FIRST ANNUAL REPORT OF

THE INDO-US SCIENCE & TECHNOLOGY FORUM

ENDING MARCH, 2002

The Indo-US S&T Forum is a bilateral body established under an agreement between the Governments of India and the United States of America with the mandate to facilitate and promote cooperation in the areas of Science and Technology through interaction between government, academia and industry in the two countries.

CERTIFICATE OF REGISTRATION

SOCIETIES REGISTRATION ACT XXI OF 1860

Registration No. S. 33231 of 2000

I hereby certify that INDO-US SCIENCE AND TECHNOLOGY FORUM located at TECH MAHINDRA BHAWAN, NEW MEHRAULI ROAD, NEW DELHI

has been registered under the "SOCIETIES REGISTRATION ACT-XXI of 1860".

Given under my hand at DELHI on this 22nd day of JUNE Two Thousand.

REGISTRAR OF SOCIETIES
Govt. of N.C.T. of Delhi

Seal
Registrar of Societies
Delhi

Compiled and edited by Dr. A. Mitra, Administrator, Indo-US Science & Technology Forum

CONTENTS

MESSAGE FROM THE CO-CHAIR (INDIA)

Prof. V.S. Ramamurthy
Co-Chair,
Indo-US S&T Forum

The scientific and technological cooperation between India and USA has taken place for more than five decades now, largely unfettered by the prevailing geopolitical dimensions of the time. The rich legacy of this cooperation even though substantially driven by individual-to-individual contacts has nevertheless been prompted by the two governments, which have always played a pivotal role towards envisioning and supporting some major science and technology initiatives. The Green Revolution in India ushered by the PL 480 grants, the establishment of the Indian Institute of Technology, (IIT) Kanpur, eventually providing the gene pool for the Silicon Valley and the Satellite Instructional Television Experiment (SITE) providing for the first time the concept of tele-education reaching the remotest corners of India are some of the few classic examples of this long drawn cooperation.

The establishment of the Indo-US Science and Technology Forum under a historic bilateral agreement entered upon by the two governments in March 2000 is the manifestation of the conviction and belief in this legacy of mutual scientific and technological cooperation with the aim to further strengthen this bond through a systematic focus on frontier and topical areas of scientific innovation and interest in both the nations. In particular, the Forum should endeavour to identify such programs, which have a distinct societal impact translated through a high impact factor benefiting the people and polity at large. Notwithstanding the fact that the Forum has limited resources, it can certainly act an enabling and facilitating agency by playing a catalytic role through seeding of activities, harbouring contacts by networking and stimulating new ideas between the scientific and technological milieu of the two countries.

The Forum should best capitalize on the synergism of both the governments and at the same time pave way towards an active public – private partnership aimed towards generating new innovations, products and ideas. The intellectual capital per dollar of India should be best leveraged by the Forum through an effective mechanism of equal partnership with USA where 'one' and 'one' does not remain two but translates into 'eleven'! Hence the Indo-US relationship fostered and nurtured through the Forum should create a win – win situation for both the scientific communities driven by the true spirit of cooperation and collaboration and not hindered by the shadows of competition.

Both India and USA have a vast and strong intellectual tradition coupled with large, varied and complex scientific establishments. The Forum certainly has to synthesise and harness these inherent strengths already available in two great democracies of the world in order to nurture a sense of excitement for the young and old alike in developing scientific entrepreneurship and leadership. As one of those who has been associated from the very concept which gave birth to the Forum, I am indeed very happy and overwhelmed to pen down this message for the first annual report of the Forum and wish it all success in years to come as an outshining example of bilateral cooperation between India and the United States of America.

MESSAGE FROM THE CO-CHAIR (US)

Dr. Norman P. Neureiter
Co-Chair,
Indo-US S&T Forum

The Indo-US Science & Technology Forum was launched with a new vision to catapult Indo-U.S. science and technology (S&T) cooperation into the 21st century. Pivotal to this new approach is the common understanding that the Forum should act as a facilitating mechanism, playing a catalytic role to leverage additional resources from national and international programs as activities under the Rupee Fund wane. It should also broaden the scope of its participants to include industry and academia. The Forum notion of cooperation is true partnership between two nations engaged in S&T activities for mutual benefit. A new chapter in Indo-US relations was started with the creation of this historic public-private partnership.

The Governing Body launched the Forum with a set of six initial areas for cooperation to stimulate and enhance Indo-U.S. co-operation in science and technology: nanoscale science and technology, genomics (human, animal and microbial), weather modeling, education, brain research and S&T related to health, energy and environment. Consequently, the Forum has sponsored a workshop in the emerging area of Nano Technology at Santa Barbara in November 2001, a workshop on Brain Research in New Delhi in January 2002, and a workshop on Weather and Climate Modeling in New Delhi in February 2002. A summary of these and other activities supported by the Forum is found in this volume.

As with any new organization, there are a number of concerns, and the overall progress of the Forum has been slower than was initially envisioned. The Forum has acquired a now-remodeled office space in the Fulbright House, New Delhi from October 2001 but still needs an Executive Director and supporting staff. We also need to improve the process of proposal solicitation, peer review, and funding processes, and increase coordination of the administrative functions between the two countries. Nonetheless, given the number of outstanding events over the past year, we remain optimistic about the growth and development of the Forum.

The long-term goal of the Forum is to build a completely new cooperative partner relationship between the strong S&T communities of our two nations. This means that the possibilities are without limit. The ultimate promise of a truly successful Forum may lie in its eventual evolution into a jointly endowed Indo-US Binational Science and Technology Foundation, with sufficient resources to fund joint research as well as workshops and travel grants. The realization of that future depends upon the seeds we sow today in the Forum and the care we provide to nurture its future development.

LAUNCH OF THE FORUM

In February 1987 the Agreement between the Government of the Republic of India and the Government of the United States led to the establishment of the United States India Fund (USIF). Until 1998 the USIF remained as one of the prime funding sources for the Indo-U.S. collaborative projects carried out under the recommendations of the Indo-US Sub-commissions for Science and Technology covering a very broad range of subjects of mutual interest.

Since USIF was scheduled to end in January 1998, an alternative arrangement to continue and strengthen the Indo-US S&T cooperation was equivocally felt. The idea to create the Indo-U.S. Science and Technology Forum (Forum) was born during an official level meeting of the Indian and U.S. scientific agencies in New Delhi during 19-21 May 1997. Information was exchanged on the bilateral S&T cooperation spanning over more than forty years in order to identify post USIF new modalities to continue and strengthen this symbiotic relationship. It was unanimously felt that though India and USA lacked an umbrella S&T Agreement, this has neither been a pre-requisite, nor has its unavailability been an impediment, in the success of the Indo-US bilateral S&T cooperative activities, as long as a structure was in place. During this meeting it was suggested to have a new vision for the future with a more flexible and less bureaucratic science and technology partnership between the two nations envisaged in the form of an Indo-US Science and Technology Forum.

India and U.S. both committed to continue a strong collaborative arrangement for the advancement of Science and Technology

India and U.S. both committed to continue a strong collaborative arrangement for the advancement of Science and Technology, led to the signing of a joint Statement on Intent to establish the S & T Forum. Dr. Y. K. Alagh, Minister of State for S&T and Planning, Government of India and H.E. Richard Celeste, U.S. Ambassador to India, signed this statement on 29 December 1997. Subsequent dialogue ushered into the conclusion of the historic Agreement on the establishment of the Forum during visit of the then U.S. President Bill Clinton to India, which opened a new vista in the Indo-US relations. The Agreement were concluded in New Delhi on 21 March 2000 by Dr. Murli Manohar Joshi, Minister for S&T, Human Resources Development & Ocean Development from the Indian side and Ms. Madeleine Albright, Secretary of State on the U.S. side, thus unfolding a new chapter towards reiterating and reaffirming the Indo-U.S. relationship in the important area of Science and Technology.

JOINT STATEMENT BETWEEN THE GOVERNMENT OF THE REPUBLIC OF INDIA AND THE GOVERNMENT OF THE UNITED STATES OF AMERICA

The Government of the Republic of India and the Government of the United States of America recognize the significant historical contributions and future potential of Indo-US Collaboration in Science & Technology. Nearly forty years of bilateral cooperation in the pursuit of scientific excellence and research achievement have led to progress across a broad range of scientific fields addressing some of the most pressing global concerns and have contributed to human development and economic growth.

During the past ten years, bilateral cooperation has strengthened and deepened under the framework established by the Agreement between the Government of the Republic of India and the Government of United States of America on Educational, Cultural and Scientific Cooperation signed January 7, 1987 and extended December 23, 1996 to expire January 7, 1998. Both Governments are committed to continuing strong collaboration towards the advancement of science and development of technology. To meet that goal, the Government of the Republic of India and the Government of the United States of America intend to establish an Indo-US Science and Technology Forum under the following framework :

A structure would be developed under convenors, composed of appropriate bodies of the Governments of the Republic of India and the United States of America. The convenor would serve as a point of contact for overall science and technology policy direction to such committees, as may be decided upon. The Forum would endeavour to form public and private sector partnerships to accomplish mutually beneficial goals.

Within this framework, it is intended that appropriate agencies of the Governments of the Republic of India and the United States of America develop the composition and terms of reference of the Indo-US Science & Technology Forum that best facilitate and promote collaborative activities.

FOR THE GOVERNMENT OF THE REPUBLIC OF INDIA

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA

NEW DELHI, December 29, 1997

AGREEMENT BETWEEN THE GOVERNMENT OF THE REPUBLIC OF INDIA AND THE GOVERNMENT OF THE UNITED STATES OF AMERICA ON THE INDO-US SCIENCE & TECHNOLOGY FORUM

The Government of Republic of India and the Government of the United States of America (hereinafter the "Parties").

Desirous of promoting scientific and technological cooperation between the peoples of their two countries and enhancing the ability of their peoples to contribute to the store of human knowledge and achievement.

Article I

The Purpose of the forum

The two parties agree to establish the Indo-U.S. Science and Technology Forum (the "Forum") which shall facilitate and promote the interaction, in India and the United States, of government, academia, and industry in science, technology and other areas addressed by its predecessor, the U.S.-India Fund (USIF). The Forum shall focus on issues of common concern and activities of mutual benefit while exploring trends in science and technology. The Forum shall promote research and development, the transfer of technology, the creation of a comprehensive electronic reference source for Indo-U.S. Science and Technology cooperation, and the electronic exchange and dissemination of information on Indo-U.S. Science and Technology cooperation, and other programs consistent with the previous practice of the USIF.

The Indo-U.S. Science and Technology Forum shall facilitate and promote the interaction, in India and the United States, of government, academia, and industry in science and technology.

Article II

Forum Activities

1. The Forum shall establish an electronic reference source in order to promote an active electronic exchange of ideas and opportunities in Indo-U.S. science and technology cooperation and other areas addressed by USIF. The dialogue fostered by this electronic interchange would be available to support the deliberations of the Forum's Governing Body.
2. The Forum shall provide a medium for reporting on the status of existing co-operative activities and for dissemination of Governing Body guidance and deliberations.
3. The Forum shall commission studies, reports and papers and would assist in facilitating and promoting joint collaboration of projects.

4. The Forum shall seek recognition and affiliation with other international scientific societies deemed beneficial to promoting the goals of the Forum.
5. Participation in all programs, events and activities sponsored by the Forum shall be subject to the concurrence of both Parties. Nothing in this agreement shall require the Parties to act contrary to their national laws or regulation.

Article III

The Governing Body

1. The Forum shall be registered as a non-profit Society under the Indian Societies Act and shall have the ability to receive funds from public and private sources to carry out its activities.
2. To ensure that the activities undertaken by the Forum conform to the highest standards of excellence, a Governing Body of eminent persons shall be established with equal Indian and U.S. representation. Members of the Governing Body shall be highly respected representatives from government, industry, academia, and private organizations with a genuine interest in encouraging Indo-U.S. Science and Technology collaboration.
3. The Governing Body shall meet at least once a year.
4. In providing guidance and leadership to the Forum, the members of the Governing Body shall monitor present activities and trends in bilateral science and technology cooperation and make recommendations and identify priorities for future cooperation.
5. Unless otherwise specified in this Agreement, the Governing Body shall have ultimate authority for all decisions implementing this Agreement. The Governing Body may vote to delegate in writing its decision-making authority to the Executive Director, consistent with the Director's responsibilities as defined in Article IV below. The Governing Body may also establish advisory groups or committees for specific purposes as required.
6. Except as provided in paragraph 7 below, the terms of service for the Governing Body members shall be three years.
7. The Governing Body shall be composed of seven members from India and seven from the United States. Of the seven members from each Party, four members shall come from government and the remaining members from

To ensure that the activities undertaken by the Forum conform to the highest standards of excellence, a Governing Body of eminent persons shall be established

industry, academia and private organizations. To provide official linkage to the GOI, the Secretary of the Department of Science and Technology, Ministry of Science and Technology, shall be one of the seven Indian members of the Governing Body. The Secretary shall serve on the Governing Body as long as he/she holds his/her appointment as Secretary of the Department of Science and Technology. The other representatives shall be nominated by the respective Parties.

8. The Governing Body shall to the extent possible operate on the basis of consensus. When it is necessary to vote on an issue, policy matters shall be decided by a simple majority vote and budgetary matters shall be decided by a two-thirds majority. For all votes, the majority vote shall include the votes of all the government representatives of both Parties to this Agreement.

Article IV

Administration of the Forum

1. The Forum shall employ a full time Executive Director, who shall be a non-member convener of the Governing Body, and minimal support staff (preferably no more than two). The Executive Director shall be selected and supervised by the Forum Governing Body.
2. The Executive Director shall be responsible for scientific, administrative, fiscal oversight, coordination of Forum activities, support of Forum fund raising and providing services to the Forum. The Executive Director shall submit a report annually to the Governing Body on the activities of the Forum.

Article V

Financing of the Forum

1. The Parties shall use funds allocated from the so-called "Regular Fund", established upon conclusion of the Agreement Between the Government of the Republic of India and the Government of the United States of America on Educational, Cultural and Scientific cooperation, signed at New Delhi, January 7, 1987, to create an endowment to support the operations of the Forum.
2. The Forum shall manage this endowment and use the annual interest earnings to support its operations and activities.
3. Each year, the Government of India shall provide the Forum with matching funds that are equal to the annual interest earnings from the endowment.
4. The Forum, in its capacity as an Indian Society, may also seek to raise funds from industry and private sources, in India and the United States, to support its activities, in accordance with the laws, regulations, and policies of the country in which the funds are being raised.

The Forum, in its capacity as an Indian Society, may also seek to raise funds from industry and private sources, in India and the United States.

Article VI

Facilitation of Cooperation

1. Each Party shall use its best efforts to facilitate financial contributions to the Forum from industry and private sources, in accordance with its national laws and regulations.
2. The Parties shall use their best efforts to facilitate cooperation under this Agreement, including taking appropriate measures with respect to the prompt entry into and exit from their territory of personnel, supplies, research materials and equipment of the other side and with respect to exemptions from taxes and other fees of personnel and equipment connected with the Forum or activities under this Agreement in accordance with the applicable laws and regulations of each country.

Article VII

Qualifications and Restrictions

1. Activities under this Agreement shall subject to the laws and regulations in each country and the availability of funds.
2. Nothing in this Agreement shall be construed to prejudice other arrangements for cooperation between the two countries. The Parties shall use their best efforts to ensure compatibility between the operation of this Agreement and other such agreements. The Forum shall neither sponsor, nor permit under its auspices, any activity that would be proscribed by either Party's national laws or regulations.

Article VIII

Entry into force, Termination and Amendments

1. The Forum shall be established upon signature of this Agreement.
2. The Agreement shall remain in force until terminated by either Party giving six months advance notification to the other Party in writing. Any remaining assets would be disposed of in India as mutually agreed by the Parties.
3. This Agreement may be amended by mutual written agreement by the Parties.

Done at New Delhi, March 21, 2000, in two originals, in the Hindi and English Languages. In the case of divergence between the two language texts, the English language text shall prevail.

FOR THE GOVERNMENT OF THE REPUBLIC OF INDIA

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA

LAUNCH OF THE FORUM

Inaugural Address by Prof. Murli Manohar Joshi, Minister for Science and Technology, HRD and Ocean development, on the Occasion of the Launching of the Indo-US Science & Technology Forum in New Delhi on July 20th 2000

Prof. Murli Manohar Joshi

"Sometimes modest beginnings have a significance far beyond the apparent. At one level there is nothing overwhelmingly extraordinary in the launch of a bilateral initiative for cooperation in the field of Science & Technology, particularly when the long history of Indo-US cooperation is replete with examples of very remarkable achievements. After all our self-sufficiency in food production today is primarily the outcome of a collaborative effort to apply Science and Technology for a social end. Why then do we treat the launch of Indo-US Forum on Science and Technology as something unique and exciting and almost momentous?

There are many reasons. This is the first major bilateral initiative between the two largest democracies of the world in the new millennium. It has been taken in the wake of a US Presidential visit to India, the impact of which on the popular consciousness was electrifying. The nuances, the undertones, the harmonics of our mutual relationships have subtly, but undeniably, changed for the better. It is one of standing tall, shoulder-to-shoulder, quiet and proud as equal partners in the shaping of human destiny. The structure of the Indo-US Science Forum reflects that new spirit of partnership of equality. The Forum has been taken out of the pale of mere Government-to-Government relationships and given an identity of its own and an ability to outlive Governments. The creation of a corpus fund ensures its self-reliance and operational autonomy. In many ways, it represents a new measure of confidence in each other's strengths.

The long history of Indo-US cooperation is replete with examples of very remarkable achievements.

The social context in which we live today is dominated by the phenomenon of globalization. Globalization, of course, means many things to many people. To many it is a threat to an insular, protectionist existence – a juggernaut which must be resisted as long as possible. To many others, it is the inevitable march of modern Science and Technology led by giant trans-national corporations into ever-new markets and the subjugation of diverse economies into homogenized common economic order. Some few, however, see in it a rare opportunity for rediscovering and reinventing the inter-relatedness of the universe, of the entire humanity, of man and man, of man and nature. The challenge is to see how this latter meaning of globalization can be made the part of a new global 'commonsense' and how we employ Science and Technology to produce this commonsense.

Globalization itself has to be seen in the context of sharp inequalities prevailing among the countries of the world. Inequalities of consumption, of productive wealth generation capacities, of infrastructure availability, of the availability of public goods and services. In its present form, the process of globalization is premised on wasteful consumption patterns of the rich, a propagation of the value of unlimited consumer choice as the driving force of economic growth, and a fuelling of aspirations for the life-styles of the rich. In a situation of disproportionate consumption on the part of the rich on the one hand and the vicious spiral of poverty-environment-population problem triad on the other, the strain on natural resources of the earth has become unbearable. Global warming, water scarcity, arable land degradation, desertification, carbon-dioxide emissions, deforestation, are all the consequences of unsustainable forms of the consumption and production. A globalization process which relies on perpetuating ever higher levels of consumption can only mean the globalization of poverty, inequality and ecological degradation.

In a number of my recent speeches, I have dwelt at length on the concept of 'Sustainable Consumption' and argued that without fundamental changes in consumption patterns and value systems, the goal of sustainable development is not achievable. Development has to be redefined in a more holistic terms and distinguished from linear, mechanistic, economic and technological growth.

Conventional growth strategies which rely on purely technological solutions to complex social, cultural and ecological problems are doomed to failure. My objective today in reiterating some of these arguments is to stress that globalization processes have to be anchored in the principles and values inherent in the concept of 'sustainable consumption' to make globalization work for the creation of a global community of healthy, creative, cultivated and convivial human beings. In the realm of science and technology, cooperation has to replace competition as the prime-mover, the motor of development.

Without fundamental changes in consumption patterns and value systems, the goal of sustainable development is not achievable.

Questioning the theology of competition of market forces, of growth through high levels of energy consumption, invites criticism from many quarters. In a milieu which is used to categorizing all phenomena in terms of binary opposites, it is concluded that if you question the theology of the market you are arguing for state control and intervention and futile resistance to the inevitability of the process of globalization. You are, therefore, seen either as a romantic reactionary, a Luddite or as a rabid leftist or worse, as both. I like to believe, however, that there is an alternative. That alternative is to recognize and appreciate the enormous positive energy unleashed by the globalization process, enrich it by adding the dimension of ethics and spirituality

and harness and guide it towards a social end. Such harnessing and guidance does not necessarily require state control and centralized decision making because the state itself can be and has been an instrument of oppression. It requires a new architecture of community governance – decentralized and democratic, which uses science and technology in its most sophisticated form to wrest control and initiative for itself.

Is this a Utopian fancy? Before you dismiss it as such, let me draw your attention to the single most important technological development of our times – the Information Technology revolution and the unprecedented growth of the Internet. What has the Internet done by way of impacting on social structures and systems? Firstly, it has led to the mushrooming of small numbers of net savvy entrepreneurs coming together to form small but highly profitable businesses. Secondly, it has redefined the relationships between home, the neighbourhood and the workplace. The home is also the workplace. Thirdly, it has completely changed the nature of business organizations. Even giant I.T. trans-nationals are nothing more than a very large number of highly decentralized small groupings, fully networked, working under the common umbrella. The monolithic industrial organization is the dinosaur of the past – it has been made irrelevant. Fourthly, it has brought in new forms of economic exchange relations. It has revived forms of barter, trading in knowledge bytes and even a knowledge currency. Fifthly, it has shattered hierarchies within organizations – pyramids have been replaced by networked nuclei. Lastly, it has obliterated distinctions between owners, shareholders, and wage employees because everyone in the organisation is all of these. These fundamental changes have taken place within a time span of three to five years. Do we still dismiss the dream of decentralized, inter-connected, economically and politically autonomous sustainable communities as idle fancy?

Now is the time to open the doors and bring about a convergence between contemporary knowledge and ancient wisdom

What can the coming together of the two greatest democracies for the formulation of this Forum do for the realization of such a dream ? First it can get scientists to engage in a deep and meaningful dialogue with social scientists, artists, philosophers, mystics, community leaders, activists – at the level of scientific philosophy and epistemology on how to change the nature of scientific knowledge and knowledge production. Science has to expand its horizons and come out of rationalist, empiricist warp in which it is caught. Scientific theory, particularly quantum theory, has been knocking at the doors of ancient spiritual wisdom for some time. Now is the time to open the doors and bring about a convergence between contemporary knowledge and ancient wisdom, between the sciences and humanities, between mathematics and music, poetry and prose. The Forum is ideally placed to bring about such a churning of ideas in the Universities and other academic

institutions in India and the USA – a churning with wide open minds and a kierkegaardian 'passion' for creativity.

The second major task for the Forum, in my view, is to use cooperation, in its fullest and deepest sense of 'co'- 'operation' as the driving force of joint technology development, adaptation and transfer. We have to alter ways in which we think and design technology. This requires placing the social end-use of technology in the forefront. It requires treating Nature and the limits imposed by it as sacred. It requires the development of criteria by which we discriminate between 'good' and 'bad' technology. It requires converting 'clean' and 'green' technologies into public goods widely accessible, easily affordable and universally shareable. It requires designing an Intellectual Property Rights regime which protects traditional knowledge systems from predator organizations and shifts control over technological processes from the firm to the community. It requires the redesigning of industrial processes to mimic natural processes.

It requires the complete redesigning of our educational processes to make education not a packaged commodity for passive consumption but an active process of discovery, exploration and knowledge production.

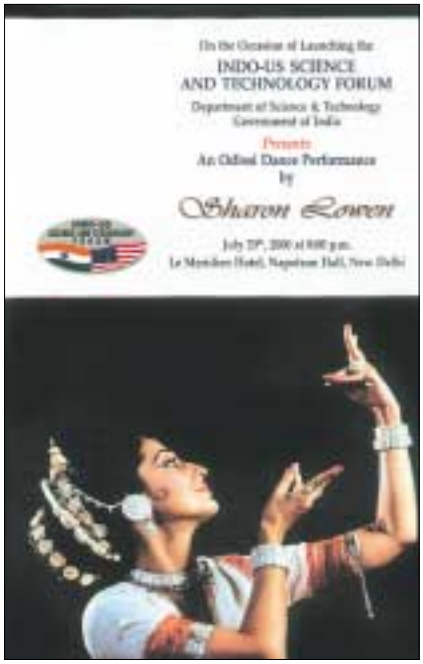
To bring about such a fundamental paradigm, shift may appear a formidable task. But should not the coming together of the two largest democracies, commanding the wealth of material resources on the one hand and the abundance of spiritual and knowledge resources on the other, mean that taking up any task less ambitious is a poor reflection of their capabilities? I urge to listen to the plea of Walt Whitman from his 'Passage to India':

'Sail forth – steer for the deep waters only,
Reckless O soul, exploring,
I with thee, and thou with me,

For we are bound where mariner has not yet dared to go,

And we will risk the ship,
Ourselves and all.'

Ladies and gentlemen, I have great pride in launching the Indo-US Forum on Science and Technology to embark."



HISTORY OF INDO-US S&T COOPERATION

1950's	Era of Green revolution facilitated with the PL 480 Funds
1960's	Establishment of IIT, Kanpur; NCERT, N. Delhi
1970's	NASA-ISRO – SITE (Satellite Instructional Television Expt) Indo-US S&T Sub-Commission
1980's	Gandhi Reagan Science & Technology Initiative (STI) US-India Fund (USIF)
1990's	Indo-US Fellowships Program DST-NSF S&T Collaboration Program (Ongoing) NASA-NOAA / ISRO-DST MoU (Ongoing) DBT-NIH Health Programs (Ongoing)
2000	Indo-US Science & Technology Forum (Ongoing) Indo-US Biotechnology Alliance (Ongoing)

CHRONOLOGY OF MAJOR EVENTS CONNECTED WITH THE FORUM

May 1997	First official level meeting of Indo-US Scientific agencies on post USIF modalities for bilateral S&T Cooperation at New Delhi.
Dec 1997	Joint Statement of Intent to establish the Indo-US S&T Forum signed at New Delhi.
Mar 2000	Conclusion of an Agreement to establish the Indo-US S&T Forum signed at New Delhi.
Mar 2000	First Indo-US Roundtable Dialogue on S&T Cooperation at Hyderabad.
Jun 2000	Forum was registered as a non-profit Scientific Society at Delhi.
Jul 2000	Forum was formally launched in New Delhi in conjunction with the first Interim GB meeting
Sep 2000	Second Indo-US Roundtable Dialogue on S&T Cooperation at Washington D.C.
Mar 2001	First meeting of the regular GB co-chaired by Prof. V.S. Ramamurthy, Secretary, DST and Dr. Norman P. Neureiter, Scientific Adviser to the US Secretary of State at New Delhi.
Nov 2001	Forum office established at Fulbright House, 12 Hailey Road, N. Delhi
Mar 2002	Second meeting of the regular GB co-chaired by Prof. V.S. Ramamurthy, Secretary, DST and Dr. Norman P. Neureiter, Scientific Adviser to the US Secretary of State at New Delhi.

CHRONOLOGY OF EVENTS

Post Forum S&T Roundtable

Signing of the Forum Agreement was followed by the organization of a one-day Indo-U.S. Round Table Dialogue in Hyderabad on 24 March 2000. This was an informal high-level meeting between eminent scientists and administrators of the two countries as a curtain raiser to the activities to be undertaken under the Forum. Professor V.S. Ramamurthy, Secretary to the Government of India in the Department of Science and Technology and Professor Neal Lane, Science Adviser to U.S. President co-chaired the Dialogue. Several eminent scientists, including Professor Rita Colwell (Director, NSF) Professor M.G.K. Menon (former Union State Minister of India for S&T), Professor C.N.R. Rao, (President, JNCAR), Professor U.R. Rao (former Chairman, Department of Space) and Secretaries of Scientific Departments in Government of India participated in the Dialogue. The deliberations in this event were focused to explore the new frontiers of science & technology in Indo-US collaboration and were quoted by President Clinton in his public speech in the High Tech City at Hyderabad.

Registration of the Forum

The Indo-US Science and Technology Forum was registered at Delhi as a non-profit, scientific society on 23 June 2000 under Indian Societies Registration Act 1860, with ability to receive funds from public and private sources to carry out its activities. The Memorandum of Association of the Forum envisages that the Forum shall facilitate and promote interaction of government, academia and industry in science, technology and other related areas and shall focus on issues of common concern and activities of mutual benefit. It shall promote R&D, transfer of technology, electronic exchange and dissemination of information and opportunities, and creation of a comprehensive electronic reference source for Indo-US S&T cooperation. The Forum shall commission studies, reports and papers, facilitate joint collaborative projects and programmes and organize workshops, courses, training programs etc. It shall work towards establishment of Indo-U.S. Centers of Excellence at places in India and provide encouragement to competent people and scientists within India and the US as well as expatriate Indian abroad and others to participate in the activities of the Forum. The Forum shall also seek recognition and affiliation with other international scientific societies deemed beneficial to promoting the goals of the Forum.

Interim Governing Body Meetings

Since, the Governing Body of the Forum was still under constitution at the time of registration, an 'Interim Governing Body' was constituted to look after the affairs of the Forum. Professor V. S. Ramamurthy, Secretary, Department of Science & Technology, Government of India was

the Chairperson along with H.E. Mr. Richard Celeste, Ambassador of the United States of America in India; Dr. R. A. Mashelkar, Secretary, Department of Scientific & Industrial Research, Government of India and Director General, CSIR; Dr. (Mrs.) Manju Sharma, Secretary, Department of Biotechnology, Government of India; Professor K. A. Padmanabhan, Director, Indian Institute of Technology, Kanpur; Ms. Alice Dress, Counselor, U.S. Embassy in New Delhi as members and Dr. A. P. Kulshreshtha, Adviser & Head (International Division), Department of Science & Technology, Government of India and Officer on Special Duty for the Forum as Member-Secretary.

The first meeting of the Interim Governing Body of the Forum was held in New Delhi on 20 July 2000. Several enabling resolutions for operationalizing of Forum were adopted during the meeting. This meeting was followed by a ceremonial function, during which Professor Murli Manohar Joshi, Union Minister for S&T, HRD and Ocean Development received a cheque of Rs. 319.8 million from the U.S. Ambassador, H.E. Mr. Richard Celeste for creating an endowment for the Forum. During this ceremony he also launched the Forum web site http://www.ind-usstf.org.

The second meeting of the Interim Governing Body of the Forum was held in New Delhi on 19 August 2000, primarily to discuss the issues related to the organization of a Round Table Dialogue in Washington D.C. coinciding with the visit of the Indian Prime Minister to the United States. It was expected that the proposed Roundtable would set the agenda for the future work of the Indo-U.S. S&T Forum.

Second S & T Round Table

A seven member delegation led by Professor V.S. Ramamurthy visited Washington D.C. during 13-17 September 2000 for the 2nd India-US High Level Roundtable Dialogue on S&T. On 14 September 2000 the Indian delegation was present in the meeting of the U. S. President's Committee of Advisers on Science and Technology (PCAST), co-chaired by Professor Neal Lane, the then Assistant to the President of USA for S&T and Mr. John A. Young, Former President and Chief Executive Officer of Hewlett – Packard Co. Professor Ramamurthy addressed this High Level Committee on "Borderless Science, Sustainable Technologies and Equitable Development – A Shared Vision for the New Millennium". The Roundtable was held on 15 September 2000 at Cloisters, National Institute of Health and was co-chaired by Professor Neal Lane and Professor V.S. Ramamurthy. It focused on Genomics, Agricultural Biotechnology, Nanoscale Science & Engineering and Computer & Mathematical Modelling. Subsequently the Indian Prime Minister

was briefed on the proceedings of the Roundtable at a reception hosted by the Indian Ambassador on 16 September 2000. Indo-US S&T Cooperation found a prominent place in the joint US-India Statement brought out on occasion of the official visit of the Indian Prime Minister. It was mentioned in this Statement that: "they welcomed the establishment of the Science and Technology Forum in July and agreed that the Forum should reinvigorate the traditionally strong scientific cooperation between the two countries. In that connection, they noted the contribution of the two science and technology related roundtable meetings held in March and September".

Regular Governing Body Meetings

The **Third meeting** of the Governing Body of the Forum was held in New Delhi on 31 March 2001. While the two earlier meetings of the GB were of 'Interim' nature, this was a 'Regular' meeting of the Governing Body. The Indian and the U.S. governments formally constituted the fourteen member Governing Body, with Professor V.S. Ramamurthy, Secretary, Department of Science & Technology, Government of India and Dr. Norman P. Neureiter, S&T Adviser to the U.S. Secretary of State as the two co-Chairs along with six other eminent scientists and technologists from each country as members.

The U.S. Ambassador to India, H.E. Richard Celeste was also present in this GB meeting. The Ambassador was profusely thanked by the GB members for his unstinted efforts during the last three years to make the Forum a reality. "Wow!" - an "exclamation of pleasure, surprise or strong feeling", captured the Ambassador, whose tireless efforts to constitute and launch the Forum and his exhortation to "engage world class scientists to perform innovative science on cutting edge topics" were noted.

In his remarks, Dr. Neureiter called the Indo - U.S. Forum, a major new departure in science and technology co-operation between India and the United States based on the principle of true partnership, which will result in mutual benefit. Professor Ramamurthy said that the Forum is a new plank to launch India-U.S. science and technology co-operation into the 21st century. Forum should not act like a funding agency, but as a facilitating mechanism, and should play catalytic role, leveraging additional resources from national and international programs.

The Forum should not act like a funding agency, but as a facilitating mechanism, and should play a catalytic role.

The GB launched the Forum with a set of concrete activities that will stimulate and enhance Indo-U.S. co-operation in science and technology. Six initial areas of co-operation, namely, Nanoscale Science

and Technology, Genomics (Human, Animal and Microbial), Computer Modelling, S&T related to Health, Energy and Environment, Education, and Brain Research were identified. It was decided to hold workshops in these areas that will provide the platform where Indian and U.S. scientists will formulate joint research proposals. It was also agreed to develop a Distinguished Lecture Series as well as a program that would gather together top young and mid-career Indian and American scientists and technologists as Indo - U.S. Forum Fellows. Such gatherings would allow this young bi-national talent to explore unconventional approaches to the solution of new and difficult science and technology related problems.

The Board discussed other important items such as the development of a database on the Indian Diaspora and on American scientists who have a history of collaboration with Indian institutions, and on developing a methodology to facilitate participation of American and Indian scientists at one another's "big science" facilities.

The **Fourth meeting** of the Governing Body was held on 18-19 March, 2002 at New Delhi under the Co-Chairmanship of Prof. V.S. Ramamurthy, Secretary Department of Science & Technology, Government of India and Dr. Norman P. Neureiter, Science Advisor to the U.S. Secretary of State.

Prof. Ramamurthy mentioned that with the establishment of the Forum, the bonds of S&T collaboration between India and USA would be substantially strengthened and focused on the frontier areas of science as well as those, which have a societal impact. He was of the opinion that with its limited resources, the Forum should act as an enabling and facilitating agency that would help to catalyze and strengthen S&T interaction between the two countries. In his opening remarks, Dr. Neureiter while recalling the untiring efforts put in by Ambassador Celeste whom he described as the " Father of the Forum ", stated that there was an immense potential for the two countries to collaborate in the emerging fields of S&T and that the Forum should seize the opportunity to accelerate the pace of this co-operation. Dr. Neureiter also felt that the Forum should function in a autonomous manner and should elicit private sector participation in order to make a potentially significant impact on the S&T scenario of both the countries.

A presentation was also made by Dr. Rodney Nichols on the S&T Trends and Policies in the United States and its implications for the Forum. Through this presentation, the GB was informed of the priorities and research opportunities as well as the thrust areas identified in the United States budget paper specially in the areas of Networking & Information Technology, Nano-technology, Health care, Biotechnology – both Medical & Agriculture, Neuroscience, Climate

Change, Cosmology & Astrophysics and Defence R&D. He highlighted the role of Venture Capital in promoting R&D in the United States and the possibilities of the participation of the Forum in this venture. In his response, Prof. Ramamurthy recapitulated the S&T perspectives of the Government of India from 1958 onwards to the recent time and informed the GB of a new policy on Science & Technology of the Government of India which was on the anvil. He also informed that compared to an R&D spending which was about 2.5% of GDP in USA, India has enhanced its spending to about 1% of GDP.

An important session on Industry Perspective and S&T Collaboration between the two countries was made by the Industrial Federations like US-India Business Council, Confederation of Indian Industries and Federation of Indian Chamber of Commerce & Industry. From the Private Sector perspective, it was felt that Forum can act as a neutral and authoritative agency to facilitate discussions on S&T issues and knowledge trade, survey the capabilities of private sector R&T infrastructure towards identifying collaborations and bring in venture capital to foster industry partners specially in the fields of biotechnology, pharmaceuticals, energy systems and defence production etc.

The highlight of this GB meeting was a Round Table Dialogue sessions in which eminent scientists and scientific administrators in India participated. The dialogue meeting was aimed towards generating new ideas, visions and directions upon which the Forum can readily embark as its future course of activities. Dr. R. Chidambaram, Principal Scientific Advisor to the Government of India initiated the Round Table discussions, which was attended by about 20 leading scientists from a spectrum of S&T sectors. From the Round Table discussions, it was evident that there existed remarkable synergies in future scientific and technological activities which have been identified both by United States and India in which the Forum can act as a catalytic agent towards promoting R&D activities of mutual significance and societal benefit. The broad thrust areas of cooperation between the two countries which could be facilitated through the activities of the Forum were identified at the end of this Round Table.

There exist remarkable synergies in future scientific and technological activities which have been identified both by United States and India

New address for the Forum

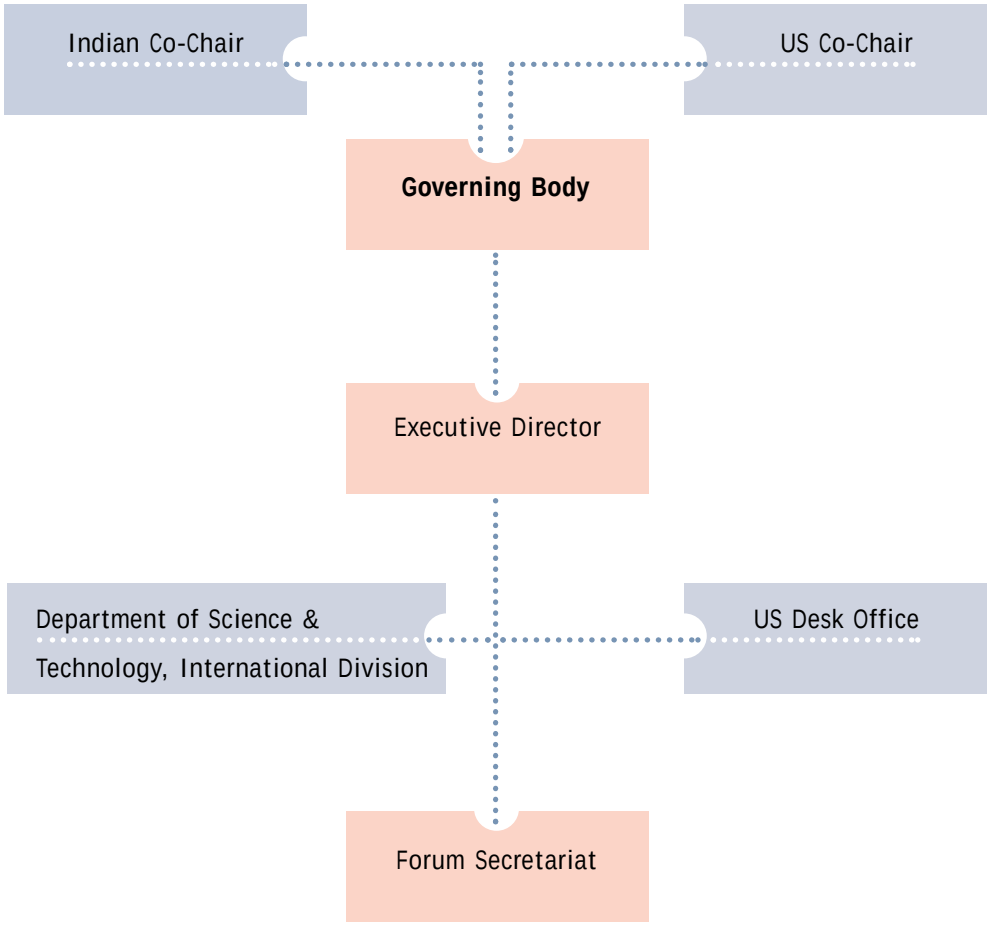
The Forum entered into an agreement in October 2001 with the United States Education Foundation in India (USEFI) to lease hire a part of the Fulbright House at 12 Hailey Road in the central area of New Delhi for use as it office premises. The Fulbright House is a heritage building and to make it suitable to meet the requirements of the Forum offices, necessary interior work and refurbishment is currently under way. It is expected that the office will be functional by the year end. This valued relationship established between USEFI and the Forum is a reflection of the synergy of the programmatic profiles of the two bilateral bodies.

OBJECTIVES & AIMS OF THE FORUM

The Forum is a catalyst to facilitate and promote the interaction in India and the United States, of government, academia and industry in science and technology with following objectives at the backdrop

- To focus on issues of common concern and activities of mutual benefit while exploring trends in S&T
- To create comprehensive electronic reference source for Indo-US S&T Cooperation
- To promote electronic exchange and dissemination of information and opportunities in bilateral S&T cooperation
- To commission studies, reports and papers and promote Indo-US cooperation in R&D and transfer of technology
- To identify and facilitate joint collaborative projects and programs and organize workshops, seminars, symposia, courses and training programs
- To establish Indo-US Centers of Excellence at places in India.

STRUCTURE OF THE FORUM



Administrative Mechanism: Bilateral Non-Governmental, Non-Profit, Scientific Registered Society under Indian Laws.

Funding Source: Annual Interest from Endowment Fund as US Contribution with matching contribution from Department of Science & Technology, Government of India.

Composition of the Current Governing Body

Professor V.S. Ramamurthy, Co-Chair
Secretary to the Government of India
Department of Science and Technology
Email: dstsec@alpha.nic.in

Dr. R.A. Mashelkar
Secretary to the Government of India
Department of Scientific & Industrial Research and
Director General, CSIR
Email: dgcsir@csir.res.in

Dr. Manju Sharma
Secretary to the Government of India
Department of Biotechnology
Email: manju@dbt.nic.in

Mr. Rajeeva Ratan Shah
Secretary to the Government of India
Department of Information Technology
Email: secretary@mit.gov.in

Professor P.N. Tandon
President
National Brain Research Center
Email : tandon@nbrc.ac.in

Professor Goverdhan Mehta
Director, Indian Institute of Science
Email : diroff@admin.iisc.ernet.in

Dr. Anji Reddy
Chairman, Dr. Reddy's Laboratory Ltd.
Email : drreddy@drreddys.com

COMPOSITION OF THE CURRENT GOVERNING BODY

U.S. Side

Dr. Norman P. Neureiter, Co-Chair
Science and Technology Adviser to the Secretary of State
U.S. Department of State
Email: Norm2346@aol.com

Prof. Bruce Alberts
President, National Academy of Sciences
The National Academies
Email: balberts@nas.edu

Dr. Norman M. Bradburn
Assistant Director for Social, Behavioural and Economic Sciences
National Science Foundation
Email: nbradbur@nsf.gov

Dr. Robert K. Dixon
Deputy Assistant Secretary, Office of Power Technologies
U.S. Department of Energy
Email: robert.dixon@hq.doe.gov

Dr. Joseph Jen
Under Secretary, Research, Education, and Economics
U.S. Department of Agriculture
Email: Joseph.Jen@usda.gov

Dr. Rodney Nichols
Former President and CEO
New York Academy of Sciences
Email : rod.nichols@verizon.net

Prof. Maynard V. Olson
Director, Genome Center
University of Washington
Email: mvo@u.washington.edu

Indian Side

ACTIVITY PORTFOLIO

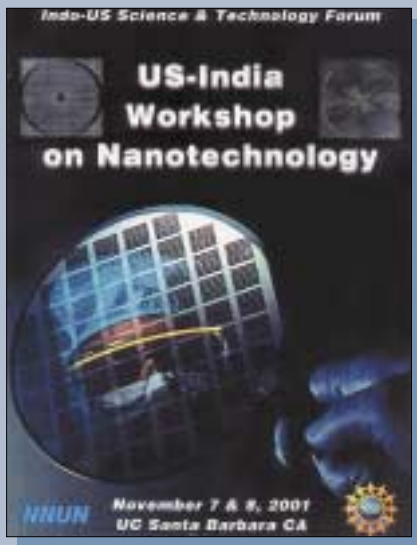
Possible programs of the Forum under development

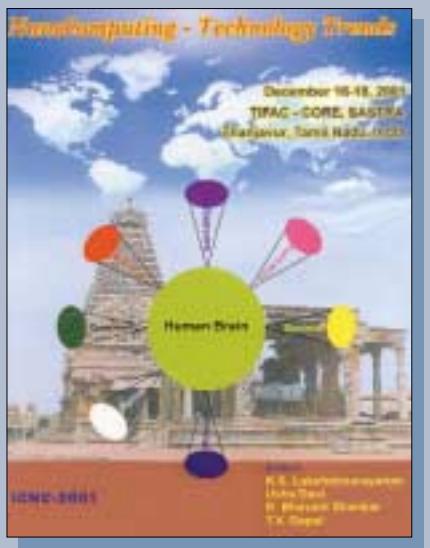
- Support joint workshops and symposia in India & the US in emerging areas of S&T
- Promote joint R&D projects of mutual interest
- Exchange visits of expert scientists from the two countries
- Identify and initiate few flag projects with societal benefit and impact
- Initiate Forum Frontiers Symposia
- Interface private and public sector participation in joint R&D efforts
- Promote Distinguished lecture series & Visiting Professorship
- Catalyze training and capacity building programs
- Catalyze to establish Centers of Excellence and Networked Centres
- Create database on various aspects of S&T and R&D

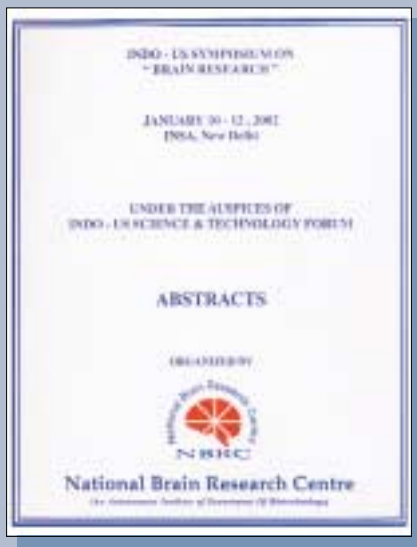
INDICATIVE THRUST AREAS FOR MUTUAL COOPERATION

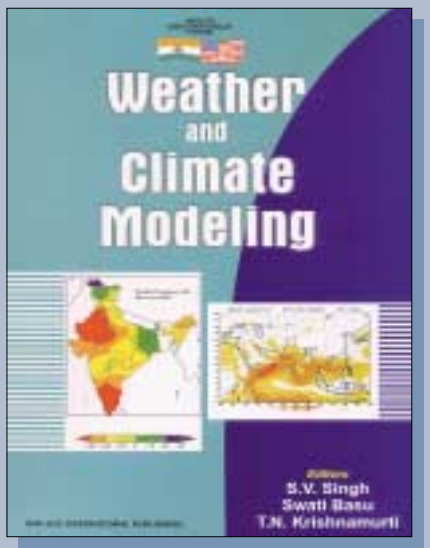
- Distributed Energy Systems including Hydrogen Fuel
- Renewable Energy Sources (Biofuels and Bioenergy)
- Nanotechnology, covering nanocomputing, quantum computing, biocomputing, molecular computing, nanofabrication and advanced materials
- Climate Modeling and Global Change with emphasis on improvement of analysis and forecasting of ocean-weather systems and natural disasters
- Brain Research, covering developmental neurobiology & computational neuroscience; diagnostic medical tools including telemedicine; health and pharmaceuticals
- Biotechnology including Human & Plant Genomics, Bioinformatics etc.
- Universal Digital Library & Distance Learning, Communication and Neural connectivity
- Information Technology and e-security
- S&T to Counter Terrorism
- High Energy Physics and Astro-physics

ACADEMIC ACTIVITIES ACCOMPLISHED









INDIAN OCEAN ARGO MEETING

Venue: Hyderabad, India **Dates: 26-27 July 2001**

Principal Investigators and Institutions:

K. Radhakrishnan, Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, India

Stan Wilson, National Oceanic and Atmospheric Administration (NOAA), U.S.A

ARGO envisages a global array of more than 3000, freely floating drifting buoys that will provide temperature, salinity and pressure profiles of upper layers of the global ocean up to a depth of 2000 m, every 10-15 days in near real mode. Data from these floats when used in conjunction with the satellite based and other in-situ observations would enhance the understanding of the ocean circulation pattern and its influence on the global climate change. This is aimed towards improving the capability for collection, assimilation and dissemination of data required for improving climate analysis and prediction, both on regional and global scale.

The ARGO policy allows data to be put on the global telecom system for free access towards an important component of the operational ocean observation system as well as a major contributor to the Climate Variability and Predictability Program and other international scientific research programs. World Meteorological Organisation (WMO) and International Oceanographic Commission (IOC) coordinate the ARGO program internationally. INCOIS, Hyderabad of the Department of Ocean Development, Government of India has been made responsible for the national program, which envisages the deployment of about 150 floats in the Indian Ocean – North of 10 degree S latitude between 2001 –2005.

The ARGO meeting at Hyderabad provided an opportunity to initiate formal planning for coverage of the Indian Ocean by the ARGO floats. The Hyderabad meeting was attended by representatives from 17 countries including 5 scientists from USA and more than 25 from India. The U.S. scientists were from NOAA, Naval Oceanographic Office and Scripps Institute of Oceanography.

In addition, participants from about a half a dozen regional and international bodies helped to realize the following:

- Countries were forthcoming in participating in the ARGO program in a variety of ways including capacity building, providing floats, helping to deploy these, extending complementary observing systems and utilizing the resulting data.
- The ARGO data policy will be 'full and open', making data accessible to all and with no period of exclusive use – both in a real time and delayed modes.
- A uniform international approach to the data system is needed – such as quality control (QC) on a basin scale, formats, protocols etc. before putting it on the Global Telecom System or the Internet for access.
- The anticipated deployments in the Indian Ocean through 2002 by the seven float providing nations including India and the USA were also discussed. It was agreed that India could act as a regional coordinator and data center for the Indian Ocean operations.

At the conclusion the participants agreed that operational oceanography is becoming a reality and would make significant contribution in the area of weather and climate prediction, as well as applications to fisheries and food security.

The Indo-US S&T Forum provided partial assistance towards participation of some of the US scientists in this important meeting towards the first academic activity partially supported by the Forum.

CONFERENCE ON NANOCOMPUTING

Venue: Thanjavur, India **Dates: 17-18 December 2001**

Principal Investigators and Institutions:

Usha Devi, Shanmuga Arts , Science, Technology & Research Academy (SASTRA), Thanjavur, India.

Cato Laurencin, Department of Chemical Engineering, Drexel University, USA.

An International Conference on Nano-computing was organized by SASTRA, Thanjavur in which more than 120 scientists participated including 15 foreign delegates. Four U.S. scientists drawn from University of Drexel, University of Notre Dame, University of Cincinnati attended this conference. Invited lectures were also given by Indian scientists from Tata Institute of Fundamental Research, Mumbai; Indian Institute of Science, Chennai; Central Semiconductor Complex, Chandigarh; Indian Institute of Science, Bangalore, IISc to provide the Indian perspective in the field of nano-computing.

The conference had five technical sessions covering the areas of Bio-computing; Molecular-computing; Quantum-computing; Optical-computing and Micro-Electro-Mechanical Systems (MEMS). A total of 25 papers were presented in the technical sessions with each having an expert inaugural speaker. A special paper on 'Nano-technology and tissue engineering' was presented by the American authors from the University of Drexel. The event while focusing on the latest trends in this evolving area of technology simultaneously addressed the industrial and consumer application potential of the five nano areas individually or in combinations which is clearly seen calling for a new way of approaching and meeting the needs of modern society.

A pre-conference tutorial was also held on Nano-technology and Nano-computing for the benefit of the students and researchers in this advanced area of technology. Tutorials in the subject areas of quantum computation, optical computing, materials for nano-computing, nano-fabrication technologies inorganic nano-tubes and MEMS technology application were also delivered.

A panel discussion on 'Bio-molecular electronics and nano-technologies – the

Indian initiative' was sponsored by the Indian National Academy of Engineering with panelists drawn from Semiconductor Complex, Chandigarh; Indian Institute of Science, Bangalore; Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore; and National Center for Biological Sciences, Bangalore. This helped in enunciating the technical capabilities and description of facilities of India and of Indian interests.

The event which was inaugurated by Prof. V.S. Ramamurthy, Co-Chair of the Forum concluded with the decision to launch an International Society on Nanotechnology with its registered office in SASTRA, Thanjavur.

INDO-US WORKSHOP ON NANO-TECHNOLOGY

Venue: University of California, Santa Barbara **Dates: 7-8 November 2001**

Principal Investigators and Institutions:

Sandip Tiwari, National Nanofabrication Users Network (NNUN), Cornell University, Ithaca, NY, USA

K. A. Padmanabham, Indian Institute of Technology (IIT), Kanpur, India

The goal of this Indo-US event sponsored by the Forum was to focus on information exchange encompassing an overview of nano-fabrication and nanotechnology activities, expected trends in it for the short and the long term, discuss the organization of resources for effective research in the diverse technical areas covered by science and engineering at the nano-scale, and to identify areas of mutual interests in collaboration.

The event started with a visit to Digital Instruments (DI), the world dominant supplier of scanning probe instruments that are extensively used for study of nanostructures. The visit included a presentation of DI capabilities, their use in nano-science studies, a tour of the facilities followed by discussion of directions to serve as a catalyst to establish direct links between visitors and DI. A visit was also undertaken to the UCSB labs which forms one of the nodes of NNUN, to look at the instrumentation required for nano-fabrication.

The goals of the workshop was enunciated by the organizers through introductory remarks and NSF efforts in the United States interests in the area of materials research which was also highlighted in light of possible Indo-US collaboration in this emerging field. The technical contents of the event consisted of 17 presentation, 10 from US and 7 from India over the wide spectrum of uses of nano-structures. These included application in electronics (digital, high frequency & high power), optics, composites, chemistry, biology, drug delivery, coatings to the underlying science of their behaviour, from the perspective of size effects, interface effects, synthesis, deformation and meso-scale behaviour.

The panel session of the workshop focused on two aspects. The first was the issues and organization of nano-structures oriented facilities and the methods they

can benefit a larger group of users. A review of the two NNUN facilities of Stanford and Cornell was made followed by a discussion of responsiveness to the special research users of the facilities with non mainstream interests or those requiring specialized equipment. The second half of the panel discussion focused on collaborative aspects of U.S.- India interactions, the interests on each side, the directions for the future with a set of recommendations for the Forum to continue and conduct the bilateral collaboration in the sphere of nano-technology.

The event was the first major academic activity supported by the Forum and held in the United States. It had a participation of 8 Indian scientists drawn from IIT, Kanpur; Indian Institute of Science, Bangalore; Indian Association for Cultivation of Science, Kolkata; Saha Institute of Nuclear Physics, Kolkata, Chemistry Dept, Univ of Delhi; International Advanced Research Center, Hyderabad and Indian Institute of Physics, Bhubaneshwar. More than 20 American researchers participated in the workshop from various universities, laboratories, industry and government.

INDO-US WORKSHOP ON BRAIN RESEARCH

Venue: INSA, N. Delhi **Dates: 10-12 January 2002**

Principal Investigators and Institutions:

V. Ravindranath, National Brain Research Center (NBRC), Gurgaon, India

John Miller, University of Montana, U.S.A

This workshop was the first fully supported academic activity of the Forum to be held in India and was inaugurated by Prof Murli Manohar Joshi, the Hon'ble Minister for Science and Technology, HRD and Ocean Development. This was a well attended event which had a registered participation of 232 scientists including about 150 young students and researchers from all over India. The U.S. delegation to the meeting consisted of nine distinguished neuroscientists and representatives from the National Science Foundation and the National Institute Health.

The workshop consisted of scientific sessions in the fields of Development Neurobiology, Neurogenetics, Computational Neuroscience and Systems & Cognitive Neuroscience. Each session had an invited speaker followed by paper presentations. The development neurobiology session ranged from talks that dealt with patterning of the brain regions to the way single cells differentiate into neurons, to how stem cells can be used for transplantation. The neurogenetics session focused on various diseases of the central nervous system. The session on computational neuroscience dealt with neural information processing and neural encoding in sensory systems. In the last session discourse was made on brain organization and plasticity used for learning and remembering.

A special poster session was also organized where 103 posters were displayed. Towards encouraging the younger scientists five awards were also presented in the five areas of poster category. Prof. V. S. Ramachandran from University of California, San Diego, also delivered a well attended popular evening public lecture on the Human Brain. The last day of the workshop had a special session on Indo-US funding opportunities with presentations made from NSF, NIH of USA and DST, DBT, ICMR of India and also from the Indo-US S&T Forum.

The workshop recognized the strong mutual interest of both the countries in the emerging field of neuroscience and recommended ways and means to cultivate and strengthen the same through joint projects and an intensive workshop on computational neuroscience.

The American scientists who participated in this joint workshop were from University of California, San Diego; Montana State Univ; Duke Univ; National Institute of Health; Saccomanno Research Institute; Univ of Michigan; Center for Complex Systems and Brain Sciences, Boca Raton; MIT, Cambridge and the Univ of Maryland. The Indian scientists were drawn from more than 30 institutions, labs, hospitals and universities.

INDO-US WORKSHOP ON WEATHER & CLIMATE RESEARCH

Venue: N.C.M.R.W.F, N. Delhi **Dates: 7 – 9 February 2002**

Principal Investigators and Institutions:

S. V. Singh, National Center for Medium Range Weather Forecasting (NCMRWF) India.

T.N. Krishnamurti, Florida State University, USA.

Understanding and predicting weather and climate is truly a global issue. Severe weather events, heavy rain, tropical cyclones along with large scale floods and droughts caused by the vagaries of monsoon affect societies significantly worldwide. Prediction, or even simulation of the Indian monsoon, has been a challenging task for the global meteorological community and only limited success has been achieved so far in this direction. Scientists from India as well as USA have been equally concerned with these issues and have been collaborating under various mechanisms to address them. In order to take stock of our understanding of weather processes of mutual interest and also to identify the problems for joint collaboration, a workshop on weather and climate modeling was organized in New Delhi under the aegis of the Indo-US S&T Forum. Scientists from both the countries presented topical papers under four major themes viz.

- Improvement of global forecast system;
- Meso-scale NWP model development, cloud processes and land surface processes;
- Dynamical extended range prediction; and
- Location specific forecast and disaster management.

More than a hundred delegates attended and deliberated in the workshop. Twelve scientists from major establishments in the USA like National Oceanic and Atmospheric Administration, National Centre for Atmospheric Research, Naval Research Laboratory and universities like the Florida State University, University of Maryland and the North Carolina State University participated and presented papers in the workshop. From India, scientists from organizations like Indian Meteorological Department, National Centre for Medium Range Weather Forecasting, Indian Institute of Tropical Meteorology, Space Applications Centre, and the Indian Institute of

Technology (Delhi and Roorkee) participated alongwith representatives from user communities like the Indian Air Force, Indian Navy, Indian Council of Agricultural Research and the Snow and Avalanche Study Establishment.

As an outcome of this workshop, a greater appreciation of each countries capabilities, facilities and interests has emerged which resulted into identification of several joint projects in the area of Weather & Climate including Monsoon studies. It was also decided that an MoU could be entered between NCAR, USA and NCMRWF, India to work jointly on the problems of Meso-scale modeling and Madden Julian Oscillation studies. It was also recommended to hold the next workshop on the subject in about two years' time from hence.

FINANCING OF THE FORUM

In accordance with the inter-governmental bilateral agreement, the Government of India, through the Department of Science & Technology is contributing to the Forum each year matching funds, which are equal to the annual interest earnings from the endowment created by the U.S. Government. The annual interest earned from this U.S. endowment and the matching contribution from the Indian Government are being used by the Forum to support its annual operations. In addition, the Forum is also mandated to raise funds from government, industry and private sources, in India and the United States, and also receive grants, gifts, donations or other contributions from various organizations, foundations, companies, donors, etc. to support its activities. The endowment is being maintained with the Bank of America at an annual interest rate of 10.5%, and the Indian contribution is being deposited with the Union Bank of India. Care is being taken to reinvest the available funds in short-term deposits with these banks to earn an additional income for the Forum.

FINANCIAL STATEMENT - AUDIT REPORT

The Members,
Governing Body,
Indo-US Science and Technology Forum,
New Delhi

We have audited the attached Balance Sheet of INDO-US SCIENCE AND TECHNOLOGY FORUM, New Delhi as at 31st March, 2002, the Receipts and Payments Account and Income and Expenditure Account for the year ended on that date and report that:

1) We have obtained all the information and explanations which to the best of our knowledge and belief, were necessary for the purpose of the audit;
2) The Forum has maintained proper books of accounts so far appears from the examination of such books;
3) The Balance Sheet, Receipts and Payments Account and Income and Expenditure Account are in agreement with the books of account;

In our opinion and to the best of our information and according to the explanations given to us, the said accounts read with the attached notes thereto, give a true and fair view;

a) In the case of the Balance Sheet, of the state of affairs of the above named Forum as at 31st March, 2002.
b) In the case of the Receipts and Payments Account and Income & Expenditure Account, of the surplus for the accounting year ending 31st March, 2002.

For K. S. GUPTA & CO.
CHARTERED ACCOUNTANTS,

(P.K. GUPTA)
PARTNER

Place: DELHI
Date: 1st October, 2002.

BALANCE SHEET AS AT 31ST MARCH, 2002

LIABILITIES	AS AT 31st MARCH, 2002		AS AT 31st MARCH, 2001	
		Amount Rs.		Amount Rs.
US Endowment Fund		319,800,000		319,800,000
Capital Fund:				
Opening Balance:	40,715,013		-	
Add: Surplus of Income Over Expenditure:	59,429,414	100,144,427	40,715,013	40,715,013
Other Liabilities:				
T.D.S. Payable		-		1,447
	Total	**419,944,427**		**360,516,460**
ASSETS				
Fixed Assets:				
Computer & Peripherals	207,965			-
Less: Depreciation	83186	124,779		
Cash and Bank Balances:				
a) Term Deposit with Banks				
Bank of America - FDR (US Endowment)	319,800,000		319,800,000	
Bank of America - Short Term Deposits	44,500,000		17,000,000	
Union Bank of India - Short Term Deposits	46,000,000	410,300,000	23,454,300	360,254,300
b) Balance with Banks:				
Bank of America - Savings A/c	1,903,857		155,526	
Union Bank of India - Savings A/c	1,453,314	3,357,171	5,100	160,626
c) Cash In Hand		2,477		87
d) Sundry Advances:				
Imprest for Expenses of Governing Body Meeting	-		100,000	
Advance for Scientific Workshop Expenses to				
Travel Agent - M/s Carlson Wagonlit Travels	2,600,000		-	
Advance for Brain Research Workshop	2,200,000		-	
Advance for Weather & Climate Workshop	1,048,000		-	
Advance Recoverable (T.D.S.)	-	5,848,000	1,447	101,447
e) Security Deposit:				
Rent	300,000		-	
Telephone	12,000	312,000	-	-
	Total	**419,944,427**		**360,516,460**

(R. VARADARAJAN)
OFFICIATING MANAGER

(DR. A. MITRA)
ADMINISTRATOR

(Y. P. KUMAR)
OFFICER ON SPECIAL DUTY

Subject to our Report of even date
For K.S. GUPTA & CO.
CHARTERED ACCOUNTANTS

(P.K. GUPTA)
PARTNER

Place: Delhi
Date : 1st October, 2002

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2002

RECEIPTS	FOR THE YEAR ENDED 31st MARCH, 2002 AMOUNT Rs.		FOR THE PERIOD ENDED 31st MARCH, 2001 AMOUNT Rs.	
Balances Brought Forward:				
a) Term Deposits with Banks:				
Bank of America - FDR (US Endowment Fund)	319,800,000		-	
Bank of America - Short Term Deposits	17,000,000		-	
Union Bank of India - Short Term Deposits	23,454,300	360,254,300	-	
b) Balance with Banks:				
Bank of America - Savings A/c	155,526		-	
Union Bank of India - Savings A/c	5,100	160,626	-	-
c) Cash In Hand		87		-
d) Imprest for Governing Body Meeting Expenses		100,000		-
Subtotal		**360,515,013**		
Endowment/ Contribution Received:				
Endowment from US Government	-		-	319,800,000
Contribution from Department of Science and Technology (Government of India)	27,047,196	27,047,196	23,459,300	343,259,300
Bank Interest Received on:				
US Endowment FDR	33,670,997		16,927,496	
Short Term Deposits with Bank of America	1,593,324		398,462	
Short Term Deposits with Union Bank of India	1,530,844		-	
Savings Bank Account (Bank of America/ UBI)	91,797	36,886,962	15,911	17,341,869
Other Receipts:				
Advances Recoverable		1,447		-
	Total	**424,450,618**		**360,601,169**
PAYMENTS				
Establishment & Office Expenses:				
Salaries	162,666		-	
Car Hire Charges	144,465		-	
Telephone Expenses	29,589		-	
Printing & Stationery	91,307		1,026	
Postage & Courier	9,901		-	
Office Expenses	19,065		-	
Miscellaneous	18,700		4,914	
Advertisement	-		15,617	
Web Development	5,816		64,600	
Office Rent	425,900		-	
Audit Fees	12,600		-	
Bank Charges	432	920,441	-	86,157
Purchase of Computer & Peripherals		207,965		-
Governing Body Expenses:				
Governing Body Meeting Expenses	3,373,406	3,373,406	-	-

	FOR THE YEAR ENDED 31st MARCH, 2002 AMOUNT Rs.		FOR THE PERIOD ENDED 31st MARCH, 2001 AMOUNT Rs.	
Scientific Expenses/ Advances for:				
Argo-Workshop	19,531		-	
Brain Rearch Workshop	108,180		-	
Advance for Brain Rearch Workshop	2,200,000		-	
Advance for Weather & Climate Workshop	1,048,000		-	
Advance for Expenses for Nano Materials Workshop, Santa Barbara, US/ Nano Computing Workshop, Tanjore, India/ Brain Research Workshop, New Delhi, through M/s Carlson Wagonlit Travels	2,600,000	5,975,711	-	-
Sundry Advances/ Payments:				
Imprest for Expenses of Governing Body	-		100,000	
Rent Security	300,000		-	
Telephone Security	12,000		-	
T.D.S. Paid	1,447	313,447	-	100,000
Subtotal		**10,790,970**		**186,157**
Balances Carried Forward:				
a) Term Deposits with Banks				
Bank of America - FDR (US Endowment Fund)	319,800,000		319,800,000	
Bank of America - Short Term Deposits	44,500,000		17,000,000	
Union Bank of India - Short Term Deposits	46,000,000	410,300,000	23,454,300	360,254,300
b) Balance with Banks:				
Bank of America - Savings A/c	1,903,857		155,526	
Union Bank of India - Savings A/c	1,453,314	3,357,171	5,100	160,626
c) Cash In Hand		2,477		87
	Total	**424,450,618**		**360,601,169**

(R. VARADARAJAN)
OFFICIATING MANAGER

(DR. A. MITRA)
ADMINISTRATOR

(Y. P. KUMAR)
OFFICER ON SPECIAL DUTY

Subject to our Report of even date
For K.S. GUPTA & CO.
CHARTERED ACCOUNTANTS

(P.K. GUPTA)
PARTNER

Place: Delhi
Date : 1st October, 2002

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2002

PARTICULARS		FOR THE YEAR ENDED 31st MARCH, 2002 AMOUNT Rs.		FOR THE PERIOD ENDED 31st MARCH, 2001 AMOUNT Rs.	
INCOME					
Contribution from Department of Science and Technology, Government of India:			27,047,196		23,459,300
Interest on:					
US Endowment FDR with Bank of America		33,670,997		16,927,496	
Short Term Deposits with Bank of America		1,593,324		398,462	
Short Term Deposits with Union Bank of India		1,530,844		-	
Savings Bank Account (Bank of America\ U B I)		91,797	36,886,962	15,911	17,341,869
		Total	**63,934,158**		**40,801,169**
EXPENDITURE					
Scientific expenses:					
Argo-Workshop Expenses		19,531		-	
Brain Rearch Workshop Expenses		108,180	127,711	-	-
				-	
Governing Body Meeting Expenses			3,373,406	-	-
Establishment & Office Expenses:					
Salaries		162,666		-	
Car Hire Charges		144,465		-	
Telephone Expenses		29,589		-	
Printing & Stationery		91,307		1,026	
Postage & Courier		9,901		-	
Office Expenses		19,065		-	
Miscellaneous		18,700		4,913	
Advertisement		-		15,617	
Web Development		5,816		64,600	
Office Rent		425,900		-	
Audit Fees		12,600		-	
Bank Charges		432		-	
Depreciation on Computer & Peripherals		83186	1,003,627	-	86,156
		Total	**4,504,744**		**86,156**
Surplus of Income Over Expenditure Carried over to the Balance Sheet			**59,429,414**		**40,715,013**

(R. VARADARAJAN)
OFFICIATING MANAGER

(DR. A. MITRA)
ADMINISTRATOR

(Y. P. KUMAR)
OFFICER ON SPECIAL DUTY

Subject to our Report of even date
For K.S. GUPTA & CO.
CHARTERED ACCOUNTANTS
(P.K. GUPTA)
PARTNER

Place: Delhi
Date : 1st October, 2002

ACCOUNTING POLICIES AND NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31ST MARCH, 2002

Attached to and forming part of the Balance Sheet and Income and Expenditure Statement for the year ended 31st March, 2002

1. ACCOUNTING POLICIES:

a) The Forum has adopted cash system of accounting.

b) Any surplus of Receipts over Payments is carried forward to next year for utilization as per Objectives of the Forum.

c) All receipts of interest against Time Deposits with the bank are accounted for on actual receipt/ credit in the bank account of the Forum.

d) All the assets acquired for research projects would remain with the institution where the research work is carried on. The Forum would however retain the right to transfer those assets to other institution if so required, on completion of the projects for which the assets are purchased. The expenditure on those assets would be accounted for in the Income & Expenditure Account under the head "Scientific Expenditure" or such similar account and hence such assets will not be taken in the Balance Sheet of the Forum.

e) Funds released for various research projects will be shown as Scientific Expenditure in the Income & Expenditure Account on the basis of disbursements made by the Forum and not on the basis of the expenditure on the projects by receiving institutions out of the disbursements.

f) Contingent Liabilities in respect of any ongoing or projected activities are not provided for as expenses.

2. NOTES TO ACCOUNTS:

a) The Forum has been recognized as a Scientific and Industrial Research Organisation (SIRO) by the Department of Scientific and Industrial Research (DSIR) for the period from 2.9.2000 to 31.3.2003.

b) The Forum has applied to Income Tax Authorities for Notification as Scientific Institution under Rule-6 of the Income-tax Act, 1961, which is awaited.

c) Total grant receivable from the Government Of India, Department of Science and Technology equivalent to the interest received on the US Endowment with Bank of America for the financial year ended 31st March, 2002 amounting to Rs. 2,71,39,193/- against which Rs. 2,70,47,196/- has been received during the year. Balance amount of Rs. 91,997/- is receivable as at year end.

d) Total interest received on FDR- US Endowment Fund and matching contribution received from the Department of Science and Technology, Government of India, upto 31st March, 2002:

	Financial Year 2000-01 (Rs.)	Financial Year 2001-02 (Rs.)	Total upto 31.03.2002 (Rs.)
Interest on US Endowment FDR with Bank of America	16,927,496	33,670,997	50,598,493
Matching contribution from Department of Science & Technology, Government of India	23,459,300	27,047,196	50,506,496

e) The previous year figures have been regrouped wherever necessary to confirm to current year's classification.

(R. VARADARAJAN)
OFFICIATING MANAGER

(DR. A. MITRA)
ADMINISTRATOR

(Y. P. KUMAR)
OFFICER ON SPECIAL DUTY

Subject to our Report of even date
For K.S. GUPTA & CO.
CHARTERED ACCOUNTANTS

(P.K. GUPTA)
PARTNER

Place: Delhi
Date : 1st October, 2002

Address of the Forum

Indo-US Science & Technology Forum

Fulbright House, 12 Hailey Road

New Delhi – 110001

India

Phone: 91-11-23321552 to 1555

Website: www.indousstf.org

www.indusstf.org

Contact Points

In India

Dr. A. Mitra

Administrator

Indo-US S&T Forum

Department of Science & Technology

Technology Bhawan, New Mehrauli Road

New Delhi 110016.

Phone : 91-11-26864642

Email : amitra@alpha.nic.in

Mr. Y.P. Kumar

Head, International Division

Department of Science & Technology

Technology Bhawan, New Mehrauli Road

New Delhi – 110016.

Phone : 91-11-2691912

Email : ypk@alpha.nic.in

Mr. R. Varadarajan

Manager

Indo-US S&T Forum

Department of Science & Technology

Technology Bhawan, New Mehrauli Road

New Delhi – 110016.

Phone : 91-11-26692704/26692705

Email : varadaarc@yahoo.com

In USA

Mr. Michael Cheetham

National Research Council

The National Academies

2101 Constitution Avenue, NW

Washington, DC 20418

Phone : 001- 202-334-1802

Email : mcheetha@nas.edu

Dr. Ranjan Gupta

U.S. Department of State

Office of the S&T Advisor to the

Secretary (STAS)

S.A.- 23, 1990 K Street

Washington, DC 20522-410

Phone : 001- 202-663-3243

Email : guptarx@state.gov

Photo: Jantar Mantar, the Astronomical observatory built by Jai Singh II in Jaipur, India, between 1728 & 1734

Indo-US Science & Technology Forum

Fulbright House, 12 Hailey Road

New Delhi – 110001

India

Phone: 91-11-23321552 to 1555

Website: www.indousst.org

www.indusst.org

Design - Mugdha Sethi / Photodisc India / 2003

Cover photograph - Inder Gopal / Indiapicture

Annual Report

First Annual Report of
The Indo-US Science &
Technology Forum
Ending March, 2002