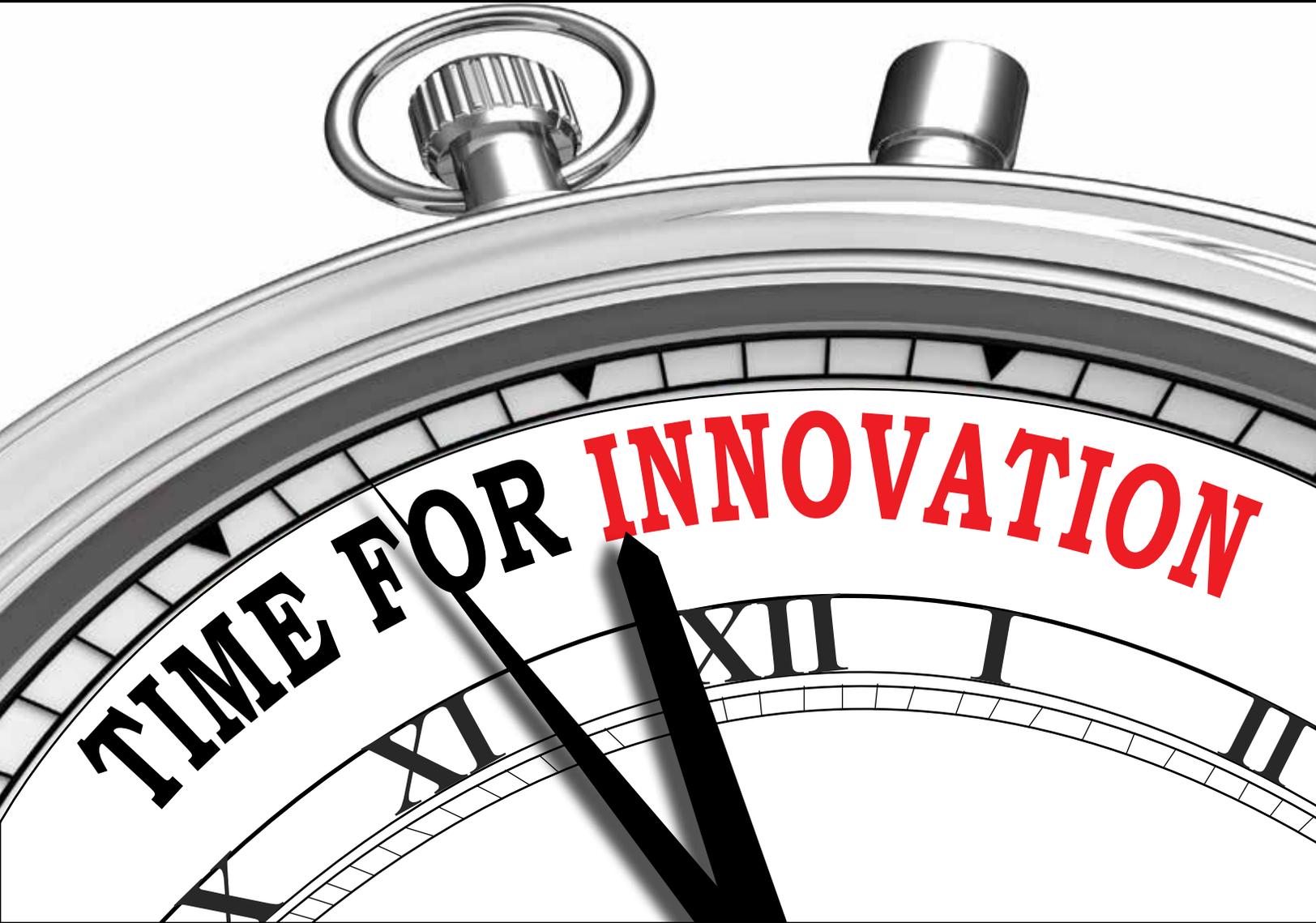


Indo-US Science & Technology Forum **Connect**

Newsletter of IUSSTF

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UNITED STATES - INDIA SCIENCE AND TECHNOLOGY
ENDOWMENT FUND

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From the Editor-in-Chief



The last few months have been very exciting and fruitful with the expansion of our program profile and attaining new heights in existing programmatic activities. Many new partners have joined us in developing and implementing our programmatic activities.

It has been our continuous endeavour to nurture young talent and motivate them to pursue science and technology as a career. To realize these goals, the IUSSTF has been implementing several internship programs with guidance and financial support from the Science and Engineering Research Board (SERB), Indian Department of Science and Technology and the Department

of Biotechnology, in partnership with the University of Wisconsin-Madison, other CIC universities, University of Southern California and several Indian academic and research institutions including IITs, IISc, IISERs. We feel proud to state that **this year 100 Indian undergraduate students availed internships at U.S. universities** under the *Khorana Program for Scholars, S.N. Bose Scholars Program and the Viterbi-India Program*. **30 U.S. Undergraduate, Masters and Doctoral students availed internships at Indian academic and research institutions** under the *S.N. Bose Scholars Program and the Research Internship in Science and Engineering (RISE) program*. IUSSTF thanks our partners for this accomplishment and expects these numbers to grow further in the coming years.

On another front, the *Indo-U.S. Research Fellowship Program* implemented in partnership with SERB (for early career scientists in Indian academic and research institutions to conduct research in U.S. S&T institutions for a duration of upto 12 months), has been doubled to accommodate upto 50 scientists every year. Most of past fellows have continued their interaction with U.S. hosts and pursued joint research.

The *Fourth U.S.-India Strategic Dialogue* co-chaired by Secretary of State John F. Kerry and External Affairs Minister Salman Khurshid was held in New Delhi on 24-25 June 2013. It recognized the ever-expanding bilateral relationship in science and technology for clean energy, innovation and entrepreneurship, climate, water etc. IUSSTF has played an important role in furthering U.S.-India relationships in several of these areas.

The *U.S.-India Science and Technology Endowment Fund* completed its 3rd call with several joint proposals for commercializing research and technology for societal benefit. The awards were announced in a ceremony held on 24th June 2013 which was blessed by the presence of John Holdren, Science Advisor to U.S. President, Indian S&T Minister Jaipal Reddy, S&T Secretary T. Ramasami, NASA Administrator Charles F. Bolden, USAID Administrator Rajiv Shah and many senior policy makers and industry representatives. Under this initiative awards committing about 5 million USD have been announced until now. Brief descriptions of these awards are covered in this issue of *Connect*.

SERB has also signed MoUs with National Science Foundation to partner in the *GROW (Graduate Research Opportunity Worldwide)* fellowships for U.S. students to visit India as well as with the National Institute of Biomedical Imaging and Bioengineering (NIBIB) of NIH for collaboration on affordable blood pressure measurement devices. SERB has chosen IUSSTF as the implementing partner for these important initiatives. ●

Rajiv Sharma

Executive Director, IUSSTF

U.S. India S&T Endowment Fund

Time for Innovation

Innovation and Entrepreneurship are prime drivers of economic growth in today's world. Given the inherent complexity of new technologies and the multi-disciplinarily nature that underlies any new product or service; pooling of knowledge and insights from groups with diverse expertise and backgrounds is considered a way to speedily resolve technological challenges and successfully push innovations forward.

The **United States - India Science & Technology Endowment Fund (USISTEF)** has been set up by India and the US to harness the significant potential for synergy between the S&T institutions of the two countries. The aim of the Fund is to support and foster joint applied R&D to generate public good through commercialization of technologies achieved through sustained partnerships between US and Indian researchers and entrepreneurs.

Jointly spearheaded by the *Department of State* (for the US Government) and the *Department of Science and Technology* (for Govt. of India), USISTEF is a novel mechanism to promote joint activities that lead to innovation and techno-preneurship through the application of science and technology.

In this edition's Cover-story, we present to you the winners of the Endowment Fund awards thus far.

U.S. India S&T Endowment Fund At a Glance

Objectives

To select and support through a grants program financially promising joint US-India entrepreneurial initiatives. These initiatives can originate from government, academic, non-governmental or commercial entities, and any combination thereof provided they focus on applied R&D, incorporate a business plan and proof of commercial concept, and have significant sustainable commercial potential.

Priority Areas

Healthy individual: Affordable biomedical devices, diagnostic / preventive / curative measures, or food and nutrition products to improve health. (Drug development and clinical trials are not eligible activities in this category).

Empowering citizens: Reducing the digital/technology divide. This could include amongst others, information and communication technologies with societal impact in areas such as water, agriculture, financial inclusion, and education.

Structure

Proposals must include a minimum of one partner from each country. Bi-national teams applying to the Endowment will work together to commercialize technologies for societal impact.

The Bi-national teams can include: Start-up companies; or Incorporated companies; or Non-incorporated entities; or Individuals or consortia from academia, government laboratories, non-government R&D institutions

The proposed technology must have potential towards commercialization within 2-3 years

Fund

Grants of up to Rs. 2.50 crores or approximately \$450,000 (subject to prevailing exchange rate). Proposals outside this range may be considered under exceptional circumstances at the discretion of the US-India Science & Technology Endowment Board.



The Solution

The team has developed an off-grid refrigerated container, which will be installed on small farms and remote villages throughout India. This will increase the farmer's incomes by eliminating costly spoilage while allowing them to sell the produce at a fair price independent of harvest timing. The system does not use an on-board refrigeration compressor for cooling and therefore will not release harmful refrigerant gas into the atmosphere and would reduce capital and operating costs.

A Fair Price for
Healthy Fruits
& Vegetables:
Helping Farmers
Access
Cold-Storage
Technology

The Problem

Nearly \$10 billion of agricultural produce is lost in India every year due to inadequate cold storage and post-harvest transportation facilities.



The Problem

Over 1.9 million people in India are above-the-knee amputees and unable to live productive lives. With 77% of India's population living under \$2 a day, amputees rarely receive rehabilitation and have no access to quality prostheses.

Affordable and
User-Centric
Knee Joints to
Remobilize
Above-Knee
Amputees
in India and
Globally

The Solution

The team proposes to co-develop an affordable polycentric and user-centric knee joint-the ReMotion Knee version 3, to remobilize above-knee amputees in India and globally. The ReMotion Knee is a high-performance, low-cost prosthetic knee joint for above-knee amputees specifically designed for low-resource users. ReMotion is radically affordable. It will retail at less than \$80, yet is designed to perform on par or better than expensive polycentric knees, which usually start at \$1,400. Unlike other prosthetic knees, ReMotion will be optimized specifically for the environment, activities, and price parameters of low-resource users. The US-India Science & Technology Endowment Fund will support the final development, testing and launch of the ReMotion knee (version 3). With the US- India S & T Endowment Fund support, the ReMotion Knee will reach global markets in 2014.

Branchless Banking and Financial Services for the Unbanked and Under-banked

The Problem

A large section of the Indian population (500 million) still remains without access to banking services. Traditional financial service delivery models have failed to serve low income populations.



The Solution

The objective of this project is building a low-cost payment infrastructure for instant small value financial transactions by leveraging existing retail shops, tele-connectivity and banking infrastructure to extend branchless banking services to the common man. The project aims to deliver financial services efficiently and at scale through smart phone based application mechanism integrating with the Unique Identity UID.



A Novel Way to manage Fecal Incontinence in Non-ambulatory Patients

The Problem

Fecal incontinence, the inability to control the release of stool, is a ubiquitous clinical problem that affects more than 50 million patients globally. The absence of an adequate management solution for fecal incontinence leads to increased utilization of hospital resources and adversely impacts mortality by 7%.

The Solution

The team has developed a self-expanding device to manage fecal incontinence in non-ambulatory patients with a unique placement, deployment and withdrawal mechanism. The device requires minimal training and can be administered without the need for imaging and works on all patients, irrespective of their stool type or sphincter tone. The product offers a hygienic insertion mechanism and is overall very sanitary and patient friendly. The accomplishments of the team include :



- Exclusive license agreement - Govt. of India
- Contract manufacturing established
- Series A venture capital and international grants
- FIM safety study successful (AIIMS)
- GenI product development completed
- Patents in national phase
- Efficacy study in target patients ongoing



The Problem

Over 160 million households constituting 70% of India's population are cooking on polluting cookstoves/indoor open fires. Over 50 million households do not have access to reliable electricity.

Affordable,
Clean
Cookstove
and
Electric Power
Sources for
Rural India

The Solution

The Greenway Power Stove is a complete household energy solution that combines clean cooking and reliable, on-demand power generation. The stove employs a novel clean combustion technology and state of the art thermoelectric power generation technology, making it high performance and user desirable. The solution is based on low cost thermoelectric modules that generate electricity from the stove during cooking. It cooks for a family of 8 delivering 65% fuel savings and 70% smoke reduction while generating 5 watts of power i.e. a roomful of light (120 lumens) for 6 hours + a full smart phone recharge over 2.5 hours of cooking. It has been designed maintaining usability features such as a front feeding design and control over combustion and power generation.



The Solution

The Solar Electric Tractor (Solectrac) is a full function agricultural tractor that operates with up to 5 times the efficiency of a diesel tractor performing the same farming tasks. The solar electric tractor with a battery-inverter system provides electric power anywhere anytime. Solectracs can also be used for portable power, home power, water pumping and mechanical functions as well as for hauling and transportation needs. Because the Solectrac is electric, its batteries can be charged directly by clean renewable energy or it can be charged at low cost from the electric utility grid at off-peak rates. Solectracs use patented "quick change" battery packs to extend operational periods.

The Problem

Rising diesel prices make it very difficult for subsistence farmers in less developed countries to afford tractors to increase agricultural production.

Solar
Electric
Tractor-
Agriculture
and Power



Mobile
Phone based
HbA 1c
Analyzer

The Problem

There is an acute need for a low-cost and portable Hb1Ac monitor top screen to manage diabetes in the developing world. However, most standardized HbA1c monitors are expensive, bulky and assay-based systems and thus not suited for mass adoption.



The Solution

The team proposes to co-develop a low-cost mobile phone platform to measure HbA1c. Their novel platform comprises of two components- a colorimetric test strip for HbA1c and a software application that uses the phone's camera to analyze the test strip. Additionally, the software application can provide automated decision support and transmit data to remote specialists, thus enabling millions of field health workers to screen and manage diabetes in even the most remote communities.

Commer-
cialization of
Cultivated Sea
Plants-based
Organic Bio-
stimulants

The Problem

There are two fundamental problems that are targeted – the endemic poverty in India and the rising consumer demand for organic products in the US Market.



The Solution

Aquagri has pioneered seaweed cultivation in India with a prime focus on creation of livelihood opportunities for coastal communities and to enhance its sustainability by developing a wide range of value added products. Aquagri through sea plant cultivation would help in expanding the cultivation base itself. GloBridge Ventures LLC plans to work in collaboration with Aquagri to market and distribute the products/solutions with a focus on organic segments that improves efficiency, lowers cost and improves the health of livestock and enhances crop productivity.



The Solution

The innovation (NeoBreathe™) is an integrated neonatal resuscitation solution that's much easier to use and suitable for field conditions. It will therefore empower front-line health workers such as medical professionals, community health workers, midwives and other skilled birth attendants to perform basic neonatal resuscitation effectively - with minimal training.

The Problem

Five out of every hundred babies born (6 million worldwide, 1.3 M in India every year) have birth asphyxia. In fact, 904,000 children (210,000 in India) will die and an equal number will be disabled for life every year. 811,000 deaths annually from Birth Asphyxia are largely preventable by basic resuscitation. Current devices are difficult to use and ineffective especially in the developing world.

Easy to use,
Integrated
Neonatal
Resuscitation
Solution



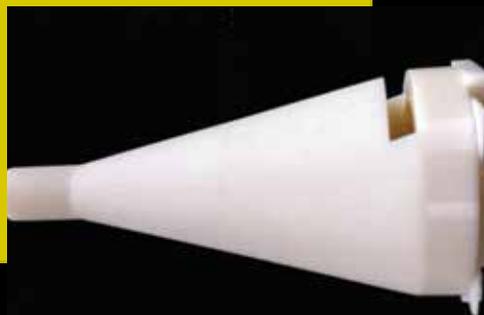
The Solution

The ultimate objective of the proposal is to serve the rural/impooverished population of the world in meeting their most important ophthalmic diagnostic requirements. Due to the rapid growth and advancement in smartphone technology, we are able to harness the power of mobile technology in order to reach the largest markets and therefore deliver an affordable and accurate diagnostic to those who can't otherwise afford it. The team strongly believe that their innovative smartphone based diagnostic technology has tremendous commercial potential because of its simplicity and its ability to provide high-resolution images for the accurate diagnosis of cataract and various other debilitating human diseases for rural and impooverished patients.

The Problem

According to the World Health Organization, estimates suggest that over 80% of all undiagnosed cataract conditions will lead to permanent blindness as acute ophthalmic problems are exacerbated without timely diagnosis.

Blindness
Prevention
through
Integrated
Smartphone
Technology
Young
Entrepreneur
Award



Using Computation to Enrich Policy

Observation, theory, modeling and prediction are major verticals to understand the complex nature of a real system. Probably Johannes Kepler was the first scientist who subjugated theory to observation and predicted the elliptic path of the earth around the sun while Aristotelian/Ptolemaic syllogism found that the motion was circular.

A model can be viewed as an abstract representation of the theory. The system (simple or complex) exists and operates in time and space. A model simplifies the system-representation at a particular point of time and space to understand the real system. The model based simulation manipulates the model parameters enabling to perceive the interactions and predict the different scenarios. Models are of central importance in many scientific contexts. Computational modeling becomes a principle instrument of modern science. And, as we argue in this article, it is also a powerful tool for enriching policy research.

A policy maker or planner is always concerned with the question “How do we predict and plan for the future?” Could we have predicted the Uttarakhand disaster and taken preventive action to minimize the casualties? How much energy does India need by 2050 and how do we achieve it in a low carbon manner? How does climate change impact the livelihoods of poor people living in deltas of Sunderbans and Cauvery rivers? Computational models can provide insights to these kinds of questions. The power of computing helps generate thousands of different scenarios of the future. We then need to develop strategies that work in most of the above scenarios. When the complexity grows in technology enabled policy options, we need

not only deterministic scientific theory based on observations but a modeling framework to solve the complex problems.

At the Center for Study of Science, Technology and Policy (CSTEP), Bangalore, we are attempting to develop models combining physical science, social science, mathematics and economics to analyze and visualize complex policy problems. We have used some of these models to make contributions and influence policy in pressing areas of concern for the nation.

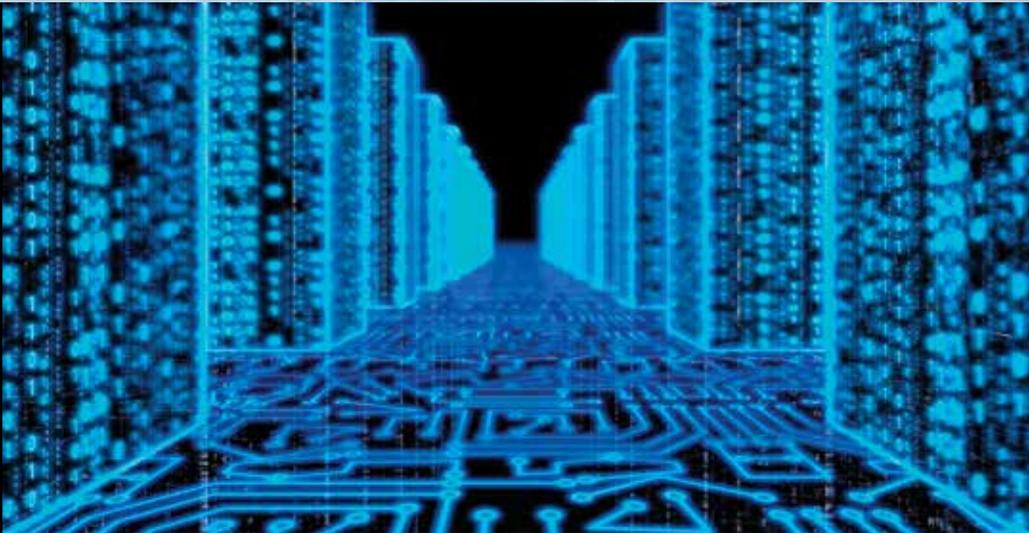
The phenomenal growth of computers with their processing power and speed is removing the constraints imposed on modeling complex systems. CSTEP’s ambitious project is to build a major computing and visualization analysis platform – ‘Decision Environment’. As of now, we have developed a relatively simpler prototype. When fully developed, it will have the capacity to model and visualize complex inter disciplinary problems and generate thousands of scenarios and explore options to suggest a few for decision making. A key aspect of this is an interactive visualization system built using intense graphics technologies, where the core component is a series of screens that can display panoramic computer graphics. This advanced environment enables individuals



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to see detailed representation of the impacts of policy decisions and examine potential future scenarios in innovative and exciting ways. The visual software applications that best suit model requirements are system-dynamics, geographic information systems, data mining, statistical analysis, and modeling applications. Each model is constructed in close collaboration with stakeholders to identify the key variables, so as to present decision-makers with visual depictions of their possible policy options.

We have used the above platform to model problems in energy systems. Karnataka has a large wind power potential and the state is considering adding aggressive wind power generation. However, wind is an intermittent resource and therefore, requires careful planning. Several factors need consideration such as: wind speed and wind power density at various heights, availability of wasteland, transmission infrastructure and managing intermittency associated with wind power. The models develop a GIS enabled platform, which integrates these layers and helps in decision-making regarding siting of projects and the impact of wind generation on the grid.

We also used the prototype decision environment to compare the transport infrastructure option such as building expressways and high-speed rail networks. The decision is impacted by various

parameters such as population, gross domestic product, population density, future proposed investments, state and national highway networks, and the rail network. The model develops a GIS enabled platform to select the route location and consider the impact of above factors. It compares the infrastructures on cost, life cycle carbon emissions, connectivity etc.

Finally, we modeled large-scale emergency and disasters such as nuclear, chemical or biological accidents. These require detailed understanding of the physics of the process, and transport and dose – response characteristics. The use of fluid dynamics and agent based modeling techniques in decision environment shows the complex behavior of different agents. Our prototype environment is able to handle the complex computation in predictive modeling and the decision makers are able to visualize the critical zones, critical scenarios required for mitigation.

The decision environment is not only limited for these three problems which are the most active research at CSTEP related to decision environment. It can accommodate innumerable numbers of policy problems, which are complex, inter-disciplinary and computationally expansive. The present simpler prototype decision environment elevates the present policy research in a new direction. ●



AMERICAN
SOCIETY FOR
MICROBIOLOGY



IUSSTF
Indo-US Science and Technology Forum

ASM-IUSSTF INDO-US PROFESSORSHIP IN MICROBIOLOGY

American Society for Microbiology (ASM) in partnership with the Indo-US Science & Technology Forum (IUSSTF) announces the ASM-IUSSTF Indo-US Professorship in Microbiology. This program is open to ASM members and non-members alike. The program seeks to broaden collaboration between microbiologists in India and the US through scientific exchange.

Visiting Teaching Professorships

Provides microbiologists in India and the United States with an opportunity to visit institutions in the other country to teach an interactive short course on a topic in any of the microbiological disciplines.

Eligibility

- Researchers and faculty members scientifically recognized in the area of microbiology.
- Actively engaged in teaching at post-secondary level.

Duration: 1-2 weeks.

This is not for Teaching Professors only.

It is strongly recommended that the course include a hands-on component, such as a wet lab or other practical activity.

Visiting Research Professorships

Provides microbiologists in India and the United States with an opportunity to participate in an interactive short course on a topic in any of the microbiological disciplines, or conduct a research project in partnership with a colleague at a research facility in either country.

Eligibility

- Researchers actively involved in microbiological sciences.
- Preference given to applicants who have obtained within the past 5 years, or are in the process of obtaining, a PhD, or equivalent academic degree.

Duration: Minimum 6 weeks.

FUNDING

Grant up to USD 5000 is provided to cover travel costs, visa and contingencies. Funds must be matched by the host institution. Matching funds provided by the host institution may be in-kind contributions such as housing and board for the visiting professor, supplies, facilities, administrative support, etc.

For program details visit:

www.indoustf.org

www.asm.org/international/indo-us

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Annual Deadline: 15 October

India-U.S. Grand Challenge: **Affordable Blood Pressure Measurement Technologies for Low-Resource Settings in India and the U.S.**

Hypertension diagnosis and management is a critical healthcare issue. However, the basic underlying approach for the measurement of Blood Pressure has essentially remained the same for the past several decades. This is an obvious area that is ripe for disruptive technological innovation. The **Science & Engineering Research Board (SERB)**, Department of Science & Technology, Government of India has partnered with the **National Institute of Biomedical Imaging and Bioengineering (NIBIB, NIH)**, USA to announce the **Indo-U.S. Grand Challenge Initiative on Affordable Blood Pressure Measurement Technologies for Low-Resource Settings in India and the U.S.** The purpose of the initiative is to encourage collaborative research within and between both the countries

to propose new approaches to the measurement of Blood Pressure that are unobtrusive or passive, low cost and which can automatically provide frequent data recording and reporting to healthcare workers as well as feedback to the patients. SERB and NIBIB have launched two separate and parallel, but fully coordinated, funding opportunity announcements in India and the U.S. respectively to promote research in this area and generate alternate scientific approaches and technological options. It is expected that this partnership between the two countries will leverage knowledge and material resources to develop new technologies which are relevant for low resource settings not only in their respective political domain but other similar settings all over the world. ●

For more information, please visit:

Indian Applicants

<http://www.indoustf.org/Funding-Opportunity-Announcement.html>

U.S. Applicants

<http://grants.nih.gov/grants/guide/rfa-files/RFA-EB-13-001.html>

Graduate Research Opportunities Worldwide

The **Graduate Research Opportunities Worldwide (GROW)** program is a partnership between the **Science and Engineering Research Board (SERB)**, Department of Science and Technology (DST), Govt. of India and the **National Science Foundation (NSF)** to provide NSF Graduate Research Fellows with opportunities to enhance their professional development through research collaborations at top-caliber science and engineering research sites in India. National Science Foundation (NSF) Acting Director Cora B. Marrett signed this new research partnership with T.K. Chandrashekar, Secretary of the Science and Engineering Research Board (SERB). The objectives of the program are to promote research and capacity building in frontline areas of science and technology; to pave way for the next generation scientists and technologists from the United States to interact with their Indian peers, thus helping to build long-term R&D linkages and collaborations; and, to bring talented American students to research

laboratories and academic institutions in India to build a deeper appreciation of the culture of innovation and long-standing tradition of scientific enquiry in India.

In his statement Dr. Chandrashekar said *“The GROW Initiative provides an excellent opportunity to introduce talented American students to the S&T landscape and the long-standing tradition of scientific inquiry in India. We also hope that the program helps foster long-term interactions between the next generation of innovators and thought leaders from India and the United States and contributes to the prosperity of not only our respective countries but the world at large.”* Dr. Cora Marrett remarked, *“GROW fosters increased collaboration between Graduate Research Fellows and their peers around the world. Connecting them to leading scientists and research infrastructure outside of the U.S. will help them engage successfully in the global research enterprise.”* ●

For more details please visit:

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504876

and

<http://www.indoustf.org/grow-program.html>

Fourth U.S.-India Strategic Dialogue

Excerpts from the Joint Statement

23-25 June 2013 | New Delhi

Both governments reiterated their commitment to facilitating greater two-way trade and investment, including with respect to goods, services, and skilled professionals. Both governments also reaffirmed their commitment to strengthening the innovation climate in each country as a means of promoting economic growth and other legitimate domestic and trade policy objectives. Noting the importance of technology to both economies, the United States and India discussed their cooperation under the Information and Communications Technology (ICT) Working Group and reaffirmed plans for a follow on ICT Working Group Meeting in Washington this year. Both sides plan to discuss best practices and cooperation in ICT manufacturing and testing, cloud computing, research & development in ICT, and other related areas. To take advantage of the benefits of cyberspace and to manage the increasing threats, both also agreed on the importance of deepening high-level discussions and cooperation on cybersecurity and Internet governance through various mechanisms, including the Cybersecurity Consultations and the Strategic Cyber Policy Dialogue.

The two leaders recognized that the United States and India enjoy ever expanding bilateral cooperation in our science and technology relationship. Together, the United States and India are using science and technology to tackle global cross-cutting issues such as climate change, disease mitigation, water resources, and clean energy. Both countries facilitate leading edge research and are building public-private partnerships that support technology-based innovation and entrepreneurship. The United States and India look forward to the next Joint Commission Meeting in 2014 to plan, coordinate, and provide strategic guidance to help advance our mutual science and technology endeavors.



U.S. Secretary of State **John F. Kerry** and External Affairs Minister of India **Shri Salman Khurshid** met in New Delhi and co-chaired the fourth U.S.-India Strategic Dialogue on June 24. During the meeting, they reviewed the extensive transformation of the bilateral relationship and identified key sectors of cooperation that will continue to add strategic depth to the partnership.

The Strategic Dialogue, inaugurated in 2009, is a forum for discussing the full range of U.S.-India cooperation on bilateral and regional issues, reflecting the strong strategic partnership between our countries. Topics for discussion included bilateral and regional economic engagement, regional security and defense, science and technology, climate change, and other global issues such as women's empowerment, non-proliferation and space cooperation.

The two delegations discussed the critical importance of energy to sustaining economic growth and securing prosperity, and acknowledged the robust and full range of cooperation under the U.S.-India Energy Dialogue, co-chaired by the Secretary of the U.S. Department of Energy and the Deputy Chairman of India's Planning Commission. The United States and India plan to continue their ongoing efforts to expand partnerships in clean energy and energy efficiency through the U.S.-India Partnership to Advance Clean Energy (PACE) and under the multilateral Clean Energy Ministerial. Since 2009, PACE – Deployment has mobilized approximately \$2 billion in clean energy financing to India and PACE – Research has created innovative public-private consortia through the \$125 million Joint Clean Energy Research & Development Centre. They noted the decision taken to create a new Sustainable Growth Working Group under the U.S.-India Energy Dialogue, and the growth of U.S. investment in India's energy sector. The United States and India welcomed additional efforts aimed at financing clean energy investments, promoting the development of smart grid technologies, energy efficient buildings, solar power, smart and efficient air conditioning and space cooling, and expanding off-grid access to clean energy.

The Secretary and the Minister welcomed the expanded work plan endorsed by the U.S.-India Civil Space Joint Working Group in a number of areas, including measures that will improve the use of earth observation data to promote sustainable development and the compatibility-interoperability between the U.S. Global Positioning System and the Indian Regional Navigation Satellite System. They applauded the agreement by the Indian Space Research Organization and the U.S. National

Fourth U.S.-India Strategic Dialogue

Aeronautic and Space Agency to explore further cooperative space exploration work, including future missions to the moon and Mars. They welcomed the announcement of NASA support through its Deep Space Network facilities to ISRO's Mars Orbiter Mission, and the ISRO-NASA technical discussions to integrate U.S. L-band and Indian S-band synthetic aperture radar on an Indian spacecraft for earth observation studies.

The two sides welcomed continuing engagement on women's empowerment and the four meetings that have been held since

the establishment of the U.S.-India Women's Empowerment Dialogue in 2009. The Secretary and the Minister welcomed the opportunity to further cement U.S.-India cooperation in these existing areas and explore additional areas of mutual interest, including in the fields of clean energy and women in science, technology, and engineering.

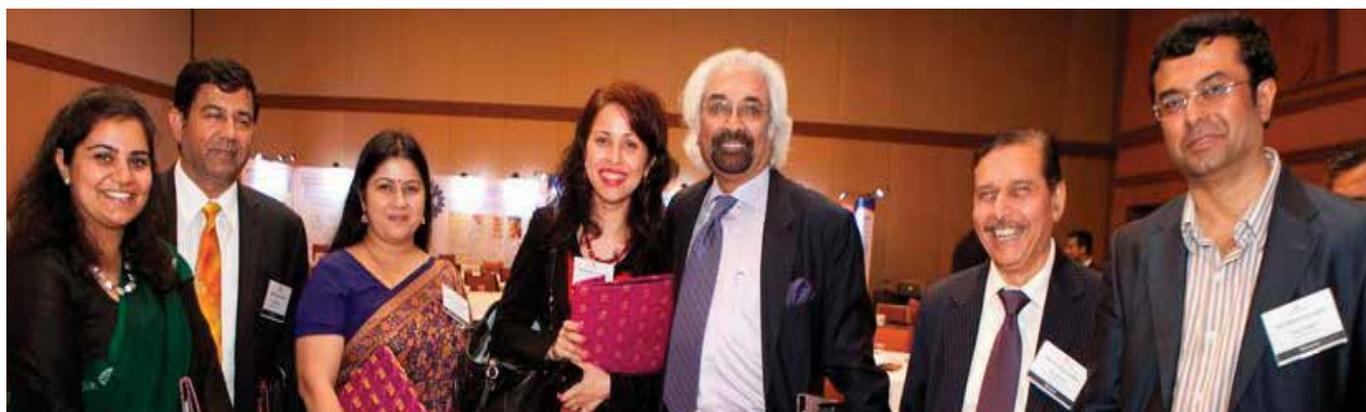
The two co-chairs expressed satisfaction at the consistent progress being made in the annual Strategic Dialogues towards deepening the U.S.-India partnership. ●

Text Courtesy: U.S. Department of State

Full text can be accessed at: <http://www.state.gov/r/pa/prs/ps/2013/06/211084.htm>

India Innovation Summit

Chicago, 18-19 July 2013

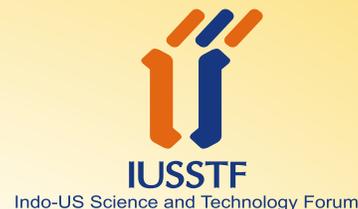


The **India Innovation Summit** organized by the Confederation of Indian Industry (CII) in partnership with the Chicago Council on Global Affairs (CCGA), the US-India Business Council (USIBC), PanIIT Alumni Association and TiE Midwest was organized at Chicago on 18-19 July 2013.

The summit brought together creative minds, experts and entrepreneurs, financing institutions and economic development

officials from both countries, packing the halls with tremendous energy and enthusiasm.

Discussions were free wheeling and encompassed key policy interventions required to spur innovation. This included funding mechanisms, institutional issues and partnership opportunities between institutions from India and the U.S. in the innovation space. ●



KHORANA Program for SCHOLARS

The Department of Biotechnology, Govt. of India, University of Wisconsin-Madison (UW) (and partner universities) and the Indo-US Science and Technology Forum (IUSSTF) are partnering to support the prestigious **Khorana Program for Scholars** named in honor of Dr. Har Gobind Khorana, who won the Nobel Prize in 1968 for his work at the interface of Chemistry and Biology while a member of the UW faculty. **The Khorana Program will provide opportunities to Indian students to undertake research at University of Wisconsin-Madison and partner universities in Summer 2014 for a period of 10 weeks.** A list of UW partner universities is available at https://www.biochem.wisc.edu/faculty/ansari/khorana_program/

The Khorana Program is envisaged to:

- Provide encouragement to young scholars to undertake R&D
- Enable students to carry out research at a premier University in the United States
- Transform research into societal benefits
- Build a seamless scientific community between India and the United States

Eligibility:

B.Tech, M.Tech and M.Sc. students currently enrolled in a recognized institution of higher education in India in the areas of biotechnology including agricultural, health and biomedical sciences.

Scholarship includes:

- Stipend
- Accommodation
- Airfare

For application guidelines refer to:
www.indousstf.org

For program information contact:

Dr. Nishritha Bopana
Indo-US Science and Technology Forum (IUSSTF)
12 Hailey Road, Fulbright House,
New Delhi- 110 001
E-mail: scholar@indousstf.org

Application Deadline : 30 NOVEMBER 2013

VITERBI-INDIA PROGRAM

The Viterbi School of Engineering, University of Southern California (USC) and the Indo-US Science and Technology Forum (IUSSTF) have partnered to support the **Viterbi-India Program**. This program will provide opportunities to Indian students to undertake a research internship at the Viterbi School of Engineering in summer **2013** for a period of 8 weeks.



The Viterbi-India Program is envisaged to:

- Provide an opportunity to the best and brightest Indian students to gain exposure and access to world class research facilities in the Viterbi School.
- Promote research and capacity building in frontline areas of engineering and technology.
- Encourage outstanding students to take up research as a career.
- Pave the way for the next generation engineers from India to interact with American peers, thus help building long-term R&D linkages and collaborations.

Eligibility:

- Indian students currently pursuing a Bachelors or Masters degree at recognized institutions of higher education in India.
- Open to students of Electrical Engineering, Computer Sciences and Computational Sciences.

Scholarship includes:

- Stipend
- Airfare

For application format and guidelines please visit: www.indoustf.org

For program information contact:

Dr. Nishritha Bopana

Indo-US Science and Technology Forum (IUSSTF)

12, Hailey Road, Fulbright House, New Delhi-110001, E-mail: viterbi-india@indoustf.org

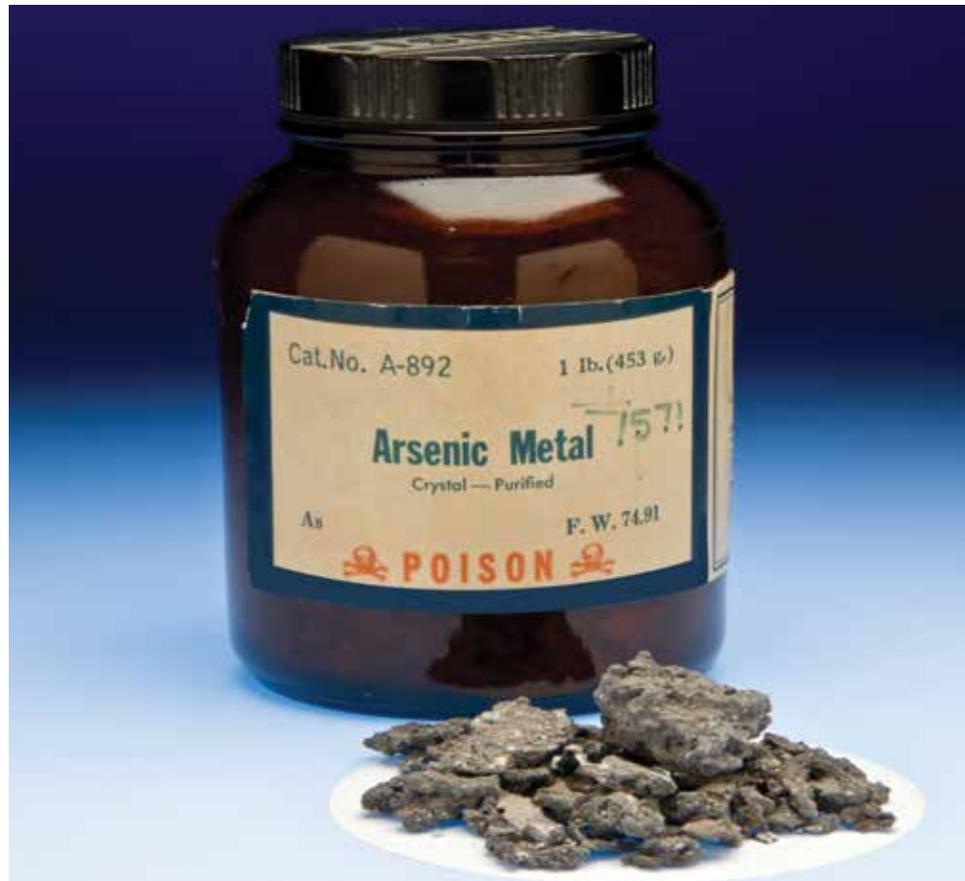
APPLICATION DEADLINE : 15 November 2013



Scourge avoided

What do you get when you mix water, arsenic, and a Silicon Valley perspective? You get entrepreneurs, financiers, and technical experts brainstorming to develop competing commercially-viable business plans to remove contaminants from drinking water in South Asia.

Ever since hazardous levels of arsenic were detected in drinking water in South Asia, the problem has had a global dimension. In 2000, the World Health Organization called arsenic contaminated drinking water “...the largest mass poisoning of a population in history...,” with over 100 million people worldwide drinking water contaminated by arsenic, concentrated in South Asia, but also including parts of the United States. The statistics show disaster on a global scale. Some of the ill effects of drinking water containing arsenic over a long period of time include multiple types of cancers, gastrointestinal issues, gangrene, reduced IQ in children and severe skin conditions, and even



Arsenic contamination of water



death. If detected early, however, some of the symptoms can be reversed.

In India, in seven eastern states, including the most populated state of West Bengal, arsenic is a major contaminant in ground water used for both drinking and agriculture. While there have been many attempts by non-governmental organizations (NGOs), development agencies, and the Government of India to remove the arsenic, no sustainable and scalable solution has been found. The U.S.-India Joint Commission meetings on Science and Technology in 2010 and 2012, declared safe drinking water an

important area for collaboration between the two governments.

Mission India's Environment, Science, and Technology (EST) team, led by an FSO in New Delhi, began discussions with several dozen "players" in this area, including NGOs, Indian and multilateral agencies, private capital providers, and other stakeholders in early 2013 to try to understand why previous attempts to address the issue of arsenic contaminated drinking water has proved unsustainable.

Our EST team brought to bear the staff's previously acquired skills in venture capital financing for start-up companies in formulating its solution. The approach we took was unique in first conducting thorough interviews, then bringing together the best financiers, entrepreneurs, scientists, and development experts in the field for a no-holds barred brainstorming session. The EST team organized and assembled all these stakeholders to develop possible solutions that can be piloted with latest nanotechnology-polymer filtration technologies in an event called the "Rural Drinking Water Roundtable: Thirst for a Business Model." Participants included 22 interviewed and selected experts from 17 organizations.

Major Challenges

Technology: While many arsenic removal technologies have been tried in recent years,

Signs of arsenical keratosis fade as consumption of arsenic laced water is stopped.



none have functioned for more than a couple of years on a sustainable basis. In some cases the filters malfunctioned due to oxidation of aluminum, in others the accumulated arsenic sludge backed up in the filters and wasn't properly disposed of, in yet other cases the equipment was not operated or maintained properly. The newer technology, using iron oxide and chemicals in an electrolysis process, appears promising and has been successfully piloted on a small scale. The issue of toxic sludge

disposal is an important issue that could result in serious consequences if not handled properly. While several countries, including Japan, are disposing arsenic sludge through aeration and imbedding in above ground concrete slabs or road making asphalt, these methodologies have not been tried in India.

Financing: With 70% of the Indian population living in rural parts of the country with little or no infrastructure and with little assurance of electricity, project financing is a major challenge. Safe and free drinking water is considered a citizen's right in many rural areas, which results in very limited pricing flexibility. While private enterprises recognize an enormous market for drinking water, few have succeeded in sustaining their operations profitably. With scarce financing from private institutions, the Government of India has stepped in to provide limited financing that is inadequate for national needs. It is clear that proper incentives must be provided to attract private capital.

Regulations: Water is considered a local asset giving local, district and state governments a final say in regulating their water. While the national central government has authority to promulgate national standards and regulations, the state and local governments often create rules contrary to the national mandate. The



EST Officer Nilesh Shah, standing, moderating the creation of the final action plan

participants acknowledged any solution the group develops will necessarily depend on the cooperation of local governing bodies to ensure project viability.

Community Involvement: The experts agreed that ultimately the local community being served must be involved in building and maintaining the filtration plant. There are several issues, including pricing, water sharing with neighboring communities, power supply, delivery mechanisms, sludge disposal, and ongoing plant maintenance and support that require local community involvement and "ownership" to assure sustained operation of the plant.

Action Plan

The roundtable participants, through detailed deliberations in breakout sessions, agreed to a comprehensive action plan based on a combination of two commercially-viable business models. The group agreed that a district-wide deployment of latest technology should be the goal of the group. This will comprise of at least 25-30 villages, with a total population of between 100,000 and 150,000 and the target date for the opening of the first plant will be in February 2014. All the participants will play a role related to their core competency, and each of the challenge areas will have a small dedicated

Arsenic contamination of water

team to address the challenge. The EST team will continue to lead the effort and work with the Indian government officials in appropriate site selection and regulatory input. The NGOs and the government officials will work at the local community level for their buy in and involvement in the implementation. All aspects, including pricing, sludge disposal, maintenance, etc., will be addressed with local community's involvement. Several

participants will work with the government, World Bank and other funding sources for the initiative.

It is expected that lessons learned through this ambitious initial deployment will assist in developing a more sustainable and scalable solution that begins to make a dent in the "massive poisoning of population" around the world. ●

Khorana Program Technology Transfer Course



20 July-04 August 2013,
University of Wisconsin-
Madison

The Technology - Transfer Batch of 2013 after their meeting with Sam Pitroda (Adviser to the Indian Prime Minister on Public Information Infrastructure and Innovation) in Chicago.

The **Department of Biotechnology**, Govt. of India, **University of Wisconsin-Madison (UW)** and the **Indo-U.S. Science and Technology Forum (IUSSTF)** have partnered to support the **Technology Transfer Course** under the aegis of the prestigious Khorana Program. The program has been named in honor of Dr. HarGobind Khorana, who won the Nobel Prize in 1968 for his work at the interface of Chemistry and Biology while a member of the UW faculty. The Technology Transfer Course is specially designed as an

intensive program aimed to provide participants with significant insight into managing technology in its journey from the laboratory to the marketplace. The course consists of pedagogical lectures, round table discussions, case studies, and site visits. The UW training program in technology transfer draws on almost a century of experience. In 1925, UW established the first university patenting and licensing office in the world (Wisconsin Alumni Research Foundation; WARF), and to this day that office has consistently been among the top five in patents and in licensing revenue. ●



Department of Biotechnology
Govt. of India



Department of Science & Technology
Govt. of India



IUSSTF
Indo-US Science and Technology Forum



Khorana and S.N. Bose Programs welcome the new batch of scholars!

The University of Wisconsin-Madison in partnership with the Indo-U.S. Science and Technology Forum organized an **Orientation Program for Students** selected under the **S.N. Bose Scholars Program** (Partners: Science and Engineering Research Board of the Government of India, University of Wisconsin-Madison and Indo-U.S. Science and Technology Forum) and the **Khorana Program for Scholars** (Partners: Department of Biotechnology of the Government of India, University of Wisconsin-Madison and Indo-U.S. Science and Technology Forum) on 29th May 2013 at the University of Wisconsin-Madison. The orientation was structured as an integral part of the internship program and aimed at building group cohesiveness and initiating a leadership perspective. It allowed students to meet each other and look beyond just one summer and beyond their own immediate goals and aspirations. It also allowed the students to interact with faculty mentors and program administrators.

Dignitaries who addressed the students at the Orientation program included **Kathryn Vanden Bosch** (Dean, College of Ag. & Life Sciences, University of Wisconsin-Madison), **Norman Neureiter** (Director, AAAS Center for STSP, Co-Chair Indo-U.S. Science & Technology Forum), **Rajiv Kumar Tayal** (Advisor, Department of Science & Technology, Ministry of S&T, Government of India), **Rajiv Sharma** (Executive Director, Indo-US Science & Technology Forum), **Molly Teas** (Senior Advisor for Education, U.S. Department of State) and **Guido Podesta** (Dean, International Studies, University of Wisconsin-Madison). The students also attended a scientific talk by Nobel Laureate **Eric Wieschaus** who won the Nobel Prize in Physiology or Medicine in 1995 along with Edward B. Lewis and Christiane Nüsslein-Volhard for their discoveries concerning the genetic control of early embryonic development.

For more information about the
Khorana Program for Scholars, please visit:
indousstf.org/Khorana/khorana_program.html
www.biochem.wisc.edu/faculty/ansari/khorana_program/

For more information about the
S.N. Bose Scholars Program, please visit:
www.indousstf.org/bose/scholars.htm
www.biochem.wisc.edu/faculty/ansari/bose_scholars/bose.aspx

Supporting S&T Innovation



Maj. Gen. Charles Frank Bolden, Jr., NASA Administrator interacts with Members of the Indo-U.S. Joint Clean Energy Research and Development Centre (JCERDC): Prof. Ahmed Kamal (Indian Institute of Chemical Technology), Prof. Pradip Dutta (Indian Institute of Science) and Prof. Rajan Rawal (CEPT University).

The Government of India, the United States Government, the Federation of Indian Chambers of Commerce and Industry, and the Indo-U.S. Science and Technology Forum announced the winners of the Millennium Alliance and U.S.-India Science and Technology Endowment Fund awards.



Honorable Minister for Science and Technology and Earth Sciences Mr. S. Jaipal Reddy addresses the gathering at the Indo-U.S. Partnership for Affordable Innovation Expo.



One of the winners of the U.S.-India Science & Technology Endowment Board Award, Dr. Pooja Sandeepan Mukul (Bhagwan Mahaveer Viklang Sahayata Samiti, Jaipur) explains her affordable knee-joints technology to remobilize above-knee amputees in India and globally to Dr. John Holdren (Assistant to the U.S. President for Science and Technology), Mr. Jaipal Reddy (Minister for Science and Technology and Earth Sciences, Govt. of India) and Dr. Rajiv Shah (U.S. Agency for International Development Administrator).

The award ceremony took place at New Delhi, June 24, 2013 in the presence of the Honorable Minister for Science and Technology and Earth Sciences Mr. S. Jaipal Reddy; U.S. Ambassador to India Nancy J. Powell; Assistant to the U.S. President for Science and Technology Dr. John Holdren; U.S. Agency for International Development (USAID) Administrator Dr. Rajiv Shah; Secretary of Department of Science & Technology Dr. T. Ramasami; and FICCI National Executive Committee Member and CA Technologies India Chairman Mr. Saurabh Srivastava.

The U.S.-India Science & Technology Endowment Board, a bi-national initiative to support commercialization of jointly developed innovative technologies with social impact, awarded eight winners and two young entrepreneurs from its second and third calls for proposals. The winners will each receive up to INR 2.5 crores and the entrepreneurs will together receive approximately INR 14 lakhs.

The Millennium Alliance is a partnership between USAID, FICCI, and India's Technology Development Fund, Department of Science and Technology to support new innovations that strengthen early-grade reading as well as

increase access to clean and affordable energy, safe drinking water, quality health care, and a nutritious food supply to those most in need.

Out of over 1,400 applications in the first round, nine awardees were announced with the award amount totaling to approximately INR 8.9 crores. ●

Text Courtesy: U.S. Embassy, New Delhi
[Full text can be accessed at <http://newdelhi.usembassy.gov/pr130624.html>]



Winners of the U.S.-India Science and Technology Endowment Fund awards with Honorable Minister for Science and Technology and Earth Sciences Mr. S. Jaipal Reddy and members of the Indo-U.S. Science and Technology Forum.



U.S. Secretary of State John Kerry, Secretary Department of Science and Technology (Govt. of India) Dr. T. Ramasami, U.S. Secretary of Energy Dr. Ernest Moniz, and U.S. Ambassador to India Nancy Powell listen as a young entrepreneur Neha Juneja describes her camp stove product [State Department photo/ Image Courtesy: U.S. Embassy New Delhi].



S.N. Bose SCHOLARS PROGRAM



To nurture future innovators and thought leaders, the **Science & Engineering Board (SERB)**, **Department of Science and Technology (DST)**, **Govt. of India**, the **Indo-U.S. Science and Technology Forum (IUSSTF)** and the **University of Wisconsin-Madison (UW)** are partnering to develop a dynamic and transformative student exchange program between premier institutions in India and the United States. The program is named in honor of **Satyendra Nath Bose** (1894 - 1974), a visionary Indian physicist best known for his work on quantum mechanics in the early 1920s. The class of particles that obey Bose-Einstein statistics, **Bosons**, was named after him.

ELIGIBILITY:

- Indian citizens currently pursuing a Bachelors or Masters' degree at a recognized institution of higher education and learning in India.
- Open to students of Atmospheric and Earth Sciences; Chemical Sciences; Engineering Sciences; Mathematical and Computational Sciences; and, Physical Sciences

Note: *Students with a biology background should consider applying to the **Khorana Program for Scholars**.*

SCHOLARSHIP INCLUDES:

- Stipend
- Accommodation
- Air-fare

THE PROGRAM IS ENVISAGED TO:

- provide an opportunity to Indian students to experience world-class research facilities in leading U.S. institutions;
- encourage and motivate students to take up research as a career;
 - pave the way for the next generation of pioneers and innovators in science and technology to interact with each other, and;
- build long-term R&D linkages and collaborations cutting across boundaries around the globe.

**Submission Deadline:
15 November 2013**

For program information contact:

Dr. Nishritha Bopana

**Indo-US Science and
Technology Forum**

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New Delhi - 110001,

E-mail: bose@indousstf.org

www.indousstf.org

June-July - 2013

ORGANIC SOLAR CELLS

24-26 June
Golden, USA

Organic solar cell (OSC) technology is a promising and potentially disruptive technology for large area, high throughput and large volume production of PV devices and modules. This area has seen remarkable success in research and has made remarkable progress in pushing power conversion efficiencies to over 10% in research labs. Better understanding of stability and lifetime of these devices have also been got in the past decade. These have led to the spawning of a few enterprises which are working to commercialise products using this technology. Many of the early discoveries and inventions related to this technology have been in the United States. The country continues to report path-breaking work related to OSCs

at regular intervals. Many research groups in institutes across India too have been reporting a number of novel ideas and exciting discoveries over the last decade. OSC technologies are important for both the countries in the coming decade and are a critical area of research and development in these countries. Keeping this in mind, **S. Sundar Kumar Iyer** (Indian Institute of Technology-Kanpur) and **Vikram Dalal** (Iowa State University, Ames) organized a workshop on **Organic Solar Cells** to bring together scientists and researchers from the two countries in this important area to initiate new collaborative projects as well as to give a momentum to existing collaborative work. ●

MOLECULAR MATERIALS

15-17 July
Bangalore, India

The Indo-U.S. workshop on **Molecular materials** organized by **Uday Maitra** (Indian Institute of Science, Bangalore) and **Sanjay V. Malhotra** (Frederick National Laboratory for Cancer Research, Frederick) aimed at addressing key global challenges and providing solutions through chemical sciences. This summit brought together the best minds in chemical research from both India and the United States; and challenged them to propose innovative solutions for society's most pressing needs in the areas of health, food, energy, and the environment, through the application of chemical principles. ●



Indo-US Science & Technology Forum

Who we are

The Indo-US Science and Technology Forum (IUSSTF), established under an agreement between the Governments of India and the United States of America, is an autonomous, not for profit society in India, co-funded and co-governed by both the governments. IUSSTF promotes and catalyzes Indo-US collaborations in science, technology, engineering, biomedical research and innovation through substantive interaction among government, academia and industry.

What we do

- Foster** excellence by capitalizing on the scientific and technological synergy
- Disseminate** information and create awareness through scientific exchanges
- Build** linkages through networking between academia and industry
- Explore** new frontiers by nurturing contact between young and mid-career scientists
- Pave** way to sustainable interactions and establish long term relationships
- Encourage** public-private partnership to inculcate elements of innovation and entrepreneurship

We support

Exciting and innovative collaborative programs cutting across disciplines and institutions

- Academia-Industry Connect Programs
- Advance Schools & Training Programs
- Bilateral Workshops & Symposia
- Flagship Events
- Knowledge R&D Networked Joint Centers

- Programs on Innovation and Entrepreneurship
- Public-Private Networked R&D Joint Centres
- Research Fellowships for Faculty
- Special Initiatives for Strategic Partnerships
- Student Internships & Visiting Professorships

We invite

Proposals which are peer reviewed both in India and USA for awards

Bilateral Indo-US Workshop/Symposia & Indo-US Training/Advanced Schools

Submission Deadlines
 15 February
 15 August

Award Announcements
 30 June
 31 December

Indo-US Public-Private Networked Centres & Indo-US Knowledge R&D Networked Centres

Submission Deadline
 15 August

Award Announcement
 31 December

How to contact us?

For program details visit:

<http://www.indousstf.org>

**Indo-US Science and Technology Forum:
Catalysing Indo-US Science & Technology Cooperation over a decade.**