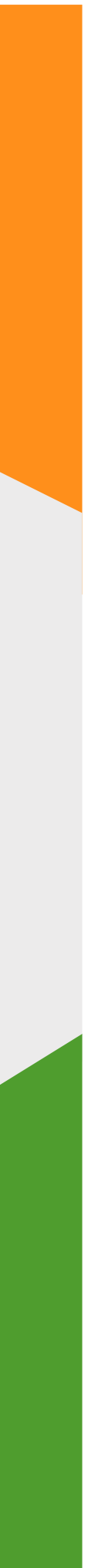


Association of American  
Universities

**TASK FORCE  
REPORT ON  
EXPANDING  
U.S.-INDIA  
PARTNERSHIPS**

January 2024

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# Task Force on Expanding U.S. – India University Partnerships

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## Introduction

In 2023, AAU formed the Task Force on Expanding United States-India University Partnerships. The objective of the Task Force has been to specifically explore how the United States can work with institutions and institutional leaders in India to expand bilateral research and higher education partnerships as part of a pathway toward a strategic strengthening of the U.S.-India relationship.

Since the naming of the Task Force co-chairs and members in April 2023, the group has been meeting regularly, discussing challenges and barriers to expanding such collaboration, and thinking carefully about opportunities to overcome those barriers. This report reflects the Task Force's deliberations to date and makes recommendations on how the United States and India might better partner to significantly expand collaboration between their universities. These recommendations are to be viewed as a starting point rather than an ending point. They are intended to provoke a thoughtful and much-needed dialogue between universities and university leaders in both countries as well as their respective governments and other important stakeholders (such as industry leaders) concerning ways to improve and strengthen higher education, increase scientific research and technological advancement, and enhance workforce development in both nations.

### Why Now?

The time is ripe to examine how we further develop and expand academic and research partnerships with India. According to recent estimates from the United Nations, India will surpass China as the world's most populous nation by the middle of this year and has the additional advantage of a much younger population: people under the age of 25 account for more than 40% of India's estimated population of 1.4 billion.<sup>1</sup> It is also one of the world's fastest-growing economies, recently surpassing France and the United Kingdom to become the world's fifth-largest economy ranked by nominal GDP.<sup>2</sup>

The United States and India share an opportunity to strengthen both countries' economies by enhancing educational attainment and investing more in research and development. We also share certain fundamental values and ideals. Both nations' institutions of higher education are committed to academic freedom and scholarly excellence, while our people share a commitment to democratic ideals and universal human rights such as freedom of expression, free inquiry, and the open exchange of knowledge and information. These shared values, as well as the long history of U.S.-Indian engagement as two of the world's largest democracies, provide a strong foundation for partnerships between U.S. and Indian institutions. Continuing to prioritize these values will ensure that these partnerships maximally serve U.S. and Indian interests while remaining durable far into the future.

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<sup>1</sup> Laura Silver, Christine Huang and Laura Clancy, "Key facts as India surpasses China as the world's most populous country," Pew Research Center, February 9, 2023, <https://www.pewresearch.org/short-reads/2023/02/09/key-facts-as-india-surpasses-china-as-the-worlds-most-populous-country/>

<sup>2</sup> Jenni Reid, "India's population is on the brink of overtaking China's, UN says," CNBC, April 19, 2023, <https://www.cnbc.com/2023/04/19/indias-population-is-on-the-brink-of-overtaking-chinas-un-says.html>

Indian leaders have also recently opened the door to increasing foreign university collaboration.<sup>3</sup> They have announced plans to establish a new National Research Foundation and have committed to making major new investments in scientific areas such as deep ocean research, sustainable agriculture, virology, advanced manufacturing, climate change, and hydrogen energy research and development.<sup>4</sup> Most recently they have also announced a new National Quantum Mission to be overseen by the Indian Department of Science and Technology (DST).<sup>5</sup>

These domestic initiatives have been coupled with a series of international agreements with the United Kingdom, France, and Australia aimed at creating innovation partnerships that could serve as models for future collaborations with the United States. The UK-India Science and Innovation Council (SIC), held in London on April 27, 2023, led to the announcement of £32 million of joint research funding spread across four programs, including agriculture and sustainable materials.<sup>6</sup> Similarly, India and France have a longstanding collaboration centered on the Indo-French Centre for Promotion of Advanced Research (IFCPAR/CEFIPRA), which has been working to link industry clusters in both countries in sectors such as aerospace and biotechnology.<sup>7</sup> Finally, the Quad Fellowship, launched in 2021, is another recent initiative that links India with regional partners and the United States. Intended to dovetail with the aims of the Quadrilateral Security Dialogue (QSD) – a military and diplomatic alliance initially launched in 2007 by Japan, India, the United States, and Australia – the fellowship is directed by a board composed of academic, foreign policy, and private sector leaders from each country and funds scholarships for 100 STEM masters and doctoral students to study in the United States while creating collaborative linkages between all of the Quad Fellowship countries.<sup>8</sup>

Meanwhile, with the passage and enactment of the CHIPS and Science Act, the U.S. Congress has demonstrated an understanding of the importance of strengthening and diversifying global supply chains; investing in scientific research; revitalizing U.S. semiconductor technology development and manufacturing; and training the skilled and technical workforce required to continue to maintain and support U.S. national security and ensure future economic success.

In addition to the individual initiatives undertaken by the United States and India to support and grow academic research, last May President Biden and Prime Minister Modi

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<sup>3</sup> ICEF Monitor, “India simplifies procedures for foreign institution partnerships,” May 4, 2022

<https://monitor.icef.com/2022/05/india-simplifies-procedures-for-foreign-institution-partnerships/>

<sup>4</sup> Editorial, “India must protect the independence of its landmark science agency,” Nature, February 9, 2022,

<https://www.nature.com/articles/d41586-021-00327-1>

<sup>5</sup> The Hindu Bureau, “Indian scientists to develop own technology under National Quantum Mission,” April 24, 2022,

<https://www.thehindu.com/news/cities/bangalore/indian-scientists-to-develop-own-technology-under-national-quantum-mission/article66774219.ece>

<sup>6</sup> UK Research and Innovation, “UK and India commit to research and innovation collaboration,” April 27, 2023,

<https://www.ukri.org/news/uk-and-india-commit-to-research-and-innovation-collaboration/>

<sup>7</sup> Indo-French Centre for the Promotion of Advanced Research, “About the Centre,” June 4, 2022,

[http://www.cefipra.org/About\\_the\\_Centre.aspx](http://www.cefipra.org/About_the_Centre.aspx)

<sup>8</sup> Quad Fellowship, “About Us,” Accessed on June 14, 2023, <https://www.quadfellowship.org/about-us>

announced the U.S.-India initiative on Critical and Emerging Technology (iCET).<sup>9</sup> iCET specifically seeks to grow “...strategic technology partnership and defense industrial cooperation between the governments, businesses, and academic institutions of our two countries.”

More intentional cooperation between leading Indian and U.S. research universities can bolster the science and technology initiatives conducted by both nations. The United States continues to lead as the top destination for higher education, research, and entrepreneurship training. India continues to build on prior U.S. engagements to enhance and serve its vast need for higher education talent to support its rapidly advancing societal needs. Both countries are making significant investments to provide the necessary skills training to create and expand an effective workforce in the respective countries, leading to natural expansion of ties between leading Indian and U.S. research institutions. These ties present an excellent opportunity to support concomitant goals for workforce training through cooperative programs and developing closer research partnerships between U.S. and Indian universities.

### Why AAU?

The Association of American Universities (AAU) is an organization of leading research universities working to promote a strong system of academic research and education. Founded in 1900, it consists of 63 U.S. universities (both public and private) and two universities in Canada.<sup>10</sup> AAU member universities collectively help influence U.S. policy for higher education, science, and innovation; promote best practices in undergraduate and graduate education; and strengthen the contributions of leading research universities to American society.

AAU has long promoted broad international collaboration to advance scientific research and discovery. Top students and researchers from around the globe have come to the United States for decades to pursue academic studies and research, with many choosing to stay and contribute to the U.S. economy, national security, and culture after completing their studies. At the same time, U.S. scientists have traveled abroad to conduct groundbreaking research and formed collaborations with researchers in other countries. Previously these collaborations required regular international travel or relocation abroad. New technologies and their increased acceptance, however, have enabled such collaborative efforts to be increasingly conducted virtually.

Historically, AAU institutions have led the way in developing meaningful and impactful partnerships with universities in India. In the early 1960s, nine AAU universities (the Massachusetts Institute of Technology; the California Institute of Technology; the University of California, Berkeley; the University of Michigan; Case Western Reserve University (then

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<sup>9</sup> The White House, “Fact Sheet: United States and India Elevate Strategic Partnership with the initiative on Critical and Emerging Technology (iCET),” January 31, 2023, <https://www.whitehouse.gov/briefing-room/statements-releases/2023/01/31/fact-sheet-united-states-and-india-elevate-strategic-partnership-with-the-initiative-on-critical-and-emerging-technology-icet/>

<sup>10</sup> AAU's membership will increase to 71 institutions (69 in the United States, 2 in Canada) effective July 1, 2023, <https://www.aau.edu/newsroom/press-releases/six-leading-research-universities-join-association-american-universities>

Case Institute of Technology); Princeton University, The Ohio State University; Purdue University; and Carnegie Mellon University) played a central role in the creation of IIT Kanpur as a part of the USAID-funded Kanpur Indo-American Program (1962-1972).<sup>11</sup> The Kanpur Indo-American Program has been identified as “one of the most significant success stories in the rich history of bilateral higher education exchange programs between the United States and India.”<sup>12</sup>

Other longstanding relationships between AAU and India include The Ohio State University’s College of Food, Agricultural, and Environmental Sciences agricultural research partnership with Punjab Agricultural University and the Johns Hopkins University’s longstanding efforts to partner with Indian institutions to improve public health.<sup>13</sup> More recently, several new collaborations between AAU member universities and leading Indian research universities have been launched. (See Appendix 1).

AAU sees tremendous value in deepening and expanding such research and educational collaborations with Indian higher education and research institutions. It will be essential to continue to engage leaders from India’s leading research universities as we seek to further advance these efforts. As a part of the development of this report, AAU convened and incorporated input from a small group of leaders from top Indian institutions.<sup>14</sup> AAU looks forward to further solidifying important collaboration with this group of Indian higher education leaders as the Task Force develops its final report.

## **Expanding U.S. – India University Partnerships: Challenges and Opportunities**

Despite historical and more recent efforts to increase bilateral higher education and research collaboration between the United States and India, numerous obstacles inhibit the expansion of such a partnership. These barriers fall into three main categories: (1) funding deficiencies and issues around dividing the costs of research; (2) regulatory and policy barriers such as those resulting from the U.S. visa system, from U.S. export control policies, and from India’s Foreign Contribution Regulation Act (FCRA); and (3) additional structural and cultural challenges which result in differing priorities within the U.S. and Indian higher education systems. These barriers are not insurmountable. However, overcoming them will require sustained government-to-government engagement, as well as continued engagement and support from industry, academia, and civil society in both

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<sup>11</sup> Norman C. Dahl, R.L. Halfman, R.S. Green, J. Mahanty, G. Oakley and J.G. Fox, “Kanpur Indo-American Program - Final report (1962 - 1972),” Education Development Center, accessed on June 14, 2023, <https://www.cse.iitk.ac.in/users/amit/books/dahl-1973-kanpur-indoamerican-program.html>

<sup>12</sup> Robert Blake Jr., “U.S.-India Partnership: Kanpur Indo-American Program and Beyond,” U.S. Department of State, July 9, 2010, <https://2009-2017.state.gov/p/sca/rls/rmks/2010/144465.htm>

<sup>13</sup> The Ohio State University, “CFAES’ History in India,” accessed on June 14, 2023, <https://ipa.osu.edu/global-gateways/india>; The Johns Hopkins University, “The Gupta-Klinsky India Institute,” accessed on June 20, 2023, <https://indiainstitute.jhu.edu/about/>.

<sup>14</sup> Including leaders from IIT Kanpur, IIT Bombay, IIT Madras, IIT Delhi, The Indian Institute of Science, Amrita, Plaksha, and BITS Pilani



countries. Initiatives that explicitly highlight the importance of partnerships and collaboration between U.S. and Indian universities (such as the U.S.-India Education and Skills Development Working Group, jointly hosted in May 2023 by the U.S. State Department and the Indian Ministry of Education) should continue to be developed as the U.S. and Indian governments strengthen their relationship.<sup>15</sup>

## Funding and Support

One of the most significant barriers to increasing the volume and intensity of scientific and technological cooperation between the United States and India will be finding the required resources and funding to support new joint cooperative initiatives in both countries. For partnerships to succeed, this funding must be sustainable and oriented toward the long-term; it must be equitably sourced from both the United States and India; and it must leverage government, industry, philanthropic, and institutional funding sources.

For joint initiatives to succeed, stakeholders must believe that both governments are serious about reducing existing barriers inhibiting cooperation and that both the United States and India are prepared to make significant and sustained investments in bi-national research efforts. Institutions and researchers must be provided with the required resources to think strategically and to establish robust, multi-institutional collaborations that can make meaningful progress on issues of mutual interest such as climate change, quantum technologies, and artificial intelligence.

Without a commitment by both countries to provide significant investments to support new and much larger partnerships, collaborations will continue to remain localized and uncoordinated, with limited impact in furthering each nation's strategic priorities.

Closely related to the overall funding barrier is the need to equitably divide the costs of conducting collaborative research. Many existing partnerships operate as essentially parallel projects, with U.S. funding supporting the U.S.-based elements of the project and Indian funding supporting the Indian-based elements. Research costs are significantly higher in the United States compared to India, which in many cases makes a dollar-for-dollar model unsuitable. This "parallel" model presents fewer opportunities for sustained, in-depth collaboration and is more difficult to scale. An alternative model features greater levels of cross-border funding and engagement. For example, several existing partnerships instead focus on outputs, with each country funding an equal number of postdoctoral researchers or each country providing the support to establish an equivalently resourced laboratory.

In addition to taking advantage of funding provided by the U.S. and Indian governments, philanthropic organizations, industrial partners, and venture capital firms can facilitate effective new university collaborations that increase the exchange of both knowledge and

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<sup>15</sup> U.S. Department of State, "Launch of Education and Skills Development Working Group Furthers U.S.-India Cooperation," May 22, 2023, <https://www.state.gov/launch-of-education-and-skills-development-working-group-furthers-u-s-india-cooperation/>



human capital. Continuing commitments from philanthropic organizations can be helpful in supporting joint research aimed at addressing shared challenges facing both nations (including sustainable agriculture, global health, and climate change). Meanwhile, industry can help facilitate support for research and the workforce needs that are essential to advancing critical and emerging technologies. Industry, especially the numerous Indian and U.S.-based multinational corporations with operations in both countries, can also play an important role in building connections between innovation ecosystems in the United States and India that will assist with transitioning research results into useful products and services. Additionally, funds from these non-governmental sources can sometimes be more easily accessed and utilized to facilitate new partnerships and avoid some of the challenges associated with the requirements that come with government support.

### Regulatory and Policy Barriers

In the past, the respective regulatory environments in both the United States and India have made it difficult for U.S. and Indian higher education institutions to collaborate.

One major barrier obstructing scientific collaboration between the United States and India is the significant visa backlog at the U.S. State Department, which has resulted in extremely long wait times for Indian citizens attempting to visit the United States. While progress has been made in terms of quickly processing Indian students on F and J visas, other Indian citizens who require a variety of other visa categories often continue to face wait times exceeding a full calendar year. In practical terms, this frequently prevents Indian researchers from participating in U.S.-hosted workshops, conferences, and short-term research visits while also making hiring Indian workers more difficult. Unpredictability surrounding the visa application process is itself another serious obstacle. Institutions in both countries are less likely to invest their time and resources into research partnerships if the mobility of their students and faculty research collaborators is uncertain. Building confidence in the U.S. visa application process will be important if the United States is to expand research and higher education collaborations between the two nations.

Similarly, India's visa approval requirements for researchers can be extremely burdensome and sometimes prevent or dissuade U.S. faculty from traveling for research collaborations. Streamlining the visa processes in both countries will dramatically increase the overall attractiveness of research collaborations and will facilitate activities like workshops, student exchange programs, and guest faculty programs.

Compliance with India's Foreign Contribution Regulation Act (FCRA) has been another major impediment for U.S. universities attempting to work in India. However, recent regulatory adjustments in India, most notably by the University Grants Commission (UGC) in November 2023, represent a step forward in helping pave the way for increased engagement by U.S. universities in India. These modifications to the Foreign Contribution Regulation Act (FCRA) regulations will allow established, high-quality foreign universities to

set up autonomous campuses in India offering a full range of educational pathways: certificates as well as undergraduate, graduate, doctoral, and postdoctoral degrees.<sup>16</sup>

While some obstacles and uncertainties still remain, especially at this early stage, the opportunity for U.S. institutions to open such campuses in India will potentially provide an additional avenue for future educational and research collaboration while contributing to the overall strengthening of the relationship between the higher education sectors in the two countries. In addition to research collaboration, these campuses, if effectively implemented, could help catalyze partnerships at all educational levels: skilling and vocational training, undergraduate student exchange programs and study abroad, joint PhD supervision and advising, and opportunities for guest faculty programs. Of particular interest is the potential for new pathways for U.S. students to study in India, either fully or for a year or a semester. While the regulations have not been finalized yet, with details still to be determined following public comment, the AAU Task Force on Expanding U.S.-India University Partnerships commends this step and looks forward to future developments.

Beyond the opportunities presented by the UGC provisions for entry and operation of foreign higher educational institutions in India, many U.S. institutions already collaborate with local Indian partners on research initiatives and will continue to do so. These efforts in many cases involve transferring funds from the U.S. institution to its local partners to support collaborative work in India. In order to maintain and grow this robust collaborative ecosystem, it is important to minimize barriers to funds transfers in support of research.

An additional barrier is that some of India's tax rules make it difficult for U.S. institutions to send faculty and researchers to India for collaborations. The challenges with these rules center on the way India defines and treats "permanent establishment" of an entity. More specifically, the problems involve the low threshold for being considered a "permanent establishment," uncertainty under the U.S.-India tax treaty about whether collaborative activities will be considered as creating a "permanent establishment," and the significant financial and administrative burdens imposed when a collaboration is considered a "permanent establishment." Using nonprofit entities in India for education and research is usually not a viable solution, because it is very difficult to set up and use these entities for this purpose. U.S. institutions must then also contend with the restrictions on sending funds to India under India FCRA requirements.

The immense complexity of the combined U.S. and India regulatory environments is itself a major barrier to additional collaboration. Even well-resourced institutions have found it difficult to navigate these waters, and those who have are often forced to rely on external consultants to find their way. Those unable to afford such support have chosen not to pursue collaborations. The lack of centralized "front door" authorities in both countries that could help institutions comply with local regulations and set them up for success from the beginning is a significant missed opportunity.

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<sup>16</sup> University Grants Commission, "Setting Up and Operation of Campuses of Foreign Higher Educational Institutions in India Regulations," November 7, 2023.

Conflicts over intellectual property (IP) ownership and data sharing are additional obstacles that will need to be surmounted to successfully establish robust and multi-faceted research collaborations between the United States and India. This will be a complicated process, as institutions will need to collaborate with a range of industry partners, academic institutions, philanthropic organizations, and nonprofit entities – some of which will be governed by U.S. law and others by Indian law. A potential model for clearly assigning IP rights in advance is the National Science Foundation’s (NSF) Industry–University Cooperative Research Center (IUCRC).

Finally, U.S. officials have increasingly expressed alarm about threats to domestic research posed by foreign government actors. These concerns span the breadth of interference at American universities directed or sanctioned by foreign governments (including theft of intellectual property, breaches of scientific integrity, and targeted cyberattacks), and have resulted in numerous new government policies and requirements.

Combined with existing and potential U.S. export controls, these policies could impede collaborations with Indian institutions and Indian industrial partners. It is therefore imperative that policies designed to address these threats not encumber U.S and Indian researchers’ ability to collaborate on critical and emerging areas of technology and other important fundamental scientific work. Furthermore, it is important that existing EAR and ITAR export requirements do not pose obstacles to collaborations between universities and industry in the United States and India and that fundamental scientific knowledge continues to flow freely.

### **Additional Cultural, Structural, and Perceptual Challenges**

Increasing the number of Indian and U.S. students and faculty members studying and conducting research in both countries will be an important building block as the two countries seek to deepen their level of educational, scientific, and technological cooperation.

A first step will involve addressing the COVID-19-induced slump that has affected international student enrollment in both countries. In the United States, the number of Indian international students has recovered quickly post-pandemic, with 199,182 students enrolled during the 2021-22 period compared to a pre-pandemic high of 202,014 in the 2018-19 period. The population of U.S. students in India has been much slower to recover, falling to a low of only 16 students in the 2020-21 period compared to 3,366 students in 2018-19. Even before the onset of the COVID-19 pandemic, the number of U.S. students studying in India had been stagnant for a decade while Indian enrollment at U.S. universities steadily climbed.<sup>17</sup>

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<sup>17</sup> Institute of International Education, Open Doors Report 2022, accessed on June 15, 2023, <https://opendoorsdata.org/>

Prospective international students and scholars from both countries need to be reassured that they will have safe living, educational, and research environments during their time abroad. Recent research has shown that gun violence in the United States has increasingly become a concern for international students and has pushed prospective international students toward other countries, such as Canada and the United Kingdom.

To ensure healthy and equitable collaborations, U.S. institutions will need to foster campus culture and departmental climates that are welcoming and hospitable. Attention to the behavior, policies, and practices necessary to create environments in which Indian students and faculty members feel a sense of belonging and have the support necessary to achieve their desired educational, research, and professional goals will be essential.

Reinvigorating and expanding the flow of U.S. students and faculty members to India will also require addressing issues related to research facilities, living-learning spaces, and safety. India and its universities must continue to invest in the types of infrastructure and living spaces required to host large numbers of international students, scholars, and researchers. Additionally, there is a need to further develop research facilities in India; fortunately, progress is being made in this area. Some very modern laboratories have recently been developed and more are being proposed, including the Laser Interferometer Gravitational-Wave Observatory (LIGO)-India project that includes collaborators from more than 100 institutions from around the world combined with support from the Indian Department of Atomic Energy, the Indian Department of Science and Technology, and the U.S. National Science Foundation.<sup>18</sup> Such facilities will serve as magnets for international students and researchers, creating much-needed incentives to study and conduct research in India.

Another hurdle will be overcoming the significant differences between the higher education systems in the United States and India in terms of available incentives and ability for faculty members to conduct research. Indian universities do not have the same tenure and incentive structures that exist at U.S. universities. The differences in academic cultures and faculty rewards systems between the two countries pose inherent structural challenges for joint research collaborations.

## Recommendations

In the development of this report, AAU's [Task Force on Expanding U.S.-India University Partnerships](#) has examined ways to facilitate new connections for joint research partnerships, dual faculty appointments, and increased student mobility between both countries and at all levels. To address and overcome the challenges to developing new collaborations between U.S. and Indian institutions, new models of engagement are needed. These models must seek to expand meaningful, high-impact, and co-designed partnerships between U.S. and Indian research universities.

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<sup>18</sup> LIGO India, accessed on June 14, 2023, <https://www.ligo-india.in/>

## **RECOMMENDATION #1: Establish New Joint U.S.-India Institute to Address Scientific Grand Challenges**

In response to an earlier recommendation made by the Task Force in its interim report, AAU and the Council of Indian Institutes of Technology, the governing body responsible for all of the Indian Institutes of Technology (IITs), signed a memorandum of understanding in September 2023 that commits both parties to “promote and seek support for the design and establishment of the Indo-U.S. Global Challenges Institute.” This commitment was highlighted in the joint statement released by President Biden and Prime Minister Modi following the 2023 G-20 summit in New Delhi.

The Indo-U.S. Global Challenges Institute will be a network of U.S. and Indian institutions that will focus on facilitating and coordinating new research collaborations at both individual and institutional levels in five high-impact areas of mutual interest: (1) semiconductor technology and manufacturing; (2) sustainable agriculture and food security; (3) sustainable energy and the environment; (4) health equity and pandemic preparedness; and (5) critical and emerging technologies, including AI, cybersecurity, and quantum science. The Institute will be co-directed and guided by a governing council to be established in 2024.

The Institute will serve as a hub for both leveraging existing institutional research partnerships and projects -as well as generating new cooperative arrangements to grow collaborative research efforts between the United States and India. To facilitate collaboration, the Institute will coordinate, host, and support activities such as virtual and in-person workshops, conferences, and international faculty and student exchanges. The Institute will also play a role in helping facilitate curriculum co-design, joint supervision of graduate students, and collaborations aimed at increasing technology transfer and commercialization. Additionally, the Institute will play a role in helping both individual researchers and institutions identify and compete successfully for funding opportunities with U.S. and Indian government agencies, nonprofit entities, and industry partners.

The Institute would serve as a locus for hub-and-spoke research networks formed around societal and scientific “grand challenges” of vital interest to both nations. The grand challenge hubs coordinated by Indian and U.S. university partner leads would create faculty networks across multiple disciplines to design and develop joint research projects in critical areas ripe for bilateral research cooperation. These efforts will be guided by a governing council to be established in 2024.

## **RECOMMENDATION #2: Scale Up Student-Based Research Collaboration and Exchanges to Address Societal Challenges**

To facilitate a resurgence in U.S. academic visitors to India, a new model is required to shore up significant participation. A select group of Indian universities – in collaboration with U.S. universities – are well positioned to host a competitive program inviting multidisciplinary teams to create projects that address shared societal challenges. Under such a model, U.S. and Indian students would collaborate online in cross-country teams

over the course of the academic year. These teams would consist of undergraduate and graduate students working together from one university in the United States and one in India, with a faculty mentor to help support the team located at each institution. American students would then travel to India over the summer to work with their Indian counterparts and participate in competitions as part of these cross-country teams.

Such competitions could be operated by an external nonprofit entity or directly by an individual institution and would focus on local challenges and global themes such as climate change, health, and disruptive technologies. An existing example is the EPICS program, established by Purdue University in 1995, that pairs a Purdue-based team with student teams from IIT Delhi and IIT Tirupati.<sup>19</sup> Other models such as the iGEM program also provide a useful model for the development of interdisciplinary student-led teams oriented to addressing real world global challenges.<sup>20</sup> Models like this, informed by the Vertical Integrated Projects Program, would help India expand its foothold as both an innovation incubator and top hosting destination for U.S. study abroad students.<sup>21</sup> As a dual benefit, this “teaming” or “cooperative corps” model at the undergraduate and graduate levels opens new areas for India and the United States to work together. The benefits of research experiences for undergraduates are well-documented and provide a basis for lifelong inquiry and discovery. This plants the seeds for greater research collaboration at all education and skill-attainment levels and across multiple disciplines.<sup>22</sup>

### **RECOMMENDATION #3: Expand Opportunities for Internships and Apprenticeships**

The expansion of internship and apprenticeship opportunities for Indian and U.S. undergraduate and graduate students, as well as for post-doctoral researchers, will be critical to meeting the objectives of the [Initiative on Critical and Emerging Technology](#). Partners across government, business and industry, and academia must redouble their efforts to train the next generation of professionals who possess both technical and cross-cultural skills. This will require a coordinated effort to establish short-term placements in companies and nongovernmental organizations for practical training. Working with the U.S.-India Business Council, universities should organize professional development training cohorts to participate in short-term or semester-long internship and apprenticeship opportunities.

### **RECOMMENDATION #4: Catalyze Collaborative Research with Targeted Faculty Support**

Philanthropic and industry support can be leveraged to award collaborative research projects between faculty members in the United States and India. Creating new one-to-

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<sup>19</sup> Purdue University, “EPICS Team India – About Us,” accessed on June 14, 2023, <https://epics-india.wixsite.com/epicsindia>

<sup>20</sup> iGEM, “Welcome to the 20<sup>th</sup> Year of iGEM,” accessed June 15, 2023, <http://competition.igem.org>

<sup>21</sup> Georgia Tech, “VIP: The Vertically Integrated Projects Program,” accessed on June 15, 2023, <https://www.vip.gatech.edu/vip-vertically-integrated-projects-program>

<sup>22</sup> James Gentile, Kerry Brenner, and Amy Stephens, Editors, “Undergraduate Research Experiences for STEM Students,” National Academies of Sciences, Engineering, and Medicine, 2017, <https://nap.nationalacademies.org/catalog/24622/undergraduate-research-experiences-for-stem-students-successes-challenges-and-opportunities>



one distinguished chair positions and/or endowed research programs linking academic researchers and departments at U.S. and Indian institutions will formalize lasting cooperation between participating universities in both countries. These “professorship partnerships” would create the direct people-to-people linkages necessary for joint research and support development of top-level STEM talent in key areas of critical and emerging technologies. A targeted program coupling an endowed professor in the United States with one in India provides the immediate benefit of guaranteeing shared responsibility for joint scholarship. More importantly, the faculty member in the United States assumes a direct supervisory and advising role for students in India, and the same is true of the faculty member in India and their students in the United States. Encouraging these connections at the faculty-to-faculty level will forge lasting collaborations, accelerate cooperative research, lay the groundwork to establish future dual faculty appointments, and help buy out teaching time to allow faculty more resources to conduct research. This will also support increased travel and remote connectivity.

### **RECOMMENDATION #5: Broaden Participation in GIAN, VAJRA, and Other Existing Programs**

The Indian Global Initiative of Academic Networks ([GIAN](#)) and Visiting Advanced Joint Research Faculty Scheme ([VAJRA](#)) are laudable examples of Indian government programs designed to engage international faculty in instruction and research.<sup>23</sup> To take full advantage of these government investments, U.S. funding agencies and philanthropic organizations can supplement GIAN and VAJRA awards with a funding match. Doubling the honorarium and stipend will elevate both the prestige and appeal of these programs, making them more attractive for faculty to pursue. These programs can also be mirrored and made bi-directional. The expansion of other existing programs aimed at promoting student and faculty exchanges, such as the Fulbright-Nehru program and the Indian Council of Medical Research (ICMR) and Department of Health Research (DHR) International Fellowship Programme for Indian Biomedical Scientists should also be considered.<sup>24</sup>

### **RECOMMENDATION #6: Host Indian Researchers at Core Facilities**

The United States must demonstrate its commitment to supporting India’s domestic research enterprise. Research infrastructure – both federal facilities and government-funded facilities at universities – is fundamental to the United States’ global leadership in science and technology. Inviting access to these facilities – either in-person or remotely – establishes a distinct brand of science diplomacy and helps jumpstart Indian research projects. An annual “capacity-building” program can be administered through which U.S. federal laboratories or academic institutions designate time for Indian scholars to access specialized instruments and conduct fundamental research experiments. Such a program

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<sup>23</sup> Global Initiative of Academic Networks, accessed June 14, 2023, <https://gian.iitkgp.ac.in/>; Visiting Advanced Joint Research Faculty Scheme, “About VAJRA,” accessed June 14, 2023, <https://vajra-india.in/>

<sup>24</sup> USIEF, “2024-2025 Fulbright-Nehru Academic and Professional Excellence Fellowships, accessed June 20, 2023, <https://www.usief.org.in/Fulbright-Nehru-Academic-Professional-Excellence-Fellowships.aspx>; ICMR, “ICMR-DHR International Fellowship Programme For Indian Biomedical Scientists,” accessed June 20, 2023, <https://main.icmr.nic.in/content/icmr-dhr-international-fellowship-programme-indian-biomedical-scientists>.



could be paired with an exchange component where a visiting U.S. scholar builds on this research and conducts parallel research and experiments with colleagues in India.

### **RECOMMENDATION #7: Accelerate Knowledge Transfer from Lab to Marketplace**

Working with nonprofit partners like [AUTM](#), U.S. and Indian universities are well-poised to maximize new commercial ventures resulting from their joint research efforts. As a global leader in technology transfer, AUTM has assisted many countries in the growth and development of technology transfer capacity; these nations include Chile, Egypt, Hong Kong, Mexico, South Africa, South Korea, Spain, and Thailand. AUTM's diverse membership, composed of approximately 3,000 members from 60+ countries, provides unprecedented insight into technology transfer from ecosystems across the globe.

To support the acceleration of knowledge transfer from the lab to the marketplace, AUTM (in collaboration with AAU) is positioned to establish a bilateral multi-year technology transfer capacity-building program – composed of online and in-person trainings – similar to ones that have been implemented successfully in South Korea and Thailand. AUTM's training repertoire includes both broad, foundational modules on the lifecycle of academic technology transfer as well as advanced, specialized topics like marketing, negotiations, technology valuation, startups, and more. AUTM technology transfer capacity building is provided through both:

- *Asynchronous training:* AUTM has developed a “Technology Transfer Essentials” online package composed of 14 distinct webinars that provide basic training for getting started in the technology-transfer profession. Indian participants can view these webinars at their own pace, and AUTM will schedule live follow-up Q&A sessions to discuss the webinars with AUTM instructors.
- *Quarterly in-person workshops:* AUTM will deliver quarterly in-person workshops in India led by world-class trainers on in-depth topics such as “Anatomy of a License Agreement,” “Successful Practices in Small Technology Transfer Offices,” and “Software Commercialization.”

By enhancing technology transfer capabilities, leveraging new research agreements, and facilitating new commercial partnerships, both countries can quickly translate new discoveries and scientific findings into products, technologies, and other services that provide direct benefit to their citizenries. This effort also aligns well with the current objectives of the U.S. Department of Defense's INDUS-X program to enhance strategic and defense partnerships between India and the United States as well as the mission and objectives of NSF Technology, Innovation and Partnerships (TIP) directorate to increase support for the transition of new ideas from the laboratory to the marketplace.

Success in this program will be measured by the number of Registered Technology Transfer Professionals (RTTPs), which is the international professional standard administered by the global Alliance of Technology Transfer Professionals for knowledge

and technology transfer practitioners working in universities, industry, and government laboratories.

### **RECOMMENDATION #8: Build the “Front Doors” with Coordinated Nationwide International Education Strategies in Both Countries**

While the U.S. Departments of Education, State, and Commerce have devoted some resources to attracting and retaining international students, these efforts are not holistic or coordinated around a central objective. The time is ripe for a concerted international education strategy. A new era of academic partnership will require both nations’ embassies to “build the front doors” to each other’s country. Each diplomatic outpost should create a dedicated liaison office to assist foreign universities in navigating the myriad legal hurdles required to establish nonprofit academic centers or satellite campuses in-country – alleviating the need to work through private consultancies. In addition to their role in assisting institutions through the hosting country’s tax and regulatory landscape, these “front door” offices should work with local Chambers of Commerce to create clearinghouses for the business and academic communities to better engage on technology transition and commercialization.

### **RECOMMENDATION #9: Surge Staffing Resources to Rapidly Process Visas Applications**

The U.S. Consular Missions in India have made a guarantee to issue one million visas to Indian citizens this year and reduce wait times for student visa applications.<sup>25</sup> While this is a commendable pledge, we urge the State Department to further double down and commit to an immediate month-long sprint of visa processing. By surging resources in the near term and prioritizing visa interviews for not only students, but also exchange visitors and conference/workshop attendees, the United States will signal its commitment to meet demand and chip away at the backlog that has choked the talent pipeline. Indian students, scientists, and exchange visitors should be awarded multi-year, multiple-entry visas with the opportunity for stateside renewal. While considerable improvements to the U.S. immigration system are needed to comprehensively address long wait times, an all-hands staffing approach at the U.S. Consular Missions is required now to restore confidence in predictable, timely processing. This is imperative to jumpstart faculty exchanges, boost meeting participation, and accelerate student enrollment.

As a longer-term goal, legislation must be adopted to overhaul the United States’ strained visa and immigration system. Legislative solutions such as the National Security Innovation Pathways bill or the creation of a special immigrant visa category for Quadilateral Security Dialogue (“Quad”) countries are urgently needed to fast-track visa applications and open up new green cards.

### **RECOMMENDATION #10: Establish and Disseminate Best Practices and Procedures for Sharing Data and Intellectual Property (IP)**

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<sup>25</sup> Divya A, “US to issue one million visas to Indians this year,” The Indian Express, March 14, 2023, <https://indianexpress.com/article/india/us-one-million-visas-indians-this-year-8494794/>

Deepening scientific and technological cooperation between the United States and India will require significant exchange of scientific data and information – digital information, biological specimens, chemical samples, human subjects (IRB) reports, and more – and steps therefore must be taken in both countries to ensure that data can be shared effectively and securely while also respecting privacy and other shared values.

Policymakers can assist by rationalizing and harmonizing laws and regulations in both countries to break down barriers in this space. Institutions can work to build robust internal data-sharing procedures and can prioritize addressing plans and expectations for data sharing during the initial stages of building research partnerships. Many institutions in both countries already have established best practices and institutional policies in areas like encryption, data classification & access control, and data sovereignty. These should be developed further and disseminated throughout the research community. Additionally, given that a major goal of the Indo-U.S. Global Challenges Institute is the facilitation of research that will lead to new innovations, start-up companies, and inventions, similar efforts must take place to ensure that research partners in the United States and India can agree on how resulting intellectual property (IP) should be shared. Possible models for these kinds of collaborations already exist – for example, the particle physics work done at the European Organization for Nuclear Research (CERN), which currently is supported with funding from 22 nations.

#### **RECOMMENDATION #11: Harmonize Research Administration Procedures**

Both U.S. and Indian institutions should take steps to improve coordination between their research administration ecosystems as another building block for establishing successful research partnerships. Research administrators in both countries can be effective conduits for sharing opportunities for joint funding and can help researchers navigate issues like research security and research integrity. The University of Maryland's Borderless Research Administration Knowledge Exchange (BRAKE) training program is a potential model, offering international workshops and exchange programs so that research administration best practices can be developed and disseminated among partner countries.<sup>26</sup>

#### **Examples of U.S.-India Research Partnerships**

AAU continues to collect examples of successful U.S.-India research partnerships. These examples can be found on our website at: <https://www.aau.edu/education-community-impact/international-collaborations/us-india-university-partnerships>

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<sup>26</sup> University of Maryland, "Borderless Research Administration Knowledge Exchange (BRAKE)," <https://research.umd.edu/brake>