USING SCIENCE FOR/IN DIPLOMACY
FOR ADDRESSING GLOBAL CHALLENGES

S4D4C EUROPEAN SCIENCE DIPLOMACY ONLINE COURSE

MODULE 3

Who Are the Science Diplomacy Stakeholders?

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S4D4C EUROPEAN SCIENCE DIPLOMACY ONLINE COURSE MODULE 3 – WHO ARE THE SCIENCE DIPLOMACY STAKEHOLDERS?

Table of Contents

3.1 Introduction to the module 4
3.1.1 Learning objectives and experts' preliminary insights 4
3.1.2 The S4D4C Approach to Science Diplomacy: a Multi-Stakeholder Endeavour 5
3.1.3 Science Diplomacy Stakeholders. Our Proposal 7
3.2 Types of Science Diplomacy Stakeholders 7
3.2.1 Governmental Stakeholders 9
3.2.2 Intergovernmental and Supranational Stakeholders 15
3.2.3 Research Stakeholders 18
3.2.4 Academic Stakeholders 21
3.2.5 Private Sector Stakeholders 23
3.2.6 Civil Society Stakeholders 24
3.3. Types of Science Diplomacy Networks 26
3.3.1 Sub-national Networks 27
3.3.2 National Networks 31
3.3.3 Sub-global Networks 41
3.3.4 Global Networks 48
3.4 Question Time ..... **¡Error! Marcador no definido.**
3.4.1 Brainstorming Questions ..... **¡Error! Marcador no definido.**

3.1 Introduction to the module

3.1.1 Learning objectives and experts' preliminary insights

Learning objectives

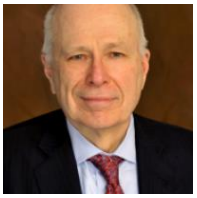
At the end of this module you will have learned:

- Who are the main stakeholders of science diplomacy at the local, national, sub-global and global level
- What is the nature of their work
- How they interact and create collaboration networks, and be able to explain different types of networks

Please, bear in mind that the examples given throughout the session are illustrative and not exhaustive.

What the experts think

We have asked a number of experts to share who they think the main stakeholders in science diplomacy are. They will introduce you to different actors from both the government sphere (especially foreign affairs ministries and science, technology, and innovation ministries) and the scientific community. The role of international stakeholders is also mentioned, as well as that of civil society organisations. Watch the videos below:

	**William Colglazier** Editor-in-Chief of *Science & Diplomacy* and Senior Scholar in the Center for Science Diplomacy at the American Association for Advancement of Science (AAAS)
	How many types of science diplomats are there? What are their positions and in which institutions do they work? Video Link to YouTube

	**Nadia Meyer** Project manager in the German Aerospace Centre (DLR)
	What are the main stakeholders in science diplomacy internationally? Video Link to YouTube

	**Marga Gual Soler** Senior project director in the Center for Science Diplomacy at the American Association for Advancement of Science (AAAS)
	Who are the main stakeholders in science diplomacy internationally? Video Link to YouTube

	**Peter Gluckman** Chair of the International Network for Government Science Advice (INGSA)
	What other international stakeholders relevant to science diplomacy are there? Video Link to YouTube

Some Questions to reflect on after watching the videos

These questions are posed for you to reflect individually about the main messages put by our experts in science diplomacy. Please, take some time to think about them.

- Do you think science diplomacy is all performed through classic diplomatic relations among countries?
- Do you think there is space for researchers and researchers associations, for instance, to play a role in science diplomacy objectives and scientific advice for foreign affairs?
- Do you think there are enough interfaces for these stakeholders to interact and mutually enrich their work?

3.1.2 The S4D4C Approach to Science Diplomacy: a Multi-Stakeholder Endeavour

The S4D4C consortium celebrated its 1st Global Meeting "EU Science Diplomacy beyond 2020" in Madrid in December 2018. The main output of the conference was the publication of The Madrid Declaration on Science Diplomacy (S4D4C 2019), which has been acknowledged as one of the first public calls to all "actors", including the general public and scientists themselves, as key stakeholders in the science diplomacy endeavour. For more information about this Declaration, you may go back to **Topic 2.3.5. The Madrid Declaration on Science Diplomacy**.

Joint science diplomacy objectives are possible where actors converge around such common challenges. Therefore, science diplomacy goes beyond international science

collaboration, as it tackles interests that go beyond the scientific ones and may directly or indirectly serve to advance diplomatic goals.

This approach has a number of implications, as science diplomacy is not understood as a thread of diplomacy but as a wider framework in which a rich variety of stakeholders interact. Of course, this set up brings many advantages (the more agents working towards the same goal, the better) but it also comes with some challenges that need to be carefully understood and tackled (coordination, training, deep understanding and respect of each stakeholder's interests, etc.)

You may watch in the following video the main highlights of this 1st S4D4C Global Meeting through the experiences of the different science diplomacy stakeholders in attendance. Through this video you will be introduced to our multi stakeholder approach on science diplomacy.

https://youtu.be/PgmnUlQPs4Y

Read more about the Madrid Declaration on Science Diplomacy here:

- S4D4C (2019). The Madrid Declaration on Science Diplomacy. Madrid: S4D4C (Link) Available on:.

Values and Governance Systems: Transversal aspects that help us to make sense of the complex, multi-level, multi-actor, multi-faceted concept of science diplomacy

In our report we have identified 10 transversal aspects of science diplomacy that we have called 'matters' because they both comprise the substance of science diplomacy, and they matter, in the sense that they are consequential for both practically and conceptually understanding science diplomacy. We want to highlight here two of them:

Values – Science diplomacy efforts are influenced by two distinct sets of values, political-social values and scientific values. The former often provide the grand objectives for science diplomacy initiatives, but the later (which include universalism, communality, disinterestedness, organized skepticism, responsibleness, precautionary, openness, and truth) can form the basis of cooperation with countries that may not share political values. Different types

of science diplomacy, as identified by the Royal Society/AAAS framework, engage with different sets of values in distinct ways.

Governance systems – Governance systems are unique in their networked configuration of actors, stakeholders, processes, instruments, and institutions. We can better understand them by looking at three types of nodality (being in the middle of the network): nodality of science - how central science is vis-à-vis diplomacy, nodality of level - which levels (global, subglobal, national, subnational) are most central, and finally how the nodes cluster to create core and peripheral elements of the governance system. Nodality in the science diplomacy system provides opportunities to exert leadership and shape agendas.

Read more

- Young, Mitchell, Charlotte Rungius, Ewert J Aukes, Lorenzo Melchor, Eliska Černovská, Eliska Tomolová, Laure-Anne Plumhans, Pauline Ravinet, Tim Flink, and Ana Elorza Moreno (2020): *The 'Matters' of Science Diplomacy: Transversal Analysis of the S4D4C Case Studies*. Vienna: S4D4C (Link)

3.1.3 Science Diplomacy Stakeholders. Our Proposal

In the following topics, we will provide an overview of different types of stakeholders with an interest or a say in science diplomacy. We will identify what these interests are and, finally, give real life examples. Throughout all these topics, you will get to watch short video interviews from different experts, who will explain to you their personal perspectives.

We propose to sort the different stakeholders working on science diplomacy is a simple, yet effective one and it is based on the stakeholder type. Once we have gone through this classification, we will devote some time to reflect on how these stakeholders operate and collaborate in different networks.

Thus, our proposal has two levels:

1. **Types of science diplomacy stakeholders**, where stakeholders of different nature are listed and explained

2. **Types of science diplomacy networks**, where different types of stakeholders interact and collaborate creating networks with different purposes

3.2 Types of Science Diplomacy Stakeholders

According to the nature of their work we identify different science diplomacy stakeholders (Figure 1):

- **Governmental stakeholders**: involving national and subnational governments in science diplomacy.

- **Intergovernmental and supranational stakeholders**: in other words, multilateral international and supranational organisations that transcend national boundaries and that are directly engaged in global governance.
- **Research and academic stakeholders**: involving research and academic actors with a stake in science diplomacy cover from research councils to universities, research centres, national academies, learned societies, and also individual researchers.
- **Private sector stakeholders**: including private companies, which can be trans- or multi-national companies as well as Small and Medium Enterprises (SMEs) and Start Ups, can be also involved in science diplomacy.
- **Civil society stakeholders**: including national and transnational NGOs, civil society organisations, private charities, and even individuals acting as science diplomacy actors.

Figure 1. Stakeholders' Map. Source: own elaboration.

However, this proposal has certain challenges that are worth mentioning here:

1) Level of action: all stakeholders may operate at the local, subnational, national, sub-global and transnational levels. Industry can have transnational companies but we do not include them within the transnational and supranational stakeholders because these are focused on those bodies directly related to global governance.

2) Governments are the actors at the international bodies: in International Relations Theory, realists consider transnational organisations as tools that respond to the interests of nation states, which are the actors setting up and steering the governance of transnational bodies. On the other hand, idealists and transnationalists uphold that transnational organisations have certain degree of

action to implement policies, set global rules and lead global negotiation that foster collective action and consensus from nation states. Because of the international nature of science diplomacy, we want to cover intergovernmental and supranational stakeholders as a separate actor but understand that they are highly dependent on their nation states' interests. Regarding supranational bodies, nation states come together in a process studied by the integration theory to constitute a supranational organisation that gathers legal jurisdiction, policy competences, sovereignty from its member states, executive powers, etc. Again, nation states are actors in this integration process but the supranational body has a degree of manoeuvring worth noting.

Research is everywhere: research and individual researchers can be found not only in the academic sector, but also in industry, government, NGOs, think tanks, and other sectors. We associate it here to the academic sector to focus on academic research and the concrete role of academic institutions and individual researchers in science diplomacy.

What the experts think

Learn whether science diplomacy goes beyond traditional diplomacy between nation states by listening to some experts below!

	**Peter Gluckman** Chair of the International Network for Government Science Advice (INGSA)
	Is science diplomacy a matter for classic diplomacy only? Is there room for other type of stakeholders? Video Link to YouTube

	**Robin Grimes** Chief Scientific Adviser (CSA) to the UK Ministry of Defence on nuclear science and technology matters. Former CSA to the UK Foreign and Commonwealth Office (FCO). Professor of Materials Physics at Imperial College London
	Is science diplomacy a matter for classic diplomacy only? Video Link to YouTube

3.2.1 Governmental Stakeholders

Nation states are one clearly identifiable type of stakeholder in science diplomacy. More and more, national governments in the world are developing and deploying science diplomacy strategies. Usually, these strategies are the product of joint efforts of different

ministries or government departments with experience in either science and technology policies and/or foreign affairs, but the variety of formulas is vast.

Having said this, **globalisation with its complex and interrelated flow of people, information, technologies, ideas, resources and media has changed the way diplomacy is being undertaken**. These processes are contributing to elevate the role of **subnational government stakeholders** in the global scene. As a consequence, different levels of the public administration (from the regional to the local level) may also play an interesting role in science diplomacy through a wide array of executive actions and implementation channels.

National Governments

Nation states are traditionally the most important stakeholder in the system of international relations. They are characterised by being granted sovereignty, international recognition, and legal equality status. In their efforts to engage, compete or cooperate with other nation states, they may harness their elements of hard power (military, economic, etc.) or elements of soft power (the use of culture, science, tourism, etc.) to influence societies abroad.

Indeed, as seen in **Lesson 2.3. Science Diplomacy in the World Today**, science diplomacy has many different conceptual approaches, some of which focus on how Nation States use science diplomacy as a soft power tool trying to promote core values and to influence the opinions and behaviour of other nation states in a non-coercive manner (Nye 2004).

Having said this, nation states face the challenge of a changing world where diplomacy and international relations are no longer their unique realm. The contemporary changing international scene welcomes many diverse new stakeholders and challenges nation states to seek coordination among all their national and subnational government departments with different responsibilities (diplomacy, commerce, science, technology, education, innovation, etc.)

Main interests

Nation state governments usually deploy science diplomacy strategies that aim to raise the importance of science, technology and innovation (STI) in the country's foreign policy affairs.

The most common objectives of these strategies are:

- Strengthening bilateral scientific collaborations and the support of countries' STI interests
- Facilitating evidence-informed positions of the country in multilateral endeavours and global challenges
- Bringing new scientific opportunities and scientific talent to the country

- Using scientific collaborations as a tool for improving bilateral relations with strategic countries
- Acknowledging STI as a key asset of the country in its image abroad
- Facilitating country companies to have a good place in the international innovation market as well as in the research and development international arena

Although these strategies are government-led, the importance of other government bodies, third sector organisations, research funding and performing organisations, industry and the research community are commonly acknowledged as key elements of these strategies and their eventual success.

How they operate

Governments deploy their strategies at different layers: from high-level coordination among ministries or governmental departments to the deployment of scientific counsellors or attachés in strategic Embassies abroad and/or the appointment of high-level science advisors to Ministries of Foreign Affairs.

Budget-wise, there are again a number of formulas: cooperation among ministries, one ministry taking full responsibility, etc. As many of our countries are facing unprecedented challenges from COVID-19 the strain on our governments is extreme, departments with different portfolios are obliged to collaborate and better coordinate. Different approaches are used depending on the country (van Langenhoven 2017).

Main challenges

For all countries the coordination among different ministries is a challenge. Not only against this backdrop, training of the diplomatic corps in science and technology matters, and training of STI officials with regard to diplomatic issues and the creation of interfaces, administrative processes and trust-building among different stakeholders are examples of common challenges.

Also, acknowledging the diversity of the science diplomacy ecosystem and learning how to make the most out of it is very important. Moreover, this must be done whilst respecting different stakeholders' independence and a country's self-interests.

What the experts think

In the videos below, you will get an overview of the national science diplomacy strategy of a specific country: Spain. You will be introduced not only to the need for a close coordination between different governmental departments, but also to the responsibilities that a diplomat or a STI official have when deployed to Spanish embassies abroad. Lastly, you will explore an alternative perspective, that of a STI official in the British Embassy in Spain who aims at strengthening bilateral STI collaborations.

For detailed analysis of different national strategies on science diplomacy, check the links in the box below and additional information in **Lesson 5.2 Regional and National Science Diplomacy Strategies**.

	**Izaskun Lacunza** Head of the International Projects Unit, Spanish Foundation for Science and Technology (FECYT)
	What makes the Spanish science diplomacy strategy different from other models? Video Link to YouTube

	**Miguel Oliveros** Minister Counsellor of Cultural and Scientific Affairs at the Spanish Embassy in London
	What are the competences and skills a good diplomat needs to have in order to embed themselves in a big Embassy as the Spanish one in the UK? Video Link to YouTube

	**Ana Elorza** Science advice coordinator, International Projects Unit, Spanish Foundation for Science and Technology (FECYT). Former science coordinator in the Spanish Embassy in Washington DC
	What were your main responsibilities at the Embassy of Spain in Washington DC? What are the competences and skills necessary for a science diplomat to work at an embassy? Video Link to YouTube

	**Sara Cebrián** UK Science and Innovation Network Delegate in Spain & Portugal, British Embassy in Madrid
	What were your main responsibilities at the British Embassy in Madrid? Video Link to YouTube

Read more!

A few examples of national governmental science diplomacy strategies are listed below

Science diplomacy strategies from national government stakeholders

- Flink, Tim, and Ullrich Schreiterer (2010): "Science diplomacy at the intersection of S&T policies and foreign affairs: toward a typology of national approaches." *Science and Public Policy*, Volume 37, Issue 9, November 2010, Pages 665–677, https://doi.org/10.3152/030234210X12778118264530.
- Van Langenhoven, Luk (2017): *Tools for an EU science diplomacy*. European Commission. Luxembourg: Publications Office of the European Union, 2017. (Link)
- Ruffini, Pierre-Bruno (2017). *Science and Diplomacy. A New Dimension of International Relations*. Science, Technology and Innovation Studies. Cham: Springer International Publishing. (Link)
- Sunami, Atsushi; Tomoko Hamachi, and Shigeru Kitaba (2013): "The Rise of Science and Technology Diplomacy in Japan." *Science & Diplomacy*, Vol. 2, No. 1 (March 2013) (Link).
- Report on science, technology and innovation diplomacy in Spain (Link)
- Science diplomacy for France (in French) (Link)
- Gluckman, Peter D.; Stephen L. Goldson, and Alan S. Beedle (2012): "How a Small Country Can Use Science Diplomacy: A View from New Zealand." *Science & Diplomacy*, Vol. 1, No. 2 (June 2012) (Link).
- Epping**,** Elisabeth (2020): "Lifting the smokescreen of science diplomacy: comparing the political instrumentation of science and innovation centres". In: Humanit Soc Sci Commun, Vol. 7, 111 (September 2020). (Link)

More about soft power

- Nye, Joseph (2004): *Soft Power: The Means to Success in World Politics*. New York: PublicAffairs.

Subnational Government Stakeholders

Increasingly, subnational levels of public administration are key stakeholders in the global scene. These subnational administrative divisions receive different names depending on the country (see link).

States, regions, districts, cantons, provinces, *comunidades autónomas*, are just some of the names that refer to the first few administrative levels of subnational governments. They usually engage internationally to raise the profile of these regions for cultural and economic purposes. Some may deploy regional STI policies to promote research and development as well as talent attraction. Recently, some are even exploring ways to engage with other stakeholders in order to deploy a joint science diplomacy strategy.

Large metropolitan areas have always had a global impact. Increasingly, some are starting to design and execute science diplomacy strategies both to increase their presence worldwide and project an image of a friendly ecosystem for STI actors and potential investments. For instance, Mexico DF is experimenting with new ways to include science into different subnational government departments. Other cities rely on partnerships with other key stakeholders to design a science diplomacy strategy, this is the case of the Barcelona SciTech DiploHub, which will be further developed on the Topic **3.3.1 Local Networks** as an example of a network bringing together civil society, research and academia, industry, and subnational government stakeholders.

So, although we are mostly addressing national governments strategies under this topic, it is worth being aware of new subnational governmental layers that are raising their science diplomacy profiles.

Main interests

As said above, among the main interests for these subnational government stakeholders you may find the following:

- Promotion of the regional/local STI ecosystem to attract foreign investments and scientific talent
- Fostering STI collaboration between institutions from different regions and cities
- Facilitating regional/local companies to have a good place in the international innovation market as well as in the research and development international arena
- Increasing the importance and impact of STI policies in the governance of their own region/city
- Increasing their role in international summits and organisations through the use of their STI systems
- Networking with other cities for addressing common challenges, such as climate change

Main challenges

The main challenge for coordination in a multi-actor-network is the sorting out of delegation competences. In democratic states, political actors as the rightful custodians of societal interests (if these are even often only opaquely expressed), have little steering competences over scientific actors (both individuals and their representing institutions) and need to resort to soft governance approaches (incentivising mechanisms, competition, networked information flows, sensitive use of language). But to gain impact on the global scene, to tap into international markets, to attract investment and talent to regions, it is essential for all these actors to find a common ground and coherence first.

It is also important to recognise that these actors and specially research and innovation networks also bring different standards to the conduct of international S&T co-operation that may not be common across countries, generating scientific and societal challenges.

What the experts think

Learn from an initiative that is trying to put Barcelona on the global map as a city for science, technology, and innovation!

	Alexis Roig Barcelona SciTech DiploHub CEO

	*What role can a city play in science diplomacy?* Video Link to YouTube

3.2.2 Intergovernmental and Supranational Stakeholders

The impact of intergovernmental and supranational stakeholders on international relations has been increasing for decades, and so is their influence in science diplomacy, diplomatic summits and foreign policy goals.

In this topic we will cover those trans and supranational stakeholders hat are directly involve in global governance. In our proposal, international non-governmental organisations (NGOs) would fall within the category of civil society organisations. In addition, international research performing organisations e.g. large research infrastructures with intergovernmental international governance would fall within the category of research and academic stakeholders.

Intergovernmental organisations are composed of multiple public entities. The governance framework and scope of these international organisations are based on the establishment of intergovernmental agreements. They are international organisations set up and steered by states, sometimes with involvement of other international organisations whose voices count state-like.

Supranational stakeholders refer to the process of integration of different nation states under the umbrella of a supranational entity actively transferring part of their sovereignty and ensuring coordination and implementation of common policies in all states. The paramount current example is the European Union and is covered in this topic, but it will be developed further in **Module 4. How Does the EU Practice Science Diplomacy?**

Both stakeholders especially reach a crucial dimension in science diplomacy **when addressing sub-global and global interests/challenges**, which both require putting forward international policies to raise awareness and get many nation states and other stakeholders involved and collaborating with each other.

Explore the tabs below to learn more about these stakeholders!

International Stakeholders

An **international organisation** is an organisation established by a treaty, agreement or any other instrument under international law, and often possessing international legal status. They are mostly composed of sovereign nation states, but other international actors may be also involved.

There are many different criteria to group international organisations. From the number of members (universal, if unlimited; regional, if limited) to many different groups depending on their scope, area of influence, governance framework, etc.

Traditional examples of international organisations are the United Nations (UN), UNESCO, as one of its 17 specialised agencies, the International Monetary Fund (IMF), The Organisation for Economic Co-operation and Development (OECD), the World Health Organisation (WHO), the World Trade Organisation (WTO).

All these organisations have divisions or projects related to science diplomacy even though sometimes they will not be identified as such. For instance, **UNESCO** plays an important role in the field of science diplomacy (see here), within their Science, Policy and Society department based on UNESCO's universal mandate for science for peace and development since 1946. UNESCO has been key in creating:

- Science centres and organisations: such as CERN, SESAME, The Abdus Salam International Centre for Theoretical Physics (ICTP), The World Academy of Sciences (TWAS), or the Israeli-Palestinian Science Organisation (IPSO); some of which will be covered in **3.2.3 Research and Academic Stakeholders**
- *International science programmes*: such as the International Hydrological Programme (IHP), the Man and the Biosphere Programme (MAB), the International Geoscience and Geoparks Programme (IGGP), the International Basic Sciences Programme (IBSP) or the Intergovernmental Oceanographic Commission (IOC)
- *Science-Policy interfaces*: such as the World Science Forum, the Scientific Advisory Board of the UN Secretary-General, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

Main interests

Intergovernmental Transnational Stakeholders' main role is helping to set the international agenda, mediating political negotiations, providing a forum for political initiatives and catalysing international cooperation and collaboration among members.

In fact, a common goal for all international organisations is that they do not seek the particular interest of one of their members, but the common interests of their stakeholders.

Their objectives, goals or interests are properly addressed in their foundational mandate or agreement.

In science diplomacy they are fundamental in establishing a global agenda for common policy goals such as the United Nations' Sustainable Development Goals (SDGs) for 2030, which triggers policy implementation and cooperation among many different countries and stakeholders.

Specific regions such as the Mediterranean, Antarctica, or the Middle-East have certain needs and demands that make different national governments establish joint partnerships and institutions to execute science diplomacy actions. **Regional international stakeholders** are key to foster diplomatic ties and collaboration in general and also scientific cooperation in particular between scientific members to tackle regional challenges. The **Union for the Mediterranean** is one example that brings together 43

countries to promote dialogue and cooperation in the Euro-Mediterranean region around human and sustainable development. You may see below a video with detailed explanation.

Main challenges

International organisations are complex entities due to their governance frameworks. These usually comprise a **governing council** — which is the decision-maker, holds the executive power and represents the will of all members; a **secretariat** — the administrative body; and a **general assembly** that provides advice and exerts control but without legislative power; among some additional committees.

The balance of power among members in these structures may cause challenges for policy negotiations and reaching agreements.

Their relations with nation states are subject to changing scenarios due to political cycles and international relation approaches. Some countries want to advance in transnationalism giving more power and influence to these structures; some other countries prefer more protectionism wanting to retain their borders and power in the international scene.

What the experts think

Learn below from our experts who tell you about intergovernmental stakeholders in science diplomacy and delve into their role and mission.

	**Peter McGrath** Coordinator of the Science Diplomacy Programme in The World Academy of Sciences (TWAS)
	What are the main stakeholders in science diplomacy internationally? Video Link to YouTube

	**Miguel García-Herráiz Roobaert** Deputy Directorate General for EU External Relations and Trade, Secretariat of State for EU Affairs, Spanish Ministry for Foreign Affairs, European Union, and Cooperation
	What is the Union for the Mediterranean? How does it relate to science diplomacy?

	Video Link to YouTube

Supranational Stakeholders

A supranational organisation is a type of international groups or unions where member states transfer part of their sovereignty in order to share the process of decision making and vote on issues related to the collective body.

The European Union is a paramount example of the process of political integration between member states, their governments (represented in the Council of the European Union) and their citizens (represented by elected members of the European Parliament) that co-decide on policies, mostly proposed and executed by the European Commission. In the EU, all members decide (Council) and vote (Council and Parliament) on policies that will then affect national and subnational levels. The benefits of this polity are the synergies derived from social and economic policies and a stronger presence on the international stage, while the depth of European integration varies according to policy fields.

Science diplomacy is a crucial tool to address cross-border and global interests. Thus, supranational organisations are also needed to support these regional and global interests. We will devote more attention to the European Union and its institutions in Module **4 How Does the European Union Practice Science Diplomacy?**

3.2.3 Research Stakeholders

Research stakeholders are fundamental players of science diplomacy and they can take many different not exclusive roles in the science diplomacy arena.

Research and academic stakeholders take a variety of shapes and can be, for instance:

- Research performing organisations such as universities, non-university research institutes, research centres, and large research infrastructures
- Research funding organisations such as national research councils and project funding agencies
- Academies, professional charters, and other researchers' associations
- Individual researchers

Likewise to governmental stakeholders, they belong to and/or operate at the local, regional and national level.

Some research stakeholders may be or belong to an international or supranational organisation, but due to their research-related nature, we cover them under this topic.

Lastly, some of these research stakeholders may well fit within the academic as well as the civil society category (See 3.2.4 Academic Stakeholders and 3.2.6 Civil Society Stakeholders), like national academies or learned societies. However, due to their direct role and key influence on science diplomacy and to separate them from the general public

and the nature of other civil society organisations, we have decided to cover them under this well-defined category.

Main interests in science diplomacy

More and more, research and academic organisations develop their role in the science diplomacy domain and are becoming more important. Some of their interests:

- Establishing cross-border scientific collaborations
- Exploring or establishing new research funding opportunities
- Acting as science advisors to the Ministries of Foreign Affairs and other ministries and governments
- Lobbying for certain scientific issues to permeate into public policy affairs and raising awareness of the importance of evidence-informed policy making
- Representing academia's interests and concerns at the national level
- Raising the public value of science and making the case for science to be a key element to achieve national/sub-global/global goals
- Training on science diplomacy matters to the research community
- Mainstreaming the science diplomacy dimension into research projects

Main challenges

Training researchers and research organisations wanting to have an active role in science diplomacy is a pending issue on many occasions. Certain skills and professional profiles are required both to first build trust between scientists, policy-makers and diplomats, and then ensure a positive impact on science diplomacy activities (see **Module 6. What Set of Skills Do I Need to Be a Good Science Diplomat?**).

Also, finding steady sources of funding to sustain specific science diplomacy projects or even the very research institution itself is a great challenge indeed.

In their collaboration with Governmental stakeholders, one of the main challenges is to establish well-defined boundaries between all stakeholders to both ensure mutual interest and safeguard independency.

Lastly, designing adequate governance models is another challenge for research and academic stakeholders.

What the experts think

Scientists can play a role in shaping public policies, including those related to foreign policies. Watching the videos below, you will learn some insights from a policy practitioner as well as from active researchers who will explain the role of research centres, large international research infrastructures, international universities or scientific associations in science diplomacy.

	**Jan Marco Müller** Acting Chief Operations Officer, Head of the Directorate Office and Coordinator for Science Diplomacy. International Institute for Applied Systems Analysis (IIASA)
	Can you tell us briefly about your background and current position? What is the role of IIASA in international science diplomacy? Video Link to YouTube

	**Wolfgang Eberhardt** Advisor to the Synchrotron DESY, Council Member of the Synchrotron SESAME, and Former Director of the Synchrotron BESSY
	How can researchers in international research infrastructures contribute to science diplomacy? Video Link to YouTube

	**Jerneja Penca** Senior Researcher, Euro-Mediterranean University
	What is the Euro Mediterranean University? Why does it relate to science diplomacy? Video Link to YouTube

	**Eduardo Oliver** Senior Research Fellow at the Spanish National Center for Cardiovascular Research (CNIC; Madrid), and former Secretary-General of the Network of Associations of Spanish Researchers and Scientists Abroad (RAICEX)
	What is the role of scientific associations or civil society organisations in science diplomacy? Video Link to YouTube

Read more!

A few examples of approaches, perspectives, and reports from researchers and academic organisations are listed below.

Research funding organisations

- The Horizon 2020 calls on science diplomacy (Link).
- The NWO's (Netherlands research funding agency) fund on science diplomacy (Link).

Research performing organisations

- Science diplomacy: the role of research councils and the Global Research Council (Link).

Academies, professional charters, and researchers' associations engaged in science diplomacy actions

- The Royal Society (Link).
- The National Academy of Sciences (Link).
- ALLEA – All European Academies (Link).
- The Society of Spanish Researchers in the United Kingdom (SRUK/CERU) (Link).
- National Science Policy Network (Link).

3.2.4 Academic Stakeholders

Universities and other higher education institutions (HEIs) hold promise to be vital science diplomacy stakeholders, but their potential as such has hitherto been underutilized.

Main interests in science diplomacy

1. HEIs straddle the local, national, and international levels. This is particularly important when it comes to science diplomacy, as scientific objectives laid out on the global level – such as the UN Sustainable Development Goals (SDGs) – require implementation at the local level in order to come to fruition. Through research, teaching, and community leadership, HEIs play a major role in the local and national application of a global vision, as can be seen in numerous case studies. Not only that, they also facilitate connections between students and researchers from around the world, and contribute the human resources and knowledge to governments and international organizations. Their bridges span internationally, while also being connected to their local innovation ecosystems; this places HEIs in a unique position to build bonds between actors on all levels. Finally, they provide the physical space, such as laboratories and conference halls, where all dimensions of science diplomacy can unfold.

2. HEIs hold the key to forging a robust science diplomacy culture that is desperately needed for navigating the compounding challenges of the future. As it stands, science diplomacy practitioners are usually scientists that appreciate that their work has a diplomatic dimension, or political scientists that recognize the ample space for science in advancing international relations. The urgent need for wider international scientific collaboration cannot rest on such career serendipity, which means universities are vital for fostering curricula that shape awaiting generations of science diplomats. Some universities, such as Georgetown, Harvard, Rockefeller, and MIT, have already pioneered programs that merge science and international relations, but many more need to follow suit if science

diplomacy is to be more than a niche profession. With emerging multi-stakeholder platforms like the Center for the Fourth Industrial Revolution or the UN Forum on Science, Technology & Innovation for the SDGs, the need for professionals trained in both science and diplomacy is greater than ever, and universities are where the training process beings.

3. HEIs can help alleviate the dichotomy between openness and competition that scientific research falls within. The current age is witness to an unprecedented amount of knowledge that can be applied to mitigate the long list of global challenges ahead. However, much of that knowledge tends to be locked within national spheres in order to bolster the knowledge economies and innovation systems of states, rather than being available in the global commons of knowledge under the FAIR (findability, accessibility, interoperability and reusability) principles. If research-focused HEIs reorient themselves away from national innovation systems and more towards the global commons of knowledge, their role as science diplomacy actors would strengthen. This is because by advocating on behalf of the knowledge they impart, HEIs could combat anti-scientism, reduce fragmentation between highly specialized fields, impact public debates, and synthesize knowledge into policy advice. To succeed, however, the rewards system within HEIs must be adjusted to reflect this shift.

To conclude, HEIs stand to strengthen the practice of science diplomacy though serving as actors in its service. Not only do they facilitate links between key stakeholders on various levels, they are integral for developing a science diplomacy culture, and hold the potential to be diplomatic actors in their own right by advocating on behalf of knowledge they generate for the global commons. On top of that all, HEIs promote the values that underpin scientific inquiry – this should guarantee them a place in both the literature and practice of science diplomacy.

Main challenges

As the European Commission was formulating the EU Strategy for Universities, there was no mention of science diplomacy. This spurred the EU Science Diplomacy Alliance to release a paper that stresses the important role that HEIs play in its conduct. When the strategy was released, it addressed the bridge-building capacity of universities in science diplomacy, which was a welcomed step forward.[1] However, there is still a great deal of room to expand the role of HEIs as science diplomacy actors further.

[1] Com 2022 (16 final), p. 14.

Read more!

- Del Canto Viterale (2018). University as a global actor in the international system of the 21st Century. Tuning Journal for Higher Education 6 (1), pp. 169-98. (Link)

- Gore, Nichols, & Lips (2020). Preparing Scientists for Science Diplomacy Requires New Science Policy Bridges. The Hague Journal of Diplomacy 15(3), pp. 424-434. (Link)

- Holford & Nichols (2018). The Challenge of Building Science Diplomacy Capabilities for Early Career Academic Investigators. Science & Diplomacy 6(4). (Link)

- Mauduit & Gual Soler (2020). Building a Science Diplomacy Curriculum. Frontiers in Education 138 (5). (Link)

- Van Langenhove and Burgelman (2021). Viewpoint: Science diplomacy needs a refresh to meet contemporary European needs. Science Business. (Link)

3.2.5 Private Sector Stakeholders

The private sector can also benefit strongly from science, technology and innovation diplomacy.

Through consortia of private companies, this stakeholder is a very important partner in science diplomacy efforts led by multiple governments to build large research infrastructures, such as SESAME or SKA.

Established large research infrastructures, such as CERN, may also launch public-private partnerships where private sector stakeholders will be quite crucial to develop state-of-the-art technologies (see CERN Open Lab).

In other scenarios, private companies also accompany civil society organisations or national governments in specific actions. For instance, The "Geneva Science and Diplomacy Anticipator" (GSDA) is being launched by FDFA and the Geneva authorities, with funding from not only federal, regional and local governments, but also private sponsors such as Nestlé. During the first three years, scientific and political experts will meet to identify the issues to be addressed and launch the foundation's first projects (link). Swiss science and innovation diplomacy strategy is more important than ever in supporting Switzerland's economic and technological leadership (for more information, read this publication).

Science- and technology-driven companies have a long history of collaboration with Embassies and scientific and commercial attachés. In this sense, consider the Office of Denmark's Tech Ambassador, a formal diplomatic platform (thus, a Government stakeholder) with physical presence across three time zones in Silicon Valley, Copenhagen and Beijing – transcending borders and regions and rethinking diplomacy. The platform aims to engage in dialogue and collaboration on a broad range of topics with the tech-industry in key technology clusters, bringing them on board in STI diplomacy actions. This is recognition of the political and global influence that the tech-industry has in the 21st Century.

What the experts think

Watch below an illustrative interview about how the private sector fits in the general scheme of science diplomacy.

	**Robin Grimes** Chief Scientific Adviser (CSA) to the UK Ministry of Defence on nuclear science and technology matters. Former CSA to the UK Foreign and Commonwealth Office (FCO). Professor of Materials Physics at Imperial College London
	Is there room for other type of stakeholders in science diplomacy? Video Link to YouTube

Read more!

You may find more information about joint ventures between national governments and industry in the references below:

- Klynge, Casper, Mikael Ekman, and Nikolaj Juncher Waedegaard (2020): "Diplomacy in the Digital Age: Lessons from Denmark's TechPlomacy Initiative." *The Hague Journal of Diplomacy* Vol. 15 Issue 1-2, pp. 185-195, https://doi.org/10.1163/1871191X-15101094.

- Schlegel, Flavia (2014): "Swiss Science Diplomacy: Harnessing the Inventiveness and Excellence of the Private and Public Sectors."*Science & Diplomacy*, Vol. 3, No. 1 (March 2014) (Link).

3.2.6 Civil Society Stakeholders

Civil society is gaining relevance in all fields of public policy as a key element that participates and co-creates policy priorities with policy makers and other stakeholders. Science diplomacy is not an exception to this trend.

In fact, these stakeholders may sometimes cover science diplomacy activities between countries that cannot be performed by government stakeholders, due for example to tense diplomatic relationships.

The World Bank defines civil society organisations as "the wide array of non-governmental and not-for-profit organisations that have a presence in public life, expressing the interests and values of their members or others, based on ethical, cultural, political, scientific, religious or philanthropic considerations. Civil Society Organisations (CSOs) therefore refer to a wide of array of organisations: community groups, non-governmental organisations (NGOs), labour unions, indigenous groups, charitable organisations, faith-based organisations, professional associations, and foundations."

For simplicity, we highlight the following types of civil society organisations:

- NGOs,
- Non-for-profit private foundations or charities,

- Civil society associations and other organisations, and also
- Individuals, who for example use their reputation to catalyse actions

Main interests

Civil society stakeholders take a number of roles in this field and, among their goals we highlight:

- Engaging with the general public
- Advocating for science, public policy and politics to communicate better
- Advocating for science as a key element to improve international relations
- Facilitating communication channels and exchange interfaces among researchers, politicians and other stakeholders
- Supporting research by providing funds for international research projects
- Focusing on increasing science education worldwide with special emphasis in developing countries
- Promoting and advancing on science diplomacy for concrete specific goals
- Advocating for concrete specific goals of science diplomacy (climate change, etc.)

Main challenges

Civil society stakeholders will face challenges depending on their specific nature. For instance, the lack of funding to sustain professional activity may hinder the reach of many civil society organisations.

Also, the need to build up a social capital network to gain credibility and ensure policy impact is a challenge for new organisations.

For those organisations already established and actively present, they must navigate changes in local, regional, national and/or supranational governments (depending on their area of influence) because of new elections, switch of government officials and policy-makers, or change of policy priorities.

What the experts think

One paramount example of a civil society stakeholder in science diplomacy is the American Association for the Advancement of Science (AAAS). We have invited one expert to explain how they foster more connection between scientists and government officers.

	Tom Wang Expert in Science, Technology and International Relations. Former Chief International Officer of the American Association for the Advancement of Science (AAAS)

How does the AAAS Policy Fellow programme work and why is it important for the capacity building of researchers in science diplomacy?

Video Link to YouTube

Read more!

Explore below some examples of civil society stakeholders in science diplomacy with their variety of actions.

Non-for-profit private foundations or charities

- Wellcome Trust (Link)

Civil society associations and other organisations

- The American Association for the Advancement of Science (AAAS), Center for Science Diplomacy (Link)
- The Canadian Science Policy Centre (CSPC) (Link).
- The Barcelona SciTech DiploHub (Link): in our proposal, this is considered a Subnational network and is further described in **3.3.1 Local Networks** but we refer to it here because its leadership falls within a civil society organisation

3.3. Types of Science Diplomacy Networks

In the previous lesson, we have sorted the diverse ecosystem of science diplomacy stakeholders by type (who is the owner of the initiative). Since science diplomacy has a very strong dimension of collaboration among stakeholders, **these collaborations often become established networks with a variety of scopes**.

In this lesson, we will devote some time in trying to understand how different stakeholders collaborate through concrete networks. Depending on **the major purpose** of that network, **we will group them in four categories:**

1. **Subnational networks**: when their focus is on the local level such as any city
2. **National networks:** when their focus pursues national interests
3. **Sub-global networks**: when the array of activities are focused on a specific world region
4. **Global networks**: involving stakeholders from all nationalities and tackling global challenges

In our proposal, we identify networks as groups of stakeholders joining together for a common purpose. It is important to bear this in mind throughout the following topics. Sometimes, one single stakeholder operates in a distributed way internationally (for example the network of Austrian science counsellors) but this does NOT make it a network according to our proposal, since they only involve one stakeholder (government) without any further distinction (different government departments, for instance).

Hence, **these networks bring together stakeholders of different natures**, following our proposal they would be government, intergovernmental international and supranational, research and academia, private sector, and civil society. Therefore, we can have:

- **Mono-stakeholder networks**: when it only involves different stakeholders from the same category. For instance, governmental networks that gather together different governmental departments or ministries around a common network
- **Multi-stakeholder networks**: when the collaboration is among stakeholders of different types, such as a group composed of stakeholders from the industry sector and civil society

The examples that we show throughout the following topics should be interpreted as proof points of what we see as a clearly emerging global trend: **stakeholders are increasingly experimenting with many different ways to harness the power of science and technology in external relations**.

As in the previous lesson, please bear in mind that the networks we will show are examples and we do not intend to be exhaustive.

Science diplomacy in an interaction space

Understood as "areas of collective actions" characterized by different dominant actors, practices and rules of engagement, science diplomacy can be composed of three connected, partly overlapping arenas (1) Scientific knowledge production (2) Problem deliberation / reflection (3) politics and powering.

First, in a 'problem deliberation/reflection' arena motivations and drivers are aligned: actors engage through practices and mechanisms for co-reflection about issues calling for a science diplomacy process vis-à-vis SDGs. Typical actors in this arena are Civil Society Organization, NGOs, WHO, FAO. Second, in a 'scientific knowledge production' arena actors discuss and decide on required scientific insights, technological innovation and related infrastructures. Typical actors in this arena are universities, research institutes, NGOs. Third, a 'politics and powering' arena hosts decision-making on how a certain challenge should be governed, given specific knowledge needs. Typical actors in this arena are governments, international organisations, multinational companies.

The actor composition of each arena differs per issue, region, and knowledge domain. For example, addressing the SDG 6 "Clean water and sanitation" involves completely different challenges concerning which actors to consider or what technology to apply when discussed in a South American context vis-à-vis a Middle Eastern one. Thus, the particular, idiosyncratic character of the science diplomacy interaction space leads to context-specific outcomes in terms of which tensions are worth addressing and therefore which governance requirements or principles are suitable. Furthermore, actors often do not belong exclusively to one arena. For example, organizations such as the WHO or OECD can be placed in the overlapping area between the scientific knowledge production arena and the problem deliberation/reflection arena.

Ewert Aukes (UT), Gonzalo Ordóñez-Matamoros (UT), Stefan Kuhlmann (UT), Sanaz Honarmand Ebrahimi (UT). Report in preparation (2021)

3.3.1 Sub-national Networks

As introduced in **Topic 3.2.1. Governmental Stakeholders**, global cities have played a role in the international system, and now they are increasing their involvement in science

diplomacy actions. A new global order arises around global cities and their markets, instead of traditional nation-states and their borders.

Local stakeholders of different types may gather together to build up a network to project the image of their city as a global one that is friendly to STI activities. In this regard, Barcelona has been one of the world's first cities to implement a comprehensive science and technology diplomacy strategy.

SciTech Diplohub – Barcelona

http://www.scitechdiplohub.org/

Nature

Multi-stakeholder network

- *Lead*: Civil society
- *Other stakeholders involved*: Regional and local government, Researchers and academia, private sector

The network at a glance

SciTech DiploHub, the Barcelona Science and Technology Diplomacy Hub, is a non-profit, independent, nonpartisan civil initiative led by an interdisciplinary, international team of scientists, engineers and foreign affairs and public policy professionals.

SciTech DiploHub is committed to making Barcelona the first city in the world to implement a science and technology diplomacy strategy and to make Barcelona an influential global player in tackling humanity's grand challenges through science and technology.

Date
November 2018

Place
Barcelona, Spain

Funding
Public-private partnership

Type of Members

Individuals

Rationale and activities

SciTech DiploHub takes advantage of the increasingly relevant geopolitical actor: global cities. Big cities are economic, political and innovation powerhouses discreetly transforming

the international scene, becoming essential diplomatic players and increasingly bypassing nation states to create city-centred global policies. At the same time, science and technology are the driving forces in economic and social progress and have become key tools to tackle humanity's grand challenges. In this exciting context Barcelona has taken the lead with its own science and technology diplomacy strategy**.**

SciTech DiploHub has launched **The Barcelona Manifesto for a City-led Science and Technology Diplomacy** supported by 150 world-class scientists, tech experts, public policy and foreign affairs professionals. The manifesto aims to consolidate Barcelona as an innovation capital, ready to position the city as an influential geopolitical actor through science diplomacy.

https://youtu.be/mfawl4_5cpQ

Barcelona's science diplomacy action plan includes partnerships among the scientific community, start-ups, policy-makers, NGOs, the diplomatic corps, the private sector and civil society.

The network also aims to empower a global network of top scientists and technology experts educated in Barcelona, **Barcelona Alumni**, to foster international cooperation, showcase scientific strengths abroad and interpret key global issues.

Finally, SciTech DiploHub wants to pave the way for other cities committed to developing their own science and technology diplomacy strategies creating a network of networks. In this regards, Barcelona has been one of the world's first cities to implement a comprehensive science and technology diplomacy strategy.

What the experts think?

Find out more about the SciTech DiploHub from its CEO below!

	**Alexis Roig** Barcelona SciTech DiploHub CEO
	What is the approach of the Barcelona SciTech DiploHub? Video Link to YouTube

Read more!

Besides visiting the SciTech DiploHub's website, we also recommend you read:

- Roig, Alexis (2018): "A Science Diplomacy for Barcelona Global Cities Take the Lead." *Medium. AAAS Center for Science Diplomacy*, Nov 30, 2018. Available on: https://medium.com/sciencediplomacy/a-science-diplomacy-for-barcelona-global-cities-take-the-lead-c41a4a2a9493.
- Roig, A., J. L. Sun-Wang,and J. L. Manfredi-Sánchez (2020) "Barcelona's science diplomacy: towards an ecosystem-driven internationalization strategy." *Humanit Soc Sci Commun* 7, 114 (2020). https://doi.org/10.1057/s41599-020-00602-y

Science and Technology Diplomatic Circle of Boston

Science and Technology Diplomatic Circle of Boston

http://stdc-boston.com/

Nature

Multi-stakeholder network

- *Lead*: Governmental Stakeholders
- *Other stakeholders involved*: Regional and local governments, Regional and local Researchers and academia, Regional and local Industry sector and Regional and local civil society

The network at a glance

The Science & Technology Diplomatic Circle ''S&TDC'' Boston is an association of members from 60+ diplomatic missions and affiliated organizations in the Boston area to promote informal exchange between diplomatic missions in Boston and leaders of government, academia, and industry in Massachusetts.

Date

2014

Place

Boston, USA

Type of Members

Individuals (official representatives of countries and regional entities in the Greater Boston Area). Membership now includes representatives from over 65 diplomatic missions in Greater Boston.

Rationale and activities

The objective of the S&TDC is to offer a platform for activities, seminars and visits interacting with leaders and officials of the government, academia and private sector of Massachusetts. The primary focus is science & technology. In a team effort among the consular diplomats in the Greater Boston area, they focus on visits and encounters to explore the political, academic and private sector of Massachusetts, which shapes the innovation ecosystem. Their mission is to discover new bonds with greater Boston and connect back to their countries in the field of science & technology.

3.3.2 National Networks

Countries have different science diplomacy national strategies to pursue their international policy goals in STI. The majority of states rely heavily on specifically recruited experts working together with career diplomats. In many cases these tend to be local employees of the respective Embassy or deployed diplomats and/or officers from their home countries. The coordination of these stakeholders may rely solely on the Ministry of Foreign Affairs, the Ministry of STI, the Economics and Trade Department, or on a mixed governance model. We will cover below the **UK Science and Innovation Network** as a paramount example of mono-stakeholder governmental national networks.

An increasing number of countries are also extending their national networks (which are associated with their Embassies) by establishing additional innovation hubs abroad not necessarily linked to Embassies or Consulates, but to global innovative clusters. Here we want to highlight the case of the **Swissnex Network** of Switzerland, but the Office of Denmark's Tech Ambassador would also be a valid example.

Research and Academia as well as Civil Society Organisations may develop their own national networks too, and in doing so they influence the strategy of national governments, becoming even a significant collaborative driver for some countries. This is the case of Spain, the science diplomacy strategy of which includes a bottom-up, multi-stakeholder approach to science diplomacy. The Spanish government has been collaborating with communities of Spanish scientists abroad as key partners for public diplomacy (Elorza Moreno *et al.*, 2017).

Indeed, **Science, Technology and Innovation (STI) Diaspora Networks** may play an active role in science diplomacy and represent a special type of network that is worth exploring further.

Browse the tabs below to learn more about all of them! Note there are additional links further below and more information in Lesson **5.2 Regional and National Science Diplomacy Strategies**.

UK Science and Innovation Network

UK Science & Innovation Network

Main website: https://www.gov.uk/world/organisations/uk-science-and-innovation-network

The Global Science and Innovation Network Blog: https://blogs.fco.gov.uk/global-science-and-innovation-network/

Nature

Mono-stakeholder network: Governmental stakeholder is the unique and lead stakeholder, bringing together two governmental departments.

It may collaborate with other national and international stakeholders on a project basis.

The network at a glance

The UK is a global leader in science and innovation, and international collaboration is essential to maintaining the excellence of the UK's research base and the competitive advantage of their innovative businesses.

The Science and Innovation Network (SIN) allocates local officers in over 40 countries and territories around the world, in order to build partnerships and collaborations between the UK and other countries.

SIN officers work with the local science and innovation community in support of UK policy overseas, leading to mutual benefits to the UK and the host country.

Date
Established in 2001

Place
Around 110 officers in 40 countries and regions

UK SIN has officers around the world covering countries and territories

Funding

A network managed and funded by the UK Foreign and Commonwealth Office (FCO) with coordination and additional funding from the UK Department for Business, Energy and Industrial Strategy (BEIS).

Type of Members

A network of STI attaches (locally-hired officers) who are embedded in British embassies and consulates abroad, working alongside career diplomats

Rationale and activities

SIN strives to build up key science and innovation partnerships between UK and host countries to maintain the UK's scientific excellence and reputation, and support British interest in the global footrace on innovation. These collaborations may fill capability gaps, add value by leveraging international resources, ensure the UK is a partner of choice, and help British companies to tap into foreign markets.

SIN teams develop country-specific action plans and work to the following global objectives:

- **Prosperity** – enhancing UK growth and exports; connecting innovative UK industries and scientific expertise with international opportunities
- **Security** – delivering solutions to global challenges such as anti-microbial resistance (AMR), health, energy, the conservation and sustainable use of oceans, and enhancing resilience to natural disasters
- **Influence** – strengthening the UK's foreign policy influence through science and innovation
- **Development** – supporting international development goals and matching UK expertise to international need

SIN is pursuing these objectives via a series of thematic programmes such as: Health and Life Sciences, Clean Energy, Food and Agriculture, Future Manufacturing, Cyber and Information Communications Technology (ICT), Quantum Technology, Future Cities, Resources and Resilience, Polar Regions, Space, and Oceans.

SIN has published a list of impact stories, where you may understand their impact all around the globe in different topics and scenarios. Visit this link for further information.

What the experts think

Watch the interview below to one SIN officer!

	**Sara Cebrián** UK Science and Innovation Network Delegate in Spain & Portugal, British Embassy in Madrid
	Could you describe shortly the British science diplomacy model? Video Link to YouTube

Swissnex Network

https://www.swissnex.org/

Nature

A multi stake-holder network involving:

- *Lead:* Government (bringing together two governmental departments)
- *Other stakeholders:* Private sector (start-ups, innovation-driven companies and creative industries linked to education, research and innovation), Research and Academia, and Civil Society Organisations

The network at a glance

Swissnex is the Swiss global network connecting the dots in education, research, and innovation. Their goal is to support the outreach and active engagement of Swiss partners in the international exchange of knowledge, ideas and talent.

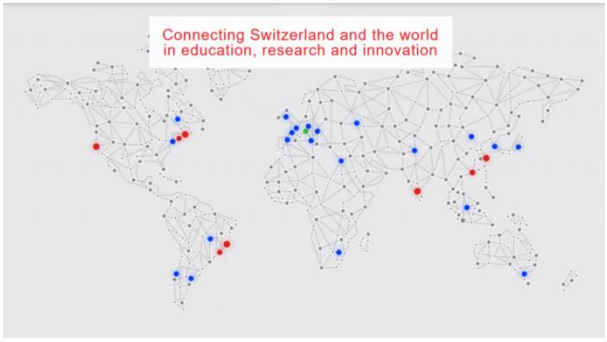
The Swissnex Network is an initiative of the State Secretariat for Education, Research and Innovation (SERI) and is part of the Confederation's network abroad managed by the Federal Department of Foreign Affairs. The activities of the Swissnex Network are based on a collaborative approach, relying on public and private partnerships and funding.

The five Swissnex locations and their outposts are established in the world's most innovative hubs. Together with around twenty Science and Technology Offices (STO) and Counsellors (STC) based in Swiss Embassies, they all contribute to strengthen Switzerland's profile as a world-leading innovation hotspot.

Date
2000

Place
Swissnex offices are located in Boston (2000), San Francisco (2003), Singapore(*) (2004), Shanghai (2008), Bangalore (2010) and Rio de Janeiro (2014), with additional outposts and the connection to Science and Technology Offices in Swiss Embassies. See map below.

(*) In 2015, after 10 years of activity, it was decided to transform Swissnex Singapore into a Science and Technology Office within the Swiss Embassy



The Swiss global network comprises five Swissnex locations (in big red), three Swissnex outposts (in small red), twenty Science and Technology Offices and Counsellors based in Swiss Embassies (in blue), and its headquarters (in green). For more information, visit this link.

Funding

Public (SERI and other public partners) with Private partners

Type of Members

A network of over 70 employees deployed in over 30 locations

Rationale and activities

The Swiss government is active in science, policies, and diplomacy through the internationalisation of almost all technical departments, its support for developing and emerging countries. For that purpose, the Swiss federal government has created a formal science diplomacy network that includes eighteen science counsellors and a set of Swissnex offices and outposts.

Swissnex is a public-private partnership to promote cooperation in science, technology, and innovation. The network is based on the organisation ordinances of the Federal Department of Economic Affairs, Education and Research (EAER) and the Federal Department of Foreign Affairs (FDFA).

The Swissnex Committee (public and private members) advises the State Secretary for Education, Research and Innovation on strategic issues relating to the Swissnex Network. It comprises ten high-ranking representatives from the most important ERI institutions (Swiss National Science Foundation, Innosuisse, swissuniversities), the foundations sector, and the public and private sector. You may find more information about Swissnex's governance, here.

The Swissnex model is based on four basic principles: strategic location selection, partnership funding model, autonomy and decentralised governance, and entrepreneurial organisational culture.

What the experts think

Learn more about the Swiss science diplomacy model from the following expert.

	**Niccolo Iorno** Swiss Federal Department of Foreign Affairs (FDFA)
	Could you describe shortly the Swiss science diplomacy model? Video Link to YouTube

STI Diaspora Networks

Researchers, tech experts and innovators of a specific nationality who live and work abroad may establish Research and Academic organisations with the aims of:

1. Increasing their voice in their host countries
2. Influencing STI policies in their home countries
3. Fostering bilateral STI collaborations and talent mobility

STI diaspora networks have vast potential as agents for innovation and internationalisation in their home countries as well as for exploring new ways of engagement between stakeholders of all natures (read more, here).

These organisations are usually run by researchers and/or tech experts and they may differ in both scope and nature (multisector, multidisciplinary, etc.). Some of these organisations closely interact with Government, other Research and Academic institutions, and Civil Society and Private funders to achieve their goals and to develop projects in partnerships.

Governments that have their STI diaspora as a policy priority strive to establish mechanisms to interact and collaborate with their STI diaspora for mutual benefit, be it through either their networks of embassies and consulates or through different STI governmental departments. This is of special importance for developing countries and emerging economies, but it is also becoming more important for advanced economies as a way to include more STI affairs in their foreign policy agenda. Some governments are even the ones establishing and managing the STI diaspora, such as Germany and their German Academic International Network (GAIN) or Greece and their "Bridges" initiative (Labrianidis *et al.*, 2019).

Research and academic institutions are also crucial partners of the STI diaspora, as they will be the direct beneficiaries of international scientific cooperation and talent mobility. Going one step further, some universities keep track of their alumni establishing their own alumni networks, while other universities foster foreign student and researcher associations in their campuses to increase their internationalisation profile, among other goals. Additionally, scientific and engineering professional societies, as well as national academies of science can support the development of STI diasporas and collaborate with them in specific projects.

Examples of STI diaspora networks

There is not a single model of STI diaspora network. Here we list some examples, but there are many more out there!

Please, note that we are considering networks from one nationality that transcends physical borders. There are STI diaspora scientific associations based in just one country (see list of examples at the end of this page), which would fall, following our proposal, under the category of "Research and Academic" stakeholders, and not under "National Networks".

Also, we will revisit STI diaspora networks in the topic **3.3.3 Sub-global Networks** and **3.3.4 Global Networks** for some particular cases.

German Academic International Network (GAIN)

https://www.gain-network.org/en/

Nature
Multi-stakeholder network

- *Lead*: Government and Research and Academia (research funders)
- *Partners:* Research and Academia (research performing organisations and individual researchers)

GAIN is a joint initiative of the three major research funding organisations in Germany: the Alexander von Humboldt Foundation (AvH), the German Academic Exchange Service (DAAD), the German Research Foundation (DFG) and receives support from the Federal Ministry of Research and Education (BMBF). With its associated members and cooperation partners, the network covers the entire spectrum of the German research landscape (see here).

Country
Germany

Place
GAIN has a total of 49 GAIN chapters present in the United States of America, Canada, the United Kingdom, Austria, Singapur, and Germany.

Date
2003

Mission
GAIN is the network of German scientists and researchers of all disciplines, working at leading research institutions worldwide. GAIN helps its members maintain and build their

international networks and facilitates transatlantic mobility and cooperation. GAIN informs about career and funding opportunities and recent developments in science policy in Germany (read more here). To achieve these aims, GAIN displays a variety of professional networking events and an annual career fair in the US.

Scientific Malaysian

SCIENTIFIC | MALAYSIAN

http://www.scientificmalaysian.com

Nature
Mono-stakeholder network (group of Malaysian scientists around the world)

Lead: Research and Academia (individual researchers)

Country
Malaysia

Place
Individual Malaysian scientists, researchers, and tech innovators belong to this network and are scattered throughout 24 countries, most of them in Malaysia, US, UK, and Australia.

Date
2011

Mission
The initiative aims to connect Malaysian scientific researchers and industry professionals across the world to discuss research issues in Malaysia, to represent the voice of the Malaysian scientific community across the world, to provide collective ideas in hopes to improve scientific research and development in Malaysia, to promote research collaboration within academia and/or with the industry, and to inspire and provide guidance for early stage Malaysian researchers.

Red de Asociaciones de Investigadores y Científicos Españoles en el Exterior (RAICEX)

RAICEX Red de Asociaciones de Investigadores y Científicos Españoles en el Exterior

RAICEX – Red de Asociaciones de Investigadores y Científicos Españoles en el Exterior

Nature
Mono-stakeholder network (a network of 18 researchers' associations in different countries).

Lead: Research and Academia (researchers' associations)

Country
Spain

Place
The network is present in 16 countries around the world: United Kingdom, Germany, United States of America, Sweden, China, Norway, Denmark, Australia, Mexico, Belgium, France, the Netherlands, Japan, Ireland, Italy, Switzerland, and South Africa.

Date
2018

Mission
RAICEX aims to foster networking and knowledge exchange between Spanish researchers and scientists abroad. It also wants to position itself as an advisory body to the Spanish STI system to exchange information and to catalyse international and multinational scientific collaborations.

Knowledge and Partnership Bridges (Gefyres Gnosis Kai Synergasias) Initiative

https://www.knowledgebridges.gr/

Nature

Mono-stakeholder

- *Lead:* Governmental Stakeholders (Ministry of Economy and Development and the National Documentation Centre)

Country
Greece

Place
The network is present in 18 countries around the world: United Kingdom, Germany, United States of America, Sweden, China, Norway, Denmark, Australia, Mexico, Belgium, France, the Netherlands, Japan, Ireland, Italy, Switzerland, United Arab Emirates and South Africa.

Date
2018

Mission
Bridges' focuses on the 'returning' of the best knowledge and experience of Greeks abroad and their interconnectivity with the country. The objective of the initiative is to bring high quality human capital of the country together and to create collaboration links between them. As part of this effort, the country's scientific personnel living abroad can have a direct active role in the transformation of the Greek economy, forming nodes of productive and innovative international centres.

The platform designed to meet the aforementioned objectives, operates on three pillars: the networking and subsequent partnerships through the creation of a global network of Greek scientists, professionals and entrepreneurs, updates on funding opportunities in Greece and the mapping of highly skilled Greeks who live and work abroad.

The above pillars are intended to run simultaneously so as to provide reliable comprehensive updates on funding and scholarships, data for Greeks in Greece and those abroad so that they can implement or boost their existing activities, and, through their registration on the platform, further enhance their search activity for new contacts and partnerships with multi-level benefits.

What the experts think

<table>
<tr><td rowspan="2">  </td><td>Jürgen Haberleithner

Professor at the Asia-Pacific Economic Cooperation (APEC) Study Centre, APEC Study Centres Consortium (ASCC) and University of Colima (Mexico).

Head of the chapter Mexico of the Austrian Scientists and Scholars in North America diaspora association (ASCINA) and president of the Austrian-Spanish Society</td></tr>
<tr><td>What is the role of scientific and innovation diasporas in science diplomacy?

Video Link to YouTube</td></tr>
</table>

Learn more about STI diasporas and their engagement with national governments in the links below!

The impact of STI diasporas

- Guchteneire, Paul de; Matthias Koenig, and Sami Mahroum (2006): "Transnational knowledge through diaspora networks." *International Journal on Multicultural Societies*, Vol. 8, No. 1. UNESCO (link).
- Royal Society, The (2011): *Knowledge, networks and nations. Global scientific collaboration in the 21st century.* RS Policy document 03/11. London: The Royal Society. (link).
- Meyer, Jean-Baptiste (coord.) (2015): *Diaspora: hacia la nueva* frontera. Marseille (FRA); Montevideo: IRD; Universidad de la Republica (Link, in Spanish).

References

- Elorza Moreno, Ana; Lorenzo Melchor, Guillermo Orts-Gil, Cristina Gracia, Izaskun Lacunza, Borja Izquierdo, and Jose Ignacio Fernández-Vera, (2017): "Spanish Science Diplomacy: A Global and Collaborative Bottom-Up Approach." *Science & Diplomacy*, Vol. 6, No. 1 (March 2017). Available on: http://www.sciencediplomacy.org/article/2017/spanish-science-diplomacy-global-and-collaborative-bottom-approach.
- Labrianidis, Lois; Evi Sachini, and Nikolaos Karampekios (2019): "Establishing a Greek Diaspora Knowledge Network through 'Knowledge and Partnership Bridges'." *Science & Diplomacy*, Vol. 8, No. 1 (May 2019). Available on: http://sciencediplomacy.org/article/2019/establishing-greek-diaspora-knowledge-network-through-knowledge-and-partnership-bridges.

More examples of STI diasporas networks

- The Polonium Foundation (link).
- Austrian Scientists and Scholars in North America (ASCINA) (link).

Examples of STI diasporas based in one country

- Asociación de Profesionales Argentinos en Reino Unido – APARU (link).
- Portuguese Association of Researchers and Students in the UK – PARSUK (link).
- Society of Chinese Bioscientists in America (link).

3.3.3 Sub-global Networks

Stakeholders may gather around specific regions or regional interests. The scope of their actions or their nature may differ. Here we display three types of sub-global networks.

In our proposal, **regional STI diaspora networks** differ from national STI diaspora networks because their members belong to or strive to improve the conditions of a specific region rather than a certain nationality. The illustrative example we show here is that of the Society for the Advancement of Science in the Arab World (SASTA), which represents all Arab researchers working abroad.

Regional educational networks focus on building capacities and knowledge around a certain region. We describe here the UArctic Science Diplomacy Thematic Network as an example.

Lastly, **regional research networks** are research funding programmes, research clusters, or international scientific cooperation networks or tools that certain countries launch to promote scientific collaboration with countries of geopolitical interest. We describe here the case of CYTED, an interregional cooperation programme between Spain, Portugal and Latin America.

Regional Diaspora Networks

Society for the Advancement of Science and Technology in the Arab World (SASTA)

Society for the Advancement of Science and Technology In the Arab World

http://www.sastaworld.com/

Nature

Mono stakeholder – Research and academia (individual researchers across the world)

The network at a glance

The **Society for the Advancement of Science and Technology in the Arab World (SASTA)** was born out of the mutual interest of Arab Expatriate Scientists (AES) and Academics living abroad to engage more effectively with the Arab Education, Science and Technology community to create a positive impact in the Arab World.

Date
2011

Place
International network, registered as a non-profit organisation with the Office of the Secretary of State of California

Funding
Membership fees and donations

Type of members

All local and expatriate Arab scientists who are graduates (holders of a PhD, MD, DO, DDS or equivalent terminal degree) are eligible for membership and voting (See guidelines, here)

Rationale and activities

SASTA's mission is to mobilise and catalyse the engagement of scientists, professionals, NGOs, academic institutions and professional societies to advance higher education, science and research in Arab countries.

To contribute to the advancement of science, technology, higher education and research in the Arab region through supporting scientific human capacity building, development of academic and research programmes and providing scientific, technical and material support to local academic, scientists and universities. SASTA seeks to achieve these objectives by:

- Developing and maintaining a comprehensive database of Arab expatriate and scientists in the Arab world and develop tools that would enable the use of this database as a catalyst for capacity building through networking and collaboration between scientists in the Arab world and abroad.
- Establishing partnerships with universities, NGOs, professional societies and industries in and outside the region.
- Developing programmes to train local scientists in specific research areas of special importance to their local society needs and/or national priorities.
- Acting as an independent non-partisan scientific body on issues related to science and its advancement in the Arab region.
- Promote science-based programmes on sustainable economic development and establish a cooperation of sustainable science and technology between academic institutions, industry and government.

To date, SASTA has established partnerships and collaborations with different institutions such as the Arab League, the Jordan University of Science and Technology, and the World Economic Forum.

European Scientific Diasporas in North America

http://northamerica.euraxess.org

Nature

Multi stakeholder – Research and academia (European associations of researchers of different Member States across the world) and supranational organisation (European Commission programme EURAXESS Hub North America and Canada)

- *Leading stakeholder*: The EU as a supranational organization addressing regional and global challenges and Scientists and their networks

- *Other Stakeholders involved*: Researchers, universities, research organisations, industry, and others

The network at a glance

EURAXESS North America reaches out European Scientific Diasporas in the United States and Canada to promote the European Research Area (ERA) as a place of excellence where they come from and can function as ambassadors.

EURAXESS Worldwide is the international arm of EURAXESS and has been operating as a part of the practical/operational side of the new ERA since it links the ERA to the rest of the world

EURAXESS Worldwide in general helps support researcher mobility and career development connecting various actors and stakeholders in science, technology, and innovation (STI) and promoting European Research Area. It offers to interact on a global scale; it is a pan-European initiative and is a networking tool supporting researchers working outside of Europe who wish to connect or stay connected with Europe.

The overall aim is to support researcher mobility and career development, while enhancing scientific collaboration between Europe and the world.

It has dedicated teams in eight countries and regions: ASEAN (with a focus on Singapore, Thailand, Indonesia, Malaysia, and Vietnam), Australia and New Zealand, Latin America and the Caribbean (LAC, with a focus on Brazil, Argentina, Chile, Mexico, and Colombia), China, India, Japan, Korea, and North America (Canada and the United States).

The main objective of EURAXESS North America is to develop, run, and animate a network outside of Europe aiming at supporting researchers working outside of Europe who wish to connect or stay connected with Europe and to promote mobility.

Through its information portal EURAXESS North America provides free information on career opportunities, fellowships, and funding programmes available to researchers in the U.S. and Canada who wish to conduct research in or by collaborating with Europe.

- It is a tool for creating and highlight events, and showcasing strong examples around the world.
- It promotes framework programmes (Horizon 2020, Horizon Europe) from the angle of mobility, e.g. MSCA and ERC.

European researchers and scientists have been an integral part of the North American research landscape for a long time. However since 2015, European scientific diaspora networks meet annually as a vital form of support and community building.

The network integrates diasporas from nearly 20 countries, among which are ECUSA (Spanish Scientists in the USA), GAIN (German Academic International Network), ISSNAF (Italian Scientists and Scholars of North America), HBA USA (Hellenic Bioscientific Association in the USA), IASF (Ireland America Science Forum, formerly the Wild Geese Network of Irish Scientists), FR@NIH (French Fellows at the NIH), TASSA (Turkish American Scientists and Scholars Association), ASCINA (Austrian Scientists and Scholars in the USA, Canada, and Mexico), RINA (Research and Innovation Network Austria) and STARS (Swedish Trans-Atlantic Researchers and Scholars Network). Beyond groups representing a nation, we also include cross-cutting groups such as the IWS Network (Immigrant & International Women in Science Network) in Canada for immigrants of all nationalities.

Date
2013

Place
Washington, DC (covering the U.S. and Canada)

Funding
European Commission

Type of members

Individuals and Organizations

Educational Networks

The University of Arctic (UA)

UArctic - UArctic - University of the Arctic

Nature

Mono-stakeholder (Research and academia)

The network at a glance

The University of the Arctic (UArctic) is a cooperative network of universities, colleges, research institutes and other organisations concerned with education and research in and about the North. UArctic launched the Science Diplomacy Thematic Network in 2017 in order to train scientists as diplomats with theory, methods and skills that contribute to informed decision-making for sustainable development in the Arctic and elsewhere across generations.

Date

UArctic – 1998
UArctic Science Diplomacy Thematic Network – 2017

Place

International Network

Funding

Public / Private

Type of Members

Higher education institutions and organisations concerned with education and research in and about the North

Rationale and activities

UArctic wants to build and strengthen collective resources and collaborative infrastructure. Through cooperation in education, research and outreach they enhance human capacity in the North, promote viable communities and sustainable economies, and forge global partnerships.

The UArctic network includes nearly 190 institutions collaborating (for a full list, visit this link). The network empowers the people of the Circumpolar North by providing unique educational and research opportunities through collaboration within a powerful network of members. The Arctic Council, the Standing Committee of Arctic Parliamentarians and other Arctic leadership institutions recognize UArctic and its members as the educational, training and research engine of the North.

The UArctic Science Diplomacy Thematic Network builds on scientific cooperation. The Network was launched in 2017 and enhances interdisciplinary research (natural sciences, social sciences, indigenous knowledge and international relations) in the Arctic context, collaborative and innovative education opportunities across the UArctic Network (science diplomacy joint courses, faculty exchanges, etc.), and will convene high-level, international dialogues and conferences.

The aim is to engage the full range of stakeholders, from diplomats and experts to students, in an international, interdisciplinary and inclusive manner. Science diplomacy in the Arctic has already proven its global relevance, as highlighted by the Agreement on Enhancing International Arctic Scientific Cooperation signed by the foreign ministers of all eight Arctic states as well as from the Governments of Greenland and the Faroe Islands on 11 May 2017 at the Arctic Council Ministerial Meeting in Fairbanks, Alaska.

Research Networks

Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo (CYTED)

CYTED PROGRAMA IBEROAMERICANO DE CIENCIA Y TECNOLOGÍA PARA EL DESARROLLO

http://www.cyted.org

Nature

Multi-stakeholder.

- *Lead:* Governmental stakeholders
- *Partners*: Research and academia, and Industry sector

The network at a glance

CYTED's main objective is to contribute to the harmonious development of the Ibero-American region through cooperation mechanisms that seek scientific and technological

results, transferable to production systems and social policies. The beneficiaries of CYTED financing instruments may be universities, R&D centres and innovative corporations in member countries.

The CYTED Programme also answers the calling to act as a bridge for interregional cooperation in Science and Technology between the European Union and Latin America.

CYTED was created in 1984 through an Interinstitutional Framework Agreement signed by 21 countries of Spanish and Portuguese language. Since 1995, the CYTED Programme has been formally included among the Cooperation Programmes of the Ibero-American Summit of Heads of State and Government.

The specific goals of the CYTED Programme are:

- Encouraging the integration of the Ibero-American Scientific and Technological Community, promoting an agenda of shared priorities for the region.
- Strengthening the technological development capacity of Ibero-American countries through the promotion of joint scientific research, the transfer of knowledge and techniques, and the exchange of scientists and technologists among R&D+i groups in the member countries.
- Promoting the participation of business sectors from member countries interested in innovation processes, in accordance with the research and technological developments of the Ibero-American Scientific and Technological Community.
- Promoting the participation of researchers from the Region in other multilateral research programmes through agreements for this purpose.

Date
1984

Place
Regional Network

Funding
Public

Type of Members

The CYTED Programme is organised according to a decentralised model, whose institutional framework is comprised of the *Organismos Nacionales de Ciencia y Tecnología (***ONCYT**), the bodies responsible for the scientific and technological policies of the 21 participating countries. Each ONCYT is responsible for the management of the programme in their country and participates with a representative in the administration bodies of CYTED.

The **General Assembly** is the highest level political decision-making body of the CYTED Programme. It is integrated by the highest authorities of the ONCYT.

The **General Secretariat** is the management body of the CYTED Programme, and which is of international nature. It comprises the Secretary General (appointed every 3 years by the General Assembly), the Area Managers (appointed for a period of two years and may

be elected for a further period), a Scientific coordinator and the technical staff that provides support in the secretariat at the headquarters located in Madrid (Spain).

Rationale and activities

As mentioned above, CYTED aims to foster scientific and technological projects to encourage harmonious development in Ibero-America. As such, the type of Research and Development tools available for CYTED are as follows:

- **Funding calls for Projects on Strategic Issues**: call for participants to apply for funding for research and technological development projects within groups of CYTED countries. These are financed with both CYTED funds as well as with external contributions from the member countries through their national organisations (ONCYT). The projects must be relevant from the viewpoints of research and innovation, should have transnational character and their duration will be of up to three years.
- The **Thematic Networks**: **clusters of research and development** (R&D) formed by public or private entities and **corporations** from the member countries of the CYTED Programme, whose scientific or technological activities are related within a common area of interest and included in one of the Programme Areas. Their main objective is the exchange of knowledge between R&D groups and the strengthening of cooperation as a work method.

Read more!

You may learn more about CYTED and its science diplomacy dimension in this reference:

- Gual Soler, Marga (2014): "El Papel de las Redes Científicas Intergubernamentales en las Relaciones Regionales y la Integración de América Latina." *Science & Diplomacy*, Vol. 3, No. 4 (December 2014). Available on: link.

3.3.4 Global Networks

Global Networks on Science Diplomacy usually bring together stakeholders from different countries/nationalities in order to fulfil goals such as:

- Sharing best practices and fostering networking
- Promoting bilateral and multilateral cooperation
- Promoting research or collaboration projects to tackle common global challenges

Below we list some exploratory categories depending on their main goal, but there are many different additional concepts to categorise them all.

Global Advisory Networks

These networks are comprised of knowledge brokers who advise policy-makers and decision-makers in governmental institutions or intergovernmental and supranational institutions (such as the United Nations). Working in the interphase between science and policy is a challenge that requires sharing best practices as to how to best present the scientific evidence or to address questions from policy-makers and decision-makers.

Below you may find some examples of this thriving type of global networks.

The Intergovernmental Panel on Climate Change (IPCC)

http://www.ipcc.ch

Nature

Multi stakeholder

- *Lead:* Intergovernmental and supranational stakeholders - UN
- *Other stakeholders involved:* Research and academia (panel of individual researchers)

The network at a glance

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. The objective of the IPCC is to provide governments at all levels with scientific information that they can use to develop climate policies. IPCC reports are also a key input into international climate change negotiations.

Date
1988

Place
UN, Geneva, Switzerland

Funding
Public

Type of Members

Governments. The IPCC is an organisation of governments that are members of the United Nations or WMO. The IPCC currently has 195 members.

Rationale and activities

The IPCC provides regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

The IPCC produces assessment reports; IPCC scientists volunteer their time to assess the thousands of scientific papers published each year to provide a comprehensive summary of what is known about the drivers of climate change, its impacts and future risks, and how adaptation and mitigation can reduce those risks.

An open and transparent review by experts and governments around the world is an essential part of the IPCC process, to ensure an objective and complete assessment and to reflect a diverse range of views and expertise. Through its assessments, the IPCC identifies the strength of scientific agreement in different areas and indicates where further research is needed. The IPCC does not conduct its own research.

The IPCC is divided into three Working Groups and a Task Force. Working Group I deals with The Physical Science Basis of Climate Change, Working Group II with Climate Change Impacts, Adaptation and Vulnerability and Working Group III with Mitigation of Climate Change. The main objective of the Task Force is on National Greenhouse Gas Inventories.

Representatives of IPCC member governments meet one or more times a year in Plenary Sessions of the Panel, where non-members can assist as observants. They elect a Bureau of scientists for the duration of an assessment cycle. Governments and Observer Organisations nominate, and Bureau members select experts to prepare IPCC reports. They are supported by the IPCC Secretariat and the Technical Support Units of the Working Groups and Task Force.

To support the preparation of its reports, the IPCC organises scoping meetings, lead author meetings, workshops and expert meetings. It also organises various outreach events that communicate its findings, methodologies and explains the way the organisation works.

The Paris Agreement on climate, concluded in 2016, was a success facilitated in part by science diplomacy. In this, the partnership of the worldwide scientific community and governments through the Intergovernmental Panel on Climate Change (IPCC) was a game changer.

Foreign Ministries S&T Advice Network (FMSTAN)

https://www.ingsa.org/divisions/fmstan/

Nature

Mono-stakeholder network

- *Lead:* Governmental (science advisers from national governments)

The network at a glance

The Foreign Ministries Science and Technology Advice Network (FMSTAN) is a global network of science advisers with experience within countries' Foreign Ministries, operating under the auspices of the International Network for Government Science Advice (INGSA).

It began in February 2016 with a meeting convened by the U.S. Science and Technology Advisor to the Secretary of State at the National Academy of Sciences in Washington, D.C. This initial meeting involved the four S&T advisers to foreign ministers from Japan, New Zealand, United Kingdom and United States along with diplomats from twelve other nations: Chile, Ghana, Kazakhstan, Kenya, Malaysia, Oman, Panama, Poland, Senegal, South Africa, Ukraine, and Vietnam. A few months later, Senegal became the next member of FMSTAN. And in 2017, Oman and Poland joined formally the network.

Date
February 2016

Place
Global Network

Funding
Public / International Organisations. Special division within INGSA. INGSA operates under the auspices of the International Science Council

Type of Members

Government representatives. FMSTAN involves science advisors to Foreign Ministries, diplomats, and other practitioners working for national. Membership to FMSTAN is by invitation.

Rationale and activities

FMSTAN is under the umbrella of INGSA. INGSA is a collaborative platform for policy exchange, capacity building and research across diverse science advisory organisations and national systems. The network aims to enhance the global science-policy interface and improve the use of evidence-informed policy formation at both national and international levels through workshops and fora.

FMSTAN's main goals are:

- to raise awareness about the importance of enduring S&T advisory capacity in foreign ministries
- to share best practices and lessons learned in building S&T advisory capacity
- to strengthen S&T advisory capacity in foreign ministries
- to coordinate respective S&T diplomacy activities.

S&T advisors to foreign ministries are not necessarily experts on all scientific matters, but they understand the logics of science, are very well networked with scientists and academic institutions and thus know where to find the most appropriate expert on any given topic. They have the skills to explain evidence required for informed decision-making about

foreign affairs, serving as evidence brokers. to reveal options that contribute to informed decision-making by nations across the international landscape.

What the experts think

Learn about the International Network for Government Science Advice (INGSA), the main forum for policy makers, practitioners, national academies, scientific societies, and researchers to share experience, build capacities, and develop theoretical and practical approaches to the use of scientific evidence in informing policy at all levels of government. INGSA involves both FMSTAN and SPIDER.

	**Peter Gluckman** Chair of the International Network for Government Science Advice (INGSA) and former Chief Scientific Advisor to the Prime Minister of New Zealand (2009-2018)
	Can you tell us a bit about INGSA? Video Link to YouTube

Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services - IPBES

https://www.ipbes.net/

Nature

Multi stakeholder

- *Lead:* Intergovernmental and supranational stakeholders – UN
- *Other stakeholders involved:* Research and academia (panel of individual researchers)

The network at a glance

IPBES was created to strengthen the science-policy interface on issues related to biodiversity and ecosystem services through its functions to:

- Identify and prioritize key scientific information needed for policymakers on appropriate scales and to catalyse efforts to generate new knowledge;
- Perform regular and timely assessments of knowledge on biodiversity and ecosystem services and their inter-linkages
- Support policy formulation and implementation by identifying policy-relevant tools and methodologies to enable decision makers to gain access to those tools and methodologies and where necessary, to promote and catalyse their further development

- Prioritize key capacity-building needs to improve the science-policy interface at appropriate levels
- Engage the scientific community and other knowledge holders with the work programme, taking into account the need for different disciplines and types of knowledge, gender balance, and effective contribution and participation by experts from developing countries.

Date
2012

Place
UNESCO, Bonn (Germany)

Funding
Public

Type of Members

All States Members of the United Nations are eligible for IPBES membership. More than 100 governments are part of IPBES nowadays

Global Diaspora Networks

You were introduced to the STI diaspora networks in the topic **3.3.2 National Networks** and they were covered again in the topic **3.3.3. Sub-global Networks**. They were characterised as groups of researchers and tech-experts from a specific nationality or region scattered worldwide. Global diaspora networks, however, group several national or regional diaspora networks or individual professionals from different nationalities under the same umbrella. See below some examples.

Networks of Diasporas in Engineering and Science (NODES)

Nature

Multi-stakeholder network, with a partnership between government (the U.S. Department of State), civil society organisation (the American Association for the Advancement of Science, AAAS) and research and academia (the National Academy of Sciences (NAS) and the National Academy of Engineering (NAE).

The network at a glance

This multi-stakeholder initiative seeks to support the establishment and practice exchange of STI diaspora networks in the United States of America.

Date

Launched in 2013

Place

US

Rationale and activities

NODES is an initiative from different US stakeholders to bring together STI diasporas of different nationalities that are active in the USA. NODES strives to:

- Sharing best practices and knowledge about science diasporas
- Increasing visibility and viability of knowledge networks by identifying appropriate capacity-building tools
- Catalysing and strengthening STI diaspora networks by linking to professional societies, universities, NGOs, and government agencies at home and abroad
- Convening diasporas to share information and best practices at various fora

NODES usually organises an annual forum during the AAAS Annual Meeting to engage scientists and engineers, students, innovators, and government and embassy officials by sharing stories from the diaspora that highlight the ways that individuals and groups are mobilizing diasporas to make a difference for and in their local, national, and global communities.

Diplomatic Circles

These are networks of diplomats and science officers from different embassies and consulates that gather on a periodic basis. As a group, they are able to better engage with the government authorities of the host country, arrange visits to scientific research centres or large research infrastructures, and organise scientific conferences in collaboration with public agencies, universities and academia, civil society organisations or even the industry sector.

These types of informal networks of government representatives are a useful and dynamic information and communications channel, benefiting not only international members, but also those science, technology and higher education stakeholders in the hosting country. These institutions may rely on the diplomatic circle to amplify their own messages to reach the international community abroad.

Usually they foster bilateral and multilateral collaborations and sometimes they also focus on addressing global needs together.

Some examples are listed below.

Science Diplomats Club of Washington DC

Science Diplomats Club of Washington, DC

http://www.sciencediplomats-washington.org/

Nature

Mono-stakeholder network

- *Lead*: Government (diplomats and STI delegates in embassies/consulates).

The network at a glance

The Science Diplomats Club (SDC) is a social club in Washington DC to provide an informal meeting place and networking channel for all science diplomats from diplomatic missions. The membership includes Science and Technology counsellors, attachés, or representatives of research institutions from more than 40 Washington-based embassies, about half of them from Europe. In addition, a few former science counsellors, as well as some U.S. personalities, have been granted the status of SDC honorary members.

Place
Washington DC, USA

Date
SDC was established in January 1965

Funding
Public

Type of Members

Government representatives' science diplomats

Rationale and activities

The Science Diplomats Club was established during a lunch held by the Embassy of Denmark at the Cosmos Club in DC in January 1965. The club was the initial site for luncheons; when the Embassy of the Netherlands took over the secretariat, luncheons were also held at their embassy and other local restaurants. Starting in 1982, various science counsellors started hosting luncheons at their embassies.

During these meetings, guest speakers from the government, associations, universities, and industries informed SDC members about developments in science and technology policy and on progress in Research and Development (R&D). In recent years, the club has also made visits to S&T organisations inside and outside the Washington area.

In 2007 the Embassy of France in Washington DC began co-organising with SDC "Science Breakfasts", which take place eight to ten times a year with speeches from prominent members of the American science and technology community. These breakfasts have provided the 30-40 guests from 15-20 countries with the opportunity to strengthen ties with American leaders in science and technology in a positive atmosphere.

List of other diplomatic circles

- The Science & Technology Diplomatic Circle Boston (link)
- The Science & Technology Diplomatic Circle Singapore (https://www.stdc-singapore.org/about/
- The London Diplomatic Science Club: established in 1960, current chair Embassy of France Prof Jean Arlat (London Diplomatic Science Club (LDSC) - Embassy Network (embassymagazine.com)

Global Research Networks

These global networks gather different stakeholders together primarily to assemble resources for research. They also promote collaborative research projects and foster networking and capacity training for researchers to better engage with the diplomatic world.

Big Research Infrastructures for Diplomacy and Global Engagement through Science (BRIDGES)

https://www.iiasa.ac.at/web/home/research/sciencepolicy/bridges/bridges.html

Nature

Mono-stakeholder (Research and Academia – Large research infrastructures)

The network at a glance

BRIDGES is an informal network of people who deal with science diplomacy and international relations in international research organisations.

Date
2019

Place
International network with the coordination based in IIASA in Austria.

Funding
Public

Type of members

Delegates from large research infrastructures

Rationale and activities

The BRIDGES network involves delegates from CERN, EMBL, ESA, ICTP, IIASA, ITER, JRC, SKA and XFEL participating. ESO, ILL and SESAME are part of it as well, and some more are being approached.

In recent years the topic of science diplomacy is gaining more and more importance, however the concept itself has remained somewhat abstract and would benefit from becoming more hands-on and operational. So, BRIDGES participants wanted to establish a joint science diplomacy platform to create a community of science diplomacy practitioners in international research organisations.

The network is a very lean operation without fees, legal commitments, or the like, and has hosted two meetings in 2019.