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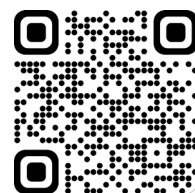


Special Issue

## EXPLORING THE IMPACT OF SCIENCE ACADEMIES OF YOUNG SCIENTISTS ON SCIENCE DIPLOMACY



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# Science Diplomacy

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## Disclaimer

The opinions expressed in this publication are those of the authors. CSIR-NIScPR assumes no responsibility for statements and opinions advanced by the authors.

# Nurturing Science Diplomacy: Young Academies’ Role in Advancing STI and Global Collaborations

In the realm of international science collaborations, science diplomacy has emerged as a captivating concept. It urges governments to prioritise scientific collaborations, including mega-science projects, and motivates young scholars to pursue research in this emerging area. The increasing number of articles and social media posts featuring science diplomacy keywords and hashtags reflects the growing interest in the field and the involvement of a wide range of actors.

While organisations like the AAAS Center for Science Diplomacy, The World Academy of Science, the International Science Council play crucial roles in advancing science diplomacy, science academies have long been champions of promoting science, technology and innovation (STI). These academies have been instrumental in fostering scientific excellence, providing expert advice to policymakers, and facilitating international collaborations, thus making significant contributions to the field of science diplomacy.

Recognising the importance of involving young scholars, the first young science national academy was established in Germany in 2000, known as the “Die Junge Akademie” or “Young Academy.” Currently, there are over 54 National Young Academies worldwide, along with additional similar national bodies, transnational young academies and young scientists’ networks forming part of the broader young academies network.

We extended invitations to young academies, urging them to share their invaluable contributions to advancing science education, research, policy and diplomacy. Here, we present the four captivating write-ups highlighting young academies’ diverse and impactful roles. The first article underscores the significance of science diplomacy in promoting a responsible global research ecosystem. It emphasises the need for the scientific community to harness science diplomacy through national academies and international organisations. This helps develop strategies tailored to local contexts while supporting globally harmonised and unified research conduct and integrity.

The second article highlights the Indonesian Young Academy of Sciences (ALMI) and its diplomatic roles in strengthening Indonesia’s impact in advancing science for the betterment of the global community. The third article sheds light on the journey of the Hong Kong Young Academy of Sciences (YASHK) and the invaluable platform it provides for young scientists to connect, learn, and engage with the broader scientific community. Finally, the article on the Sri Lankan Academy of Young Scientists (SLAYS) emphasises their commitment to enhancing their understanding of science diplomacy and policymaking.

Collectively, these articles explore the roles and achievements of young academies in advancing STI within their nations through national and international collaborations. Further interlinkages among these academies hold the potential for formulating new approaches that intertwine science and diplomacy, including capacity-building, scientific cooperation, collaboration, technology access and resource sharing.

Additionally, we present an insightful article that delves into India’s G20 Presidency in 2023, with a specific focus on healthcare, prevention, preparedness, response to health emergencies, pharmaceutical cooperation, and digital health innovations. Given the G20’s significance in terms of the global population, trade, and GDP, India’s leadership becomes crucial in driving progress and pioneering solutions for global health challenges.

Furthermore, another compelling article explores the need for a regional dialogue on open science in South Asia, highlighting the potential role of the Open Science South Asia Network (OSSAN) in fostering collaboration, innovation, and knowledge-sharing within the region. By embracing open science practices, South Asia can accelerate efforts towards achieving Sustainable Development Goals while nurturing a vibrant scientific ecosystem.

This issue also incorporates a report on the science diplomacy immersion program organised by GESDA (Geneva Science and Diplomacy Anticipator), held in May 2023. The program aimed to foster collaboration and bridge the gap between science and diplomacy, offering key insights into its activities and outcomes. It highlights the transformative potential of science diplomacy in shaping the future of international cooperation.

We hope that the readers find this latest issue of Science Diplomacy informative and insightful. We look forward to your valuable feedback and comments as we continue to explore the multifaceted intersections of science, diplomacy, and global progress.

Monika Jaggi

## Science Diplomacy in Fostering Responsible Conduct of Research: Bridging the Trust Deficit in Science in the New Normal

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The COVID-19 pandemic has increased the expectation of scientists as solution providers. There is a greater urgency for the scientific community to answer important research questions, accelerate the rate of translation of scientific discoveries into tangible solutions and provide actionable and accurate science advice to various stakeholders. Although there has been a heightened appreciation for the role of science, there appears to be growing disenchantment in the capacity of the scientific ecosystem to rise to the occasion. This sentiment is epitomised by the erosion of trust in science in the public discourse; where scientific evidence, traditionally thought to be robust, is now frequently challenged. The polarising discourse on the safety of vaccines, pandemic origins and preventative strategies such as face masks and lock-down mandates exemplify the mistrust that exists between scientists and the public – including leaders and politicians around the world who question the validity and integrity of science.<sup>1</sup>

While political ideology, religiosity, morality and scientific literacy may play a role in influencing science scepticism at an individual level, the society's composite response is both heterogenous and multifactorial in nature.<sup>2</sup> The internet, in particular social media has exacerbated this chaos through the pervasive nature of misinformation and fake news.<sup>3</sup> The scientific community has a role to bridge this trust deficit through more effective science communication, advice and engagement with different stakeholders that also include policymakers. This approach also includes shedding the 'ivory towers' mentality, being more relevant to society and providing a rationalisation for the kind of research questions under investigation. The rising retractions of publications<sup>4</sup>, the high-profile reports of research misconduct<sup>5,6</sup> and the cut-throat self-serving academic environment have further eroded trust in science. Greater awareness of the potential risks of some advancing technologies, accompanied by open science<sup>7-9</sup> has further cast a spotlight on the need for introspection and self-governance within the scientific enterprise. Hence, there is a need to calibrate how

future scientists are trained. We need a new generation of relevant and socially responsible scientists who are able to meet multi-stakeholder expectations and uphold the integrity of science. The global character of the scientific enterprise provides a natural vehicle for both diplomacy and security assurances.

A number of relevant international frameworks exist on research governance and integrity. For example, in the arms control arena, the Biological and Toxin Weapons Convention (BWC)<sup>10</sup> and the Chemical Weapons Convention (CWC)<sup>11</sup> both contribute to norms associated with responsible science. In particular, the Organisation for the Prohibition of Chemical Weapons (OPCW), the implementation arm of the CWC, answered a call from the States Parties to address the issue of responsible conduct of the chemical sciences. Two workshops in 2015 led to the drafting of the Hague Ethical Guidelines. The core of the document maintains that "achievements in the field of chemistry should be used to benefit humankind and the environment".<sup>12</sup> The dissemination of the guidelines is an important part of the process as described in the release statement by the OPCW Director-General in the opening remarks to the 80th session of the Executive Council: "The Hague Ethical Guidelines have been made available on the OPCW public website. I encourage all States Parties to share the guidelines with their National Authorities, Ministries of Education, educational institutions, scientific communities and other stakeholders to advance understanding of the importance of nurturing responsible and ethical scientific development among chemistry professionals".<sup>13</sup>

There are no similar guidelines associated with the BWC yet, although efforts are underway. Nevertheless, the yearly meetings of the BWC have activities "on the margins" that bring NGOs and other sub-national players together to discuss ethical concerns related to the advances in the life sciences. A second model document is the "Statement on Biosecurity" by the InterAcademy Partnership (IAP), which was endorsed by 68 national academies of science.<sup>14</sup> The International Science Council (ISC), through its Committee on Freedom and Responsibility in the Conduct of Science, has organised various initiatives such as the World Conferences on Research Integrity to foster universal responsible conduct of research (RCR) dialogue and workshops on research assessment and quality in science. Various statements have also been declared to encourage the development of unified strategies and language to foster greater research integrity worldwide. Amongst these statements include the Singapore Statement on Research Integrity (2010), the Montreal Statement on Research Integrity in Cross-Boundary Research Collaborations (2013) and the Global Research Council's Statement of Principles of Research Integrity (2013).<sup>15</sup>

While legal frameworks and codes of conduct have their own function and value, ultimately, much like what the pandemic has revealed, effective and sustainable solutions can only be achieved through the fostering of a culture of responsibility at an individual and institutional level. As international research partnerships become increasingly essential, as seen in the global response to COVID-19, science diplomacy plays a role in harmonising the cross-border discourse on responsible conduct of science to ensure a common understanding of scientific integrity and responsibility.<sup>16</sup> As such, science academies are recognised as having crucial roles in the international arena of science diplomacy. While constitutionally independent, most are established to serve their nations by representing national perspectives and commitment to international issues.<sup>17</sup> National academies, by virtue of belonging to global networks such as the IAP and ISC, have been shown to be effective platforms for transboundary science diplomacy.<sup>18</sup>

In the 2011 workshop conducted by the US National Academy of Sciences, Engineering, and Medicine (NASEM) Committee on Global Science Policy and Science Diplomacy Development, Security, and Cooperation Policy and Global Affairs, RCR was highlighted as an essential area in which the international scientific community needs to collaborate for effective global science cooperation and science diplomacy would be the best tool to enable dialogues on RCR harmonisation and development of a uniform code of conduct to facilitate global research. RCR generally means good citizenship in research<sup>19</sup> that covers various topics in the research process such as conflicts of interest, human and animal subject research, mentoring, collaboration, peer review, data management, research misconduct, authorship and publication, social responsibility, financial responsibility, a culture of safety as well as contemporary topics such as big data, open science and use of statistics.<sup>20</sup>

The US NASEM has played a leading role in developing strategies to promote ethical behaviour and decision-making in science amongst researchers and policymakers.<sup>21-24</sup> In 2013, US NASEM, in collaboration

with the Academy of Sciences Malaysia (ASM), organised the first Educational Institute on Responsible Science in Kuala Lumpur. In this workshop, early- to mid-career researchers from Malaysia, India and Pakistan were introduced to the concept of RCR through a variety of active learning and assessment techniques to demonstrate the impact of active learning pedagogy in teaching RCR (Fig. 1). The ASM subsequently engaged the Young Scientists Network-Academy of Sciences Malaysia (YSN-ASM) (<https://ysn-asm.org.my/>) to develop a formal RCR programme in Malaysia in 2015. Since the inaugural US NASEM initiative in Kuala Lumpur in 2013, YSN-ASM has trained thousands of researchers in the country through the organisation of nationwide RCR workshops. The RCR programme highlights the value of engaging with policymakers, politicians, and top leaders of academic institutions, as well as in international collaboration with US NASEM in initiating RCR dialogues in the local as well as regional science community.<sup>25</sup> The increased awareness and discourse on RCR led to the development of the Malaysian Educational Module on RCR ([https://issuu.com/asmpub/docs/rcr\\_module\\_readonly](https://issuu.com/asmpub/docs/rcr_module_readonly)), the explicit inclusion of RCR education as a strategic initiative in the Malaysian National Policy on Science, Technology and Innovation 2021-2030<sup>26</sup> and the expansion of the programme to the ten member states of the Association of Southeast Asian Nations (ASEAN).



Figure 1. Participants of the Educational Institute of Responsible Science organised by the US NASEM and the Academy of Sciences Malaysia, in Kuala Lumpur

The establishment of the ASEAN RCR Project that leverages the collaborative network of emerging researchers in the region is science diplomacy in action. Modelled upon the US NASEM Educational Responsible Science Institute and supported by the International Science Council Regional Office for Asia and the Pacific (ISC-ROAP) and the International Network for Government Science Advice (INGSA), this 3-year project (2019-2021) aims to create awareness of RCR amongst researchers in the region, build capacity to champion RCR in the individual member states and formulate a regional strategic framework to cohesively foster RCR (Fig. 2). The collaborations between national young academies and scientific institutions in the region not only promote RCR but also enhance the capacity and trust to foster regional collaborations to enable an innovative, competitive, vibrant, sustainable and economically integrated region.<sup>27</sup> The interconnectivity between integrity, building trust and relationships and cross-boundary research collaborations reflect the interdependence between science and diplomacy.



Figure 2. Participants from the 10 ASEAN member states attended the ASEAN RCR Workshop in Malaysia on 10-13 December 2019

Whilst it is essential to engage scientists at the individual level as key drivers for successful implementation, institutions play a critical role in providing the platform for these cross-boundary initiatives.<sup>28</sup> A common challenge faced by individual bottom-up initiatives is the lack of political will to ensure the sustainability of efforts. Rising nationalism and unhealthy competition between countries may also hamper science diplomacy efforts. Therefore, the RCR experience in the Southeast Asian region has demonstrated the importance of national academies (both senior and young) that have well-established global networks (e.g. IAP, The World Academy of Sciences, Global Young Academy), international and regional organisations (e.g. ISC-ROAP, INGSA and ASEAN), and respective national policymakers (e.g. Ministries in charge of Science, Higher Education, Foreign Affairs etc.) in both the cross-boundary sharing of knowledge and experience as well as effective shaping of domestic foreign policies. Although the language of science is universal, there is greater diversity in the scientific ecosystems among countries and regions. While the principles of RCR are universal, the process by which it should be locally enculturated must take into consideration the socio-cultural-economic variations as well as the scale and capacity of the research ecosystems in each country.<sup>29</sup> Therefore, the scientific community should leverage on science diplomacy through national academies and international organisations to promote the development of locally-contextualised strategies to support a globally harmonised and unified RCR; satisfying a country's pragmatic needs while promoting the capacity for cross-border cooperation.<sup>30</sup> Ultimately, fostering a global responsible research ecosystem requires both top-down and bottom-up science diplomacy approaches. The ratification and declaration of

statements and cross-border agreements as well as national codes are essential in defining national policies within a uniform code of conduct but for these policies to be acted on locally and embraced pervasively, collaboration between the international scientific community is paramount. As the world comes to terms with the new normal and we deal with various grand challenges at a greater frequency than anticipated, the role of science diplomacy, particularly in promoting a responsible global research ecosystem will be more crucial than ever.

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## Indonesian Young Academy of Sciences and its Current Diplomacy Roles

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Science diplomacy finds its roots in the field of international relations, where the interests of science and policy converge, and science is employed by policymakers to facilitate and mediate uncertainty issues of global concern, as well as how to resolve the increasing number of conflicts around the world.<sup>1</sup>

The Covid-19 outbreak highlighted the significance of science diplomacy and collaborative work in addressing the pandemic. Globally, there have been 764,474,387 confirmed cases of Covid-19, including 6,915,286 deaths, reported to the World Health Organisation.<sup>2</sup> Though Covid-19 vaccines being widely available in high-income countries since mid-2021, the vast inequality of vaccine access was highly problematic. Only a quarter of people in low-income countries received at least one dose, resulting in unnecessary loss of lives.<sup>3</sup> This situation was further exacerbated by the dissonance between political leaders' rhetoric and decisions, which also prioritise policies benefiting capital accumulation.

It seemed an uncertain situation faced by many countries, including the scientific community worldwide. Indonesian scientists were also grappling with such paradoxical and uncertain circumstances during the pandemic. Hence, the Indonesian Young Academy of Sciences (ALMI) felt the need to contribute to resolving complicated cases and policies in responding to Covid-19. ALMI is an organisation for prominent young Indonesian scientists, established in 2016 as an autonomous organ of the Indonesian Academy of Sciences (AIPI).

ALMI aims to promote a culture of scientific excellence and the advancement of science in Indonesia. It has four missions: first, to promote the progress of frontier science through interdisciplinary collaborations among young Indonesian scientists. Second, to inculcate a scientific temper and scientific culture of excellence among the younger generation in Indonesia. Third, to encourage the integration of science in shaping public policy-making processes. And fourth, to be part of the global young academy movement, forging connections and collaborations with young academies worldwide.

ALMI has been actively promoting strategic academic programs to achieve its missions, mainly through four organisations of working groups: *Frontier of Science*, *Science and Society*, *Science and Policy*, and *Science and Education*. While the term "science diplomacy" may not be explicitly stated, ALMI members actively engage in activities that embody its principles, reflected in many academic activities and collaborations with foreign partners through conferences, research, and bilateral meetings exchanging knowledge and experiences. The effectiveness of ALMI's role in changing situations depends on the specific context and outcomes of these engagements, which can vary in their impact and influence.



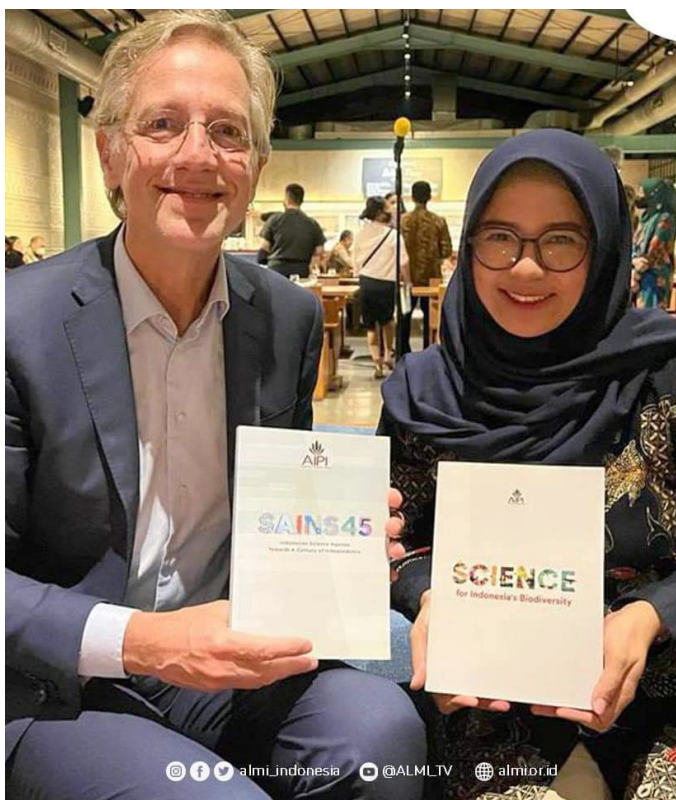
The 1<sup>st</sup> Indonesian Congress of Young Scientists, Jakarta, 3 December 2022

### Science for Humanity

With the increasing globalisation of science, policymakers are looking for new avenues for the advancement of society. The demand for international cooperation is ever-expanding and science diplomacy plays a crucial role in facilitating this process. Science diplomacy is vital for societal growth, especially in dealing with the objectives of science for humanity. *Science in diplomacy* means that science provides support for policies, law, innovation, and strategic plans with scientific inputs. Through *diplomacy for science*, diplomacy facilitates international scientific cooperation, while *science for diplomacy* is the meaningful use of science as a soft power to enhance international cooperation.

Furthermore, scientific diplomacy means enabling scientific researchers to influence foreign policy with science-based evidence and advice. The most obvious examples are found in international negotiations on global issues such as climate change, food security or energy. Science and scientific expertise aid in decision-making in foreign policy: to achieve its purposes, diplomacy must make effective use of science.<sup>4</sup>

ALMI plays a crucial role in advising, synthesising solutions, and issuing public statements (press releases or public discussions) related to finding solutions for problems. Collaboration among young scientists is regularly carried out in several countries. For instance, a delegation of ALMI member scientists attended a special invitation to a meeting with the Minister of Education of the Kingdom of the Netherlands, Prof. R. H. Dijkgraaf, in Jakarta on 21 July 2022. ALMI worked voluntarily to seek more effective collaboration by visiting and having meaningful discussions with the Royal Netherlands Academy of Arts and Sciences (KNAW) at its headquarters in Amsterdam, Netherlands, on 28 September 2022.



Prof. R. H. Dijkgraaf, Minister of Education of the Kingdom of the Netherlands and ALMI President, July 2022

Besides, collaborative programmes such as the Week of Indonesia-Netherlands Education and Research (WINNER) program display the efforts of Indonesian and Dutch governments and scientists to build commitment and collaboration among young Indonesian scientists. The last WINNER took place in Utrecht and Jakarta from 18-20 October 2022, with the theme for the conference being “Learning and research collaboration for sustainable blue, green and digital economies and societies”. The fourth edition of WINNER will be held under the theme of “Enhancing knowledge connectivity for regional impact” from 10-12 October 2023.

Young Indonesian scientists regularly engage with various countries, including those within the Southeast Asian region and the United States. Examples include the Indonesian-American Kavli Frontiers of Science Symposium, a joint program organised by the Indonesian Academy of Sciences (API) and the US National Academy of Sciences (NAS). These annual symposia bring together some of the very best young scientists to discuss exciting advances and opportunities in their fields in a format that encourages informal collectives and one-on-one discussions among participants.

### ALMI at Global Level

ALMI's vital role as an organisation of young scientists is not just being a resource person or being involved in international scientific agendas but also actively arguing fundamental strategies for addressing global challenges that must be resolved through research and policy. That is why ALMI needs to become a reference for research and scientific-based policy strategies.

The issue of climate justice, the global impact of the Russian and Ukrainian wars, socio-economic impoverishment, and attacks on academic freedom, ALMI has officially voiced in the 2022 Worldwide Meeting of Young Academies and Joint Conference with the InterAcademy Partnership, November 2022 (Arizona, USA). ALMI is fully aware that the political situation has turned into an authoritarian tendency in many countries, which affects science and scientists. Therefore, ALMI has also been defending scientists' rights and academic freedom since these are fundamental values in promoting science for not merely policy changes but also progressive and meaningful science for humanity.

Hence, becoming a part of the Global Young Academy (GYA), network with Scholars at Risk (SAR) and member of the International Science Council (ISC), will further strengthen the role of ALMI globally in promoting science. ALMI, in its statement to ISC members (2023), stated, “...by collaborating and expanding networks for advancing sciences, this would enable us to bring the progressive message for social and ecological justice. In solidarity, we are really eager to promote science for advancing human civilisation. ALMI will be ready for taking this challenge, together with all members of ISC.”

For ALMI, it emphasises the importance of science diplomacy to build bridges between science, technology, and innovation, as well as national interests and global challenges. Advanced technology has played a significant role in shaping and regenerating nature and altering the environment. Transforming and regenerating the earth will bring massive benefits to future generations.

## Concluding Remarks

Indonesia's strategic role as the leader of the G20 in 2022 for a year, driven by the political commitment to mastering technology and innovation, is one of the priorities for the Indonesian government during the 2019-2024 period. This role serves as a unique opportunity to enhance Indonesia's influence in advancing science for the betterment of global civilisation.

Indonesia's challenges as a tropical country, including issues such as massive deforestation and the destruction of natural resources through the expansion of mining capitalism and the palm oil business, greatly impacted its efforts to protect biodiversity. It creates socio-economic impoverishment and ecological threats, disturbing the delicate balance of nature and its sustainability. However, a wide array of technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and data analytics, can be leveraged to create, expand, and monitor the effectiveness of sustainable development and environmental protection, including building the advanced health system.

In this context, science refers to the approach to enhance multi-, inter- and trans-disciplinary collaborative works with multiple stakeholders to benefit people and the planet and ensure prosperity for all parties. ALMI, a young scientific community, could continuously strengthen cooperation to enhance science and technology contributions, with the aim of leaving no one behind. Senior Diplomat Makarim Wibisono emphasised the importance of involving scientists in foreign diplomacy from an early stage. This is because science diplomacy can be a second path involving non-governmental actors such as scientists, NGOs and journalists. "The role of the second line is also capable of successful diplomacy," said Makarim.<sup>5</sup>

During the first Indonesian Young Scientist Congress (KIMI), ALMI stated, "Science is a way of humanity, be brave and progressive." This statement signifies the call for scientists to fortify their expertise, foster collaborations, and demonstrate unwavering commitment through their scientific endeavours. The objective is to drive transformative changes in civilisation that prioritise compassion and ecological sustainability for the well-being of our shared planet.



Annual Meeting of ALMI, Jakarta, December 2022

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## Role of the Hong Kong Young Academy of Sciences

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### **Introduction**

The Hong Kong Academy of Sciences (ASHK), established in 2015, is Hong Kong's highest academic honour conferred by peer scientists to recognise the outstanding contributions of Hong Kong scientists. It currently has 38 renowned members.

ASHK's objectives include promoting science and technology (S&T) research, development, and talent nurturing, raising public awareness of S&T issues and fostering Hong Kong as a centre of scientific excellence. ASHK has gained an excellent reputation regionally and globally for advancing technological development and science popularisation.

The Hong Kong Young Academy of Sciences (YASHK) was founded in 2018 as a chapter of the ASHK. It builds on ASHK's strengths and networks to engage with academia, industry, and the public sector. YASHK aims to create a vibrant community of aspiring young scientists dedicated to serving the community, fostering scientific talents, and advancing science, technology, and innovation (STI). YASHK provides a platform for young voices, enabling the younger generation to contribute meaningfully to Hong Kong. Furthermore, it seeks to improve the research and education environment for S&T. For the advancement of education on a non-profit basis, YASHK aims to advance education, promote S&T development, enhance science teaching, and educate the public on issues pertaining to S&T.

Currently, YASHK has 53 members, and its membership will grow further through new elections. Their expansion will enhance its capacity for academic and societal influence. The Young Academy's enthusiastic members would inject fresh momentum into ASHK's work. Through active participation in international conferences and exchanges, YASHK members contribute to the global development of S&T. Details of their achievements are available on YASHK's [Facebook](#) and [Instagram](#) pages.

### **YASHK: Empowering Young Scientists for Scientific Advancement**

YASHK plays a vital role in influencing policies and education in the field of S&T, acting as a bridge between young scientists and stakeholders. YASHK has formed five Sub-Committees to enhance operational efficiency.

The *Policy Advisory Committee* channels the views of YASHK members to relevant government departments, providing expert advice on matters concerning young scientists. The aim is to contribute to the research & development policies, such as the Hong Kong Innovation and Technology Development Blueprint promulgated in December 2022.



YASHK Founding Members Vic Law, Stephanie Ma and Anderson Shum as distinguished speakers at the Global I&T Summit 2022

The *Internal Affairs Committee* supervises and coordinates internal events within the academy. Its responsibilities include organising YASHK Members' Meetings and New Members' Election process. By doing so, the committee aims to strengthen the connection among members and commit to the thriving development of the academy.

The *Academic Committee* promotes the excellence of young scientists from Hong Kong and facilitates interactions between local and international counterparts. It is also involved in organising an upcoming international Summit series to be held in 2023-2024.

The *Industrial Partnership Committee* focuses on bridging the gap between academics and industrial parties. By collaborating with organisations such as the Hong Kong Young Industrialists Council, it facilitates the translation of research outputs and conducts Industry Workshops to introduce the latest scientific developments on topics such as AI, robotics, COVID-19, clean energy, advanced manufacturing technologies, etc.

YASHK's *Outreach Committee* strives to cultivate scientific and innovative talents in Hong Kong. It organises different science popularisation activities, collaborating with organisations like the Hong Kong Academy for Gifted Education and The Hong Kong Federation of Youth Groups, who share similar visions. For example, it hosts a workshop series called "How to Start a Research Project" for secondary 4 and 5 students, providing guidance and hands-on experience.

YASHK members lead the workshops with their relevant expertise on topics, including but not limited to how to start a research project and how to improve their analytical, planning, organising, and presentation capabilities. The workshop series includes sharing sessions by outstanding scientists, lab visits, science competitions, and scientific forums.

Besides, YASHK also supports ASHK programmes designed to nurture future talents. These programmes include the Distinguished Master Accomplished Students (DMAS) Mentorship Program and the S.T. Yau High School Science Award (Asia) [YHSA (Asia)].

The DMAS Mentorship Programme, co-organised by ASHK, the Hong Kong Academy of Engineering Sciences, and the Hong Kong Institution of Science, is launching its fifth cohort in 2023, following the success of the previous editions. The Programme aims to provide Hong Kong students with valuable exposure to current scientific and technological developments while nurturing their talents. Through a one-year

mentorship, experienced professionals, including YASHK members, share their real-world experiences and industry knowledge with students. The mentors inspire and guide students, offering advice to help them unleash their potential and realise their ambitions.

YHSA (Asia) is a prestigious regional research competition held in Hong Kong, co-organised by ASHK, Yau Mathematical Sciences Center of Tsinghua University, and The Institute of Mathematical Sciences of The Chinese University of Hong Kong. The competition attracts participants from Hong Kong and the entire Asian region, excluding Mainland China.

Secondary students participating in YHSA (Asia) submit their research report showcasing their advanced level of research beyond the general education requirements. Additionally, they present their work in an oral defence session before Assessment Panels, some of which include YASHK members. The winning teams earn the opportunity to compete in the YHSA Finale held in Beijing, where they compete against teams from Mainland China and other countries.

Through their initiatives, YASHK actively promotes S&T, encourages practical learning experiences, fosters a spirit of scientific inquiry and contributes to the growth of Hong Kong's scientific community.

### **YASHK's Global Connections**

YASHK is expanding its impact and collaboration with similar academies in the Greater Bay Area, Mainland China and overseas regions through a series of summits called "The Young Academy of Sciences Summits". These summits aim to provide a unique platform for young local academics and scientists to connect, engage, and exchange ideas with their counterparts from around the world. The goal is to stimulate cross-disciplinary, cross-cultural, and cross-institutional cooperation in Hong Kong.

To develop and strengthen international connections, esteemed academies like the UK Young Academy, Global Young Academy, and Young Academy of Europe will be invited to participate in the summits. This initiative aims to foster collaboration among scientists and academics who share a common vision and passion for S&T, enabling them to work with YASHK members and scholars in Hong Kong.

With most members having overseas study experiences, YASHK serves as a unique group of ambassadors poised to share knowledge, contribute expertise, and enhance the development of S&T in Hong Kong, the Greater Bay Area, and beyond. By connecting different regions, YASHK members bridge the gap between local and international scientific communities, fostering collaboration and promoting scientific progress for the benefit of humanity.

In conclusion, YASHK plays a crucial role in promoting scientific research, innovation and fostering the next generation of scientists. By providing a platform for young scientists to connect, learn, and engage with the broader scientific community, the academy is shaping the future of science. Through its diverse initiatives, programmes, and outreach efforts, YASHK ensures that science continues to drive positive change in the world, creating a brighter future through the advancement of knowledge and technology.

## Driving Progress in Science Education, Research, Policy, and Diplomacy: Exploring the Impact of the Sri Lankan Academy of Young Scientists

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### **SLAYS – A Common Platform for Young Scientists in Sri Lanka**

The Sri Lankan Academy of Young Scientists (SLAYS) was established in 2012 under the guidance of the National Academy of Sciences Sri Lanka (NASSL). Its primary objective is to provide a platform for young scientists in Sri Lanka to connect, exchange ideas and collaborate for scientific advancements. SLAYS membership comprises professionals engaged in advanced research across diverse disciplines, and the council members serve voluntarily.

SLAYS is dedicated to fostering impactful research among young scientists in Sri Lanka. It prioritises safeguarding the quality and ethical standards for scientific advancements contributing to the country's development. Its mission revolves around promoting collaborative and impactful research activities that benefit the community, achieved through a cultural and attitudinal transformation facilitated by resource and information sharing. Over the past decade, SLAYS has undertaken several initiatives to systematically foster research and science education in Sri Lanka, offering attractive opportunities to young scientists with the guidance of experienced professionals. Its annual calendar includes events and activities that facilitate its mission and vision.

### **Advancing Scientific Research and Collaborations**

Leveraging on the strength of its members, comprising professionals from diverse scientific disciplines, SLAYS takes on a leading role as a national organisation for promoting scientific research. They utilise their expertise, knowledge, and skills to advance scientific endeavours. It includes conducting awareness programs for school children and society to inculcate a scientific temper and rational approaches to problem-solving. Consequently, SLAYS is invited to collaborate with national and international scientific organisations, further strengthening science education, science diplomacy and research within the country. In addition, SLAYS has created numerous opportunities for young scientists to enhance their science education and engage in research activities.

SLAYS has established strong collaborations with several South and Southeast Asian young academies, including Bangladesh (NYAB), India (INYAS), Thailand (TYSA), and Nepal (NaYAN). They frequently organise events such as workshops, competitions, and more, often in partnership or participation from these academies. Some notable milestones in their collaborative efforts include the International Poster Presentation Competition (2020), the E-Capture Photography Competition (2021), the Workshop on Predatory Academic Practices in South Asia (2022), and the Sci-Capture Photography Competition (2022).

SLAYS also acknowledges the significance of local collaborations, particularly with the National Science Foundation (NSF), the Sri Lanka Association for the Advancement of Science (SLASS), and the Sri Lanka Medical Association (SLMA). Over the years, these collaborations have enabled SLAYS to work closely with the SLMA, advising Sri Lankan inventors on improving, approving and evaluating inventions to combat the Covid-19 pandemic. Furthermore, during the post-pandemic economic crisis that led to fuel shortages in the country, SLAYS initiated a national campaign called "Cycle to Work." The campaign provided comprehensive guidance to voluntary participants on the essentials and best practices of commuting by bicycle, approaching it from a scientific perspective.

SLAYS was the first in introducing the Three Minute Thesis (3MT) competitions in Sri Lanka with the permission of the University of Queensland. The academy is not reluctant to explore novel concepts and has consistently succeeded, leading by example. One of the focal points of SLAYS activities is its annual international conference, which includes community outreach activities, workshops, and competitions. The conference features expert speeches addressing contemporary global issues encompassing science, science education and publications. It also provides a platform for showcasing the research findings of the SLAYS members and opportunities for interdisciplinary research collaborations.

In 2023, SLAYS introduced the "Science Industry Conclave" concept to enhance interactions among young scientists and industries. Another significant achievement was the launch of the SLAYS Cooperate Arm, which facilitated collaboration between industries and researchers. This initiative enabled industries to express their interest in partnering with researchers to address their challenges through scientific and innovative solutions, embracing mutual benefits. "Help a Young Scientist" was another initiative undertaken by SLAYS to support and facilitate research activities by local scientists amidst the ongoing economic crisis in Sri Lanka.

SLAYS maintains its online presence through its website (slays.lk), YouTube channel and Facebook page. SLAYS utilises these digital platforms to effectively disseminate scientific initiatives and events. The recent creation of a Twitter account has immensely facilitated swift communication and sharing of important information among the entire SLAYS membership. However, SLAYS acknowledges the need to improve the visibility of its activities through digital media and reach a wider audience, considering it a responsibility to promote scientific education and research and to motivate young scientists in the country.

### **Enhancing International Exposure and Engagements**

SLAYS consistently emphasises fostering international exposure and collaborations for young scientists in Sri Lanka. To achieve this, SLAYS has proactively implemented various measures to expand its engagement and representation at the international level. Participation of SLAYS office bearers at international forums and conferences, such as delivering a speech on "Science Diplomacy in the Asian Region" at the Triennial Conference of the Inter Academy Partnership (IAP) and the Worldwide Meeting of the Young Academies held in Arizona, USA in 2022. Through such participation, SLAYS has secured representation on the steering committee for Asian Young Academies. SLAYS members have also actively engaged in online meetings since 2020, including the Global Online Young Academies meetings, which are crucial for young scientists.

Additionally, SLAYS achieved another significant milestone in its overseas outreach by launching the SLAYS Global Arm in collaboration with the Sri Lankan Association of Oregon in the USA in November 2022. This initiative has provided a platform for collaborations between science enthusiasts worldwide and Sri Lankan scientists, effectively enhancing SLAYS' global perspective. The key objectives of SLAYS Global Arm include providing expertise to young Sri Lankan scientists, establishing connections with the scientific

community in the USA, facilitating research collaborations when needed, and supporting Sri Lankan young scientists by offering necessary equipment and assistance, including high-quality used equipment.

### **Empowering Sri Lankan Young Scientists for a Brighter Future**

Previously, SLAYS had limited direct involvement in policymaking activities, as priorities were focused on other areas. However, recognising the importance of conveying its voice and safeguarding young scientists in the country, SLAYS has taken measures to enhance its understanding of science diplomacy and policymaking. It has organised a series of discussions on science diplomacy with experts engaged in science policymaking aimed at educating SLAYS members on the subject.

At the SLAYS conference 2023, two keynote speeches were dedicated to science diplomacy, with a distinguished policymaker from Sri Lanka and an international diplomat sharing their insights on the intricacies of policymaking. Consequently, SLAYS received an invitation from the NASSL to participate in an international collaborative program to deepen its knowledge of science diplomacy and science policy. Through these efforts, SLAYS has effectively conveyed the importance of involving Sri Lankan youth in policymaking, and it eagerly looks forward to future opportunities to contribute to policy discussions and decisions that impact young scientists in the country.

# Charting the Path to Global Health: India's G20 Presidency and the Science Diplomacy Efforts for Pioneering Solutions

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The COVID-19 pandemic has brought public health to the forefront of the global agenda, necessitating a more aligned and coordinated approach to tackling health challenges. Key health issues, such as emerging and re-emerging infections, outbreaks/epidemics/pandemics, rising incidence of non-communicable diseases, impact of climate change, anti-microbial resistance, are not confined to a single country or region, necessitating a collective global response. International forums like G20, BRICS, SAARC, NAM, and the Quad, serve as vital platforms, bringing together countries from diverse regions, each contributing their unique experiences and expertise. This collective engagement provides a comprehensive understanding of health challenges and facilitates the development of holistic solutions. These forums enable policy coordination, resource mobilisation, knowledge sharing, capacity building, norm-setting, and diplomatic engagement in the realm of global health. By engaging in dialogue, they aid in aligning policies, pooling resources, sharing best practices, and setting common standards. Such concerted efforts strengthen global health governance, enhancing the capacity to respond effectively to health crises and promoting a healthier future.

India's G20 presidency in the current year holds immense significance as it provides a platform for the country to showcase leadership and actively shape global economic and development agendas, with health being a major focus. As the world's fifth-largest economy and home to a substantial population, India brings a unique perspective to the table. The G20 countries collectively represent two-thirds of the world's population, 75% of global cross-border trade, and 80% of the world's GDP, amplifying the importance of their leadership.

Under the theme "One Earth, One Family, One Future," based on India's philosophy of '*Vasudhaiva Kutumbakam*' (the world is one family), India's G20 Presidency in 2023 prioritises healthcare, recognising its vital role in global well-being and economic stability. It concentrates on three pivotal areas: prevention, preparedness, and response (PPR) to health emergencies; enhancing cooperation in the pharmaceutical sector; and promoting digital health innovations. These areas comprehensively address health challenges and foster collaboration among member countries.

On leveraging the G20 presidency, India seeks to drive international efforts in responding effectively to health emergencies, strengthening the pharmaceutical sector through enhanced cooperation, and promoting digital health innovations. These initiatives aim to contribute to global well-being and enhance nations' resilience in health crises.

The Health Track of India's G20 Presidency consists of four Health Working Group (HWG) Meetings and one Health Ministerial Meeting. The meetings have been held in Thiruvananthapuram (Kerala), Goa, Hyderabad (Telangana), and the fourth one is planned in Gandhinagar (Gujarat). The primary objective of these meetings is to build upon the health priorities and chief outcomes from previous presidencies while emphasising critical areas that require strengthening. In addition to the core meetings, various side events

have been organised, including discussions on Medical Value Travel and Digital Health, a workshop on collaborative research on drugs, diagnostics, and vaccines, and a co-branded event on the Global Centre for Traditional Medicine. The participation of over 180 delegates from G20 countries, invited states, and international organisations, demonstrates the global engagement and commitment towards addressing health challenges.

One of the essential priorities of India's G20 Presidency is health emergencies PPR with a focus on antimicrobial resistance (AMR) and the One Health framework. AMR poses a significant global health challenge, reducing the effectiveness of antibiotics and other antimicrobial drugs against infections. India's focus on AMR during its G20 Presidency underscores the need for a coordinated and multi-sectoral approach to tackle this issue. It includes policy and regulation, surveillance and monitoring, and public awareness and education as crucial areas to address AMR effectively. Strengthening regulations related to antimicrobial use, promoting responsible antibiotic use, supporting research and development, enhancing surveillance systems, and raising public awareness are cardinal steps in combatting AMR comprehensively.

The One Health approach, recognising the interconnection of human health, animal health, and the environment, is another area of focus under India's G20 Presidency. By enhancing veterinary services, improving animal health, and promoting international collaboration in research and data sharing, the One Health framework facilitates early detection, rapid response, and effective control of emerging infectious diseases. Sustainable and eco-friendly practices, including responsible antibiotic use in agriculture, pollution and contamination reduction, and safe disposal of pharmaceutical waste, are essential for achieving One Health objectives. India's G20 Presidency provides an opportunity to strengthen international cooperation on the One Health agenda.

Strengthening cooperation in the pharmaceutical sector is another priority under India's G20 Presidency. The aim is to ensure access to safe, effective, quality, and affordable medical countermeasures, which include vaccines, therapeutics, and diagnostics (VTDs). India's expertise in the pharmaceutical industry can contribute to improving access to essential medicines globally. Discussions have taken place regarding the establishment of a global R&D network as part of the Global Medical Countermeasures Platform. This network aims to bolster pandemic preparedness and response efforts by fostering collaboration and coordination among various stakeholders. This network would promote innovation, research collaboration, and cooperation between governments, institutions, and stakeholders, strengthening global health systems and resilience.

The COVID-19 pandemic has exposed the vulnerability of low- and middle-income countries in the Global South, prompting the need for innovative approaches to build local capabilities and ensure timely access to diagnostics, vaccines, and medicines during health emergencies. The global community must prioritise the needs of these countries in shaping the next global health architecture to effectively manage future pandemics. Establishing Vaccine-Therapeutics-Diagnostics Networks across different regions and diversifying research and manufacturing capabilities can enhance the world's collective response to health challenges. It is crucial to address unpredictable demand surges, scaling-up difficulties, and disrupted supply chains that have hindered the timely delivery of essential medical products. Global leadership should take responsibility for ensuring the equitable distribution of tests and treatments to all countries within a defined timeframe, and a global medical countermeasures coordination platform can play a vital role in this effort during India's G20 presidency.

India's focus on digital health innovations aims to improve healthcare accessibility, quality, and efficiency using technology. India's successful adoption of digital technologies can provide lessons for accelerating the progress of universal health coverage for the world. By expanding telemedicine services, promoting the adoption of electronic health records, establishing interoperable health information exchange systems, and leveraging artificial intelligence and data analytics, India aims to overcome barriers and improve healthcare outcomes. Successful implementation of digital health innovations requires strategic investments, policy reforms, capacity building, and collaboration with national and international stakeholders.

During the recent 3<sup>rd</sup> HWG held at Hyderabad, a panel discussion centred around the creation of a global R&D network dedicated to research in VTDs. The discussions highlighted the potential of innovation,

manufacturing networks, and partnerships in driving global health research. The session concluded by emphasising the need to create a universal reality where life-saving medical countermeasures are accessible to all. The impact of the COVID-19 pandemic on healthcare systems globally prompted the call for collaboration, innovation, and accelerated research.

The discussions shed light on the fundamental pillars necessary for a robust global R&D network. These pillars encompassed leveraging strengths, sharing knowledge, setting priorities, allocating resources, building capacity, and facilitating technology transfer. A collaborative "Network of Networks" approach was proposed, promoting regional and local cooperation while aligning with existing partnerships and principles outlined in the World Health Organisation Blueprint. The envisioned collaboration would involve the establishment of a globally accessible database encompassing priority pathogens, ongoing research on VTDs, and the development of disease-agnostic technologies. This comprehensive database aims to address challenges such as information asymmetry, availability of critical materials, and inequitable access to potential solutions.

India's G20 Presidency presents a valuable opportunity to enhance its healthcare setup while contributing to global health. By prioritising the prevention of health emergencies, strengthening cooperation in the pharmaceutical sector, and promoting digital health innovations, India can advance its healthcare infrastructure, enhance access to affordable medicines, and improve the quality of healthcare services. Strategic investments and collaboration are vital in addressing global health challenges. Through international cooperation, knowledge sharing, and resource mobilisation, India can play a crucial role in building a healthier future for all.

## Does South Asia need a regional dialogue on Open Science?

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### Introduction

The Open Science movement aims to make scientific research more accessible, transparent, inclusive, and collaborative by removing barriers to access, sharing, and reuse. The open science movement has lately become integral in global science policy conversations as it has increasingly influenced how science is done. However, open science is perceived differently across various countries and regions due to their distinct S&T priorities and diverse stakeholders. Until recently, there was no unified definition of open science. For fair and equitable access for all, the need for a shared global understanding of the concept and opportunities of open science became imminent.

International organisations, such as the United Nations, the World Health Organisation, and UNESCO, have played a key role in promoting open science globally through science diplomacy efforts. They have been instrumental in raising awareness about the importance of open science as a tool for addressing global challenges, such as climate change, public health, and food security. The global open science movement further gained impetus with the launch of the landmark Budapest Open Access Initiative in 2002, which called for free access to research and knowledge for everyone, irrespective of their geographic location and financial resources. Furthermore, the Berlin Declaration on Open Access to Knowledge was issued in 2003, calling for open access to scholarly research. In 2016, a consortium of diverse stakeholders drafted the FAIR Guiding Principles for scientific data management and stewardship, intending to make scientific data more Findable, Accessible, Interoperable, and Reusable. A key output of such coordinated international

*“Open science is defined as an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible, and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation, and communication to societal actors beyond the traditional scientific community. It comprises all scientific disciplines and aspects of scholarly practices, including basic and applied sciences, natural and social sciences and the humanities, and it builds on the following key pillars: open scientific knowledge, open science infrastructures, science communication, open engagement of societal actors and open dialogue with other knowledge systems.”*

UNESCO Recommendation Framework on Open Science in 2021

science diplomacy efforts was the [UNESCO Recommendation Framework on Open Science in 2021](#). Signed by 197 countries, this framework provided an international standard for open science policy and practice that recognises diverse perspectives on open science across disciplines and regions.

Indeed, international cooperation and science diplomacy are at the core of the open science movement. They have enriched the movement by establishing networks, frameworks and recommendations that provide a solid foundation for open science practices. However, access to resources, research capabilities, socioeconomic conditions, policy environments and legal landscapes across countries affect the adoption and attitude towards open science. Therefore, among resource-constrained regions, such as South Asia, it becomes even more imperative to promote open science.

South Asia, consisting of eight countries - Afghanistan, Bangladesh, Bhutan, India, Nepal, Maldives, Pakistan, and Sri Lanka - shares a similar science and technology (S&T), economic, cultural and political landscapes. Establishing a regional open science network in this context can foster collaboration, knowledge sharing, and access to resources, data, and infrastructure. In this article, we explore the open science landscape in the South Asian region and emphasise the need for a regional open science network in addressing the unique challenges and requirements of this resource-constrained region.

### Open Science Movement in Regional Context

While the core principles of open science are the same globally, the implementation of open science practices can vary across regions or countries depending on local factors and contexts, such as legal frameworks, funding structures, cultural norms, and infrastructure, that can influence the adoption and implementation of open science activities. For example, in some countries, there may be legal restrictions on data sharing, such as research or sensitive personal information. In terms of infrastructure, there may be differences in the availability and usage of digital platforms and tools for sharing and collaboration.

Under such scenarios, regional dialogues among neighbouring countries or regions that share similar economic, socio-political, and infrastructural strengths, such as the global South, can help to promote the open science movement by fostering collaboration, facilitating knowledge and resources sharing, and addressing common challenges related to open science practices. By engaging in regional dialogues, stakeholders can collectively develop policies and guidelines for data sharing and open access publishing. Furthermore, they can help in establishing robust digital infrastructure for effective data management and sharing and promoting awareness and adoption of open science practices among researchers and policymakers in the respective regions. There are a few existing models of such regional dialogues (Table 1).

**Table 1:** Examples of regional dialogue models on open science

Initiative	Description
Latin American Council of Social Sciences (CLACSO)	It is a regional network of social science research institutions and researchers in Latin America and the Caribbean. It actively promotes open science through its Open Science Program (CLACSO Books), providing training and resources and support for open access publishing, data sharing, and open educational resources. The program also focuses on developing digital infrastructure and establishing policies and guidelines for open science. Additionally, CLACSO hosts the Latin American Social Science Virtual Library ( <a href="http://biblioteca.clacso.edu.ar">biblioteca.clacso.edu.ar</a> ), offering free access to a vast collection of open access social science research materials, enhancing the visibility and impact of research from the region.

Africa Open Science Platform (AOSP)	AOSP is an initiative established to advance open science practices and infrastructure throughout Africa. It aims to support the development of open science policies, capacity-building efforts, and digital infrastructure across the continent. Working groups and initiatives within the AOSP concentrate on various aspects of open science, such as open access publishing, data management, and open educational resources.
Red de Revistas Científicas de América Latina y el Caribe, España y Portugal (RedALyC)	The RedALyC is a regional network of scientific journals from Latin America, Spain, and Portugal. The network promotes open access publishing and works to increase the visibility and impact of scientific research from the region.
European Open Science Cloud (EOSC)	A key part of the European Commission's Open Science Agenda, EOSC is a pan-European initiative designed to provide researchers with access to research data and services. It is a federated infrastructure that brings together existing research data infrastructures across Europe. It serves as a single point of access for researchers, making it easier to find and use the data. In addition, it provides a range of services to support research, such as data management, analysis and visualisation. By enhancing access to research data, the EOSC promotes openness, transparency and inclusivity.
Forum for Open Research in MENA (FORM)	It is a non-profit membership organisation supporting the advancement of Open Science policies and practices in research communities and institutions across the Arab region. Founded in 2017 by a group of researchers and librarians from the Arab region, FORM aims to promote open science principles in the region. Its objectives include promoting open science policies and practices, facilitating collaboration among Arab region researchers, increasing the visibility and impact of research originating from the Arab region, and empowering citizens to participate in science and innovation.

Such initiatives have been crucial in propelling the open science debate and supporting the researchers in the respective regions. Considering the successes of such models, it becomes pertinent to explore whether similar approaches would be beneficial for South Asia.

### Overview of South Asia's Open Science Landscape

According to a 2014 study, South Asia has shown tremendous growth in scholarly output and scientific publishing in the last 50 years.<sup>1</sup> South Asia further accounted for 5.3% of the global scholarly output in 2016.<sup>2</sup> Since then, several South Asian countries have undertaken initiatives to increase R&D<sup>3</sup>, with India emerging as the world's third-biggest scholarly publishing hub.<sup>4</sup> However, despite the growing trend in science, technology and innovation (STI) measures, inter-regional collaborations to address regional challenges in South Asia are relatively rare.<sup>5</sup>

Given the constraints faced by developing South Asian countries, a significant number of resources are invested to produce scientific data and output. However, for optimum resource utilisation and to avoid reinventing the wheel, fostering scientific collaborations can benefit the region immensely. To aid such collaborations, each country in the region must adopt open science practices. However, before embarking

on this path, it becomes imperative to gain a comprehensive understanding of the region's attitude towards open science, existing policies, available resources and infrastructure.

We assessed the open science landscape in the region based on publicly available and accessible data (data from a few countries was either unavailable or limited). The overarching and common issues across South Asian countries include a lack of awareness regarding open science among researchers, funding agencies and policymakers, as well as the limited focus on the development of guidelines, frameworks, and infrastructure for open access publishing and data sharing. Although policy conversations have increased on open science in the wake of COVID-19, the overall state of the open science movement is still in a nascent stage. Below, we provide insights into the open science landscape of a few South Asian countries.

## **India**

According to a 2018 report<sup>6</sup>, the status of open science among researchers in India is concerning. Although most respondents (91.96%) agreed that open science is vital for research and that publicly funded research outputs should be accessible, only a limited fraction of them shared their publications (35.07%) and data (8.41%) through open access repositories. Even among those who use openly available publications and data, only a narrow percentage share them through open access, which is alarming considering that a significant proportion of respondents cited contributing to society and addressing social needs.

However, there has been a growing movement on open science in India, prompting the Government of India to act. The draft of the 5th national STI policy by the Indian Government includes recommendations on open science. The Indian open science framework aligns with global definitions, including UNESCO recommendations, while addressing local challenges.<sup>7</sup> It emphasises open access and sharing of publicly funded research data, along with region-specific requirements such as improved access to research facilities, libraries, and open educational resources. It also seeks to integrate science and society, recognise traditional knowledge systems, and encourage inclusive participation of stakeholders in scientific pursuits. Overall, the framework aims to create a more equitable and collaborative scientific ecosystem in India.

## **Pakistan**

Similar to India, a survey conducted in 2017 painted a bleak picture of academic awareness and usage of open science resources in Pakistan.<sup>8</sup> Although a majority of Pakistani academics (71.5%) reported using open access to access scholarly knowledge, only a minority of them engage in publishing through open access platforms.

The Directory of Open Access Journals (DOAJ) recognises 50 gold open access journals in Pakistan, a product of longstanding open access initiatives such as Open Access Pakistan.<sup>9</sup> However, the open science debate in Pakistan is majorly limited to open access conversation, with limited attention given to other aspects such as open data, open source, and citizen science. Although, the scenario is rapidly changing after COVID-19 and through the efforts of international agencies<sup>10</sup>, other aspects of open science are gaining recognition and importance in the national science policy discourse. However, it has yet to reflect as a priority in their national STI policy.<sup>11</sup>

## **Bangladesh**

In Bangladesh, like India and Pakistan, there is limited literature on open science. A 2016 survey of the faculty of the University of Dhaka pointed to a lack of awareness about open access initiatives and a negative perception of open access journals.<sup>12</sup> However, this is little data and does not reflect the open science debate in its entirety in the country.

Efforts have been made to promote open access in Bangladesh. The International Network for the Availability of Scientific Publications initiated the BanglaJOL project in 2007, an online database of open access journals published in Bangladesh. DOAJ recognises 117 open access journals in Bangladesh, and

approximately five institutional repositories are hosting open access articles. In addition, Bangladesh is a beneficiary of the Research4Life initiative, which provides free or low-cost access to peer-reviewed articles to students and researchers in lower-income countries.

While the open science movement in Bangladesh has primarily concentrated on open access, there is a shift through emerging forums like Open Access Bangladesh, which actively promotes open research data, open source, and open educational resources.

## Sri Lanka

The status of open science in Sri Lanka is currently in its early stages. While the government has shown some interest in promoting open science through initiatives like the National Science Foundation's Open Access Policy and provision for Open Education Resources<sup>13</sup>, there is still a lack of awareness and understanding of open science among researchers and institutions.

A few researchers and institutions are promoting open science efforts, such as the University of Sri Jayewardenepura has established an open access digital repository for scholarly publications. However, broader institutional support and infrastructure are necessary to facilitate the widespread adoption of open science practices in the country.

Additionally, there is a lack of funding and resources for researchers to carry out open science practices, such as publishing in open access journals or depositing research data in open repositories. This poses a challenge to the growth of open science in the country. Despite some positive developments, Sri Lanka has yet to fully embrace and implement open science practices.

## An Open Science Initiative for South Asia

In 1985, the South Asian Association for Regional Cooperation (SAARC) was established to promote cooperation among South Asian countries. A Technical Committee on S&T was set up to facilitate cooperation through joint projects, capacity-building programs, and the circulation of state-of-the-art reports on different S&T sectors. Despite this, regional dialogue and scientific cooperation remained abysmal, primarily due to financial constraints and political challenges.<sup>14</sup>

To overcome these limitations, India, as a prominent STI power and adopting a neighbourhood-first foreign policy<sup>15</sup>, can potentially take the lead in the open science movement in the region. India is already host to several initiatives such as [I-STEM](#), [ITEC](#), [SAU](#) and [CURE](#), which can facilitate regional cooperation and dialogue in open science. I-STEM serves as a national portal for open research infrastructure, allowing academic institutions, national labs, and strategic sector organisations to list their facilities and share them on a pay-per-use basis. CURE provides open access resources on COVID-19, including data and educational resources. South Asian University (SAU) brings together researchers, students and stakeholders from South Asia, while ITEC offers diverse training programs to foster greater cooperation between India and recipient countries. Among these, I-STEM and CURE are open science initiatives by design. SAU and ITEC programs provide unique opportunities to develop capacity-building, leadership, and open science networks in the region. However, none of these initiatives inherently promote open science within the countries or advance discussions on open science in science policy.

Recognising this gap, the [Open Science South Asia Network \(OSSAN\)](#) (Figure 1) project was conceived to initiate the regional dialogue in South Asia. OSSAN aims to raise awareness about open science practices among South Asian researchers, identify common policy priorities among the participant countries: Bangladesh, India, Nepal, and Sri Lanka, and explore the feasibility of establishing such a network for collaboration in science.

As the project commenced, it became evident that open access publishing is a major thrust area of focus in this region. However, the open access publishing landscape varies across countries, making it difficult to identify overlapping policy priorities and interests. Nonetheless, there is a strong need for community



**Figure 1.** Open Science South Asia Network (OSSAN). (a) OSSAN Logo, (b) Online call for registration and participation in OSSAN 2022 conference, (c) OSSAN 2022 conference welcome note by Dr Akhilesh Gupta, Scientist-H, Department of Science & Technology and Additional Secretary, SERB, Govt of India – recording available on [YouTube](#) (d) OSSAN event on open innovation: [From Science to Innovation](#), organised on 18 February 2023 at IISc Bengaluru (e) OSSAN Ideathon 2022 event: open source and open innovation ideas were invited from students (f) OSSAN partnered with NASTEC, Sri Lanka to deliver a [workshop on scientometrics](#) to early career researchers in Sri Lanka

building and raising awareness of open science practices. Developing open science infrastructures that would aid the entire region is vital. Furthermore, the development of alternative innovation metrics and the promotion of open-source innovation to address common social and technological challenges is imperative.

Experts unanimously agreed on the need for a dedicated forum for open science where scientists, academics, and policymakers can interact across borders. Such a network would represent the interests of South Asia on open science global forums. In addition, arduous labour is required to raise awareness about open science tools and practises among students, faculty, funding agencies and national journals.

A dedicated open science network in the region would address the barriers and challenges in adopting open science practices. However, past experiences, such as SAARC, have raised concerns over the success of such initiatives. To ensure the long-term sustainability of the network, it is recommended to secure adequate funding, implement a multistakeholder governance model, and seek support from international bodies like The World Academy of Sciences (TWAS) and the International Science Council (ISC).

## Way Forward

Developing a dedicated open science network in South Asia can benefit this region by:

1. **Building networks and communities:** A regional dialogue could bring together researchers, institutions, and policymakers from different South Asian countries, enabling sharing of experiences, best practices, and challenges in open science. This could foster collaboration and innovation within the region.
2. **Addressing regional challenges:** The network could provide a platform for discussing and developing strategies to overcome challenges specific to South Asia, such as limited resources, infrastructure and awareness. The network can contribute to improving open science infrastructure, policies, and practices in the region, which could have positive ripple effects for the broader open science movement.

3. Enhancing capacity building: Through training programs and workshops, the network could enhance the skills and knowledge of researchers, students and professionals in open science practices, strengthening the capacity of the South Asian S&T ecosystem.
4. Advocating for policy reforms: The network could engage with policymakers and funding agencies to advocate for open science policies and influence policy reforms at the regional and national levels.
5. Raising awareness: By bringing together stakeholders from across the region, the network could raise awareness about the importance of open science and nurture a culture of openness, transparency, and collaboration within the South Asian S&T ecosystem.
6. Promoting resource sharing: The network could promote the sharing of research data, publications, and tools among institutions and researchers, overcoming resource limitations and facilitating more efficient and impactful scientific research.
7. Fostering international collaborations: Most importantly, this network could be a precursor to international collaboration by connecting researchers and institutions in South Asia with their counterparts in other regions. This can help to expand research networks, promote knowledge exchange, and encourage collaborative research projects that transcend geographical boundaries.

In summary, a dedicated open science network in South Asia could facilitate the open science movement in the region by fostering collaborations, addressing regional challenges, advocating for policies and practices, and building capacity and skills. Initiatives such as OSSAN are required to mature, become self-sustaining networks, and expand to other South Asian countries to bear the joint fruits of the regional open science movement.

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## Shaping the Future of Multilateralism through Science Diplomacy: Insights from the GESDA Science Diplomacy Immersion Program

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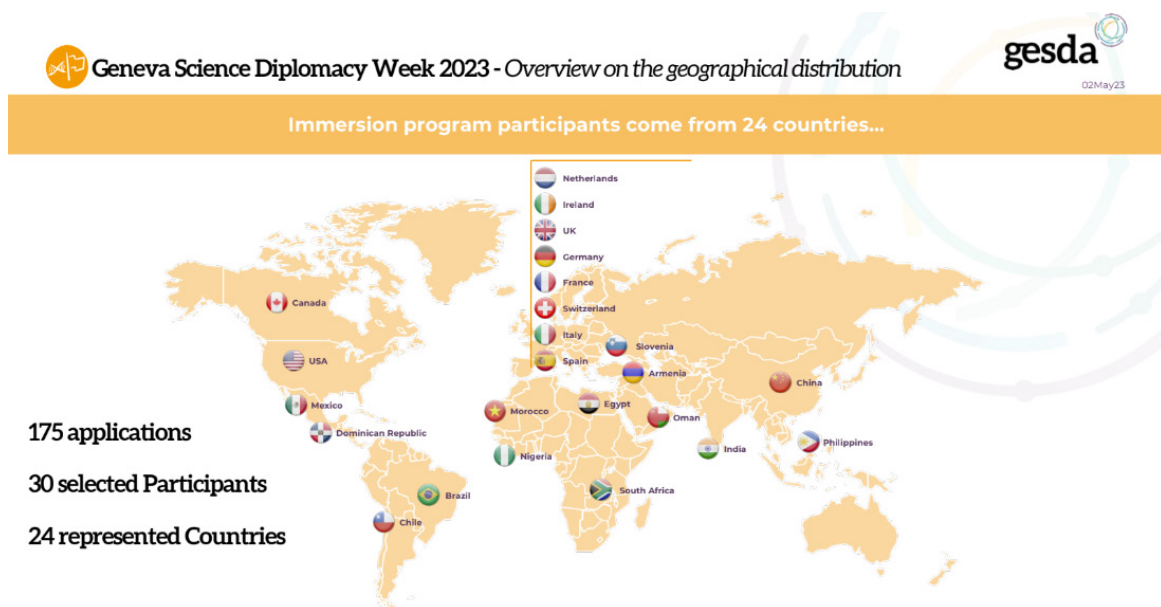
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### Introduction

Science diplomacy is an interdisciplinary field that combines scientific knowledge, international relations, policy, and diplomacy to address global challenges, foster international cooperation and build diplomatic relationships between countries. It recognises that challenges such as climate change, global health, environmental protection, natural hazards, sustainable development, and management of natural resources transcend geographical and political boundaries and require scientific expertise. By leveraging scientific collaborations, science diplomacy facilitates joint projects, diplomatic and policy dialogue, data sharing,



Map showing an overview of the geographical distribution of participants

knowledge and resource exchange between countries. Despite scientific communities often being overlooked as stakeholders in the international multilateral system, organisations like the Geneva Science and Diplomacy Anticipator (GESDA) Foundation serve as international science diplomacy hubs, training science diplomats and bridging the gap between the scientific and diplomatic communities.

GESDA, established by the Swiss and Geneva governments in 2019, is an independent foundation focused on anticipating and accelerating scientific and technological breakthroughs over the next 5, 10 and 25 years. GESDA fosters dialogue between science, politics and diplomacy, positioning the scientific community as a stakeholder in multilateralism. GESDA is playing a significant role in advancing science diplomacy through its immersion training program for future science diplomats. The Geneva Science Diplomacy Week is an exclusive program that brings together scientists, diplomats, and policymakers from various countries to explore the intersection of science, diplomacy, and emerging trends in science and technology. The 2023 cohort of the program included 30 participants from diverse scientific backgrounds, policymakers, and diplomats from 24 countries who engaged in a 5-day immersion program held in Geneva from 8 to 12 May 2023. This event celebrated the global talent and diversity of individuals committed to forging connections between science, policy, diplomacy, and society.

### **The GESDA Science Diplomacy Immersion Program**

The main goal of the Science Diplomacy Week program is to empower participants with the relevant knowledge, skills, and networks to actively engage in science diplomacy beyond the program. It offers a platform for idea exchange and equips participants with diplomatic tools and best practices to effectively navigate the intersection of science and diplomacy. Throughout the week-long program, participants engage in a wide range of activities, including plenary sessions, simulation exercises, panel discussions, interactive workshops, and roundtable discussions. Additionally, the program includes on-site visits to local institutions, research centres, and diplomatic bodies in International Geneva, providing participants with a firsthand experience of the science diplomacy setting. These diverse activities foster a comprehensive learning experience and equip participants with practical insights on how to contribute to the field of science diplomacy.

The first day of the program commenced at the Palais des Nations, where participants were introduced to the GESDA Science Breakthrough Radar, a compilation of science trends and breakthrough predictions contributed by over 700 scientists. This was followed by workshops on the Science-Policy Interface (SPI), which encompassed the various stages involved in the process, including agenda setting, policy design, adoption, implementation, and evaluation. The SPI serves as a bridge between science and policy practitioners, civil society organisations, and the media. Participants also benefited from a guided tour of the Palais des Nations led by UNITAR, providing insights into the United Nations' structure and its role in multilateral diplomacy. The first day concluded with the official opening of Geneva Science Diplomacy Week at the World Meteorological Organisation (WMO). This event featured the presentation and panel discussion on the Global Greenhouse Gas Watch, emphasising the urgency of coordinated global actions in monitoring greenhouse gas fluxes and the importance of addressing both anthropogenic and natural greenhouse gas emissions.

The second day started with a role-play simulation game at the University of Geneva. Participants assumed various roles, such as diplomats, entrepreneurs, UNESCO policy advisors, and ministers of science and technology, to address real-world challenges related to the future global governance of neurotechnology. Deliberations focussed on the establishment of global standards, regulations, ethical considerations, and ensuring equitable benefits from scientific progress. After the simulation game, participants engaged in a hands-on practical session on Data Science diplomacy. They utilised network analysis techniques to uncover patterns and diplomatic positions on issues ranging from women's rights to global health or nuclear nonproliferation in the UN General Assembly resolutions. This session facilitated a deeper understanding of the intersection between data science and diplomacy.

On the third day, activities were hosted by the Geneva Centre for Security Policy (GCSP). The focus was on discussions and a simulation exercise centred around the militarisation of emerging technologies, including Lethal Autonomous Weapon Systems (LAWS), artificial intelligence (AI), and neurotechnology. Concerns were raised about the societal risks and potential malicious misuse of these technologies in the absence of proper governance frameworks and responsibilities.

In the afternoon sessions, panel discussions delved into the rapid development of disruptive emerging technologies like synthetic biology, artificial intelligence, and neuroscience. The panel also explored the potential for misuse and malicious applications of these technologies while highlighting their beneficial uses. Discussions revolved around enhancing international security while minimising negative consequences of these emerging technologies.

The third day concluded with a diplomatic negotiation engineering session led by Prof. Micheline Calmy-Rey, the former Swiss President and Minister of Foreign Affairs. Participants were introduced to the concept of negotiation engineering, which combines analytical thinking, technical problem-solving, and diplomacy. This approach involves analysing complex situations, breaking them down into manageable sub-problems; and devising effective tactics and strategies for negotiation and mediation. The session included a case study on Switzerland's involvement in facilitating the entry of the Russian Federation into the World Trade Organisation (WTO) in 2011, which posed challenges, particularly in the context of the Russia-Georgia conflict.

On the fourth day, participants had the opportunity to visit the European Organisation for Nuclear Research (CERN), an intergovernmental organisation that operates the largest particle physics laboratory in the world. Participants gained insights into the organisation's role as a bridge between science and diplomacy. They learned about CERN's groundbreaking research, international collaborations, technological advancements, and contributions to society. Later in the day, an interactive session on Technology Diplomacy organised by DiploFoundation highlighted the role of tech envoys and the necessity for countries to develop technology diplomacy strategies. The discussions emphasised the significance of global conversations on technology governance and the need for broader representation from countries in the Global South in tech diplomacy. Participants actively shared insights, engaged in brainstorming sessions and explored the skills, practices, and challenges associated with tech diplomacy.



Photo of participants at the Palais des Nations, Geneva. Photo credit: Michael Chiribau

The final day began with valuable advice and 12 key lessons shared by Ambassador Alexandre Fasel, Special Representative for Science Diplomacy (see Box). Participants then engaged in a gamified simulation focussed on the Sustainable Development Goals (SDGs) and explored how cooperation can maximise their impact. The workshop created awareness about the current and future challenges posed by individual and country actions and their global implications. It emphasises the need to strike a balance between personal goals and the broader goals of the world in order to effectively address the SDGs.



Ambassador Alexandre Fasel, Special Representative for Science Diplomacy, Federal Department of Foreign Affairs, Switzerland, sharing lessons in science diplomacy with the participants.  
Photo credit: Michael Chiribau

Throughout the program, various activities promoted teamwork, critical thinking, and problem-solving skills, empowering participants to tackle complex global issues from a multilateralist perspective. The significance of science in multilateral governance was highlighted and participants were empowered to contribute to this governance framework. Throughout the week, the program offered invaluable mentorship and support from renowned educators, ambassadors, and diplomatic experts who provided guidance and mentorship to the participants.

## Conclusion

In just its second edition, the GESDA Science Diplomacy Week profoundly shaped the perspectives of its participants, and now it is up to the participants to shape the world around them. This marks the beginning of the real work.

The impact of these workshops extends beyond the program's duration as participants continue to think differently, adopt multilateral perspectives, and apply new frameworks to address existing and emerging challenges. Moreover, the experience illuminated the potential of multilateralism to break silos and address asymmetries between the Global North and South. Without a diversity of science diplomats at the table, limited perspectives will continue to undermine the effective, equitable and ethical use of technology's greatest advancements.

Another key takeaway from the program was the significance of finding common ground for effective multilateralism. Despite coming from different backgrounds, participants learned how to establish a common language and adopt new frameworks of understanding. Simulations on tech governance pushed policymakers – who typically think in terms of objectives, mandates, and policy memos – to deconstruct complex concepts into technical components. Conversely, scientists gained a broader understanding of the geopolitical applications and implications of the technology they work with. Altogether, they experienced a useful shift in their thinking and approach.

Besides skill building, the program fostered a spirit of collaboration among participants. From the first day, participants naturally discovered commonalities in their work and interests, laying a foundation for future collaborations. Many participants have already devised plans to reconnect, pursue joint projects, and proliferate lessons gained from the week.

During the group debrief on the final day, participants were asked how they intended to tangibly apply the takeaways from the program once they return home. Many expressed their intention to present summaries of the week to their respective teams and organisations. Others mentioned incorporating newfound knowledge and practices into programs, policies and daily operations. There was even interest in building regional science-diplomacy hubs in their locations to introduce broader communities to the concept of science diplomacy.

Whether through soft influence and encouragement or through actively embedding science diplomacy into formal policies, curricula, cohorts and centres, participants will galvanise support for the field by disseminating insights gained throughout their respective networks and institutions. Each participant has a crucial role to play in bringing the principles and practices they learned during Science Diplomacy Week to life.

## 12 Lessons in Science Diplomacy from Ambassador Alexandre Fasel

- Diplomacy and multilateralism evolve. Take courage, small things matter, quantum leaps are made in incremental steps, and never lose determination.
- Don't confuse urgency with speed, politics determine urgency.
- Multilateralism is a crowded space. Know your file, you will be responsible for the daily micro-decisions on behalf of your country.
- Multilateralism is defined by an individual; multiple daily decisions and positions as a diplomat in a multilateral setting.
- The most overlooked skill is the ability to make a bridge between policy and making a project work.
- When benevolence (goodwill) is lost, only calculation remains, and then you know you are in a bad space.
- It's all about relationships, relationships between actors in international space are more important.
- Empathy: always factor in the interests of the opposing party in your thinking.
- Shared experience is the space for convergence which then leads to shared action- we all speak different languages but we must diverse concrete strategies to work together to solve common challenges.
- Cynicism is the ultimate betrayal - if you cannot be optimistic, it is time to leave the diplomatic space.
- Multilateral events are opportunities to benefit from other individuals' brilliance and intelligence.
- The reward is now, you have to take your gratification from whatever you are doing right now not until your next post.

# News //

## India's National Quantum Mission

The Indian Government approved the National Quantum Mission (NQM) with a budget of Rs. 6003.65 crores, spanning from 2023 to 2031. The primary objective of this mission is to seed, nurture and scale up scientific and industrial research and development and create a vibrant & innovative ecosystem in Quantum Technology (QT). This will accelerate QT-led economic growth, nurture the ecosystem in the country and make India one of the leading nations in the development of Quantum Technologies & Applications (QTA). The mission's key focus is on developing intermediate-scale quantum computers with 50-1000 physical qubits in 8 years in various platforms like superconducting and photonic technology. Furthermore, the mission will support the creation of highly sensitive

magnetometers based on atomic systems and Atomic Clocks for precision timing, communications and navigation. It will also facilitate the design and synthesis of quantum materials such as superconductors, novel semiconductor structures and topological materials for the fabrication of quantum devices. Single photon sources/ detectors, entangled photon sources will also be developed for quantum communications, sensing and metrological applications. The mission would greatly benefit communication, health, financial and energy sectors as well as drug design, and space applications. By leveraging the potential of QT, India aims to revolutionise these industries and position itself at the forefront of quantum innovation.

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## Call for Proposals //

### **Indo-UK DBT-BBSRC Joint Call on Farmed Animal Diseases and Health**

Last Date: July 11, 2023

Further information at: [https://dbtindia.gov.in/sites/default/files/DBT%20Approved\\_Final%20DBT-BBSRC%20Joint%20Call%202023\\_0.pdf](https://dbtindia.gov.in/sites/default/files/DBT%20Approved_Final%20DBT-BBSRC%20Joint%20Call%202023_0.pdf)

### **VAIshwik BHArtiya Vaigyanik (VAIBHAV) Fellowship**

Last Date: July 31, 2023

Further information at: [https://dst.gov.in/sites/default/files/Guidelines%20for%20VAIBHAV%20fellowship\\_0.pdf](https://dst.gov.in/sites/default/files/Guidelines%20for%20VAIBHAV%20fellowship_0.pdf)

### **10th India-Israel Industrial R&D and Technological Innovation Fund (I4F)**

Last Date: August 10, 2023

Further information at: <https://dst.gov.in/callforproposals/10th-india-israel-industrial-rd-and-technological-innovation-fund-i4f>

### **DBT-EU Cooperation Programme on R&I 'Horizon Europe' Calls 2023-2024**

Last Date: September 19, 2023

Further information at: [https://dbtindia.gov.in/sites/default/files/DBT-EU%20joint%20call%20WEBNOTICEWP%202023-24\\_0.pdf](https://dbtindia.gov.in/sites/default/files/DBT-EU%20joint%20call%20WEBNOTICEWP%202023-24_0.pdf)

## Forthcoming Events //

### **2023 Science Policy Boot Camp**

Date: July 25-28, 2023

Further information at:

<https://www.sigmaxi.org/meetings-events/science-policy-bootcamp>

## **Regional Workshop on Science Diplomacy for the Arab Region**

Date: [October 24-26, 2023](#)

Further information at:  
<https://twas-arep-sd.bibalex.org/>

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## **2024 Ocean Decade Conference**

Date: [April 10-12, 2024](#)

Further information at:  
<https://oceandecade-conference.com/home.php>

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## **National Science Policy Symposium**

Date: [April 12-14, 2024](#)

Further information at:  
<https://www.scipolsymposium.org/>