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Science Diplomacy: Translating Science into International Affairs

The contribution of the German National Academy of Sciences Leopoldina

The concept of science diplomacy

Science diplomacy (SD) is a term used to describe the interaction between scientists (and their work) and diplomacy and foreign policy. SD builds upon the evidence, reputation, networks and entire repertoire of science to improve international relations. When official channels are restricted or when the political situation/relationship is difficult, SD can help to maintain or restore trust, build credibility and enable a constructive approach through formats off the beaten track of politics. SD can be an influential tool in building bridges between societies and states, and for developing common strategies to address global challenges. SD also supports scientists subject to repression and human rights violations.

By definition, science transcends borders; by self-conception, science uses a universal language and set of academic standards. Therefore, SD is versatile, forging channels and formats ranging from traditional international scientific exchange to multinational research undertakings or infrastructures to scientific advice. Accordingly, it engages a broad range of actors, from scientists and science managers to embassy staff and policy-makers. Its effectiveness depends considerably on the context and timeframe. It can work by official mandate of a government or it can be a genuine grass-roots action. The goals of SD can vary from idealistic to normative to pragmatic. It is widely accepted that SD is a form of "soft power", sometimes with long-term effect.

Although a recent term, SD's historic roots date back to the late Enlightenment, proving notable achievements during the Cold War (such as the Soviet-American scientific exchange). The visit of German scientists from the Max Planck Society to Israel's Weizmann Institute of Science in 1959, before the establishment of diplomatic relations in 1965, proved to be a remarkable landmark of German SD. Several bilateral visits, research fellowships and the creation of the Minerva Foundation for Israeli-German academic exchange followed.

Leopoldina's science diplomacy

In 2008, Leopoldina was appointed Germany's National Academy of Sciences. In this capacity, it was invested with two mandates: to represent the German scientific community internationally and to provide science-based advice to policy-makers and citizens. Founded in 1652 as a learned society, it gathers today around 1,600 excellent members from over 30 countries. Since 2015, Leopoldina is engaged in various forms of science diplomacy, notably in the "science for diplomacy" dimension of SD, i.e. "using science cooperation to improve international relations between countries".[1] This comes into play for instance in Leopoldina's relations with the Western Balkans, Russia and China, and in science-related human rights issues. Germany's (and the European Union's) political relations with Russia and China prove to be challenging these days. Nevertheless, the German scientific cooperation with both Russia and China is ongoing, even increasing. This confirms that science offers a space for cooperation beyond politics, keeping communication channels open which otherwise would be lost. Joint scientific work functions not only on bilateral level, but also in multilateral settings, such as the G7 and G20 science-based advice[2]. This is a key activity of the Leopoldina, focusing on setting the global agenda on grand challenges ("science in diplomacy" dimension of SD). Leopoldina is active in human rights issues as well: its Human Rights Committee directs pledges for the respect of human rights of threatened scientists to political leaders. Such cases are identified together with the International Human Rights Network of Academies and Scholarly Societies.

Leopoldina engages its members and other scientists in SD activities, also working with other research organisations from Germany and worldwide, and creating synergies with additional initiatives. As the institutional support is relevant for the effectiveness of SD, Leopoldina cooperates with the German Federal Government. Here, two aspects are fundamental: (i) the organisational independence of science based on the

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[1] UK's Royal Society and US' AAAS identify in their 2010 publication New Frontiers in Science Diplomacy. Navigating the Changing Balance of Power three dimensions of policy in which the "still fluid concept" of SD can be applied: (1) informing foreign policy objectives with scientific advice (science in diplomacy); (2) facilitating international science cooperation (diplomacy for science); (3) using science cooperation to improve international relations between countries (science for diplomacy). [Retrieved: 11.11.2021]

[2] Learn more about Leopoldina's G7 and G20 activities. [Retrieved: 11.11.2021]

"freedom of science" principle from Germany's Fundamental Law and (ii) the win-win-oriented working relationship. Trust, predictability, reactive capacity and weighing of options add quality to such interactions.

A practical example: the Berlin Process for the Western Balkans

A prominent example of science diplomacy by the Leopoldina is the Western Balkans Process (also known as the Berlin Process).

Genesis

Initiated mid-2014 by the German Chancellor Angela Merkel, this is a joint undertaking of 10 European Union (EU) Member States[3], six Western Balkan states (WB6)[4] and the European Commission to support the EU-integration of the WB6 and to foster regional cooperation in South East Europe. Conflicts and divides from the collapse of former Yugoslavia and of the communist system corroborated with many other problems still mark this area. That is why the key approach of the Berlin Process is that of connecting different fields of action to support profound transformation: from resolution of bilateral disputes to rule of law and economic development to rapprochement and cooperation in education and science.

Leopoldina has been entrusted by the German Federal Government to take the lead in the field of science, education and society within the Berlin Process, seeing this also as a German SD pilot project. Subsequently, Leopoldina has established in 2015 a platform for key national stakeholders of the education and science systems – the so-called Berlin Process Joint Science Conference (BPJSC). Its primary aim was/is to create a neutral forum on level playing field for dialogue, cooperation and joint approaches on science and education matters.

Modus operandi

The work of the Berlin Process is organised in different chapters corresponding to the fields of action in form of permanent conferences (broader involvement, also of non-political actors) or ministerial working groups. All chapters reassemble under a political umbrella with a yearly rotating presidency. The annual conferences of the chapters and the Summit of Heads of State and Government (Leaders Summit) are the pivotal elements of the process's workflow. Every chapter puts forward recommendations for the Leaders Summit. Leaders may adopt, endorse, change or decline the recommendations.

In operative terms, the work within the BPJSC unites *grosso modo* three streams: (i) an ongoing reflection on the topics chosen as priorities, including identifying experts, (ii) preparation of the annual meetings, including negotiating a Joint Statement adopted by consensus, and (iii) communication with involved actors, mainly the European Commission services and the OECD. Around 50-80 participants are involved yearly (including third-party experts and diplomats).

Results

The BPJSC[5] commenced in July 2015 as a "science for diplomacy" project with a first annual meeting in Berlin. Five additional meetings took place: 2016 in Vienna, 2017 in Paris, 2018 in Rome, 2019 in London and 2021 as a virtual meeting. At the first meeting, participants decided to widen the focus by adding the "policy for science"[6] dimension to BPJSC. In consequence, the meetings also examined necessary improvements for the WB6 science systems. In 2018, the "science for policy"[7] dimension was added as well, with two topics addressed since: in 2018, the WB6 economic convergence with the EU single market and in 2021, the COVID-19 pandemic. The major topic discussed in all meetings was the "brain drain" from South East Europe. For tackling this problematic phenomenon, participants have put forward concrete action proposals for "brain circulation" within Europe.

So far, political leaders have endorsed all Joint Statements produced by the BPJSC. The interplay between scientists, politicians and technical experts remains challenging. Nevertheless, convergency between different background actors is progressing. An increasing number of aspects is being addressed on national level and by the European Commission. Regrettably, the "brain drain" issue remains largely untouched.

Next future for science diplomacy: an outlook attempt

As shown in the case above, one question on the science diplomacy concept arises: is there a difference between SD and scientific advice in international affairs? There is no sharp distinction between the two: they are different forms of science-politics interaction which sometimes – yet not always – intermix, depending on the quality of the international relations and the topical focus in a given context. In an increasingly interdependent world, scientific knowledge will need to translate even more into international affairs and foreign policy according to the theorem "good governance needs good advice". COVID-19 is just a recent demonstration of that. Science diplomacy *can* step in at the intersection of science and foreign policy. However: with the limits of SD being influenced by the will of citizens and politicians, the concept itself will remain fuzzy in the next future. What counts in the end is the result: translating scientific expertise into good decisions for a better world.

[3] Austria, Bulgaria, Croatia, France, Germany, Greece, Italy, Poland, Slovenia and the United Kingdom (EU Member State until 31 January 2020).

[4] Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia.

[5] Learn more about the Berlin Process Joint Science Conference. [Retrieved: 11.11.2021]

[6] Policy for science: providing scientific expertise and recommendations for the design of the policy on education, R&I policy of a country/region/community.

[7] Science for policy: providing scientific expertise for policy choices for the broader benefit of a country/region/community.

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Hot paper

Storing energy with molecular photoisomers

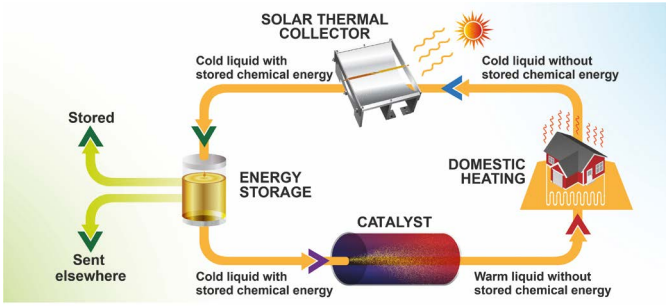

Image: Chalmers University of Technology

To comply with the worldwide increasing demand for renewable energy, new tailor-made concepts are required to capture and store solar energy for different applications and at different scale. Beside the well-established approaches for energy storage, such as batteries or power-to-X, smart molecular concepts may provide simple, small-scale solutions with the potential to complement the portfolio of established technologies for specific applications.

A particular promising concept is the so-called **'molecular solar thermal system' (MOST)**. MOST technology **combines solar energy conversion, energy storage, and energy release** in a simple molecular approach. The idea is **based on molecular photoswitches**, which are converted photochemically to a metastable high-energy state, and thus store solar energy in a simple one-molecule-one-photon process. The **stored energy** can later be **released on demand in form of heat**.

In a current review article, **eight leading research groups in the field from six countries** provide an insight into the current state-of-the-art of this exciting research field. [1] The article discusses the scientific concepts behind MOST, new ideas for molecular design, the incorporation into functional devices, and the challenges that remain for future research.

[1] Z. Wang, P. Erhart, T. Li, Z.-Y. Thang, D. Sampedro, Z. Hu, H. A. Wegner, O. Brummel, J. Libuda, M. B. Nielsen and K. Moth-Poulsen, *Joule*, 2021, DOI: https://doi.org/10.1016/j.joule.2021.11.001.

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