The mission of MIT is to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century.

The MIT-India Initiative

I. A Shared History Centered on Innovation

The first Indian student entered MIT just fifteen years after the Institute opened its doors at the end of America's Civil War. That student's MIT career, followed by the 1915 graduation of Kshitish Chandra Basu, the first Indian citizen to attend the Institute, helped set the stage for a long, productive, and still-developing relationship between India and MIT. In addition to the roles of individual students and faculty, that relationship has been built largely around a series of collaborations between MIT and Indian institutions. In every case, innovation has been at the core of these interactions.

The MIT-India relationship achieved a new level of intensity in the period following World War II. At the time, India was emerging as the world's largest democracy and the locus of an impressive industrial enterprise. MIT had the privilege of becoming heavily involved in this vital era for India, particularly with the development of the country's scientific, technological, and educational infrastructure.

In the 1960s, a distinguished MIT professor led a U.S. delegation that worked with a group of Indian counterparts to create the Indian Institute of Technology, Kanpur. Subsequently, an MIT group that included a Nobel Prize-winning economist aided in forming the Indian Institute of Management, Calcutta. During roughly that same time span, MIT faculty also joined Indian colleagues in reshaping the curriculum at the Rajasthan-based Birla Institute for Technology

and Science. (Not coincidentally, the grandson of Birla Institute founder G. D. Birla later attended MIT).

Though institutional interactions of this kind diminished to a degree as the momentum generated by India's independence lessened, the ties between MIT and India have continued. More and more MIT faculty, including many from India or of Indian extraction, conduct research related to India, take an active role in India-related affairs, or both. (See Appendix II). Growing connections are also reflected in the make-up of MIT's student body: India is among the leading countries worldwide in terms of the number of its citizens — a total of 222 — enrolled at MIT.

The Institute now plans a dramatic new phase in its historic relationship with India. Rather than a series of loosely associated collaborations, the leaders of what is called the MIT-India Initiative are creating a cohesive, philosophically consistent, and forward-looking enterprise that emphasizes science and technology. While not all elements of the Initiative are new, all are being shaped such as to create a synergy that works to the benefit of MIT, its Indian partners, and of course the larger society. And the critical dimension that links these elements is innovation.

Why does this new partnership make sense? India's remarkable growth over recent decades has produced a critical mass of talent, resources for growth, and entrepreneurial excitement. The country has more ground to cover on many fronts, including education and its research infrastructure. Still, its advances in areas like science and technology, industrial development, and socio-economic policy are making India a potent actor on the world's stage.

MIT, for its part, is embarked on a new era in both research and education. This new phase is emerging from the dynamic interaction between developments in the larger world and the Institute's own evolution. The larger context includes striking progress in numerous fields and the simultaneous emergence of new challenges. Energy, a priority focus for MIT, offers a window on the first: novel

methods for shaping the interior structures of materials on nanometer-level length scales are yielding exciting advances in technologies from batteries to solar panels to thermoelectric devices. Energy also provides an illustration of the types of challenges MIT seeks to meet. The world, notably including the Indian subcontinent, must somehow find ways to at least double energy production by mid-century while minimizing harm to the environment.

MIT is responding to both the major challenges on society's agenda and to rapid progress across a wide range of fields. The Institute, known for its interdisciplinary approach to problem solving, is further blurring the boundaries between fields. (Its planned new center for cancer research — another priority area — will house not only cancer-focused biologists but also engineers from a range of disciplines). It is rapidly building its programs in vital areas like entrepreneurship and biological engineering. In some instances, it is moving beyond basic research in selected fields to focus on specific needs, among them better ways to understand and treat conditions like autism and childhood blindness, and new techniques for precisely targeting tumors and other diseased tissues. And very importantly, it is emphasizing knowledge co-creation in ways that transcend institutional or national boundaries.

II. MIT and India: The Elements of an Enduring Partnership

Recognizing India's increasingly influential global role, and the potential benefits for MIT's faculty and students of a new partnership, Institute President Susan Hockfield directed select senior faculty to launch the MIT-India Initiative in the spring of 2007. The Initiative's leaders have since established a series of principles to guide its growth and development. Among them:

Collaboration — The activities must be true partnerships, with both Indian and MIT representatives active in shaping them.

Benefits — Though the activities may be broadly beneficial, all should be designed in such a way that MIT, its Indian partnering institutions, and India generally are the primary beneficiaries.

Focus — The activities should build on the traditions of past MIT-India partnerships in that they must be based on mutual respect, strongly focused on the future, and reliant on the most up-to-date knowledge and methods possible.

Assessments — Those who lead Initiative activities must build in means for systematically assessing the strengths and deficiencies of such activities.

The elements of the Initiative reflect these vital concepts. In addition, the projects all embody the goal of seeding innovation in a way that ensures wide dissemination. Among other strategies, that means looking for ways to publicize the projects among influential audiences, especially in India. Exactly how this will be done in each case is to be determined, but the basic goal is to make sure the lessons learned are broadly accessible.

The elements of the Initiative are:

Poverty Action Lab
The Abdul Latif Jameel Poverty Action Lab (JPAL), based in the MIT Department of Economics, pioneered the use of controlled trials as a means of gauging the effectiveness of anti-poverty strategies. The Lab was launched four years ago, and today includes 18 faculty-level staff members. In addition to the Institute, their academic affiliations include Harvard, Yale, and Columbia universities.

There are more JPAL projects in India than in any other country. Topics under study include health, education, indoor air pollution, government corruption, and the optimal use of micro-credit. Indian organizations collaborating in the Lab's work include government agencies, non-profit organizations, and leading corporations. This past July, Infosys founder Narayana Murthy, working with the Lab's leadership, established JPAL South Asia in Chennai. This semi-

independent group will not only further the Lab's work in India but will also let the Lab enhance its ties to local agencies, corporations, the media, and other Indian organizations.

Leadership: Professors Abhijit Banerjee and Esther Duflo

MIT-India Program

The MIT-India Program, part of the MIT International Science and Technology Initiatives, arranges summer internships in Indian research, corporate, and non-profit settings for MIT students. Among participating organizations are the ICICI Bank, Hikal Pharmaceuticals, and Dr. Reddy's Laboratories. MIT students have also worked in labs at IIT Madras, IIT Bombay, the National Centre for Biological Sciences, and the Indian Institute of Information Technology, Bangalore.

The Program similarly helps MIT faculty arrange research partnerships with Indian counterparts. In addition, the MIT-India Consortium, started in 2005, collaborates with companies to stage an annual summit on business and economic issues in India, with faculty presenting their research and discussing key topics with participating Indian government and industry leaders. Planned is a continued expansion of not only the internship offering but also the Program other components, including a lecture series that features presentations by Indian executives, officials, and artists.

Leadership: Dr. Arundhati Banerjee

Harvard-MIT Health Sciences and Technology Exchange

The Harvard-MIT Health Sciences and Technology Division (HST) educates students who are on a range of academic tracks, including physician and electrical engineer, in key areas of the health sciences and health technology. It also fosters research on topics like the biology of hearing, nanoscale therapeutic devices, and new technologies for heart health. Students in HST's medical engineering and medical physics program currently spend six weeks in India as part of their educations. They are based at the All India Institute of Medical Sciences or the Rockland Hospital in New Delhi — experience that allows them

not only to develop relationships with Indian colleagues but also to compare how medical technologies are applied in India as opposed to the U.S.

The Division is exploring a major expansion of its partnership with Indian institutions. One key proposal is for a formal relationship between the Division and the planned Translational Health Science and Technology Institute (THSTI). Planned is the creation of a THISTI development institute that would aid Indian groups in selecting faculty for the Translational Institute, due to open in 2011. The development entity would also bring THISTI faculty to the U.S. to work with HST colleagues. This exchange would be coordinated with a related program that would bring Indian physicians, scientists, and health technologists to HST to participate in ongoing research.
Leadership: Professors Martha Gray and Shiladitya Sengupta

UrbLab
The UrbLab, short for Urban Laboratory, is an MIT-India collaborative effort aimed at studying and responding to the challenges associated with India's rapid growth, increasing industrialization and urbanization. Most of the Institute faculty members involved are from Urban Studies and Planning Department or the MIT Center for Real Estate. Selected individual faculty in management, economics, and civil and environmental engineering are also likely to play a role, however.

The UrbLab is exploring partnerships with various Indian institutions. The goals include the development of urban planning expertise, with a special focus on areas experiencing unusually explosive growth. In the meantime, a group of MIT faculty and students have been setting the stage for what will hopefully become a series of partnerships by conducting development-related studies for the Indian community of Erode, in Tamilnadu. That study can provide a window on the types of planning enhancements that will be possible once the UrbLab is operational.
Leadership: Dean Adele Naude Santos, Professor Charles Correa and
Associate Professor Rahul Mehrotra

A Teaching Partnership

MIT and IIT Kanpur have begun discussions related to developing a three-year pilot collaboration between MIT's electrical engineering and computer science faculty and their counterparts in Kanpur. The MIT group and its Indian partners specifically plan to develop a new teaching model for selected technologically oriented Indian institutions.

This model would build on MIT's proven team-teaching methods while also introducing IIT faculty to MIT pedagogical models. With Indian faculty joining their MIT counterparts as team-teachers in Cambridge, among other collaborations, the project will lead to the development of a., new teaching models and curricula for the IITs; b., institution-building for the IITs through the teaching of selected courses in India by MIT teams; and c., major changes in teaching methods at regional engineering colleges through an outreach program involving both MIT and IITK faculty.

Leadership: Professors George Verghese and Arvind

III. Conclusion: Partnerships that Can Shape the Future

Innovation is about developing and implementing new ideas. Since such ideas are in fact relatively commonplace, innovation in the larger sense is also about making thoughtful and far-sighted judgments about what new ideas have the best chance of succeeding, and where they can be put to work most effectively.

There are some obvious points about how to make such judgments. The issue of where new ideas should be implemented, for example, depends on the willingness of an institution, country, or culture to adapt to and promote change. India clearly is ready for a new era of innovation.

It is also clear, though, that innovation is a highly creative process, and that as such it is often more of an art than a science. To aid its efforts to work effectively with Indian partners in promoting innovation, MIT plans to enlist a group of

eminent private-sector leaders in India as active members of an MIT-India Initiative leadership network. This group will play a key role in helping MIT and its partner institutions in India foster innovation, not only by offering guidance and support but also by helping frame a strategy to optimize the Initiative's success.

Longer term, we expect the Initiative to help seed new relationships and ideas. Addressing issues like attacking cancer in novel ways or reducing society's reliance on fossil fuels will require new types of collaborations. The MIT-India Initiative, therefore, is likely to evolve into an extensive set of partnerships between MIT and a range of academic and corporate organizations in India.

With the pace of innovation worldwide accelerating as never before, this is a highly promising time to develop creative partnerships between MIT and Indian organizations. At MIT, of course, innovation has long been the main driver of educational and research activities. That same type of motivation also typifies today's India. With a cadre of insightful and committed private-sector leaders from India providing counsel and support, and the enthusiasm of the participating faculty and students, the MIT-India Initiative has unlimited potential.

We invite you to come forward to participate in this important venture. The Initiative is an unprecedented effort whose long-term goal is to create a global knowledge network that readily crosses international boundaries. With your help and support, we will surely succeed.

The MIT Trust of India

MIT has established the Trust of India to allow the Institute to actively shape the development and implementation of a long-term partnership through which MIT and institutions in India can collaborate on advancing knowledge and educating students in science, technology, management, and other areas of scholarship that will best serve the world. The MIT Trust of India will transform the way scholars educate, research, and collaborate with each other across national borders. The trust will support a portfolio of activities with partner institutions in India to facilitate mutually agreed upon research and educational goals. That portfolio will include research, student financial aid, internships, technology exchanges, faculty exchanges, consortia, and associated activities.

The MIT-India Initiative Fund

The Institute has also established the MIT-India Initiative Fund to support activities associated with the Initiative in Cambridge, including seed funding to initiate relationships or to cover travel expenses, administrative support, outreach to faculty and students, and symposia.

For information on becoming involved in the MIT-India Initiative, or to provide financial support, please contact:

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APPENDIX II

Selected MIT Faculty and Staff with research interests in India

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Charles Cooney
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Charles Correa
Department of Architecture
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Michael Cusumano
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