# Towards a New Paradigm of Science Diplomacy through Strategic Anticipation and Foresight

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**Rethinking Science Diplomacy for a Rapidly Changing World**

The accelerating pace of scientific and technological advancement is disrupting traditional models of diplomacy. In this rapidly evolving global landscape, there is an urgent need to cultivate a new generation of leaders - those equipped not merely to react but to anticipate and shape the future with strategic foresight. As nations become more interconnected across domains of research, technology supply chains, and manufacturing, the concept of scientific and technological autonomy becomes more complex. True autonomy is not about developing every technology indigenously. Rather, it involves securing resilient access to critical technologies through a blend of domestic capabilities, strategic alliances, and international cooperation. The extent of autonomy a country can realistically pursue depends on



Source: Geneva Science Diplomacy Week 2025

its ambitions within global science and technology ecosystems and its control across the value chain. Here, science diplomacy emerges not as an end goal but as a key enabler - empowering nations to drive innovation, navigate interdependence, and shape inclusive, future-ready development agendas.

Science diplomacy is increasingly recognised as a mechanism for nations to exert influence through the production, exchange, and governance of scientific knowledge. While rooted in principles of transparency, ethics, and shared responsibility, it is equally shaped by the complex realities of power dynamics, geopolitical competition, and systemic crises. In today's context, marked by pandemics, climate shocks, digital disruption, and new forms of conflict, science diplomacy must bridge the idealistic and the pragmatic. Over the past seven decades, science has become central to global politics. Institutions like the IPCC and CERN exemplify how scientific collaboration underpins diplomacy and multilateralism. Yet, the global order is shifting. Geopolitical tensions and fiscal pressures strain multilateral frameworks. In response, science diplomacy is increasingly driven by bilateral, regional, and non-state actors - from tech giants and private labs to transnational civil society. This calls for a reimagined model of diplomacy that extends beyond statecraft into a dynamic, ecosystem-wide engagement. Leaders must be prepared to navigate this terrain, not just as diplomats but as systems thinkers and coalition-builders who can harness science diplomacy to safeguard autonomy, strengthen resilience, and catalyse shared global progress.

**GESDA: Geneva Science and Diplomacy Anticipator**

Founded in 2019, the Geneva Science and Diplomacy Anticipator (GESDA) brings together the Federal Government of Switzerland, the Republic and Canton of Geneva, and the City of Geneva to strengthen Geneva's role as a hub for multilateralism and innovation. Its motto, "Use the future to build the present", reflects a unique mission: anticipate scientific breakthroughs and translate them into global action. GESDA's dual identity as both a think tank and a "do tank" positions it at the nexus of science, diplomacy, and societal impact. It builds on Geneva's long-standing legacy of hosting international scientific institutions and diplomatic bodies. Born from the 2015 Geneva+ initiative, GESDA was created to:

1. Anticipate and assess the implications of technological advancements on global affairs
2. Break down silos between scientific communities, policymakers, and the private sector
3. Forge innovative partnerships to address cross-cutting global challenges

In an age where science progresses exponentially, GESDA's anticipatory framework enables global actors to co-develop timely, inclusive, and actionable responses, particularly benefiting emerging economies and underrepresented stakeholders.

**GESDA's Science Diplomacy Week 2025**

The 2025 edition of GESDA's Science Diplomacy Week brought together 36 emerging leaders from around the world for an immersive learning and networking experience. With backing from Wellcome Trust, this initiative reflects GESDA's broader mission: to develop a new generation of anticipatory leaders in science diplomacy. A centrepiece of GESDA's approach is its Science Breakthrough Radar, an annual foresight report that maps emerging technologies over 5-, 10-, and 25-year horizons. The latest edition covers 40 breakthrough topics across five scientific domains, integrating perspectives from the Pulses of Science, Diplomacy, Impact, and Society. Martin Müller, GESDA's Executive Director of Science Anticipation, introduced how this radar informs all GESDA programming during the GESDA's Science Diplomacy Week 2025.

**Insights: Anticipatory Science Diplomacy in Practice**

GESDA's Science Diplomacy Week 2025 strongly emphasised on strategic anticipation - the ability to



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use foresight not just for long-term visioning but to inform present-day decision-making. The focus was on moving beyond reactive governance to proactively detect weak signals, interpret emerging trends, and co-develop adaptive strategies that support organisations and countries in navigating complexity and uncertainty.

One highlight was the Science in Diplomacy Lab (SiDLab) at the University of Geneva (UNIGE), which demonstrated how computational tools and systemic analysis can strengthen science diplomacy. By leveraging computational science, SiDLab showcased how policymakers can quantify uncertainties and better understand the science-policy interface - deepening insights into the mechanisms driving foreign policy and international cooperation. The program also incorporated experiential learning through innovative simulations like The Neurotechnology Diplomacy Game, where participants grappled with the fallout of a hypothetical ransomware attack on brain implants. These role-based simulations enabled participants, spanning scientists, diplomats, industry leaders, and citizens, to explore the ethical, political, and technical dilemmas posed by science-driven futures. Such exercises challenged assumptions and encouraged integrative thinking, offering a safe space to test policy responses and rehearse future scenarios.

At the heart of the program was strategic anticipation as an action-oriented skillset - the ability to apply foresight to real-world governance. Participants engaged in exercises that explored future scenarios of global governance, learning how to differentiate between emerging trends and weak signals. Special focus was given to technologies with exponential growth, such as AI-assisted systems, autonomous weapons, deepfakes, and synthetic biology, and the compounding security risks they present. As technological change accelerates, the potential for systemic disruption rises, underscoring the critical role of anticipatory diplomacy. Future science diplomacy leaders must be equipped not only to understand scientific breakthroughs on the 5, 10, and 25-year horizon, but also to assess their social, political, and planetary impacts. Anticipatory methods grounded in cutting-edge science and diplomacy can enhance negotiation, conflict resolution, and global governance in an era of cascading global challenges.

**Leveraging Anticipatory Science Diplomacy Tools for India**

India's emergence as a scientific and technological power is both promising and complex. In a world where breakthroughs in AI, synthetic biology, and neurotechnology are reshaping diplomacy, governance, and global cooperation, India must harness anticipatory science diplomacy, not merely as a tool of engagement but as a strategic capacity for shaping its future. Insights from the GESDA Science Diplomacy Week 2025 offer valuable lessons. They emphasise that anticipatory diplomacy is not about prediction alone, it's about preparing institutions, ecosystems, and leaders to detect weak signals, interpret emerging trends, and co-create inclusive, adaptive responses. It demands a systems mindset and the ability to operate across science, policy, and society. This approach is critical for India as it navigates rapid technological shifts, national ambitions, and global responsibilities. To realise this vision, India must act across three strategic dimensions:

1. Building Integrated Innovation Ecosystems - India's talent, institutions, and startups are world-class but fragmented. Siloed operations and limited cross-pollination between research, industry, and policy constrain their collective impact. An ecosystem-wide engagement model should foster mission-driven collaboration, bringing together scientists, diplomats, entrepreneurs, and civil society to align innovations with long-term national and planetary goals.
2. Institutionalising Foresight and Anticipation - Strategic anticipation must be cultivated as a core leadership skill. GESDA's simulations and the Science Breakthrough Radar illustrate how structured foresight can guide real-time governance. India should establish dedicated Centers of Excellence in Anticipatory Science Diplomacy, serving as interdisciplinary hubs for research, training, and policy experimentation. These centres can simulate future scenarios, develop response strategies, and serve as incubators for science-policy talent.
3. Thinking Globally, Acting Locally - India's innovation trajectory must be globally informed yet contextually rooted. Learning from international best practices, whether in CERN's open science model or SiDLab's use of computational tools, can enhance local capability. Indian institutions must internalise the "Think Global, Act Local" ethos to tackle uniquely Indian challenges, from agritech to healthcare, with scalable, globally relevant solutions.

By embedding anticipatory tools and mindsets across its science diplomacy architecture, India can position itself not just as a participant but as a shaper of global futures. This is not only a strategic imperative, but it is also a responsibility to ensure that the benefits of scientific progress are inclusive, ethical, and sustainable for all.