expectations and demonstrated the relevance of what we have set out to achieve. This first encounter clearly pointed to a need for more dialogue and further alignment, including with a broader set of stakeholders, as we move forward.

The Science Diplomacy Plenary Meeting on 18 December 2020
A sequence in three sessions



Screenshot of the first Science & Diplomacy Plenary Meeting



A few deliverables from the first Science & Diplomacy Plenary Meeting

GESDA First Science & Diplomacy Plenary
December 18th, 2020

gesda

SAB3: Memory enhancement and cognitive engineering

Potentials:

- Cure neurogenerative disease, cure memory loss, cognitive decline
- Improve human memory
- Improving cognitive individual ability

Challenges:

1. Ethical challenges. How to prevent misuse?
Therapies and right now experimental and not accessible widely. Balance the risk and benefits. Augmentation of human abilities (IQ-what is smart?). But for memory the implications are deeper (ecPTSD)
Risk is to create new sources of inequalities and new elites

2. Policy challenge. Who should be in control?
Parallel with sensory restauration: How to regulates (law).
Risks: irreversible change or damage; incept irrelevant memories
Need to integrate neuroengineering in the lawmaking internationally. But issue of national orientation (people identify more to national level. Neural data property/neurorights. Question of consent.
Brain Hacking issue (military, mind reading)
Scale: which scale is relevant to first act?

3. Technical challenge: How to make it efficient?
neuroscience: close-loop brain stimulation systems.
engineering: affordable, mass-produced devices.
How to interface efficiently mind and machine? Do we leave it to private actors?

Solutions:
Establish neurorights (WHO, UN, G20?, regional control?)

Shape a novel scheme of governance (national then international). Patient and citizen councils.

AI/Quantum computing and Cognitive/memory enhancement should be considered together to move further

Using enhancement to compensate for starting inequalities (cognitive, educative, wealth...)

DARIA ROBINSON

Executive Director of the Diplomacy Forum

How were you able to get such meaningful engagement from the busy people involved in the Diplomacy Forum?

All the leading figures involved are clear that anticipating scientific breakthroughs is a must, yet none of them can dedicate enough resources to it. They are already heavily focused on today's needs and issues, and looking out to the next 5-10-25 years is a big challenge. Moreover, the scientific emerging topics that the Academic Forum identified as most transformative for the future of people, society and the planet, are quite complex. Understanding what the science is about and how it will impact our daily lives is not trivial. So being able to discuss this directly with leading scientists, and co-constructing solutions that make sense for all parties, is a very interesting proposition. Our Diplomacy Forum leaders understood that, and feel that it's worth their time to be able to shape how we go forward with this.

What do you believe are the key takeaways from the first Science & Diplomacy Plenary Meeting?

Our challenge at GESDA is, and will be, to constantly make sure we shepherd the different parties involved. We need to make sure they understand each other and want to work together toward a meaningful outcome. Each stakeholder group (which we call community) comes with a different perspective on the same issue. These different mindsets are all valuable and need to be taken into account in the formulation of solutions. Yet, to ensure we don't get stuck in the process, we need to have the nimbleness to decide which stakeholders we bring in at what time as we move forward (from anticipating lab discoveries to building solutions for humanity). This first meeting of our academic and diplomacy leaders underlined our challenges in creating a common understanding and aligning what we should work on. Although everyone was prepared for it, it made the gaps more tangible. Participants all stepped out of their comfort zones to anticipate and put their cards on the table, and to think and build ideas together. We emerged with some concrete proposals that could be explored immediately, and as importantly, we started a much deeper exchange on fundamental issues to put more focus on, such as governance, ethics, diversity, trust, education and multilateralism. For me, the wonderful immediate outcome is that all participants – academic and diplomacy – were willing to take the chance, to roll up their sleeves and work hard on helping move GESDA forward.

What will the next steps be in 2021 to take breakthroughs from the labs to solutions for humanity?

The next step in our Anticipatory Situation Room process will be to review each proposed idea with experts on the topic from all communities. Our Academic and Diplomacy Fora experts will assess whether these solutions can serve the intended purpose and who should be involved to develop them. Once the solutions are chosen, we will then be in a position to set up the necessary creative coalitions to take them forward.

5.3. Practical Translation & Impact Fund

2019 & 2020 in a nutshell

We are currently setting up a third GESDA commission, the Science and Diplomacy Impact Fund, under the lead of our Chairman, Peter Brabeck-Letmathe, and Vice Chairman, Patrick Aebischer, who have already raised CHF 3m from a philanthropic foundation. Taking our Fund further will require solid partnerships. We therefore conducted preparatory work in 2019 and 2020 for the Fund to be officially created in 2021.

Step 1.

Evaluating future partnerships for our Impact Fund

We conducted a thorough context analysis between March and July 2020 in order to identify the key peers and strategic partners we would like to learn from and collaborate with.

To that end, our Impact Lab started mapping the organizations that have similar goals as us, or some of the same goals, within their area of expertise. The Impact Lab identified 80 organizations with world-class expertise in one or more of the following areas:

(A) Anticipation of scientific frontiers

(B) Anticipation of new forms of multilateralism

(C) Anticipation of the role of the private sector for inclusive development

(D) Science diplomacy as tool for foreign affairs and for society

(E) Incubating and accelerating initiatives from the public sector

(F) Spearheading initiatives from the private and philanthropic sectors

(G) Including the voices of citizens and taking the pulse of society

Based on this assessment, we outlined a preliminary vision for our partnerships, taking into account each of the communities we work with, and made a list of organizations that could be interested in concrete partnerships.

Approach and community	Anticipation and foresight	Science diplomacy	Do tank action and impact orientation
Scientific community	(A) Scan R&D labs globally for next-generation research frontiers	(D) Form global scientific alliances to synthesize and translate research findings Apply a science-based approach to enhance the effectiveness of global foreign affairs	
Diplomatic community	(B) Identify future forms of effective multilateral collaboration to tackle global issues		(E) Turn scientific discoveries into practical applications for the public and multilateral sectors
Impact community	(C) Identify the future role of the private and non-profit sectors for inclusive development		(F) Turn scientific discoveries into practical applications for the private and voluntary sectors
Citizen community	(G) Include the voices and perspectives of citizens across the globe to inform and guide the selection of solutions and assist in their adoption and implementation		

This resulted in a first concrete partnership with Fondation Botnar in Basel, Switzerland, as well as preliminary contacts with other potential partner organizations, including the World Economic Forum.

Step 2.

Forming a first partnership with Fondation Botnar, on AI for health (I-DAIR)

Fondation Botnar in Basel has initiated the International Digital Health & AI Research Collaborative (I-DAIR) project, which was officially launched at the Graduate Institute Geneva on 13 October 2020 following 18 months of preparation.

I-DAIR aims to implement the recommendations of the UN Secretary General High-Level Panel on Digital Cooperation by establishing an international science-driven initiative to promote AI for health applications. Its efforts will be combined with concrete use cases on digital health. The project is being led by the Indian Ambassador Amandeep Gill, former co-director of the panel, and based at the Graduate Institute Geneva.

We have been supporting I-DAIR since day one by mobilizing significant resources. For instance, we organized two high-level scientific consultations, led numerous meetings with scientists and advised Ambassador Gill on developing a concrete, professional plan for the next phase of the initiative.

Our Academic Forum, as part of its Quantum Revolution & Advanced AI platform, conducted a thorough scientific review of the initiative in spring 2020. This review involved 15 international academic experts with diverse scientific backgrounds who provided an overall assessment of I-DAIR based on three criteria: scientific relevance and technological anticipation; potential for global impact; and critical success factors.

The general breakdown of the experts who took part in the review are given below.

Breakdown of experts (15)				
Location of host institution		Scientific backgrounds		Gender balance
Europe	6	Health systems	2	47% female
North America	2	E-health	2	
Asia	2	Bioethics	1	
Africa	5	Health economics	1	
		Computer science	5	
		Epidemiology	3	
		Data governance	1	

In a second step, a high-level review committee formulated recommendations for the further development of the project. The committee was led by Matthias Egger (member of the GESDA Board of Directors and President of the Research Council of the Swiss National Science Foundation), and composed of Prof. Lothar Thiele (ETH Zurich Associate Vice President for Information Systems), Prof. Pierre Vandergheynst (EPFL Vice President for Education) and Prof. MD. Jocelyne Bloch (University Hospital of Lausanne).

This review highlighted the potential and relevance of I-DAIR from a scientific point of view. It also identified key challenges that will need to be swiftly overcome should I-DAIR meet its short-term objective of transitioning from the current blueprint to a detailed plan with a high-level launch at the G20 Summit in spring 2022.

These challenges mainly concern providing access to cutting-edge frontier science and technology, convening global leaders in the academic, diplomatic and business communities, and setting up a highly professional, advanced and transparent governing structure with the requisite advisory bodies.

These recommendations were taken on board by Ambassador Gill and led to a favourable assessment from Fondation Botnar, paving the way to start the I-DAIR incubation period in September 2020.

SANDRO GIULIANI

Executive Director of the Impact Forum/Fund

How has GESDA's context analysis shaped the vision of future partnerships for the Foundation?

The context analysis clearly showed us that GESDA's unique selling proposition is our combination of science anticipation, diplomacy acceleration and impact translation. Consequently, our real differentiation lies in our ability to bring best-in-class representatives of different communities together to turn a scientific idea into a solution, anticipating both the topic and the engagement. Going forward, it will be essential to establish strong strategic partnerships with a selected number of leading organizations, such as the Swiss Federal Department of Foreign Affairs, the World Economic Forum, the International Science Council and the UN Chief Executive Board for Coordination.

What specifically makes GESDA attractive for philanthropic donors?

The conversations we have had with grant-making foundations and individual philanthropists have shown that there is a huge interest in our goals and activities, especially when it comes to the do tank part of our work. There are very few collaborative, multi-stakeholder initiatives that address emerging global challenges by accelerating the benefits that frontier science can bring to humanity. Such initiatives are thus of high interest for philanthropic donors. It is now on us to prove that we can deliver on our promises and live up to the high expectations these donors have of us.

Is this also true for non-Western organizations?

Absolutely. It is an important goal of ours to diversify not only our operations, but also our funding sources. As stated in the UN's sustainable development agenda, there is no longer a division of ownership or responsibility along classic funding lines. Today's emerging global challenges can be addressed only through a concerted, co-owned effort by all parties and countries from all geographic regions. It will however take a bit more time for GESDA to build up the reputation and credibility needed beyond our traditional home market.

5.4. Global Visibility and Contribution to International Geneva

2019 & 2020 in a nutshell

2019 and 2020 were punctuated by one press conference and two press releases. The press conference announced the creation of our Foundation on 19 February 2019. The first press release was issued on 9 December 2019, the day after our inaugural Board of Directors meeting, and the second on 17 December 2020, on the eve of our first Science & Diplomacy Plenary Meeting.

Most of our communications work was carried out behind the scenes, with the aim of building a global community (as discussed under Key result 3) to raise awareness about our mission and invite community members to actively participate in our initiatives and invest their energy in Geneva. These substantial awareness-building efforts, which started in 2019 and continued in 2020, led to the creation of our Board of Directors and Academic and Diplomacy Fora. The Progress Report we issued on 15 July mainly targeted this audience.

Our communications to broader audiences that are not directly linked with our development began with the publication and distribution of our online Best Reads on 29 August 2020. These newsletters "take the pulse" of what the press is saying about the four scientific frontier issues we have identified.

The Best Reads will be gradually expanded to create a digital global sounding board that takes the pulse of society and allows citizens and NGOs to participate in our work. We already stepped up these efforts in September 2020 through our regular presence on social media – in particular LinkedIn, Twitter and Facebook. By the end of 2020, we had approximately 1,000 followers on these various communication channels.

We also began forming content partnerships in summer 2020. Our first one, with the Geneva Solutions digital news platform, was launched on 29 August 2020. Here we published interviews and op-eds by Micheline Calmy-Rey (September), Michael Møller (October), Fabiola Gianotti (November) and Federal Councillor Ignazio Cassis (December). In December 2020 we enhanced our website and issued a second press release, which garnered significant media and TV coverage.

In 2020, we also participated in two events worth mentioning. The first was a joint Swiss-Geneva event on Global Digital Governance, held on 21 January 2020 at the World Economic Forum in Davos. Our Chairman Peter Brabeck-Letmathe spoke at the event, along with the Swiss Minister of Foreign Affairs; the President of the Geneva Government; the President of the CyberPeace Institute, Brad Smith; and the President of the Swiss Digital Initiative, Doris Leuthard. The second was the 2025 Data Summit held jointly by the Graduate Institute Geneva and EPFL on 25 November. The Executive Director of our Diplomacy Forum, Daria Robinson, spoke at this event.

We organized our first event, the first Science & Diplomacy Plenary Meeting, on 18 December 2020. However, we had to postpone a joint event with the Geneva Diplomatic Club that was originally scheduled on 5 November in Geneva due to COVID-19.

Last but not least, we contributed to two reports written by Fondation pour Genève: one on health, issued in December 2019 and one on Internet governance issued in October 2020. We also contributed to the launch of the Geneva Digital Atlas, published by the Geneva Internet Platform. We are also in talks to put on a joint event with the CyberPeace Institute, the Swiss Digital Initiative (both located, like us, at Campus Biotech Geneva), and other partner organizations.

Step 1.

Leveraging International Geneva

Our visibility is rooted in the reputation of International Geneva. Therefore our strategy involves amplifying the message that International Geneva is a leading global hub for multilateralism. This let us to participate in the 100th Anniversary of the League of Nations on 16 September 2019 and to contribute to various activities and reports in 2019-2020.

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Step 2.

Attracting in Geneva new audiences interested in science diplomacy

As we draw on and strengthen International Geneva as a knowledge hub of the UN, we intend to bridge the gap between established diplomacy players and new entrants by forming "creative coalitions" to address our specific initiatives. As such, the science diplomacy community we put together in 2020 is already a powerful vehicle for amplifying the resonance of Geneva's distinctive expertise and overall attractiveness.

Step 3.

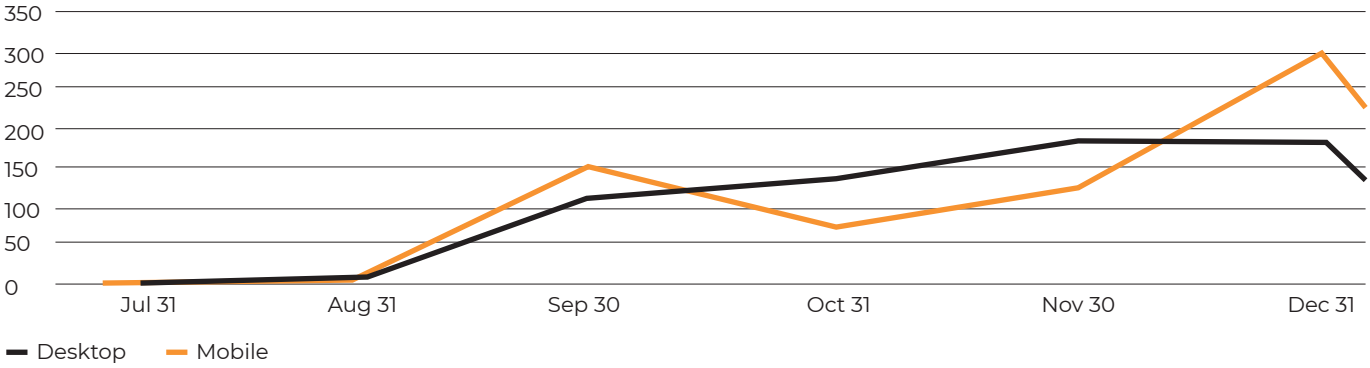
Reaching out to the broader public

We have drafted a communications strategy that describes how we plan to interact with our various audiences. Our communications are geared towards supporting our mission and enhancing its visibility and impact. The communications platforms and collaterals we developed were gradually rolled out throughout 2020.

The first indications of the effectiveness of our communications are positive. Our social-media accounts – on Facebook, LinkedIn and Twitter – are steadily gaining followers and visitors; this essentially organic growth is being fuelled by frequent, high-quality and content-heavy posts. At the end of 2020, we had 1,000 followers on our various communication channels.

Our Best Reads – a trusted media watch addressing our four scientific frontier issues – are read by approximately 200 followers weekly. And the regular pace of new subscriptions demonstrates the relevance of this new, comprehensive information source to our enlarged diplomatic and academic communities. More importantly, the Best Reads are a tool for us to "take the pulse of society" – in other words, analyze how society perceives scientific discoveries.

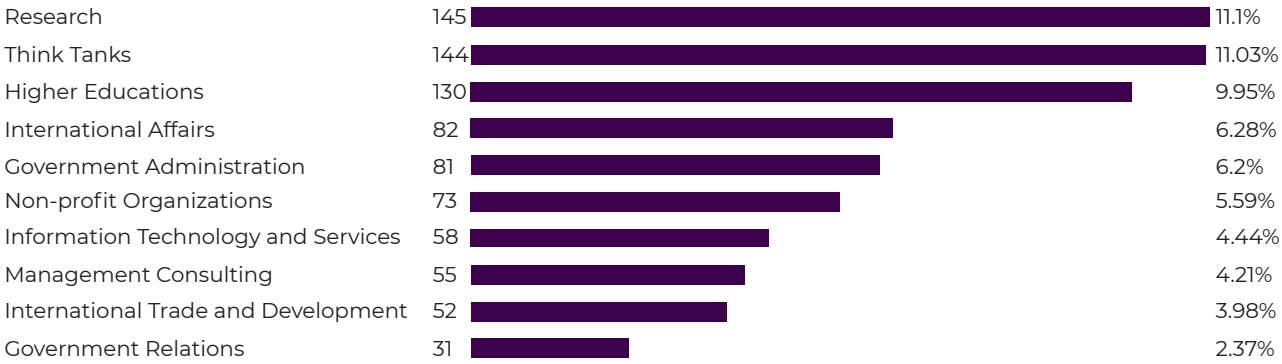
LinkedIn visitors



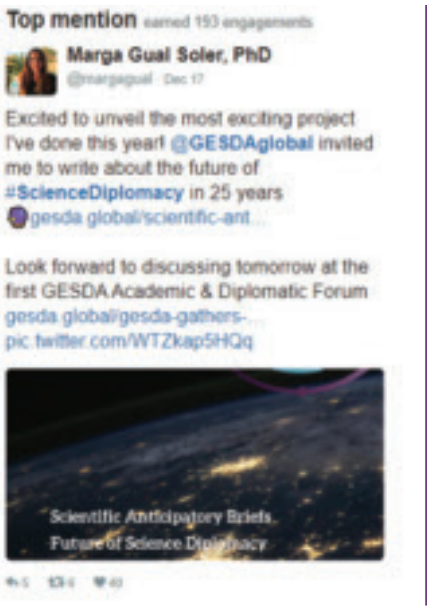
Visitor demographics

Period: **31 Jul. 2020 - 11 Jan. 2021**

Data for: **Industry**



Gaining traction on Twitter



The first indicators from our full, dynamic website, launched on 9 December 2020, are extremely encouraging with impressive initial traffic numbers that are firmly increasing.

So far, over 100 press articles have been issued mentioning GESDA since our Foundation was created. The coverage has been overwhelmingly positive, with journalists noting the useful contribution we are making to invigorate Geneva as a modern multilateral hub and give a fresh view on science diplomacy.

We entered into our first content partnership in August 2020, with Geneva Solutions – a pure-player digital news platform covering International Geneva. For an initial period of one year, we will regularly give an expert from our community an opportunity to give an interview or write an op-ed for *Geneva Solutions*.

Four such articles had been published by the end of 2020, featuring: Micheline Calmy-Rey, GESDA Board Member; Michael Møller, Chair of the Diplomacy Forum; Fabiola Gianotti, GESDA Board Member and Director-General of CERN; and Ignazio Cassis, Swiss Minister of Foreign Affairs and GESDA founder.

OLIVIER DESSIBOURG

Executive Director of Science Communication and Outreach

What are the specific challenges related to GESDA's communications?

Ours is a global, Swiss-led initiative that is just as ambitious and necessary as it is fascinating and challenging to put in place. That's because we act on many different layers and levels. This is reflected in how we interact with our various communities: the challenge here is to spread the right message, at a level tailored to their understanding, to various segments ranging from the general public and the Geneva community to high-level decision-makers. This, for instance, is what we had in mind when we developed our newly launched website, www.gesda.global, with its different sections.

What levers do you rely on?

In terms of our communications, one of the most direct levers is the interest we get when we tell people that our goal at GESDA is to anticipate the next scientific breakthroughs, so that we can help develop ways to make sure that the related technology will be available to everyone. We have also seen that even before discussing the benefits and consequences of technological advancements, there is an ever-growing and imperative need to explain today's rapidly evolving research in simple terms – that is, to "translate" lab findings into tangible, understandable and possible implications. This need has been expressed both internally at GESDA, during our diplomacy and academic community meetings, and externally, within the general public and media spheres.

What do your former science journalist colleagues say about GESDA? Does it inspire them?

The initial feedback I got when I started describing our new, original initiative was very positive and encouraging. This same reaction was also reflected in press articles: Swiss daily *Le Temps* described the work done by our Academic and Diplomacy Fora as "intended to forge a major multilateral instrument for the future of humanity". The comments on our social network accounts, which we opened in autumn 2020, are also very supportive, as our readership is growing organically and rapidly, which is a clear sign of interest.

6. Governance, compliance, finance

6.1. Governance

GESDA is governed by:

- A nine-member Foundation Board of Directors
- A Committee of the Board of Directors
- Commissions: at end-2020, these were the Academic Forum and the Diplomacy Forum; in the future we will also add the GESDA Science & Diplomacy Impact Fund
- An Executive Team of currently eight members, in charge of developing and implementing our 2020–2022 Roadmap and providing the necessary support to the above-mentioned governance bodies.

The Board of Directors officially adopted our organizational rules and procedures on 8 December 2019, which spell out the tasks and responsibilities of our governance bodies.

Foundation Board of Directors

The Board of Directors' tasks are governed by the powers granted in Article 8 of our bylaws and include:

a) Supervising our Foundation to ensure that we adhere to our stated purpose and that our resources are properly administered;

b) Developing a Roadmap setting out a calendar of activities, financial plan, HR policy, budget and procedures for generating financial statements and annual reports;

c) Establishing the fundamental principles of our Foundation, issuing and updating the organizational rules and procedures, and taking the organizational and operational measures needed to achieve our Foundation's aims and objectives in accordance with these rules and procedures;

d) Approving the Foundation's communications strategy;

e) Determining how the Foundation will be represented to third parties;

f) Determining what signing authorities various GESDA representatives will have;

g) Approving important legal documents;

h) Appointing the members of the Board Committee (with the exception of the Chairman and Vice Chairman);

i) Appointing a Secretary General;

j) Appointing independent auditors.

The nine members of the Foundation Board of Directors are currently:

Peter Brabeck-Letmathe, Chairman, appointed by the Swiss Federal Council. Vice Chairman of the Board of Trustees of the World Economic Forum (WEF); Chairman Emeritus of Nestlé SA.

Patrick Aebischer, Vice Chairman, appointed by the Swiss Federal Council. Professor of Neuroscience; former President of Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland.

Samantha Besson, Professor at Collège de France in Paris (holder of the Chair in International Law of Institutions) and Professor of Public International Law and European Law at the University of Fribourg, Switzerland.

Micheline Calmy-Rey, Professor at the Global Studies Institute (GSI) at the University of Geneva, Switzerland. Former President of the Swiss Confederation and former Swiss Minister of Foreign Affairs. Designated by the Geneva Authorities.

Matthias Egger, President of the Research Council of the Swiss National Research Foundation, and Professor of Epidemiology and Public Health at the University of Bern, Switzerland. Designated by the Swiss Minister of Foreign Affairs.

Sir Jeremy Farrar, Director of the Wellcome Trust, London, UK.

Fabiola Gianotti, Director-General of CERN (European Organization for Nuclear Research), Geneva, and Professor of Particle Physics.

Mamokghethi Phakeng, Vice Chancellor (President) of the University of Cape Town, South Africa and Professor of Mathematics Education.

Chorh Chuan Tan, Singapore's Chief Health Scientist. Former President of the National University of Singapore (NUS) and of the World Economic Forum's Global University Leaders Forum (GULF).

The Chairman's specific tasks and responsibilities are to:

a) Prepare, lead and follow up on meetings of the Board and Board Committee;

b) Take a final decision in the event of a tie at Board and Board Committee meetings;

c) Take decisions related to requests for information, rights of consultation, and convening Board and Board Committee meetings;

d) Establish and coordinate dialogue among the Foundation's founders, Board, Board Committee, Commissions and General Secretariat;

e) Sign minutes of Board and Board Committee meetings and entries in the Commercial Register;

f) Propose an initial set of organizational rules and procedures to the Board;

g) Draft a salary policy for the Foundation and submit it to the Board for approval;

h) Set the fees and salaries of Board members;

i) Define, supervise and evaluate the performance of the Secretary General.

Committee of the Foundation Board of Directors

The Board Committee's tasks and responsibilities are to:

a) At the strategic level – Conduct the Foundation's strategic affairs and ensure they are in accordance with the aims and strategy set by the Board (the strategic direction of our Foundation, as described in Article 5 of our bylaws);

b) At the operational level – Supervise the operations that it has delegated to the General Secretariat and that are under its responsibility (the operational direction of our Foundation, as described in Article 5 of our bylaws); the Committee also supports the General Secretariat in the exercise of its operational duties.

The Committee is composed of the Board Chairman and Vice Chairman, the Secretary General and the Chairs of our Commissions.

Commissions: Academic Forum, Diplomacy Forum

- We have in principle four Commissions: the Academic Forum, the Diplomacy Forum, the Impact Fund and the Friends of GESDA Club.
- During our pilot phase (2019–2022), the Chairman of the Board and Board Committee are delegated the task of establishing a schedule for the creation of Commissions, based on the development of the Foundation's operations.
- Each Commission is headed by a Chair who may be chosen from outside the members of our Board. In this case, the appointed Chair would sit on the Board in an advisory capacity and be a full member of the Board Committee. He or she may also be a GESDA employee.
- Each Commission Chair is supported by an Executive Director from the General Secretariat.
- The Secretary General or an Executive Director may be tasked with supporting several Commissions, based on the needs of our Foundation.

The Chairs of the Commissions are:

Academic Forum

Joël Mesot, Co-Chair,
President of the Swiss Federal Institute of Technology in Zurich (ETHZ), Switzerland; Professor of Physics (Dynamics of Strongly Correlated Materials and Nuclear Magnetic Resonance).

Martin Vetterli, Co-Chair,
President of Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland. Professor of Electrical Engineering and Computer Science.

Diplomacy Forum

Michael Møller, Chair,
Former Director General of the UN Office in Geneva and former Under-Secretary-General of the United Nations.

General Secretariat and Executive Team

The General Secretariat, which is headed by a Secretary General, has the following tasks and responsibilities:

- Conducting the Foundation's day-to-day business.
- Coordinating the activities delegated to it and making sure the Foundation's operations are consistent with its purpose and strategy and with decisions taken by the Board and Board Committee.
- Submitting a set of organizational rules and procedures to the Chairman for subsequent approval by the Board of Directors and Switzerland's Federal Supervisory Authority for Foundations.
- The Secretary General is assisted in the performance of his or her duties by the staff of the General Secretariat, in particular by the Executive Directors of our Commissions (Academic Forum, Diplomacy Forum, Impact Fund and Friends/Ambassadors of GESDA), as set forth in Article 5.4 of our organizational rules and procedures. The Secretary General and Executive Directors all have the status of a partner of the Foundation.
- The Secretary General may delegate certain operational tasks to his or her colleagues in the General Secretariat.
- The Secretary General will designate an individual to replace and represent him or her in the event of an absence.
- The tasks and responsibilities of General Secretariat staff are set out in their employment contracts. They are summarized in a function diagram prepared by the Secretary General and approved by the Board Chairman.

The Executive Team had the following eight members at end-2020:

Stéphane Decoutère,
Secretary General
(since 1 June 2019)

Gérard Escher,
Senior Advisor to the Board of Directors
(since 1 January 2020)

Martin Müller,
Executive Director of the Academic Forum
(since 1 September 2019)

Daria Robinson,
Executive Director of the Diplomacy Forum
(since 1 November 2019)

Sandro Giuliani,
Executive Director of the Impact Forum/Fund
(since 1 April 2020)

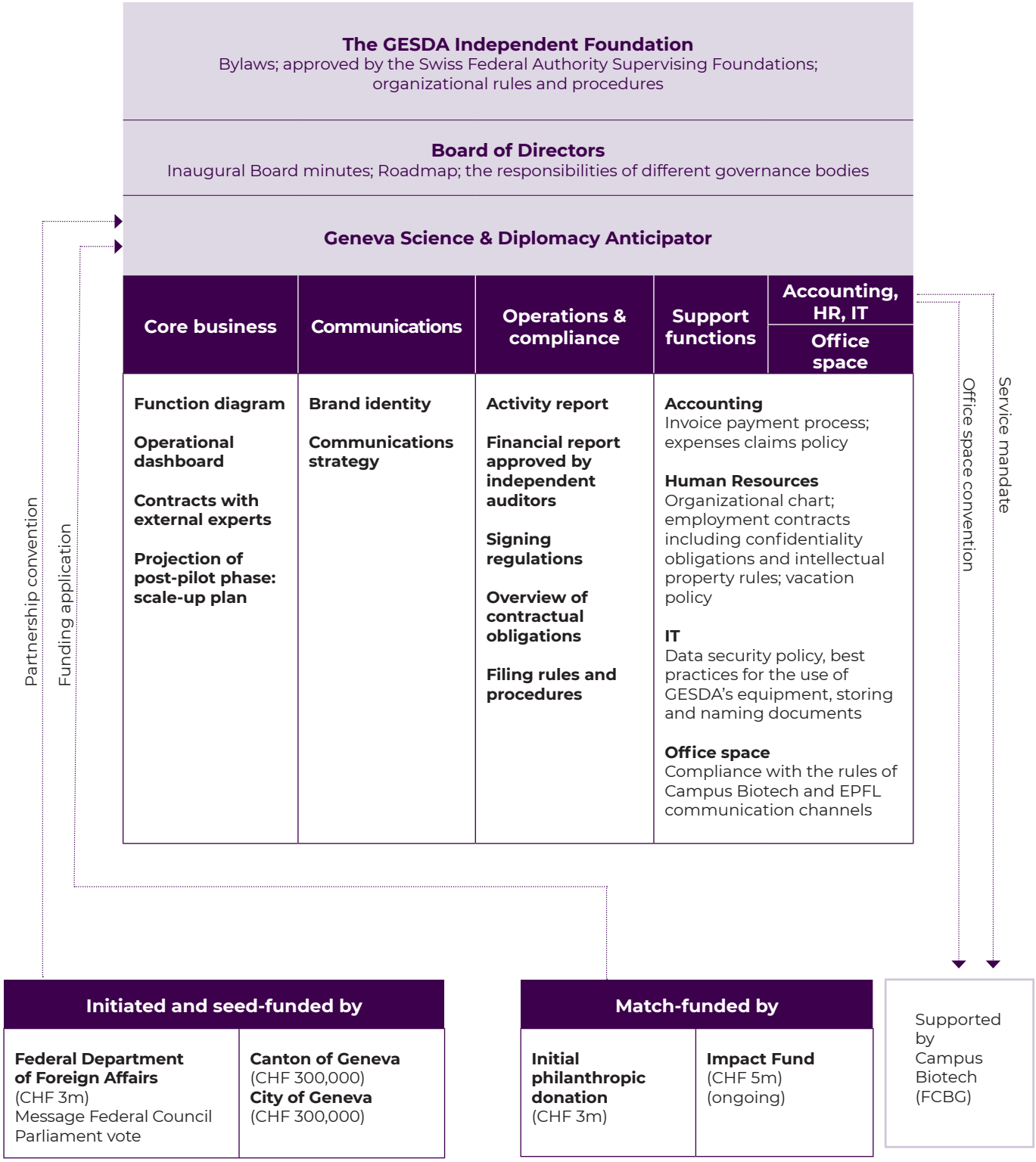
Marieke Hood,
Executive Director of Corporate Affairs
(since 1 May 2020)

Olivier Dessibourg,
Executive Director of
Science Communication and Outreach
(since 15 May 2020)

Laurianne Trimoulla,
Office and Communications Manager
(since 15 August 2020)

6.2. Compliance

Our Foundation is aligned with the highest standards of compliance. By the end of 2020, we had a solid internal control system in place to ensure the accurate monitoring of our operations and progress towards our objectives and to provide a secure framework for our activities.



MARIEKE HOOD

Executive Director of Corporate Affairs

How did you develop GESDA's compliance framework?

We wanted to make sure that from the very start of our operations – even if we are still a small team – our compliance framework is fit for purpose for the much bigger organization we intend to become from 2022 onwards. We designed our compliance framework not as a set of constraints, but rather as an instrument for greater efficiency and for building trust in our intentions and competencies. This start-up phase will be extremely short – we have just 36 months to prove our impact.
The compliance framework will enable us to monitor progress on implementing our Roadmap as closely as possible. In the same vein, our human resources, accounting, IT, legal, and other processes all contribute to our internal performance and are already fit for our scale-up phase.

GESDA is part of International Geneva. Does that affect compliance too?

Absolutely, it's the second key element of our compliance and governance framework. GESDA was created to bring something new to International Geneva, so we need to make sure we complement what other organizations are doing. We speak regularly with like-minded organizations, keeping each other informed of strategic orientations and major projects in common spheres of interest; these organizations include the CyberPeace Institute, the Swiss Digital Initiative, the University of Geneva – including the Geneva Science and Policy Interface – the Graduate Institute, the WEF, and the SDG Lab. We systematically seek fluid communications and mutual reinforcement, and we use Salesforce to keep track of our interactions with our shareholders and other stakeholders.

Are there any specific stakeholders GESDA is particularly close to?

Of course, there are our founders, with whom we've signed a four-party partnership agreement, and we are obviously in regular contact. We also keep a close eye on developments at the Swiss Federal Department of Foreign Affairs and on the Swiss government efforts to support International Geneva, for instance their recent Digital Foreign Policy Strategy. And there's the Campus Biotech Foundation, which was an early supporter of our initiative – not only hosting us on their premises but also backing us financially in the first few months, which allowed us to start up our operations quickly. Being part of such an innovative Campus is extremely stimulating, and we are striving to make it a global innovation hub also for science and diplomacy.

6.3. Finance

The Board of Directors approved our 2019–2022 budget and financial plan on 8 December 2019. Our total funding for the period, which represents a financial partnership between philanthropic organizations and our founders, is CHF 11.6 million, including CHF 8 million in private funding and CHF 3.6 million in public-sector funding (CHF 3 million from the Swiss federal government and CHF 600,000 from the Geneva government). We had already obtained CHF 3 million in philanthropy funding as of June 2019; the remaining CHF 5 million will be secured in 2021 to finance our main projects.

2019–2020 audited full-year results

Income
Public sector
Swiss federal government (confirmed)
Geneva Canton (confirmed)
Geneva City (confirmed)
Philanthropy
Financing of operations (confirmed)
Financing of projects
1. Annual Anticipatory Breakthrough Report and GESDA Summit Geneva
2. Science & Diplomacy solution accelerator
3. Science in Diplomacy Platform Geneva
Expenses
Operating expenses
Personnel costs
Indemnities for Board of Directors[A]
Salaries[B]
Social security (employer's contribution)
Communications
Global Citizens' Board
Infrastructure and expenses[C]
Projects
Project 1. Annual Anticipatory Breakthrough Report and GESDA Summit
Project 2. Science & Diplomacy solution accelerator
Project 3. Science in Diplomacy Platform Geneva
Operating Profit

A) Actual 2019-2020 including social security costs of CHF 8,298.90
B) Actual 2019-2020 including social security costs of CHF 130,087.85 from invoiced salary expenses
C) Actual 2019-2020 including investments and financial result of CHF 11,534

Budget 2019–2020		Actual 2019–2020	Difference 2019–2020	Budget 2021–2022		Total Budget 2019–2022
Sep 19-Dec 19 4 months	Jan 20-Dec 20 12 months	Sep 19-Dec 20 16 months	Sep 19-Dec 20 16 months	Jan 21-Dec 21 12 months	Jan 22-Aug 22 8 months	Sep 19-Aug 22 36 months
3,000,000	***2,200,000***	***5,200,000***	***0***	**4,900,000**	**1,500,000**	**11,600,000**
0	***2,200,000***	***2,200,000***	***0***	***600,000***	***800,000***	***3,600,000***
0	*2,000,000*	*2,000,000*	*0*	400,000	600,000	**3,000,000**
0	*100,000*	*100,000*	*0*	100,000	100,000	**300,000**
0	*100,000*	*100,000*	*0*	100,000	100,000	**300,000**
3,000,000	***0***	***3,000,000***	***0***	***4.300.000***	***700.000***	***8,000,000***
3,000,000	*0*	*3,000,000*	*0*	0	0	**3,000,000**
0	*0*	*0*	*0*	4,300,000	700,000	**5,000,000**
0	*0*	*0*	*0*	*3,000,000*	*0*	***3,000,000***
0	*0*	*0*	*0*	*1,000,000*	*0*	***1,000,000***
0	*0*	*0*	*0*	*300,000*	*700,000*	***1,000,000***
382,872	***2,115,128***	***2,185,310***	***312,690***	**5,350,988**	**4,063,702**	**11,600,000**
382,872	***1,955,128***	***2,144,957***	***193,043***	***2,726,500***	***1,728,543***	***6,600,000***
365,872	*1,732,128*	*1,915,083*	*182,917*	2,151,500	1,370,000	**5,436,583**
0	*100,000*	*113,596*	*-13,596*	*100,000*	*100,000*	***305,297***
291,475	*1,320,793*	*1,578,513*	*33,755*	*1,658,500*	*1,030,667*	***4,175,331***
74,397	*311,335*	*222,974*	*162,759*	*393,000*	*239,333*	***955,955***
8,500	*75,500*	*57,187*	*26,813*	200,000	116,000	**373,187**
0	*0*	*3,282*	*-3,282*	115,000	81,718	**200,000**
8,500	*147,500*	*180,939*	*-24,938*	260,000	160,825	**590,230**
0	***160.000***	***40,353***	***119,647***	***2,624,488***	***2,335,159***	***5,000,000***
0	*120,000*	*35,512*	*84,488*	1,724,488	1,240,000	**3,000,000**
0	*40,000*	*4,841*	*35,159*	600,000	395,159	**1,000,000**
0	*0*	*0*	*0*	300,000	700,000	**1,000,000**
2,617,128	***84,872***	***3,014,690***	***312,690***	**-450,988**	**-2,563,702**	**0**

2019–2020 Balance sheet

Assets		
Current assets	Cash and bank	3,326,717.74
	Prepaid expenses and other accruals	24,317.65
	Total current assets	**3,351,035.39**
Fixed assets	Tangible assets	9,961.89
	Total fixed assets	**9,961.89**
	Total assets	**3,360,997.28**
Liabilities and equity		
Liabilities	Short-term liabilities	131,982.73
	Other short-term accruals	165,896.45
	Total liabilities	**297,879.18**
Equity	Capital	50,000.00
	Net income	3,013,118.10
	Total equity	**3,063,118.10**
	Total liabilities and equity	**3,360,997.28**

2019–2020 Profit and loss statement

Income	Contributions from public entities	2,200,000.00
	Philanthropic donations	3,000,000.00
	Total revenue	**5,200,000.00**
Expenses	Breakthrough Report/Summit	35,512.05
	Science and Diplomacy Solution Accelerator	4,840.57
	Global Citizens' Board	3,282.05
	Personnel costs	1,915,083.01
	Communications	57,187.44
	Infrastructure and expenses	169,404.69
	Total overheads	**2,185,309.81**
	Earnings before interest and depreciation	**3,014,690.19**
	Depreciation	1,414.10
	Earnings before interest	**3,013,276.09**
	Net financial income	
	Financial income	157.99
	Financial expenses	0
	Net financial income	**-157.99**
	Net income	**3,013,118.10**

2019–2020 Cash-flow statement

Net income	3,013,118.10
Depreciation	1,414.10
Working capital	**3,014,532.20**
Increase (+)/decrease (-) in current assets	-24,317.65
Increase (-)/decrease (+) in liabilities	297,879.18
Net increase/decrease	**273,561.53**
Cash flow from operating activities	**3,288,093.73**
Investments	-11,375.99
Cash flow from investing activities	**-11,375.99**
Capital	
Cash flow from financing activities	**50,000.00**
Net increase cash and cash equivalents	**3,326,717.74**
Cash and cash equivalents at beginning of period	**0**
Cash and cash equivalents at end of period	**3,326,717.74**

Auditor's report

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To the Board of Trustees of

Geneva Science and Diplomacy Anticipator (GESDA)

Geneva, 27 January 2021

Report of the statutory auditor on the limited statutory examination [1]

As statutory auditor, we have examined the financial statements (balance sheet, income statement, cash flow statement and notes) of Geneva Science and Diplomacy Anticipator (GESDA) for the period from 9 September 2019 (date of incorporation) to 31 December 2020.

These financial statements are the responsibility of the Board of Trustees. Our responsibility is to perform a limited statutory examination on these financial statements. We confirm that we meet the licensing and independence requirements as stipulated by Swiss law.

We conducted our examination in accordance with the Swiss Standard on the limited statutory examination. This standard requires that we plan and perform a limited statutory examination to identify material misstatements in the financial statements. A limited statutory examination consists primarily of inquiries of company personnel and analytical procedures as well as detailed tests of company documents as considered necessary in the circumstances. However, the testing of operational processes and the internal control system, as well as inquiries and further testing procedures to detect fraud or other legal violations, are not within the scope of this examination.

Based on our limited statutory examination, nothing has come to our attention that causes us to believe that the financial statements do not comply with Swiss law and the deed of foundation.

Ernst & Young Ltd

Alfred Widmann
(Qualified Signature)

Licensed audit expert
(Auditor in charge)

Victoria Napoly
(Qualified Signature)

Licensed audit expert

Enclosure

- Financial statements (balance sheet, income statement, cash flow statement and notes)

[1] This version of our "Report of the statutory auditor on the limited statutory examination" as of 31 December 2020 of Geneva Science and Diplomacy Anticipator (GESDA), issued as of 27 January 2021, was created on 2 February 2021 with corrected accompanying financial statements. In the financial plan on p.9, the footnotes A, B and C were added.

gesda

Geneva Science and Diplomacy Anticipator
A Swiss Foundation located in Geneva

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