Spanish Science Diplomacy: A Global and Collaborative Bottom-Up Approach

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Science has become a global enterprise and a team endeavor. This article summarizes recent efforts by the Spanish public administration to empower a set of players in this international game: associations of Spanish researchers abroad. As part of a modern, bottom-up, multi-stakeholder approach to science diplomacy, the Spanish government has enlisted these communities of scientists to serve as key partners for public diplomacy, both within their host countries and in Spain. Many of these research associations have existed for years, established in order to improve the visibility, influence, and connectivity of scientists. Their members collaborate on projects, work with the Spanish scientific administration, and also work independently toward achieving their own agendas.1, 2, 3 With the help of these pre-existing networks of scientists, Spain has been able to strengthen its science diplomacy at home and abroad, to reinforce its scientific presence in strategic countries, and to foster career opportunities for Spanish researchers.

Networks of Science Diplomats

Science diplomacy and international cooperation are not new to Spain, and important scientific networks and partnerships have been in place for years. In the eighties, the Ibero-American Program of Science and Technology for Development (CYTED),4, 5 established a network of scientists in Latin America and Spain. More
than 28,000 scientists and innovators are now connected through this program, with the support of both scientific and diplomatic administrations in Spain.\footnote{6}

Although CYTED guaranteed a promising scenario for Spanish “diplomacy for science” in Latin America, it had become clear that a complementary “science for diplomacy” network was needed to extend beyond the region. Besides, with the recent economic turmoil in Spain,\footnote{7} alternative perspectives were required to implement and harness an approach focused on “brain circulation.”\footnote{8} A network of science diplomats was envisioned to be built around communities of Spanish scientists abroad. This network of science diplomats would allow Spain to engage with Spanish scientists’ host countries in new ways and would expand the presence of science in the Spanish foreign policy agenda. It would also foster cooperation on global challenges such as emerging diseases, climate change, and food security, which inevitably need to be addressed from an international perspective.\footnote{9} In addition, the network of scientific associations would serve as a useful “soft-power” diplomacy asset and a provider of transnational scientific guidance. This combined approach would also contribute to keep Spanish researchers abroad involved in the Spanish national ecosystem of science and innovation, ensuring scientists abroad a continual role in science development within their home country.\footnote{10}

The fact that many associations of Spanish researchers abroad had already been established made the process much simpler. At least thirteen associations of Spanish researchers abroad currently operate. However, engaging with these networks first required the establishment of proper institutional channels. Over the last few years, Spain has developed a stronger inter-ministerial collaboration to assist with this process, linking all stakeholders in the Ministry of Foreign

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<tr>
<td>• Network of Counselors for Cultural Affairs</td>
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<td>• Spanish Agency for International Development Cooperation (AECID) and its Directorate for Cultural and Scientific Relations</td>
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<td>• Secretary of State for Foreign Affairs:</td>
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<td>o Special Ambassador for International Environment Affairs</td>
<td>o 9 delegates and 22 fellows from the Centre for Development of Industrial Technology (CDTI) in 28 countries</td>
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<td>o Special Ambassador for Cybersecurity</td>
<td>o 3 international scientific coordinators from the Spanish Foundation for Science and Technology (FECYT) in 3 countries</td>
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<td>• Centers for culture and language promotion: \textit{Institutos Cervantes}</td>
<td>o Office of the Permanent Mission Representative for the European Union (REPER)</td>
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<td>• \textit{Marca España} (policy aimed at strengthening Spain’s image at home and abroad)</td>
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Table 1. List of All Stakeholders in Science Diplomacy from the Spanish Public Administration
Affairs and Cooperation and the Secretary of State for Research, Development, and Innovation (SEIDI) (Table 1). Two public institutions under this umbrella have taken the lead in developing the network of potential science diplomats: the Centre for Development of Industrial Technology (CDTI) and the Spanish Foundation for Science and Technology (FECYT).

The CDTI and FECYT have complementary roles. The CDTI fosters the technological development and innovation of Spanish companies by relaying these companies’ funding and support requests and by helping to improve their technological capabilities. The CDTI also deploys a foreign network, with a presence in twenty-eight countries, to improve the technological position of Spanish companies in the international arena. FECYT, meanwhile, a state-run public foundation within SEIDI, provides expertise in science policy and communication with the goal of promoting science and innovation, connecting science to the general public, and supporting the scientific community. In 2012, FECYT kicked off its effort to support associations of Spanish researchers abroad. Shortly after, it launched the first “Science Diplomacy Network” for the mutual exchange of scientific information between countries with diplomatic representation in Spain. More recently, it has dispatched scientific coordinators to strategic embassies to develop scientific affairs agendas abroad (Figure 1).

The effort to provide top-down support for Spanish science communities overseas is part of a larger action plan co-signed by the Secretary of State for Research, Development, and Innovation and the Ministry of Foreign Affairs and Cooperation. The plan calls for embedding the priorities of the national research, development, and innovation (R&D&I) strategy in Spanish foreign policy and globalizing the R&D&I system by establishing a close collaboration with the Spanish research diaspora and internationally promoting recruitment opportunities in Spain. Within this plan, FECYT has taken action through several different means.

First, scientists were appointed to the Spanish embassies to the United States, the United Kingdom, and Germany. These three countries were selected because they are the top three destinations for Spanish researchers and their associations of Spanish scientists abroad have the most active members. The integration of scientists in embassies is a common practice for other countries, such as the UK or France, and allows science to assume a central seat at the diplomatic table. The appointed scientific coordinators have extensive knowledge of the research landscape in Spain as well as within their host countries, and they provide advice on relevant stakeholders and potential sponsors. These coordinators have already turned the three above-mentioned embassies into long-term partners for collaboration and main points of contact for Spanish researchers abroad.

Second, permanent staff was dedicated to the project at FECYT-SEIDI headquarters, within the International Projects Unit. These personnel are responsible for coordinating engagement with Spanish researchers in those
countries that currently lack a scientific coordinator. They also coordinate efforts with other relevant external stakeholders, including EURAXESS (an initiative that supports researchers’ mobility within the European Research Area), European-related programs, and other projects and initiatives. With the help of these staff members, the new network of science diplomats has been fully coordinated with the existing science diplomacy network in Spain and with the traditional Spanish diplomatic corps.

Through providing top-down support to bottom-up associations of Spanish researchers abroad, much has been accomplished. To be sure, project leaders faced many challenges along the way, most relevant among them coordination of administrations and integration at the embassies. The results of this innovative Spanish approach will now be described for the three countries in which scientific coordinators were placed within Spanish embassies: the United States, the United Kingdom and Germany.

The U.S. Experience: Increased Visibility for Spanish Scientists

Since the initiative began, the Spanish scientific community in the United States has become organized and is collaborating with the Spanish scientific administration to improve the visibility, influence, and connections of Spanish scientists in both countries, heavily inspired by the U.S. model. The largest association, Españoles Científicos en USA (ECUSA), has more than 850 members in thirty states, and is organized into five regional chapters in Washington, D.C., Boston, New York, the Midwest, and California. This network of scientists...
facilitates the integration of newcomers and the exchange of ideas by organizing workshops and scientific talks. ECUSA fosters, through a wide range of activities, the interaction not only between scientific disciplines, but also with other science stakeholders in both the public and private sectors. The network is also active as a science policy advocacy group.

The first Joint Meeting of Spanish Scientists in the United States\textsuperscript{16} was a direct result of shared efforts between ECUSA and the Spanish administration and significantly increased visibility for Spanish scientists in the U.S. The meeting was opened by His Majesty King Felipe VI and Carmen Vela, the secretary of state for research, development, and innovation, and addressed many topics,\textsuperscript{17} including the globalization of science and its effects on the community of Spanish scientists in the United States. It also covered research in brain activity, nanotechnology, biodiversity conservation, renewable energy, and social institutions and inequalities, as well as science in society as a key tool for reaching beyond academia.

*Figure 2a. Timeline, 2014–2016, of science diplomacy in Spain (above the lines) and in the United States (below the lines). Main events or programs are set in bold. ECUSA (Españoles Científicos en USA); FECYT, the Spanish Foundation for Science and Technology; SciDip, science diplomacy; STID, Science, Technology, and Innovation Diplomacy.*
The meeting was a great success. Attended by more than 150 scientists and entrepreneurs across many disciplines, it helped consolidate the network of Spanish scientists in the United States. Following the meeting, more than forty-five related articles appeared in Spanish periodicals. Building on this success, a second meeting will take place in 2017 at the Massachusetts Institute of Technology (MIT). ECUSA is exploring new topics for discussion, including gender and entrepreneurship, the link between science policies and society as a mechanism for dialogue for policymakers, and academics and researchers working in the foreign policy and scientific communities.

The presence of a scientific coordinator at the Spanish embassy in the United States has also led to increased connectivity and opportunity for Spanish researchers. With the Spanish embassy as lead, EURAXESS North America launched the European Scientific Diasporas Initiative in the U.S. More than a dozen countries participated in the initial meeting, allowing European diaspora groups in the States to share best practices and broaden their horizons for scientific cooperation. Members of the resulting network agreed to work toward a Pan-European Mentorship Program under the umbrella of EURAXESS North America.

Thus, these Spanish scientists have also become key participants in the science diplomacy, science policy, and science advocacy arenas. SEIDI is also working closely with the American Academy for the Advancement of Science, the publisher of Science & Diplomacy, to establish the first pilot program in Spain to connect scientists to public policy and the Spanish administration.

**The UK Experience: Science Policy Advocacy**

Since 2011, the Spanish embassy in London has played a leading role in nurturing Spanish science diplomacy. In fact, it provided the initial support for the establishment of the Society of Spanish Researchers in the United Kingdom (SRUK/CERU). CERU currently has more than six hundred members, and has conducted more than two hundred activities, including outreach events at pubs and schools, international conferences, workshops for science careers, and Science+, a three-day conference. CERU features top Spanish scientists as speakers, and actively promotes the research performed by members with outreach events along with media appearances and travel grants or career awards. CERU also organizes partnership events to engage Spanish universities, research centers, and companies with their UK counterparts. Close collaboration between CERU and the embassy has led to many networking events, roundtables, bilateral conferences with the Royal Society, and a science diplomacy symposium in 2015.

CERU has also been active in science policy advocacy efforts. In time for the 2015 Spanish general elections, the group delivered a report on recommendations in R&D&I to the main Spanish political parties. This report led to an increased presence of science in the political debate, and its
recommendations about women and science have been processed as non-law propositions in the Spanish parliament. Additionally, CERU has become involved in the UK, publishing articles regarding last year’s EU referendum and surveying CERU members to better address their views and needs. Overall, CERU has boosted Spanish public diplomacy, setting an example for other Spanish scientific networks abroad, as well as non-Spanish diaspora networks in the UK.

The appointment of a FECYT science coordinator to the embassy in 2015 further strengthened Spanish science diplomacy in the UK. The embassy continues to host scientific debates, and now also organizes career development workshops for scientists as well as programs to bring science closer to society. For instance, “Science in the Classroom” sends professionals to a Spanish school in London in order to inspire students to pursue STEM careers and to raise awareness of the value of science in modern society. Likewise, “Ambassadors for Science” is an innovative shadowing scheme uniting the science and diplomacy worlds to foster new science diplomats and to introduce more science into diplomacy. The scientific coordinator has also worked with CERU to publicize information about

Figure 2b. Timeline, 2012–2016, of Spanish science diplomacy in the United Kingdom (above the lines) and in Germany (below the lines). Main events or programs are highlighted in bold. CERFA, Sociedad de Científicos Españoles en la República Federal de Alemania; FECYT, Spanish Foundation for Science and Technology; SRUK/CERU, Society of Spanish Researchers in the United Kingdom; STI, Science, Technology, and Innovation.
scientific employment opportunities in Spain, with the goal of encouraging talent circulation between both countries.29

Collaboration with other stakeholders in the UK, such as the London Diplomatic Science Club, has led to a noteworthy recent success for Spanish science diplomacy—namely, participation in the “Science Diplomacy and International Governance” symposium30, 31 by SEIDI, the FECYT science coordinator in London, and the CERU chair. Altogether, they offered a fresh vision of science diplomacy based on both a close collaboration among different public departments and proactive engagement by the scientific community.

The German Experience: Career Development for Spanish Researchers

Germany is a leader of European innovation and the biggest producer of PhDs on the continent. Moreover, academics in Germany are prepared for careers outside universities and are often employed by a strong and stable industrial sector.32 German researchers also enjoy a high degree of independence without the restrictions of market demands when compared to researchers in some other countries.33 The prospects for German researchers are very good. However, despite the high degree of internationalization of some science institutions like the Max Planck Society, 77 percent of the research positions in Germany are still held by Germans.

Since 2012, the Society of Spanish Researchers in the Federal Republic of Germany (CERFA) has boosted the career prospects of Spanish scientists in Germany. Having now reached its fifth year, CERFA is the second oldest association of Spanish scientists abroad.34 In collaboration with FECYT, CERFA has organized events on many topics, including research funding opportunities in Germany, career options outside academia, and interfaces between science and the arts. CERFA has helped junior researchers understand and emulate their German colleagues, a method aimed at improving their employment prospects. In particular, the organization collaborated with FECYT in developing a guide for Spanish researchers in Germany35 and hosts Spanish school students in German research institutions in the summer.

The Spanish embassy in Berlin, FECYT, and CERFA frequently work together on programs and initiatives. Both FECYT and the embassy organized one of the biggest concentrations of Spanish scientists in Germany in 2015, including appearances by the astronaut Pedro Duque and Ander Ramos, the first non-German recipient of the “Best Young Researcher in Germany” award. FECYT has also collaborated with CERFA in the organization of joint meetings with other Spanish scientific networks abroad, as well as programs on public science communication that covering topics such as “women in science,” “science and war,” and “ethical implications of artificial intelligence.” During 2016, FECYT’s delegation in Germany
also started to promote international collaborations between Spanish and German medical groups working on innovative therapies against cancer.36

**Summary and Next Steps**

The concept of providing top-down support to bottom-up scientific associations constitutes a new and creative model for modern science diplomacy. By placing scientists at embassies and establishing channels of interaction with scientific networks abroad, Spain has raised the visibility of its scientists in strategic countries, developed a network of science diplomats, and improved career opportunities for Spanish researchers. This recent history is summarized in the accompanying timelines (Figures 2a and 2b). However, Spain has not fully leveraged all the opportunities that this collaboration offers as a vehicle to pursue Spain’s foreign policy goals.

Rising interest in science as a part of Spain’s foreign policy is linked to the need to address an array of challenges from an international perspective,37 including emerging diseases, climate change, and food security. Furthermore, the Spanish government believes its new science diplomacy network of Spanish researchers abroad can act as assets for soft-power diplomacy and as partners and mutual multipliers for initiatives. These groups of researchers can provide transnational scientific guidance, even as they actively inspire new generations of Spanish scientists. In broad terms, new science patterns and ways to collaborate have emerged where countries compete for global talent and skilled scientists. Spain has the opportunity to tap into this national talent, wherever it may be, and explore flexible formulas for allowing the resulting knowledge to benefit the country. To this end, Spanish scientists abroad were included as panel evaluators for the country’s ANEP (National Evaluation and Foresight Agency). Additionally, SEIDI and the Ministry of Foreign Affairs recently met with Spanish science diplomacy stakeholders, including the Spanish scientific associations abroad, to discuss how to better develop their new science diplomacy framework. The recent publication of a report on science, technology, and innovation diplomacy38 marks another recent milestone as well as furnishing strategic guidance for the Spanish system of science, technology, and innovation to move naturally into the field of science diplomacy.

Three next steps will aid in the development of this new science diplomacy framework. First, Spain should establish additional scientific and technological advisor positions at strategic embassies, prioritizing those countries with a high number of Spanish scientists and a strong tradition of bilateral collaboration. Here, reinforcing the role of science diplomacy at diplomatic missions has already delivered positive recent results, and it will be crucial in the future. Second, Spain needs to promote a culture of science in public policy within both the legislative and the executive powers. By including scientists in diplomatic missions, Spain
may well be forging a model for how the Spanish public administration eventually embeds scientific advisors in different departments, thereby fostering lateral thinking. Third, Spain needs to incorporate innovative bottom-up initiatives from Spanish researchers abroad, ensuring that they can be transferred to and strengthened within the country.

From here on, Spanish-speaking research communities around the world can continue to help reinforce relationships, inspire a next generation of leaders, and propel new international programs for scientific cooperation, such as CYTED, 5+5, and the Partnership for Research and Innovation in the Mediterranean Area (PRIMA). Spain will continue to support these communities and integrate them into the national scientific system. With their aid, Spain can reinforce its scientific presence in strategic countries, strengthen its scientific reputation, increase internationalization of Spanish universities and research centers, and support Spanish companies’ strategies for international innovation. Scientific researchers have already built bridges across borders, improved bilateral relations, and enhanced the prestige of the Spanish research community. It is time for policymakers to follow suit. SD

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ENDNOTES


34. Aitziber Romero, “Puesta de largo de la ciencia española en Berlín,” DW, October 18, 2013, http://www.dw.com/es/puesta-de-largo-de-la-ciencia-espa%C3%B1ola-en-berl%C3%ADn/a-17168653.


