Indo-U.S. Science and Technology Forum

Catalyzing Indo-U.S. Science & Technology Cooperation

ANNUAL REPORT 2018-19

An autonomous organization jointly established by the
Department of Science & Technology
Govt. of India and the U.S. Department of State

Indo-U.S. Science and Technology Forum

Catalyzing Indo-U.S. Science, Technology and Innovation Collaborations for over 19 years!

IUSSTF

Indo-U.S. Science & Technology Forum

The Indo-U.S. Science and Technology Forum (IUSSTF) established under an agreement between the Governments of India and the United States of America in March 2000, is an autonomous, bilateral organization jointly funded by both the Governments that promotes science, technology, engineering and biomedical research and innovation through substantive interaction among government, academia and industry. The Department of Science & Technology, Government of India and the U.S. Department of State are the respective nodal departments.

Contents

PAST SUMMITS AND NEW FRONTIERS

(From the Executive Director's Desk)

It is with a sense of satisfaction and pride that I present this ***Annual Report (2018-19)*** of the bi-national Indo-U.S. Science & Technology Forum (IUSSTF) to all our patrons and stakeholders. As you would notice going through this Report, IUSSTF continues to march ahead with renewed vigor and a sense of purpose in realizing its core mandate of promoting meaningful engagements between the United States and India across the entire spectrum of scientific cooperation as well as the entire length of the R&D value chain. IUSSTF continues to play its pivotal role in catalyzing the strategic science, technology and innovation partnerships between both nations through our diverse programs that help build scientific networks, promote innovation and entrepreneurship, and train the next generation of scientists and students to become a productive part of a globally-engaged scientific community.

Our program in the Innovation and Entrepreneurship space– the U.S.-India S&T Endowment Fund– is growing steadily and we have thus far supported 32 joint U.S.-India

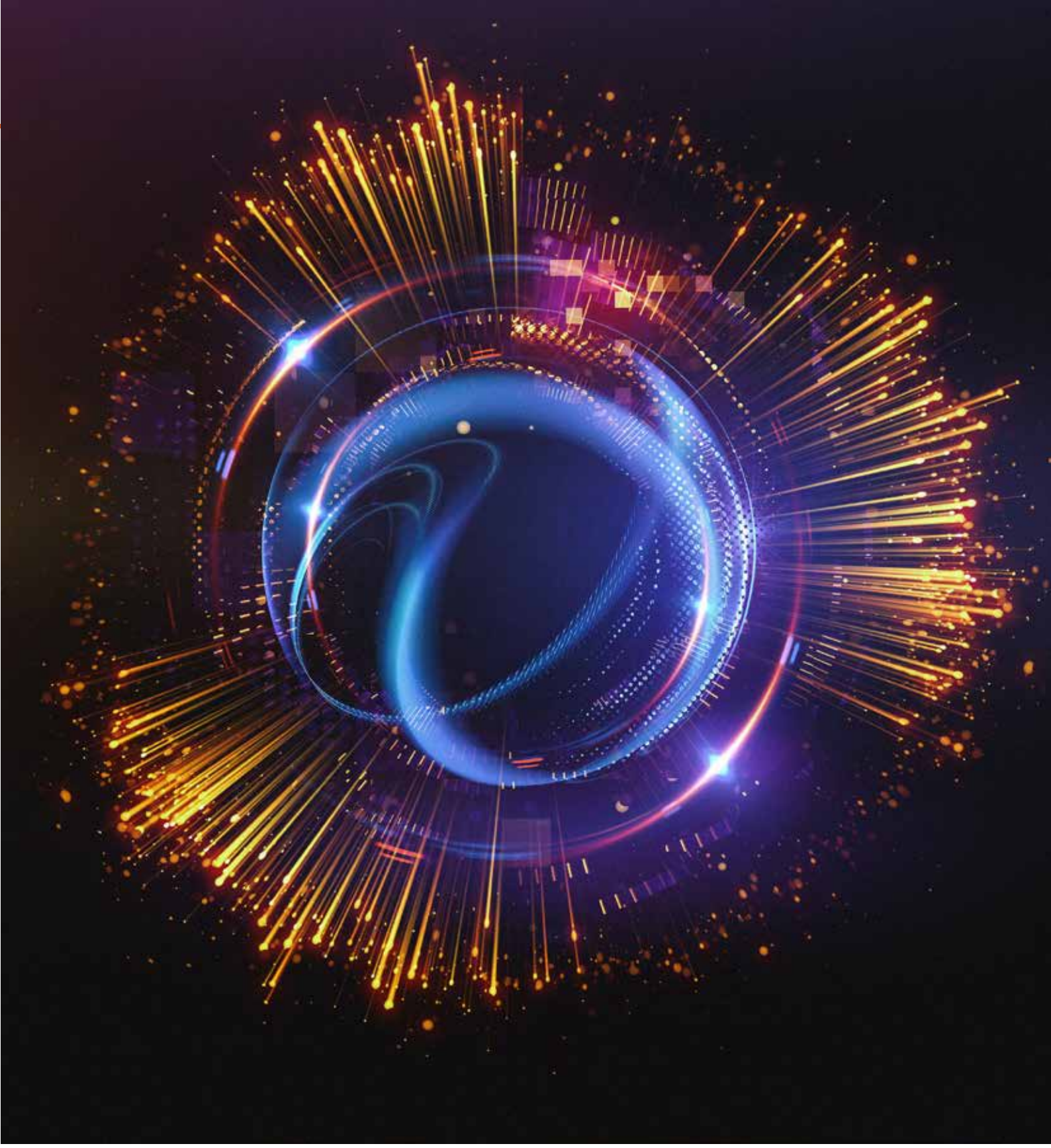
entrepreneurial projects through 8 Calls. We are currently in the process of wrapping up the 9thCall that received an overwhelming response from our stakeholders. IUSSTF also provides a platform for a large number of exchange visits for scientists, faculty and students across several institutions on both the sides. These visitations not only sustain current collaborations but more importantly act as precursors to bigger initiatives and long-term engagements in the years to follow.

Over the past 19 years, we have established an active stakeholder base of close to 600 institutions and 5000 individual scientists and academicians in both the countries. We partner with a large number of constituents of the STI eco-system comprising of federal agencies, academic institutions, national laboratories, industries, professional bodies and industry associations. Through the extended networks of our partner institutions, we reach out to more than 100,000 individual nodes on regular basis. IUSSTF can therefore rightfully claim a great deal of accomplishment in its journey up until now, fully justifying the cause for which it was established. However, there still lies enormous scope to capture several un-tapped opportunities in multiple ways, considering the vastness of the U.S.-India S&T landscape and the common values that connect the two societies at a fundamental level. I think it is now time to establish those new pathways that lead to higher summits and secure resources that may be needed for both scaling-up as well as a forward-backward integration.

I will soon be completing my term as the Executive Director of IUSSTF. During my tenure, I made a genuine attempt to envision several strategic initiatives that I believed were needed to serve the cause of IUSSTF going forward. While these initiatives were well received by the Governing Board, and I am thankful for that; the fact of the matter is that many of them are still a work in progress. I earnestly hope that the new leadership will be able to take them to fructification with the support of both the Governments.

I would like to put on record my sincere gratitude and genuine appreciation to our patrons, partners, stakeholders and my colleagues in IUSSTF who have all contributed to script this success story till so far. IUSSTF will surely need their wholesome support and blessings in chartering the next leg of its aspirational journey.

Rajiv Kumar Tayal
Executive Director, IUSSTF



INTRODUCTION

IUSSTF: The Genesis

The **Indo-U.S. Science and Technology Forum (IUSSTF)** is a bi-national organization jointly created by India and the United States of America, through a formal agreement signed by the two Governments on March 21, 2000. IUSSTF acquired legal status a few months later, when it was registered as a Society under the "Societies Registration Act" in India in June 2000, with its office at New Delhi.

IUSSTF is also the secretariat for the **U.S.-India Science and Technology Endowment Fund,** which was jointly setup later by the two Governments, through a separate agreement in the year 2009.

The Department of Science and Technology (DST) of the Ministry of Science and Technology, Govt. of India, and the U.S. Department of State, are the arms of the two Governments that overview the functioning of IUSSTF through a Governing Body, having equal representation from both sides.

IUSSTF: Vision, Mission and Objectives

VISION

Excellence in Science, Technology and Innovation space through collaborative initiatives between India and the United States of America.

MISSION

- **Act as a catalyst to promote long-term scientific collaborations between India and the U.S. through partnership amongst individual scientists, scientific institutions and the scientific community at large.**
- **Establish platforms and mechanisms to connect the S&T eco-systems of both the countries to act as a fertile ground to foster individual and institutional partnerships in a natural and sustainable manner.**

OBJECTIVES

- **Create awareness through exchange dissemination of Information and Opportunities in S&T cooperation.**
- **Capitalize and build on the scientific and technological synergy leading to long term partnership on shared values.**
- **Support exciting program portfolio that leads to sustainable interactions and strengthens strategic partnerships.**
- **Nurture contacts between young and mid-career scientists to develop mutual trust, foster excellence and explore new frontiers.**
- **Encourage public-private partnership to foster elements of Innovation, Application and Enterprise.**

IUSSTF Program Portfolio

(*Classified by Verticals*)

I. Scientific Networks

- Bilateral Workshops/Training Programs/Symposia
- Indo-U.S. Virtual Networked Centers

II. Innovation and Entrepreneurship

- U.S.-India Science and Technology Endowment Fund (USISTEF)
- India Innovation Growth Program (IIGP)
- Women Entrepreneur Quest (WEQ)
- Make Tomorrow for Innovation Generation

III. Research and Development

- Indo-U.S. Joint Clean Energy Research and Development Centre (JCERDC)
- Partnerships for International Research and Education (PIRE)
- PACEsetter Fund
- Real Time River Water and Air Quality Monitoring (WAQM)

IV. Visitations and Fellowships

- Bhaskara Advanced Solar Energy (BASE) Fellowships
- Bioenergy-Awards for Cutting Edge Research (B-ACER)
- Building Energy Efficiency Higher & Advanced Network (BHAVAN) Fellowships
- Water Advanced Research and Innovation (WARI) Fellowships
- Genome Engineering/Editing Technology Initiative (GETin)
- ASM-IUSSTF Indo-U.S. Professorship in Microbiology
- IUSSTF–American Physical Society Fellowships
- Indo-U.S. Fellowship for Women in STEMM (WISTEMM)
- Research Internships in Science and Engineering (RISE)
- Graduate Research Opportunities Worldwide (GROW)
- S.N. Bose Scholars Program
- Khorana Program for Scholars
- IUSSTF-Viterbi Program
- Initiative for Research & Innovation in Science (IRIS)

IUSSTF Program Portfolio

(Classified by Nature of Support)

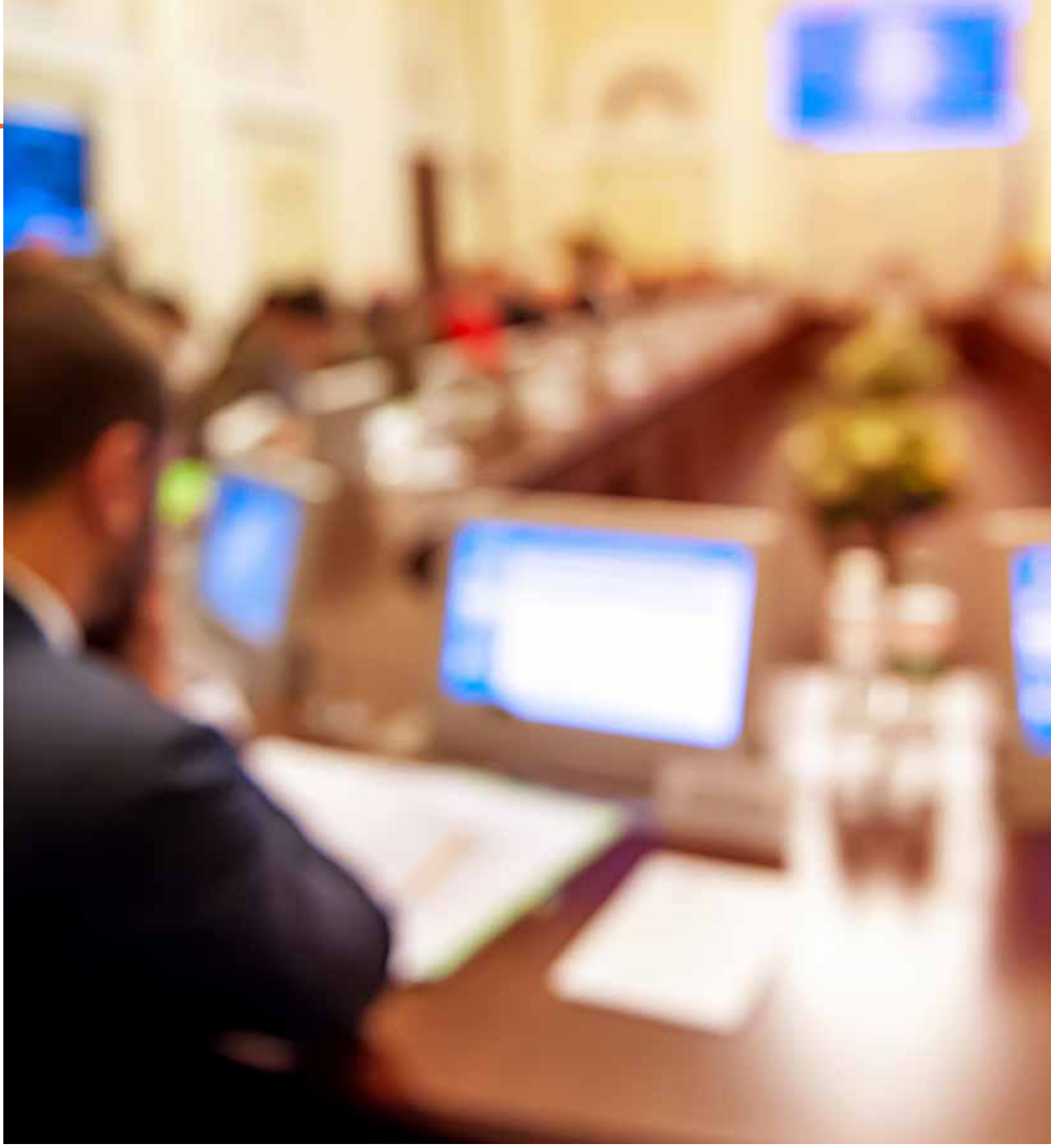
I. IUSSTF Core

- Bilateral Workshops/Training Programs/Symposia
- Indo-U.S. Virtual Networked Centers
- IUSSTF-Viterbi Program
- IUSSTF-APS Fellowships
- ASM-IUSSTF Professorship
- Research Internships in Science and Engineering
- S.N. Bose Scholars Program *(U.S. component)*

II. U.S.-India Science and Technology Endowment Fund (USISTEF)

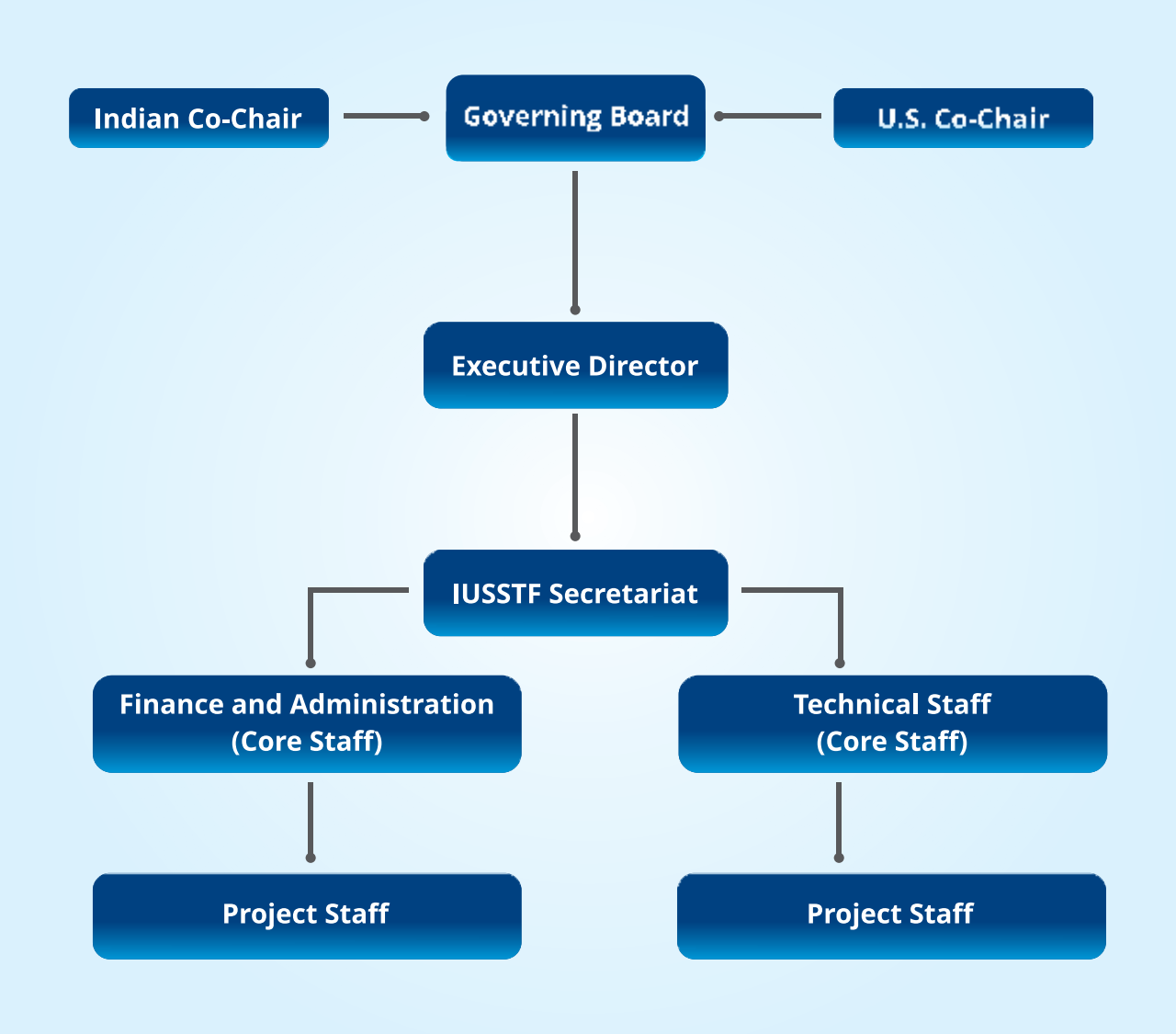
III. Extra Mural Programs- EMPs
(Supported by External Agencies/ Industry)

- Indo U.S. Joint Clean Energy Research and Development Centre
- Partnership for International Research and Education
- PACEsetter Fund
- Real Time River Water and Air Quality Monitoring
- Bhaskara Advanced Solar Energy Fellowships
- Bioenergy-Awards for Cutting Edge Research
- Building Energy Efficiency Higher & Advanced Network Fellowships
- Genome Engineering/Editing Technology Initiative
- Indo-U.S. Fellowship for Women in STEMM
- Water Advanced Research and Innovation Fellowships
- Graduate Research Opportunities Worldwide
- Khorana Program for Scholars
- S.N. Bose Scholars Program
- Initiative for Research & Innovation in Science
- Make Tomorrow for Innovation Generation



GOVERNANCE STRUCTURE

IUSSTF Organizational Chart



Administrative Mechanism

- Autonomous
- Bilateral
- Non-Governmental
- Not for Profit Society

Funding Source

- Annual Interest from U.S. Endowment Fund with matching contribution from DST, Govt. of India
- Freedom to Secure Private and Other Funding

IUSSTF Governing Board

Ashutosh Sharma
Co-Chair
Department of Science & Technology, Govt. of India

Jonathan Margolis
Co-Chair
U.S. Department of State

B. Anand
Department of Science & Technology, Govt. of India

Alka Sharma
Department of Biotechnology, Govt. of India

Elizabeth Urbanas
U.S. Department of Energy

Mark Coles
National Science Foundation

Indranil Manna
Indian Institute of Technology - Kharagpur

Ambuj D. Sagar
Indian Institute of Technology - Delhi

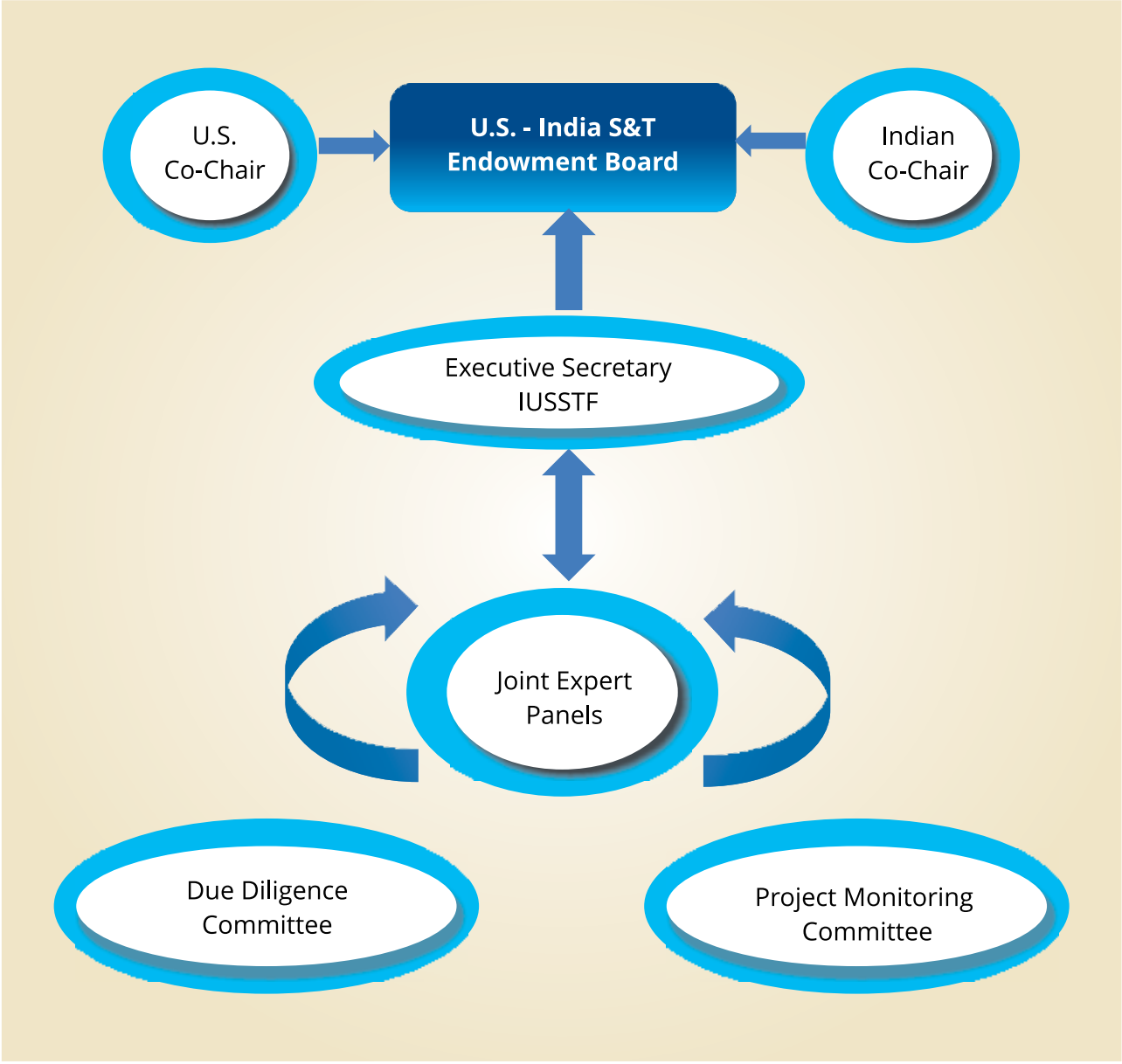
F. Gray Handley
National Institutes of Health

Kumud Srinivasan
Intel® Corporation

Hari S. Bhartia
Jublilant Bhartia Group

Gopal Iyengar
Ministry of Earth Sciences, Govt. of India

Functional Structure for USISTEF



USISTEF Board

H.K. Mittal
Co-Chair
Department of Science & Technology, Govt. of India

S. K. Varshney
Department of Science & Technology, Govt. of India

Alka Sharma
Department of Biotechnology Govt. of India

B.V. Phani
Indian Institute of Technology Kanpur

Vipin Kumar
National Innovation Foundation

P.S. Gangadhar
Director (Americas)
Ministry of External Affairs
Govt. of India, New Delhi

Ananta P. AnantaramSarma
Former-SIDBI Venture Capital Ltd.

Shirshendu Mukherjee
DBT-BIRAC-BMFG-Welcome Trust

Sanjay Vijay Kumar
Startup village, Kochi

J. Robert Garverick
Co-Chair
U.S. Embassy, New Delhi

Steven Ferguson
National Institutes of Health

Philip Singerman
National Institute of Standards & Technology

Mojdeh Bahar
U.S. Department of Agriculture

Lisa Brodey
U.S. Department of State

Sashi Reddi
SRI Capital

Peter T. Dabrowski
Tano Capital/Tano Ventures

IUSSTF Staff Members

Rajiv Kumar Tayal
Executive Director

Core Staff

R. Varadarajan
Controller

Nishritha Bopana
Principal Science Officer

Chaitali Bhattacharya
Principal Science Officer

Nikhil Jain
Associate Accounts Officer

Monika Madan
Senior Personal Secretary

Manoj Prasad
Assistant Admin Officer

Program Staff

Babulal Chaudhary
Program Officer

Pushpa Iyer
Program Officer

Priya Thomas
Program Officer

Aasita Apoorva
Associate Program Officer

Subhashree Basu
Associate Program Officer

Akanksha Kaushik
Associate Program Officer

Sravan Kumar Paleti
Assistant Program Officer

Anita Vishwakarma
Senior Accounts Associate-I

Rakesh Kumar Singh
Senior Accounts Associate-I

Rakesh Bhandari
Admin Associate

YEAR AT A GLANCE

Highlights of the Year

Operational Indicators

S.No.	Item	Numbers
1	**Bilateral Workshops**	
	Awarded	19
	Held	17
2	**Virtual Networked Centers**	
	Awarded	10
	Ongoing	23
3	**USISTEF**	
	9th Call Registrations	2269
	Submitted Applications	389
	Awards	6

Strategic Initiatives

- **New Partnerships**
  - Memorandum of Understanding (MoU) signed between IUSSTF and the American Chemical Society (ACS)
- **Virtual Platforms and Networks**
  - Launch of SPARK (Scout for Partnerships, Resource and Knowledge) : IUSSTF Alumni Network
  - Gateway for Donations to IUSSTF on the IUSSTF website *(qualifying for exemptions under Section 80G of the Income Tax Act in India and Section 501(c)(3) of the Internal Revenue Code in the United States.)*
  - Film on the Indo-U.S. Joint Clean Energy Research and Development Centre (JCERDC)

SECTION-I

SCIENTIFIC NETWORKS

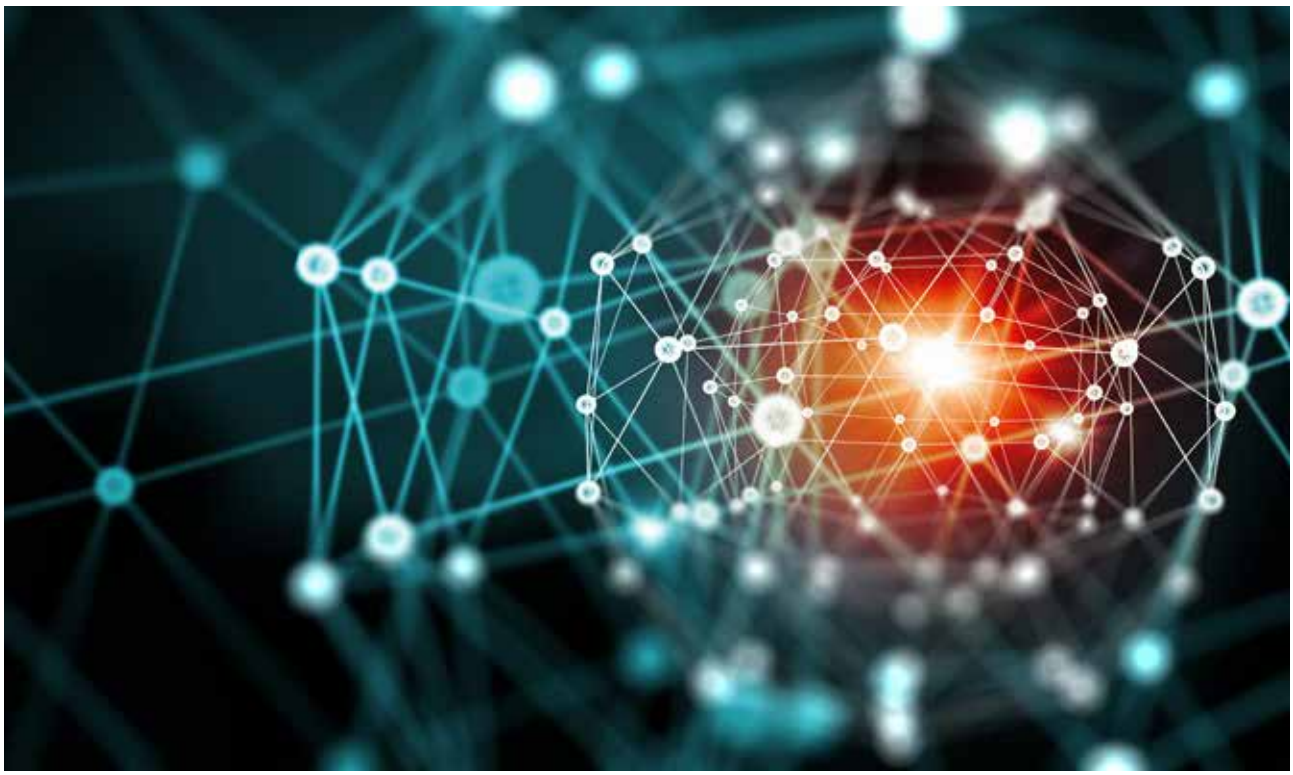
Scientific Networks

IUSSTF funded collaborations provide a platform for young and early-career scientists to interact and network with their senior and well-established counterparts, who could potentially become both lifelong mentors and collaborators. Building scientific networks not only helps share expertise thereby doubling the value of the effort; but also many times leads to the generation of completely novel ideas.

IUSSTF promotes such networks to foster long-term collaborations between the scientific communities of India and the United States through two separate yet complimentary programs. While **"Bilateral Workshops"** are expected to act as an instant connect and point of formal initiation; **"Virtual Networked Centers"** provide a formal mechanism to support specific collaborations for an extended period of time.

There are 'two' Calls for proposals for Bilateral Workshops and 'one' for Virtual Networked Centers, each year. The table below provides a summary of Bilateral Workshops and Virtual Networked Centers supported over the past three years:

	2016-17	2017-18	2018-19	Cumulative (2001-2019)
Number of Bilateral Workshops/ Training Schools	17	18	19	381
Number of Virtual Networked Centers	8	13	10	90



Bilateral Workshops/Training Programs

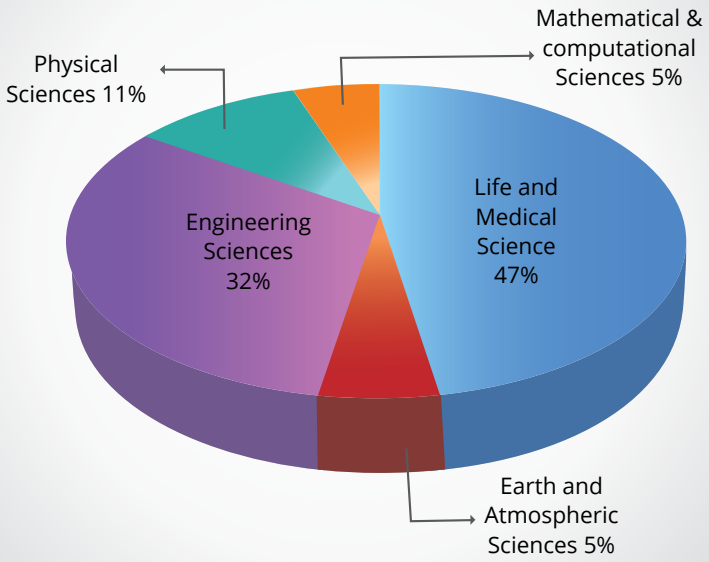
Bilateral Workshops are targeted to promote interactions between Indian and American scientists and engineers from academia, laboratories and industry with the explicit aim to develop sustained linkages. Proposals are peer-reviewed both in India and the United States. The review parameters include novelty of topic, mutual benefits to India and the U.S., background of workshop coordinators and participants, potential for developing new and sustained bilateral linkages, extent of student participation, etc.

Eighteen Bilateral Workshops were selected for support during the year 2018-19 (List provided as *Annexure I)*. The list of Workshops that were awarded earlier but were held during the year 2018-19 are placed at *Annexure II.* The data pertaining to the last three years is presented below.

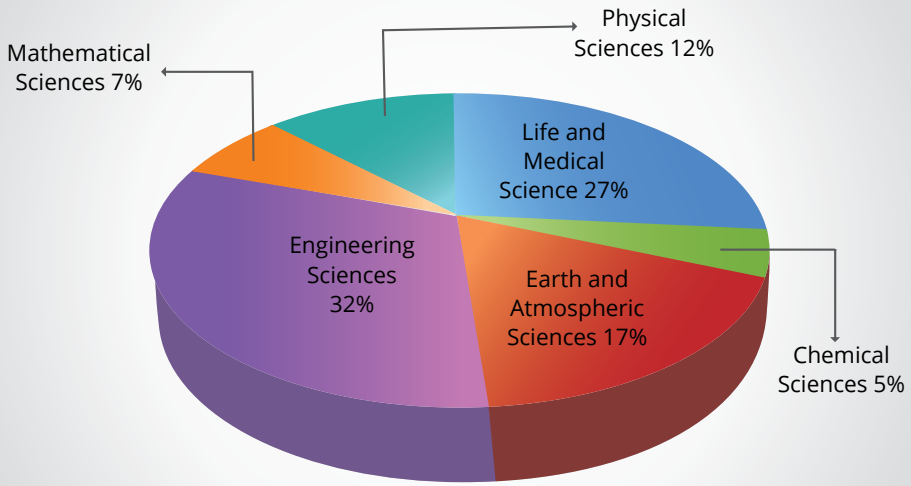
		2016-17	2017-18	2018-19
Number of Applications Received		44	47	40
Number of Awards		17	18	19
Funding	(INR/ Million)	19.4	20.9	16.05
	(USD/ Million)*	0.28	0.30	0.23

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*

Workshops: Area -wise Distribution (2018-19)



Workshops: Area -wise Distribution (2014-19)



Virtual Networked Centers

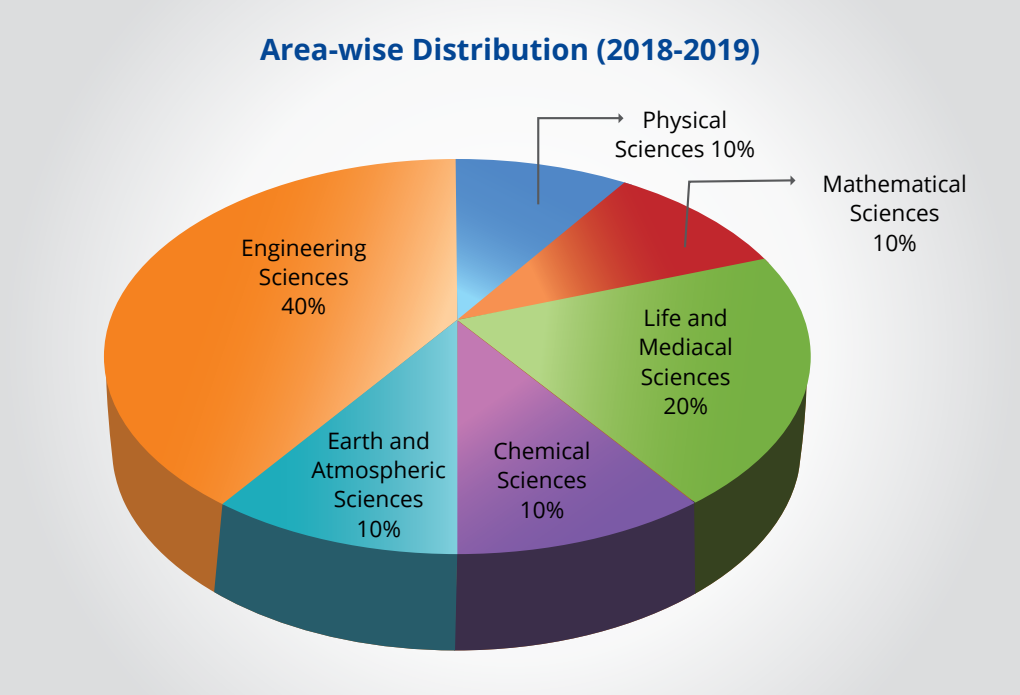
The aim of **Virtual Networked Centers** is to enable Indian and American scientists to carry out joint research activities by leveraging already existing infrastructure and funding available with the partners on both sides through a linkage established by a virtual mechanism that provides for seamless connectivity and exchange of faculty/scientists and students from both sides. These centers are supported under two categories:

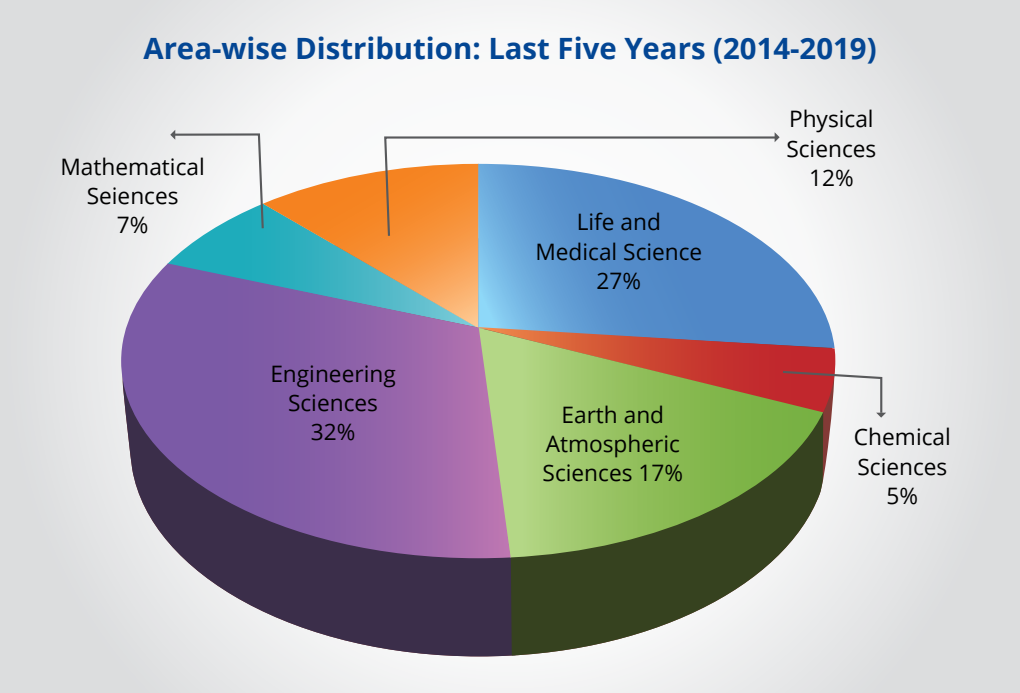
- ***Knowledge R & D Networked Centers***
  - o Partners: R&D labs and academia partnership (2+2)
  - o Provide opportunities for integrating research and education
- ***Public-Private Networked Centers***
  - o Partners: Academia/R&D lab - Industry partnership (2+2)
  - o Promote pre-commercial R & D with application potential

Thus far, 90 Virtual Centers have been supported. 10 Joint centers were awarded during the year 2018-19, (list provided as *Annexure III*). The data for the last three years is presented below:

		2016-17	2017-18	2018-19
Number of Applications Received		33	56	61
Number of Awards		8	13	10
Funding	(INR/ Million)	29.84	48.72	33.00
	(USD/ Million)*	0.43	0.70	0.47

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*


Area-wise Distribution (2018-2019)
Physical Sciences 10%
Mathematical Sciences 10%
Life and Mediacal Sciences 20%
Chemical Sciences 10%
Earth and Atmospheric Sciences 10%
Engineering Sciences 40%


Area-wise Distribution: Last Five Years (2014-2019)
Physical Sciences 12%
Mathematical Seiences 7%
Life and Medical Science 27%
Chemical Sciences 5%
Earth and Atmospheric Sciences 17%
Engineering Sciences 32%

Virtual Centers - Institutional Engagement (2018-19)

India	USA
• All India Institute of Medical Sciences, New Delhi • Department of Wildlife Protection, Jammu and Kashmir • Indian Institute of Science, Bengaluru • Indian Institute of Technology, Bombay • Indian Institute of Technology, Delhi • Indian Institute of Technology, Hyderabad • Indian Institute of Technology, Jammu • Indian Institute of Technology, Kanpur • Indian Institute of Technology, Kharagpur • Indian Institute of Technology, Madras • Indian Statistical Institute, Kolkata • Indraprastha Institute of Information Technology, Delhi • International Advanced Research Centre for Powder Metallurgy and New Materials, Hyderabad • Jadavpur University, Kolkata • National Institute of Technology, Jamshedpur • Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Shalimar • S. N. Bose National Center for Basic Sciences, Kolkata • Wildlife Institute of India, Dehradun	• Argonne National Laboratory, Argonne • Auburn University, Auburn • Boise State University, Boise • Harvard Medical School, Boston • Indiana University, Indianapolis • Michigan Technological University, Houghton • Montana Tech, Butte • Nanomechanics a KLA Tencor Company, Oak Ridge • Rochester Institute of Technology, Rochester • Smithsonian Conservation Biology Institute, National Zoological Park, Washington D.C. • SUNY Polytechnique Institute, New York • Texas A and M University, Texas • The Ohio State University, Columbus • The Samraksh Company, Dublin • University of Bridgeport, Mansfield • University of Buffalo, Buffalo • University of Hawaii at Manoa, Honolulu • University of Illinois at Chicago • University of Massachusetts, Dartmouth • University of Southern California, Los Angeles • University of Texas, Austin • Virginia Commonwealth University, Richmond

SECTION-II

INNOVATION AND ENTREPRENEURSHIP

Innovation and Entrepreneurship

Innovation supported by a vibrant entrepreneurial ecosystem will be the key to sucess in this era of rapid technological evolution.

IUSSTF supports a rich portfolio of programs to promote innovation and entrepreneurship. These initiatives are S&T driven and have the capability and potential to benefit not only our two countries, but the world at large.

IUSSTF provides grant-in-aid funding support to startups under the **United States India Science and Technology Endowment Fund (USISTEF),** which is our flagship program in the space of innovation and enterprise. This program enables bilateral teams from India and United States to translate S&T driven innovations into distinct market opportunities.

IUSSTF also implements the **India Innovation Growth Program (IIGP)** and **Women Entreprenuership Quest (WEQ)** in partnership with other Agencies and Ecosystem Partners. Both IIGP and WEQ are empowering mechanisms to recognise and reward outstanding innovations and innovators.

United States–India Science & Technology Endowment Fund (USISTEF)

The governments of the United States of America (through the Department of State) and India (through the Department of Science & Technology) established the **U.S. - India Science and Technology Endowment Fund (USISTEF)** for the promotion of joint activities that would lead to innovation and entrepreneurship through the application of science and technology.

Through a highly competetive process, USISTEF selects and supports financially promising Joint U.S.-India entreprenuerial initiatives on co-developing products or technologies that are beyond the ideation stage, high on societal impact and have significant potential to commercialize within 2-3 years. The projects are organized into two broad categories, namely "Empowering Citizens (EC)" and "Healthy Individuals (HI)".

USISTEF has supported 32 joint U.S. India Entrprenuerial Projects through 8 calls. The list of awards approved under the 9th call during the year 2018-19 is presented in *Annexure IV*.

Highlights of the Year

- The 9th Call for Proposals under USISTEF closed on 15th June 2018 and IUSSTF received 389 applications – 217 in the Healthy Individuals (HI) category and 172 in the Empowering Citizens (EC) category. As the first step, all 389 applications were screened internally by IUSSTF to examine eligibility. Following this, 210 applications in the HI category and 170 applications in the EC category were shortlisted for review by the Joint Expert Panel (JEP). The JEP shortlisted 48 proposals in the EC category and 44 in the HI category for Stage-I. These detailed proposals were then reviewed by the JEP and 12 applications in EC Category and 9 applications in HI category were invited for in-person presentations to the Joint Experts Panel (JEP) at Washington DC on 24-25 September 2018. The JEP shortlisted 9 projects (5 in HI and 4 in EC) for subsequent site-visits and Financial Due-Diligence.

- The Due-Diligence Committee met on 14th November 2018 and reviewed the 9 shortlisted projects. Following this, the 19th meeting of the USISTEF Board was held via DVC on 19th December 2018 and 6 Projects were selected for award.
- A Project Monitoring Committee meeting was held on 11th February 2019 at IUSSTF, New Delhi to review the progress of the selected USISTEF Projects under the 6th, 7th and 8th calls.
- The USISTEF Film on "Re-Motion Knee" won the Special Jury Award at 8th National Science Film Festival of India (NSFFI) 2018, held in Guwahati in February 2018.

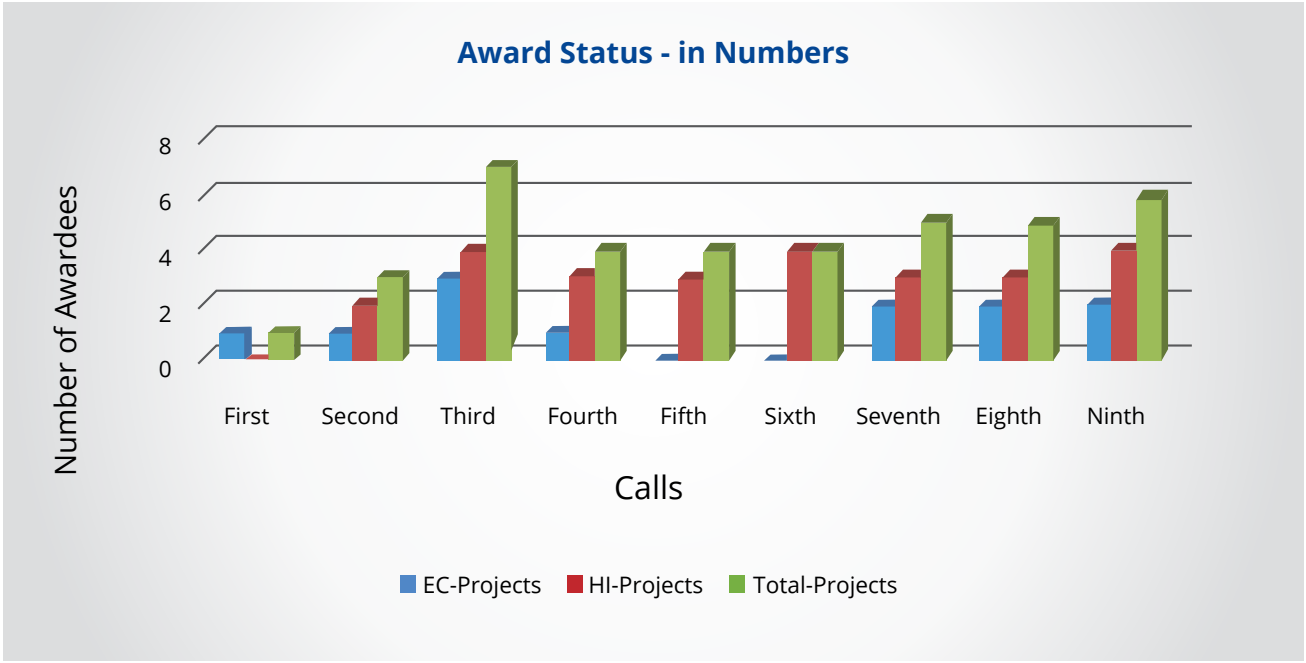
Product Launches

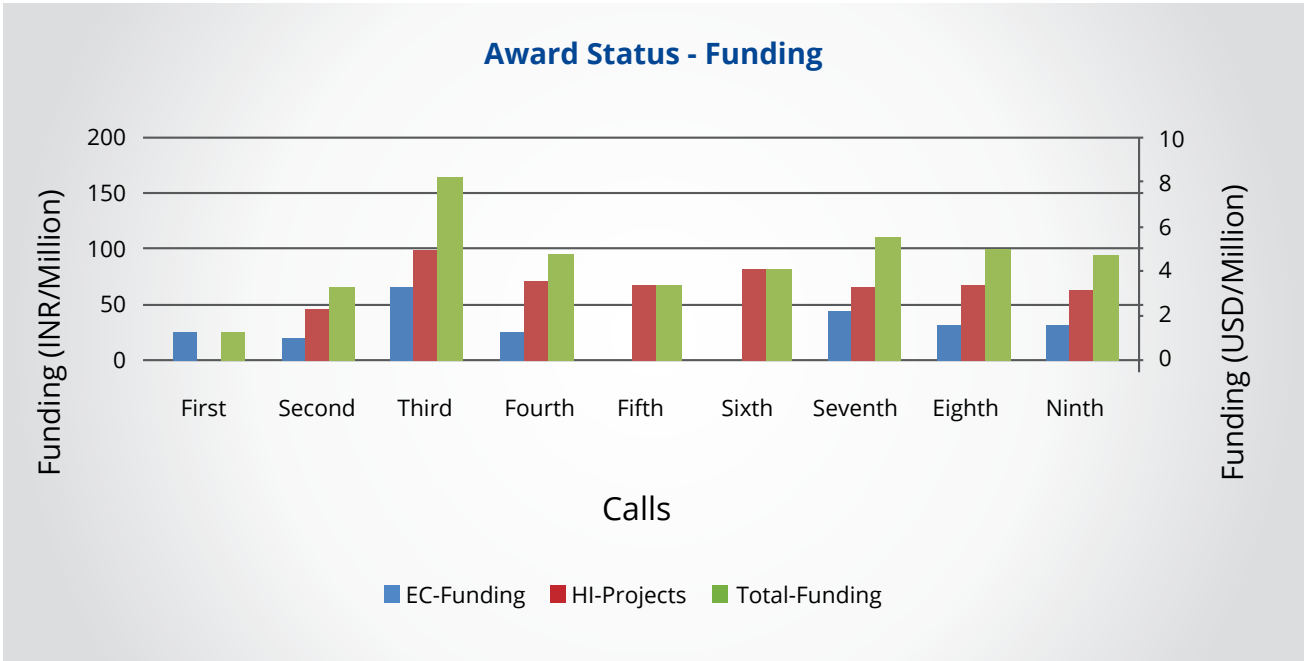
- "BrailleMe" - the world's most affordable digital braille aid in India was created with the aim of bringing the digital world to the fingertips of the visually impaired. BrailleMe has been developed through the collaboration between Innovision and Penn State University with funding support from the U.S.-India Science and Technology Endowment Fund (USISTEF).

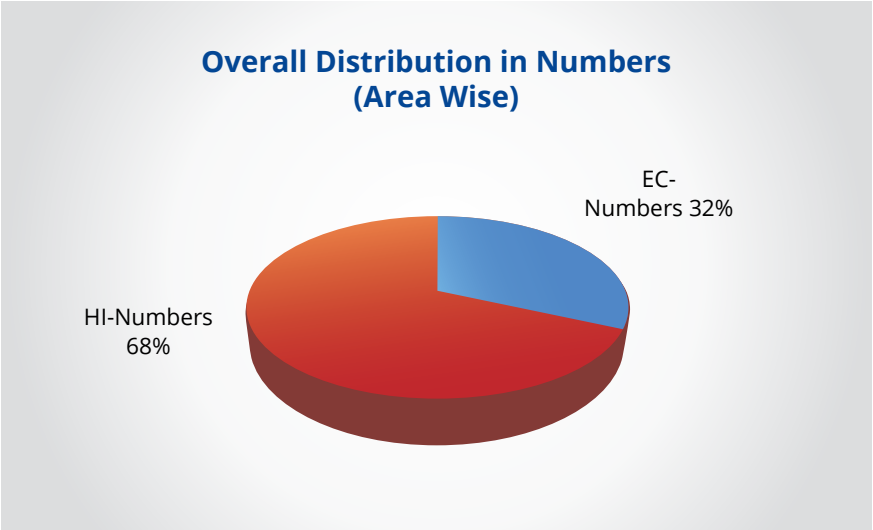
Overall Status Across all Calls

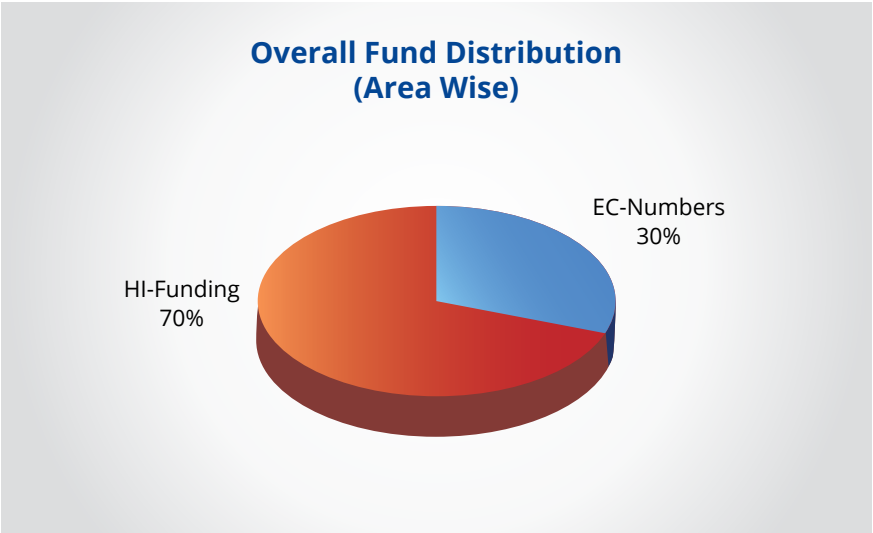
Calls	EC			HI			Total		
	Projects	Funding		Projects	Funding		Projects	Funding	
		(INR/ Million)	(USD/ Million)*		(INR/ Million)	(USD/ Million)*		(INR/ Million)	(USD/ Million)*
First	1	24.92	0.36	0	0.00	0.00	1	24.92	0.36
Second	1	20.32	0.29	2	46.51	0.67	3	66.83	0.97
Third	3	66.34	0.96	4	97.72	1.42	7	164.06	2.38
Fourth	1	24.8	0.36	3	70.96	1.03	4	95.76	1.39
Fifth	0	0.00	0.00	3	67.31	0.98	3	67.31	0.98
Sixth	0	0.00	0.00	4	81.28	1.18	4	81.28	1.18
Seventh	2	43.3	0.63	3	66.23	0.96	5	109.53	1.59
Eighth	2	32.7	0.47	3	67.9	0.98	5	100.6	1.46
Ninth	2	32.5	0.47	4	62.5	0.91	6	95	1.38
Total	**12**	**244.88**	**3.55**	**26**	**560.41**	**8.12**	**38**	**805.29**	**11.67**

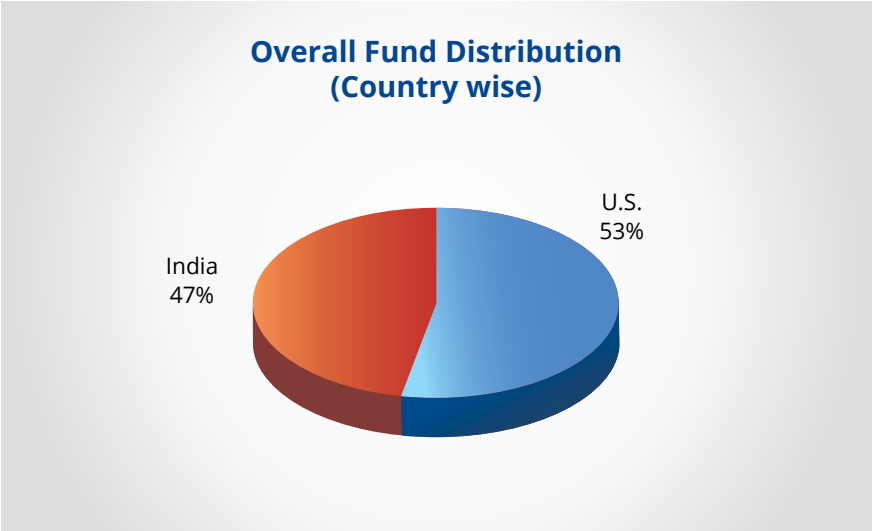
**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*


Award Status - in Numbers
Number of Awardees
8
6
4
2
0
First
Second
Third
Fourth
Fifth
Sixth
Seventh
Eighth
Ninth
Calls
EC-Projects
HI-Projects
Total-Projects


Award Status - Funding
Funding (INR/Million)
200
150
100
50
0
10
8
6
4
2
0
Funding (USD/Million)
First
Second
Third
Fourth
Fifth
Sixth
Seventh
Eighth
Ninth
Calls
EC-Funding
HI-Projects
Total-Funding







EC- Empowering Citizens
HI- Healthy Individuals

Women Entrepreneurship Quest (WEQ)

IUSSTF partnered with the National Science & Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), Government of India and the Anita Borg Institute (ABI), U.S.A. to enhance the ecosystem for women entrepreneurs in India through the **Women Entrepreneurship Quest (WEQ)** that is a unique business plan competition for women entrepreneurs in technology. The program is designed to reach out and identify talented women in the founding or leadership role of early-stage startups, who have applied technology in innovative ways to solve meaningful business problems and/or address societal issues.

Highlights of the Year

Out of the 25 women entreprenuers short-listed, 10 were selected for the Silicon Valley Experiential Visit. (List of awardees at *Annexure V*).

DST-Lockheed Martin India Innovation Growth Program (IIGP) 2.0

The 2018 Edition of the **India Innovation Growth Programme (IIGP) 2.0** was launched at the Rashtrapati Bhawan on 21st March 2018 during the concluding session of the Festival of Innovation; in the presence of Hon'ble President of India Shri Ram Nath Kovind. IIGP 2.0 (introduced in 2017) is an improved version of the Program leveraging learnings from the past decade. New components such as grants and incubation support have been added. TATA Trusts joined the newly revamped IIGP 2.0 along with founding stakeholders the Department of Science and Technology (DST) and Lockheed Martin Corporation, with a focus on innovations addressing socio-economic challenges. Partners have committed a funding support of US $ 2 million for the program.

The Indo-U.S. Science and Technology Forum and Federation of Indian Chambers of Commerce and Industry (FICCI) are the key implementation partners for IIGP 2.0.

Highlights of the Year

- Both in University and Open Innovation Challenge an online evaluation was conducted where each application was reviewed by multiple experts. From the pool of 3125 Applications (710 Applications under the University Challenge and 2415 Applications under the Open Innovation Challenge) and based on the evaluations, the top 40 in the university challenge were shortlisted and the top 50 in open innovation challenge were shortlisted respectively.
- The University Challenge competition was held at IIT Bombay from 29-30 June, 2018. The top 40 teams pitched to a jury of 7-8 members in each track. The jury then went on to select the top 15 teams (7 from social and 8 from industrial) for the final awards.

- At IIM Ahmedabad, a week-long bootcamp from 16-21 July, 2018 was held. The top 50 OIC 2018 teams and top 9 university challenge 2017 teams attended the bootcamp.

- Following a rigorous weeklong boot camp at IIM Ahmedabad, the 50 finalists of the IIGP 2.0 Open Innovation Challenge 2018 presented their innovations to an expert jury panel at an Innovators Competition on 1-2 August 2018 in New Delhi. The 4 top teams from the previous year's University Challenge also competed alongside the 50 finalists. The jury panel announced 16 teams (8 social, 8 industrial) as winners of the Open Innovation Challenge 2018.
- The IIGP 2.0 award ceremony was held on 2nd August, 2018 at Hotel Taj Mahal, New Delhi. The University Challenge winners and the Open Innovation Challenge were awarded. Ten winning teams of the 2017 edition of IIGP 2.0 also showcased their innovations on the side-lines.
- The awarded 16 teams were also sponsored for U.S. ecosystem learning visits to MIT and Harvard in the months of Sep-Oct 2018.

Make Tomorrow for Innovation Generation

'Make Tomorrow for Innovation Generation' is a public-private partnership initiated by National Council for Science and Technology Communication (NCSTC), Department of Science & Technology, Govt. of India and Intel® with IUSSTF as the implementation partner. It is also supported by NITI Aayog - Atal Innovation Mission. Designed to work with schools, teachers and maker spaces to skill youth on creating indigenous technology based solutions for local communities, this program was initiated to nurture and develop an innovation ecosystem in the country.

Under the aegis of the program, a series of 5 Rapid Prototyping Camps (RPCs) were held for students and teachers in 5 different locations – Dharamshala, Dehradun, Bhubaneshwar, Shillong and Jamshedpur. Each RPC was a 3- day residential event and had sessions on Design Thinking, Ideation, IPR, Copyright, etc.; Tech creation hands on activities/DIYs, through specially designed challenges and brief introduction about Atal Tinkering Labs. The sessions were designed in sync with the global learning path, and participants were guided by mentors experienced in conducting such workshops, together with local volunteers.

Post the camps, students were asked to identify problems in and around them and share their proposed solutions for the same online and a total of 415 ideas were received.

The ideas were judged online by a panel of judges and 50 ideas were shortlisted and invited for the National Showcase in Delhi during 1-4 December, 2018. During the showcase-cum-competition event, these projects were evaluated by a panel of experts and top 10 projects listed in *Annexure VI* were selected and felicitated during the Awards ceremony.

SECTION-III

RESEARCH AND DEVELOPMENT

Research and Development

IUSSTF supports a fairly broad portfolio of R&D programs in key strategic areas that are of mutual interest to both countries. The current portfolio includes programs like the **Joint Clean Energy Research and Development Centre (JCERDC)** - the second phase of **PACE-R on Smart Grid and Grid Storage; Partnership for International Research and Education, PACEsetter Fund** and **Real Time River Water and Air Quality Monitoring.**

Joint Clean Energy Research and Development Center (JCERDC)

The Indo-U.S. Joint Clean Energy R&D Centre (JCERDC) is a joint initiative of the Ministry of Science and Technology, Govt. of India and the U.S. Department of Energy. The program began in the year 2012 with IUSSTF as the implementing agency. The aim of the program was to facilitate joint research and development on clean energy technologies that may be deployed rapidly with the greatest impact. The JCERDC is based on a public-private partnership model of funding and is a first-of-its-kind initiative that has brought together more than 100 Indian and U.S. academic and industrial partners to work jointly in the space of clean energy research.

JCERDC Phase I

The three priority areas for cooperation under the first phase of the JCERDC were Solar Energy, Second Generation Biofuels, and Energy Efficiency of Buildings. The projects awarded under the First Phase were:

- The **Solar Energy Research Institute for India and the United States (SERIIUS),** co-led by the Indian Institute of Science at Bengaluru (IISc) and the National Renewable Energy Laboratory (NREL)
- The **U.S.-India Joint Centre for Building Energy Research and Development (CBERD)** co-led by CEPT University-Ahmedabad and the Lawrence Berkeley National Laboratory
- The **U.S.-India Consortium for Development of Sustainable Advanced Lignocellulosic Biofuel Systems** (**SALBS)** co-led by the Indian Institute of Chemical Technology-Hyderabad and the University of Florida-Gainesville

The above projects concluded after their 5 year tenures in March 2018. A Final Review Committee meeting for these projects was held at the IUSSTF Office, New Delhi on 25th March 2019. The committee was chaired by Prof. Anil Kakodkar (Chairman, Rajiv Gandhi Science & Technology Commission) and comprised of eminent experts from the relevant fields and representatives from Govt. of India and IUSSTF.

The Review Committee was of the opinion that the JCERDC model has been one of the largest and most succesful collaborative R&D initiatives. They noted that all three tracks had sucessfully achieved their objectives and mandates.

JCERDC Phase II

Based on the success of Phase I of the JCERDC, both countries decided to expand the "Partnership to Advance Clean Energy Research (PACE-R)" to two new research areas critical to improving the reliability, flexibility, and efficiency of the electricity delivery system: **Smart Grid and Energy Storage**. This initiative was envisaged to bring together top researchers from both countries and generate key technological advancements through collaborations between the U.S. and India. The U.S. Department of Energy and the Government of India (through Ministry of Science and Technology) each committed US$ 1.5 million per year over a five year period (with 50% cost share coming in from the consortium partners).

After a multi-level, bi-national review process, a consortium titled **"UI-ASSIST: U.S.-India collAborative for smart diStribution System wIth Storage"** led in India by Prof. Suresh C. Srivastava from the Indian Institute of Technology (IIT) Kanpur and in the United States by Prof. Noel Schulz from Washington State University, Pullman, was selected and awarded in September 2017.

Institutional Engagement: UI-ASSIST

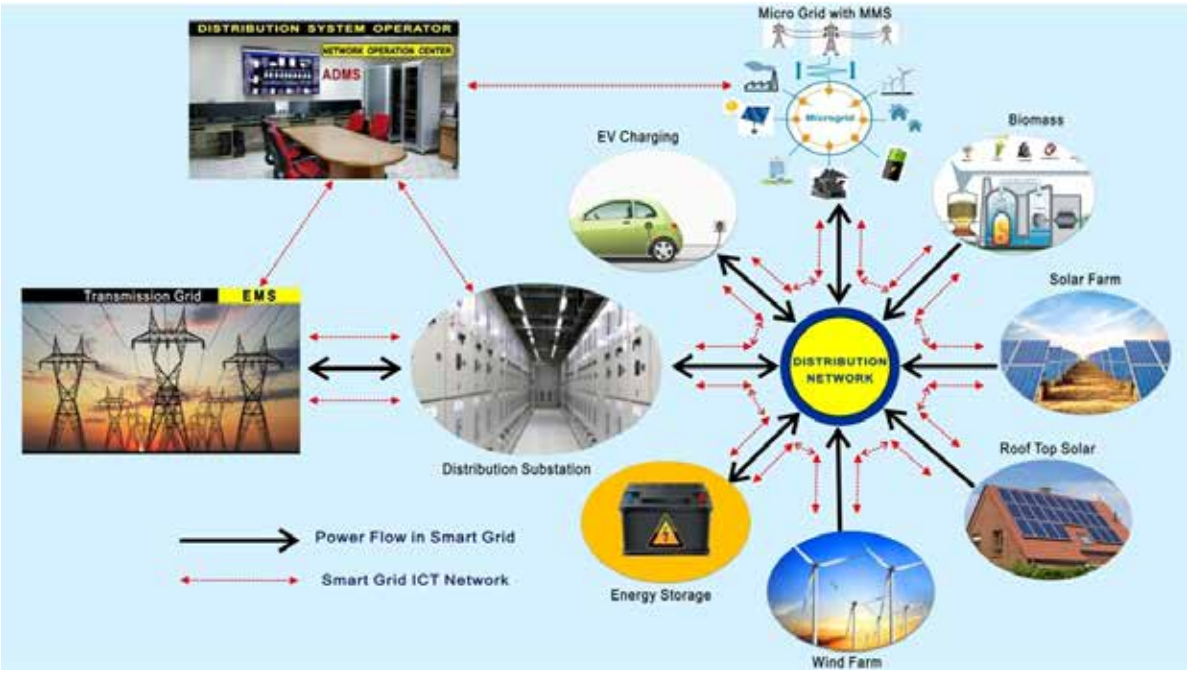
India	USA
• Indian Institute of Technology, Kanpur • Indian Institute of Technology, Delhi • Indian Institute of Technology, Madras • Indian Institute of Technology, Roorkee • Indian Institute of Technology, Bhubaneswar • The Energy and Resources Institute, New Delhi • NTPC Energy Technology Research Alliance, Greater Noida • BSES Rajdhani Power Ltd., New Delhi • UP Power Corporation Limited, Lucknow • Power Grid Corporation of India Limited, Gurgaon • Customized Energy Solution, Pune • GE Global Research, Bengaluru • Synergy Systems and Solutions, Gurgaon • Mindteck, Bengaluru • Panasonic India Pvt. Ltd., Gurgaon	• Washington State University, Pullman • Massachusetts Institute of Technology, Cambridge • Texas A&M University, College Station • Hawaii Natural Energy Institute, Honolulu • Idaho National Laboratory, Idaho Falls • Lawrence Berkeley National Lab, Berkeley • Snohomish County Public Utility District, Everett • AVISTA Utilities, Spokane • Burns and McDonnell, Kansas City • ETAP, Operation technology, Inc., Irvine • National Rural Electric Cooperative Association, Arlington • GE Grid Solutions, Redmond • Clean Energy Storage, Inc., Temecula • ABB Inc, Sugarland • Philadelphia Navy Yard, Philadelphia

Objective of UI-ASSIST

- To evolve future distribution grid that will allow the continuing increase of Distributed Energy Resources (DER) penetration towards a carbon-free electricity system.
- To develop and demonstrate the Distribution System Operator (DSO) functions for optimal utilization and management of DER by interfacing with DER control and microgrid control system with high penetration of energy storage.

Scope

- R&D Activities on Microgrid and Active Distribution Network Concepts, Storage Optimization and Management, Electric Vehicle and Renewable Integration, Microgrid and Advance Distribution Management Systems, Cyber-security Measures, Market and Policy Issues.
- Lab scale pilots for proof of concepts, and 5 field pilots, each in U.S. and India, for demonstration in rural, semi-urban and urban areas.
- Manpower training in Smart Grid area.



Highlights under the project

S.No.	Details	Numbers
1	Papers published in Journals	12
2	Papers presented in Symposia/ Conferences	37
3	Joint workshops conducted	1
4	Scientists/Faculty Exchange visits undertaken	6
5	Researcher/Student Exchange visits undertaken	3

Events

- The first Joint Meeting of India and U.S. Consortia Members was held during 2-3 August, 2018, at Portland, Oregon, U.S.A. It was organized by Washington State University, and attended by 14 persons from the Indian consortium including 5 Ph. D. students, Dr. Rajiv K. Tayal from IUSSTF, Dr. Sanjai Bajpai from DST, and Dr. M. Ramamoorty, Member Advisory Board from India. More than 35 persons attended from the U.S. including consortia members from different organizations, Advisory Board Members, students and staff. Michael Pesin, Merrill Smith and Elena Thomas-Kerr from the U.S. Department of Energy also attended the meeting. On 2nd August, 2018, a brief meeting with the U.S. leads and Indian team was held, followed by a reception to network for the participants from India and the U.S. The full day workshop on the project activities was held on 3rd August, 2018.

- A Film on the JCERDC Program was screened during the workshop in Portland. The film covered the overarching objectives of the program, the objectives of the 4 projects awarded thus far and the key outcomes under each of them.

- As part of the JCERDC, UI-ASSIST project activities, a two days' workshop on 'Smart Grid Technology' was held during 13-14 Feb, 2019 at IIT Delhi. Over 60 participants mainly from utilities, industries and R&D organizations were present for the workshop.
- The First Project Monitoring Commitee of the project was held on the 15th Feb 2019 at IIT Delhi. The meeting was chaired by Prof. Ramamoorthy, Former Chancellor, K. L. University, Vijayawada, Andhra Pradesh and attended by domain experts and consortium members.

Research Initiative for Real-time River Water and Air Quality Monitoring

Recognizing the importance of developing online River Water and Air Quality Monitoring (WAQM) systems, the Department of Science and Technology (DST), Government of India and Intel® have collaborated to jointly initiate the **Research Initiative for Real-time River Water and Air Quality Monitoring.** The intent is to develop tools and constituent blocks that will enable end-to-end water and air quality monitoring systems on smart, networked, low cost, low power sensor nodes with large-scale cloud based data analysis. The program is administered by IUSSTF. Under the WAQM call, four projects were identified for award (*Annexure VII*) of these two have been funded under 'Air' and two under 'Water' Quality Monitoring categories respectively.

Highlights of the Year

The first and the second Project Monitoring Committee Meetings were held at IUSSTF on 15th June 2018 and 7th December 2018 respectively, to review the scientific outcomes of the four awarded projects and monitor their progress in conformity with the milestones, targets and objectives, and also to assess the global developments impacting the domain of the Projects.

Indo-U.S. PACEsetter Fund

The Ministry of New and Renewable Energy (MNRE), Govt. of India and the U.S. Embassy support the **PACEsetter Fund (PSF)** that is an INR 50 crore (USD 7.9 million) fund jointly capitalized by the Governments of the India and the United States of America. The Fund's main purpose is to improve the viability of off-grid renewable energy businesses that sell small scale (under 1 megawatt) clean energy systems to individuals and communities without access to grid connected power or with limited/intermittent access (less than 8 hours per day). IUSSTF is the administrator of the fund.

Highlights of the Year

- A Techno-Financial Expert Commitee Meeting (TFC) was held on 19th November 2018 at IUSSTF to review 22 detailed proposals out of the 26 shortlisted EoI's under PSF-Round II and monitor the progress of four projects supported under the PSF-Round I. Based on the technical merit, innovativeness, feasibility of real-time application, possibility to scale-up as a marketable product, credentials of the applicant and organization etc. 14 proposals were shortlisted for Techno-Financial Presentation in front of the Commitee.
- On 19th February 2019, a Techno-Financial Expert Commitee Meeting (TFC) was held at IUSSTF. 12 project teams presented their technology, objectives, milestones, deliverables and finances. The recommendation of the TFC has been put forth to the steering committee for selection of awards.

Partnerships for International Research and Education (PIRE)

PIRE or **Partnerships for International Research and Education is** the U.S. National Science Foundation's (NSF's) flagship international program to support high quality research and education projects across all disciplines. The program aims to leverage the resources of individual funding agencies towards advancement of knowledge and the individual efforts of research groups cutting across national boundaries. The Science and Engineering Research Board (SERB) entered into a formal understanding with NSF to partner for the PIRE program. IUSSTF is the implementation partner for the program on behalf of SERB.

Progress thus far

A current ongoing project under the PIRE program is the Project that was selected for award 2014-15 titled, "GROWTH: Global Relay of Observatories Watching Transients Happen". GROWTH is an international collaborative network of astronomers and telescopes dedicated to the study of short lived cosmic transients. The partners under the project are: ***India:*** Inter-University Centre for Astronomy and Astrophysics; ***U.S.A:*** San Diego State University, University of Maryland, Pomona College, University of Wisconsin, Los Alamos National Laboratory; ***Japan:*** Tokyo Institute of Technology; ***Sweden:*** Oscar Klein Center at Stockholm University; ***Israel:*** Weizmann Institute of Science; ***Taiwan:*** National Central University; ***Germany:*** Humboldt University of Berlin

Left: *Inside the dome of GROWTH-India telescope at Hanle;* ***Right:*** *Omega Nebula captured by GROWTH-India telescope at Hanle in Ladakh.*

A fully robotic optical research telescope designed to capture cosmic events occurring in timescales much shorter than light years – years, days and even hours has been set up in Hanle, Ladakh, India. Together with partner telescopes strategically located around the world, continous monitoring of the sky uninterrupted by daylight would be possible. An extension for two years was granted to the project considering the progress made during the first three years of the project tenure.

SECTION-IV

VISITATIONS AND FELLOWSHIPS

Visitations and Fellowships

It has been unambiguously demonstrated that providing students and young scientists with an exposure to cutting-edge scientific research experiences at a formative stage not only broadens their intellectual horizons but also leads to increased engagements in scientific and technological research careers. A key area of focus is also to bring talented American students to research laboratories in India to build a deeper appreciation of the culture of innovation and long-standing tradition of scientific enquiry in India.

IUSSTF collaborates with several Federal agencies, Industry, Professional Bodies and Not-for-profit Organizations to administer a large number of Visitation Programs, across various domains and stakeholder levels.

Overall Matrix of Visitation Programs

S.No.	Name of Program	Partners*	Area	No. of Internships/ Fellowships
1	Indo-U.S. Genome Engineering/ Editing Technology Initiative (GETin)	DBT	Genome engineering/ editing technology	5 Student Internships; 5 Overseas Fellowships; 5 Visiting Fellowships;
2	Indo-U.S. Fellowship for Women in STEMM (WISTEMM)	DST	Science, Technology, Engineering, Mathematics and Medicine	10 Student Internships; 10 Overseas Fellowships
3	Water Advanced Research and Innovation (WARI) Fellowship	DST, UNL and DWFI	Water Science and Engineering	5 Student Internships; 5 Fellowships
4	Bhaskara Advanced Solar Energy (BASE) Fellowship	DST	Solar Energy	7 Student Internships; 7 Fellowships
6	Bioenergy-Awards for Cutting Edge Research (B-ACER)	DBT	Biofuel and Bioenergy	5 Student Internships; 5 Fellowships
7	Building Energy Efficiency Higher & Advanced Network (BHAVAN) Fellowships	DST	Building Energy Efficiency	7 Student Internships; 7 Fellowships
8	IUSSTF–American Physical Society Fellowships	APS	Physics	4 Professorships; 4 Fellowships
9	ASM-IUSSTF Indo-US Professorship in Microbiology	ASM	Microbiology	Upto 5 Professorships
10	Research Internships in Science and Engineering		All areas of Science and Technology	Upto 30 Internships
11	Graduate Research Opportunities Worldwide (GROW)	SERB and NSF	All areas of Science and Technology	Upto 10 Fellowships
12	Khorana Program for Scholars	DBT and WINStep Forward	Life Sciences	50 Student Internships

S.No.	Name of Program	Partners*	Area	No. of Internships/ Fellowships
13	IUSSTF-Viterbi Program	USC	Electrical Engineering, Computer Sciences and Computational Sciences.	20 Student Internships
14	S.N. Bose Scholars Program	SERB and WINStep Forward	All areas of Science and Technology (except Life Sciences)	50 Student Internships
15	Initiative for Research & Innovation in Science (IRIS) *(Details provided in Annexure VIII)*	NCSTC, DST and Intel® through Intel® India	All areas of Science and Technology	For High School Students

*PARTNERS

- APS - American Physical Society
- ASM - American Society for Microbiology
- DBT - Department of Biotechnology, Govt. of India
- DST - Department of Science and Technology, Govt. of India
- DWFI - Robert B. Daughtery Water for Food Institute at the University of Nebraska
- NCSTC - National Council for Science & Technology Communication, Govt. of India
- NSF - National Science Foundation (NSF)
- SERB - Science and Engineering Research Board, Govt. of India
- UNL - University of Nebraska- Lincoln
- USC - University of Southern California, Los Angeles

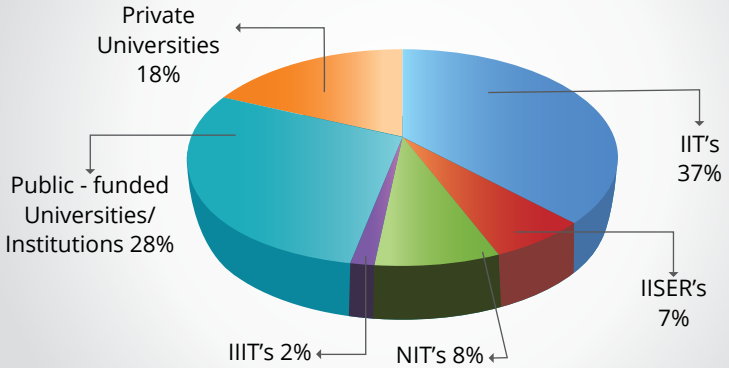
Highlights of the Year

Actual Number of Exchanges	
	Numbers
India to U.S.	
• Undergraduate/Postgraduates	114
• Doctoral	52
• Post-Doctoral	31
• Professorship	4
Sub-Total	**201**
U.S. to India	
• Undergraduate/ Postgraduates	6
• Doctoral	9
• Post-Doctoral	5
• Professorship	5
Sub-Total	**25**
Total Number of Exchanges in 2018-19	**226**

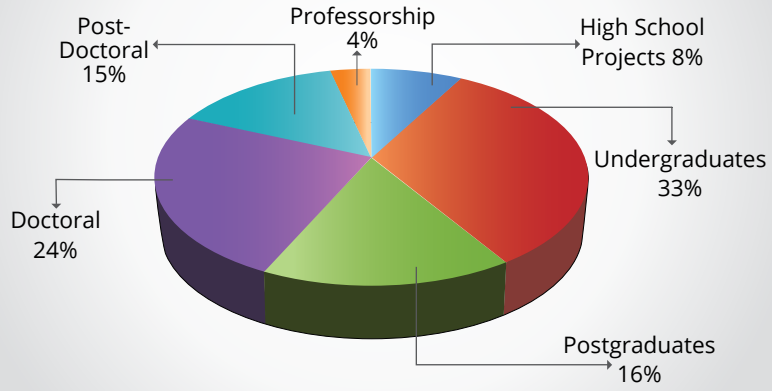
Distribution Across Institutions	
Host Institution	**Numbers**
• American	87
• Indian	14
Total	**101**

Top Host Institutions	
U.S.	**INDIA**
• Carnegie Mellon University • Harvard University • Johns Hopkins University • Lawrence Berkeley National Laboratory • Massachusetts Institute of Technology • Northwestern University • Purdue University • Stanford University • Texas A&M University • The Ohio State University • University of California, Davis • University of California, San Diego • University of Chicago • University of Maryland • University of Michigan, Ann Arbor • University of Minnesota • University of Nebraska-Lincoln • University of Southern California • University of Wisconsin - Madison	• Bhaskaracharya College of Applied Sciences, University of Delhi • ICAR, Central Institute for Research on Buffaloes, Hisar • Indian Institute of Astrophysics, Bengaluru • Indian Institute of Science Education and Research, Pune • Indian Institute of Science, Bengaluru • Indian Institute of Technology, Bombay • Indian Institute of Technology, Kanpur • Institute of Trans-Disciplinary Health Sciences and Technology (TDU), Bengaluru • National Centre for Biological Sciences- Tata Institute of Fundamental Research (NCBS-TIFR), Bengaluru • Shroff Eye Hospital, New Delhi • Tibetan Delek Hospital, Dharamsala • University of Delhi, South Campus

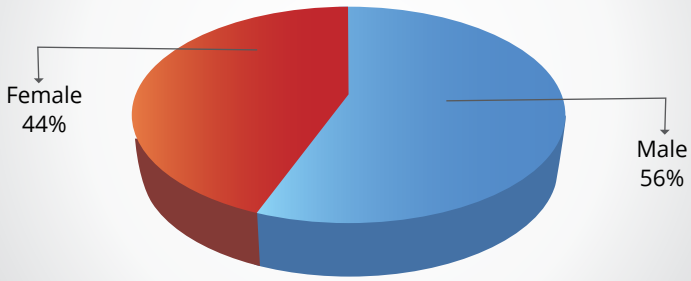
2018-19 Fellows/Interns: Parent Institutes in India



2018-19: Number of Interships/Fellowships and Professorships supported



Gender Distribution among the Visitation Program Awardees



SECTION-V

PROMOTION, SHOWCASING, OUTREACH AND EVENTS

a. Promotion and Showcasing

- On 4th February 2019, ***Dr. Thomas M. Connelly***, Executive Director and Chief Executive Officer of the *American Chemical Society (ACS),* and ***Dr. Rajiv Kumar Tayal***, Executive Director of the *Indo-US Science and Technology Forum (IUSSTF),* signed a memorandum of understanding (MoU). The MoU establishes the intent to collaborate in areas seeking to focus on the United Nations Sustainable Development goals (subject to the availability of requisite funding).

- The Hon'ble Minister of Science & Technology, Govt. of India- ***Dr. Harsh Vardhan*** and U.S. Secretary for Energy- ***Mr. Rick Perry*** met on 16th April 2018 in New Delhi to discuss future prospects of Collaboration in the field of *Clean Energy Research* and strengthen and widen the existing ties between the United States and India. The possibility to add new areas of research cooperation in clean coal, carbon capture and accessible and affordable water was also discussed. These areas will be in addition to strengthening ongoing partnerships under PACE-R.

b. Outreach

IUSSTF currently has a fairly active stakeholder base of at least 5000 individuals and 600 institutions in India and the United States. Additionally, IUSSTF has touched upon the lives of more than 20,000 people during the course of its journey over the last nineteen years. The following are some of the key outreach activities during the last year:

- **Dr. Rajiv K. Tayal,** *Executive Director, IUSSTF,* interacted with **Prof. Kumble R. Subbaswamy**, *Chancellor*, **Dr. Michael F. Malone**, *Vice Chancellor for Research & Engagement*; **Prof. Timothy J. Anderson**, *Dean* and **Prof. Russell Tessier**, *Associate Dean* at the *University of Massachusetts* at Amherst. He also made a brief presentation to the faculty titled "*Indo-U.S. Science and Technology Forum: Catalysing bilateral collaborations for over 18 years!*" at the *UMass Campus*.
- On 7th August 2018 **Dr. Tayal** met **Dr. Tom Wang,** *Director, and Centre for Science Diplomacy*, American Association for the Advancement of Science (AAAS) and **Julia Mackenzie**, *Director of International Relations*, *AAAS* to discuss possible visitation initiatives and engagement opportunities with regard to Science Policy between AAAS and DST/ IUSSTF.
- **Dr. Tayal** met with, the ACS Leadership on the 8th August 2018 including, **Dr.Thomas M. Connelly Jr.**, *Executive Director/Chief Executive Officer;* **Flint Lewis**, *ACS Secretary;* **Glenn Ruskin,** *Senior Director*, **Bradley Miller**, *Chief International Officer & Director of International Activities* to discuss ongoing and existing programs and opportunities. He also met **Anirban Mahapatra**, *Assistant Director, Biological Chemistry, Publications Division* and **Erin Wiringi**, *Director, Marketing Communications and Community Development, Publications Division*.

- **Dr. Chaitali Bhattacharya** *(Principal Science Officer, IUSSTF)* and **Ms. Subhashree Basu** *(Associate Program Officer, IUSSTF)* were invited to the **Science and Research Opportunities Young Investigator Meeting - Chicago (Sci-ROI YIM-C),** Third Annual event held on 7-9 September 2018 at the University of Chicago. They spoke on Indo-U.S. Partnership Models and the manifold avenues available for bilateral S&T Collaborations.

- Since its inception in the year 2000, IUSSTF has played a pivotal role in catalyzing strategic partnerships in science, technology and innovation between India and the United States. IUSSTF has provided a platform to thousands of Indian and American scientists, engineers, entrepreneurs and students to collaborate and enable the creation of sustainable and vibrant linkages between the two nations, as well as build long-term Indo-American science and technology relationships. The vision and mission of the **Scout for Partnerships, Resource and Knowledge– "SPARK"** is to create a virtual-seamless network of IUSSTF stakeholders across India and the United States. This unique platform will enable Members to establish new connections, explore new opportunities, have creative discussions about topical issues, and build a committed transatlantic grid of scientists, engineers and entrepreneurs. At the same time, it will allow IUSSTF to re-establish and re-affirm our ties with our valued stakeholders/patrons.

Board Meetings

- The Ninteenth Governing Body Meeting of the Indo-U.S. Science and Technology Forum was convened at New Delhi on **12th March 2019** under the Co-Chairmanship of **Prof. Indranil Manna,** JC Bose Fellow & Institute Chair Professor, IIT Kharagpur (Indian Co-Chair) and **Dr. Jonathan Margolis,** Acting Deputy Assistant Secretary for Science, Space, and Health, Bureau of Oceans and International Environmental and Scientific Affairs (U.S. Co-Chair). **Prof. Ashutosh Sharma,** Secretary DST, along with all Board Members had made valuable contributions in the proceedings.

- The **Nineteenth Meeting** of the **U.S.-India Science and Technology Endowment Board (USISTEB)** was held via DVC on 19th December, 2018 under the Co-Chairmanship of **Mr. H. K. Mittal,** Head, National S & T Entrepreneurship Development Board, Department of Science & Technology, Govt. of India (Indian Co-Chair) and **Mr. J. Robert Garverick,** Minister Counselor, Economic, Environment, Science & Technology Affairs, U.S. Embassy, New Delhi (U.S. Co-Chair) to take a final decision on the projects to be awarded under the 9th Call.

SECTION-VI

MONEY MATTERS

Money Matters

IUSSTF receives funding from three broad channels

- Direct support from the U.S. Government
- Direct support from the Indian Government
- Extra Mural Programs (EMPs)

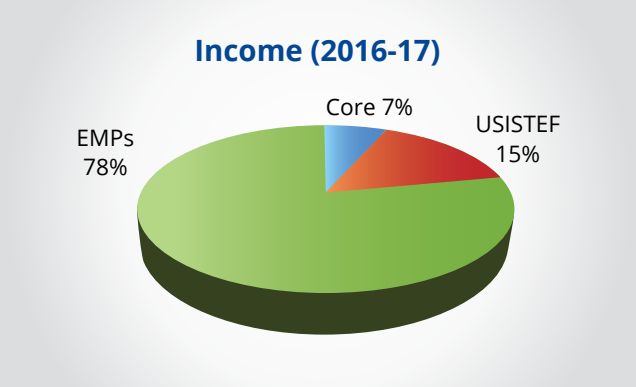
The support from the U.S. Government comes by way of annual interest on two separate Endowments (IUSSTF and USISTEF), to which the Indian Government provides matching grants annually.

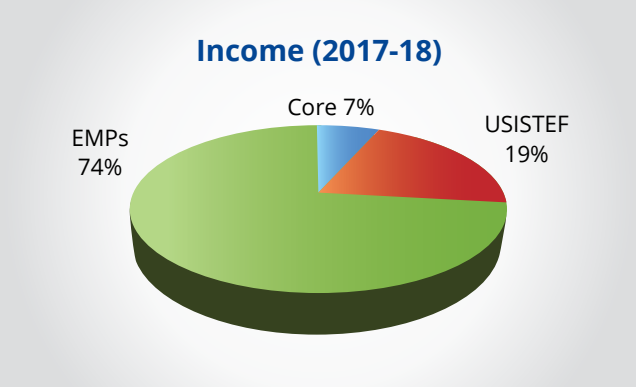
Support for the EMPs is received from various federal agencies such as DST, DBT, MNRE, SERB and Industries like Intel® and Lockheed Martin. Such support is provided in project mode for the implementation of specific program(s).

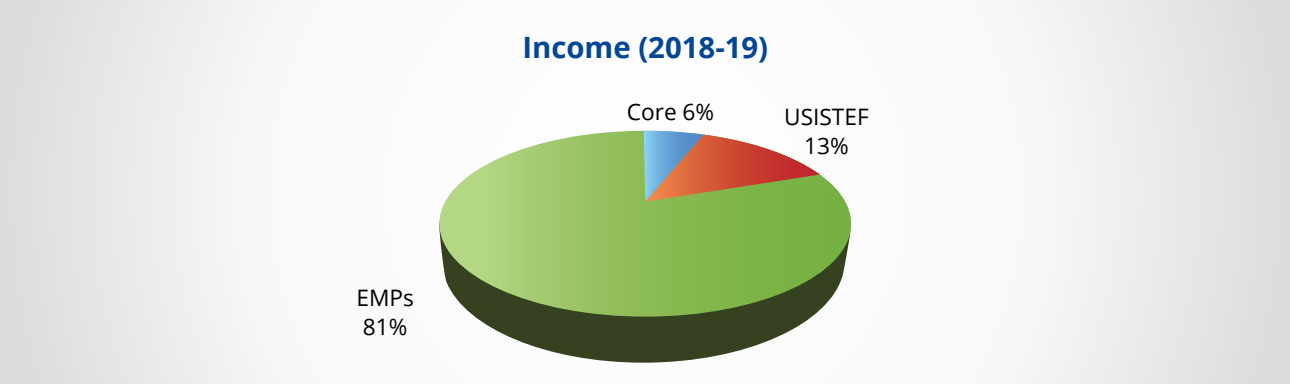
(A) Overall Income (2016-2019)

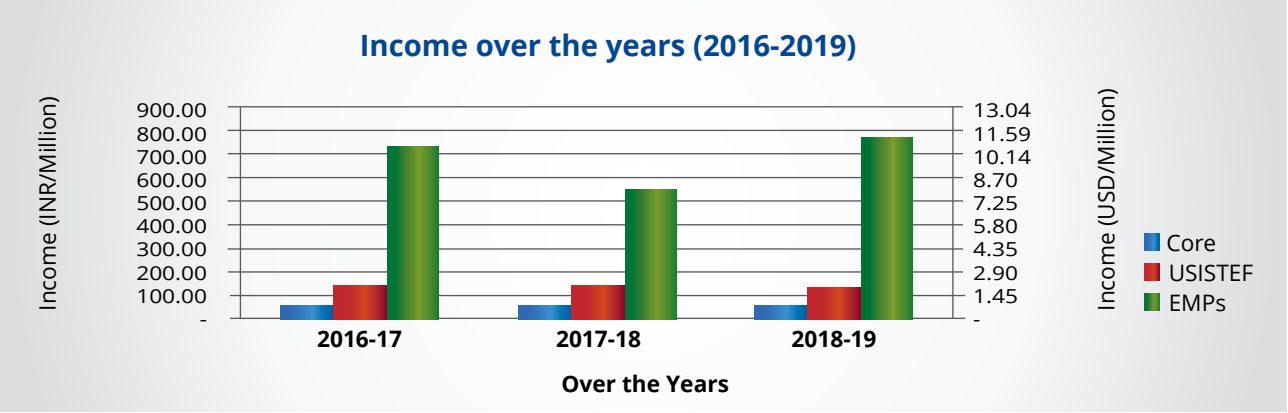
S.No.	Head	2016-17		2017-18		2018-19	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Core	60.76	0.87	53.34	0.77	53.38	0.77
2	USISTEF	143.73	2.08	143.93	2.09	129.49	1.88
3	EMPs	737.82	10.69	557.18	8.08	774.88	11.23
TOTAL		**942.31**	**13.66**	**754.45**	**10.93**	**957.75**	**13.88**

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*







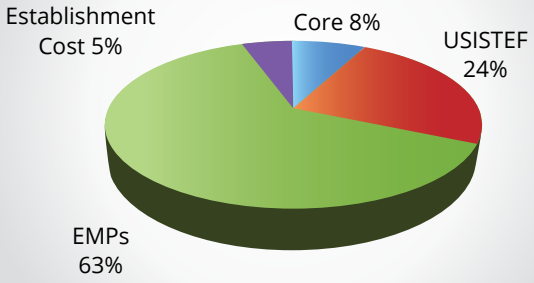


(B) Overall Expenditure (2016-2019)

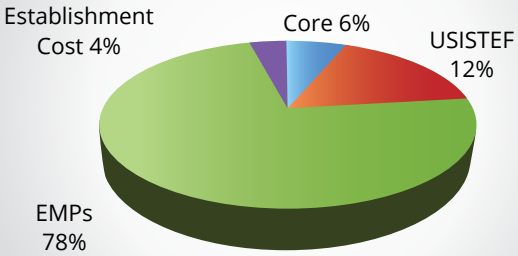
S.No.	Head	2016-17		2017-18		2018-19	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Core	47.06	0.68	47.65	0.69	45.18	0.65
2	USISTEF	147.59	2.14	96.82	1.40	92.22	1.34
3	EMPs	383.04	5.55	639.50	9.27	579.76	8.40
4	Establishment Cost	28.30	0.41	37.14	0.54	35.11	0.51
	TOTAL	**605.99**	**8.78**	**821.11**	**11.90**	**752.27**	**10.90**

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*

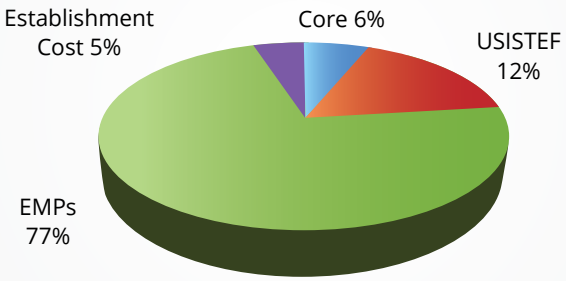
Expenditure (2016-17)



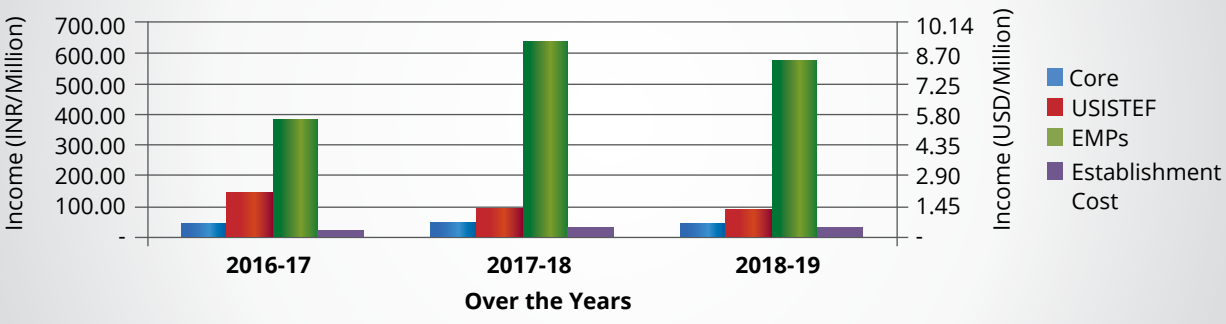
Expenditure (2017-18)



Expenditure (2018-19)



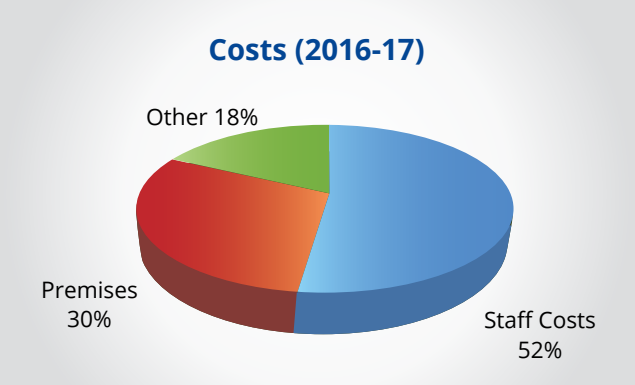
Expenditure over the years (2016-2019)

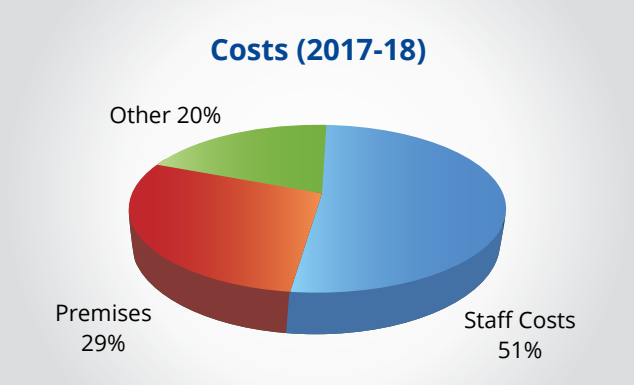


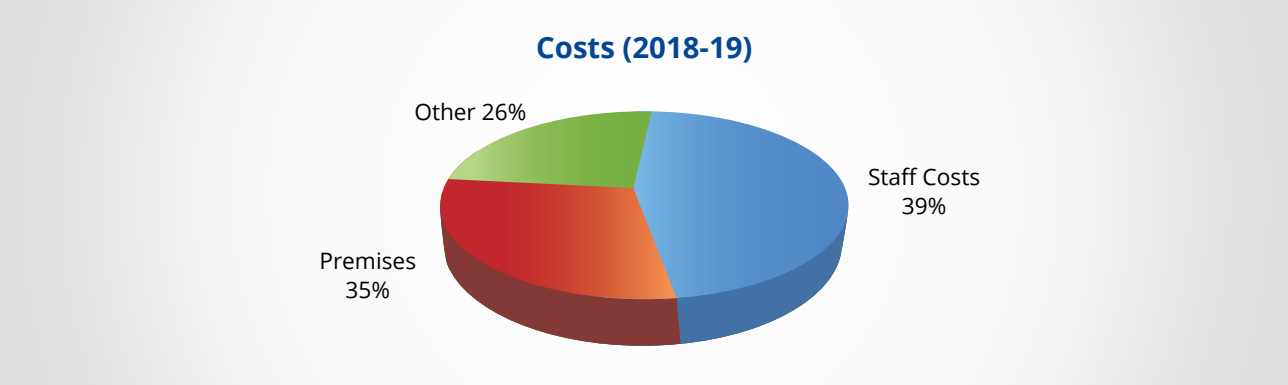
(C) Establishment Cost (2016-2019)

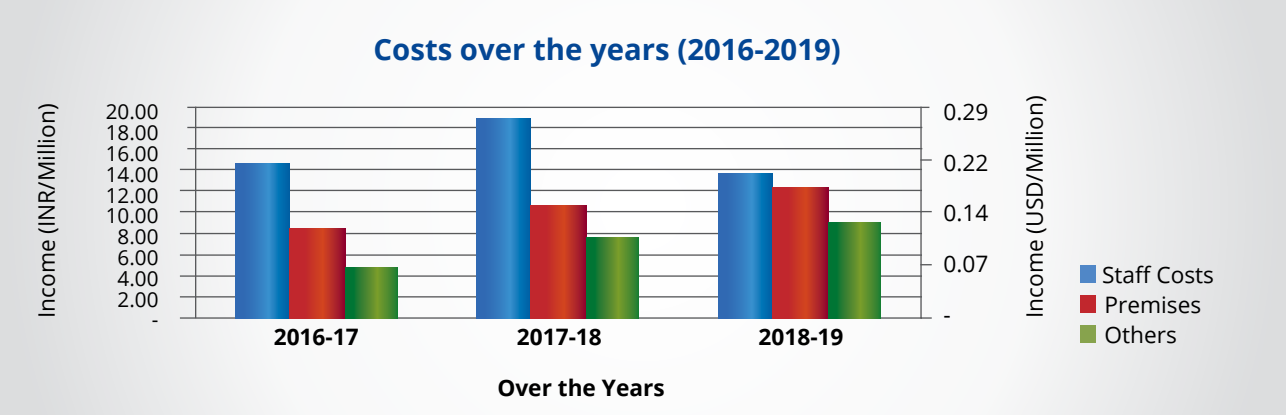
S.No.	Head	2016-17		2017-18		2018-19	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Staff Costs	14.79	0.21	18.95	0.27	13.72	0.20
2	Premises	8.50	0.12	10.70	0.16	12.29	0.18
3	Others	5.01	0.07	7.49	0.11	9.10	0.13
	TOTAL	**28.30**	**0.41**	**37.14**	**0.54**	**35.11**	**0.51**

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*





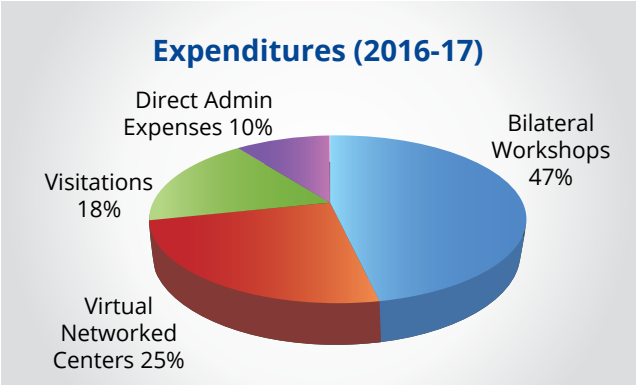


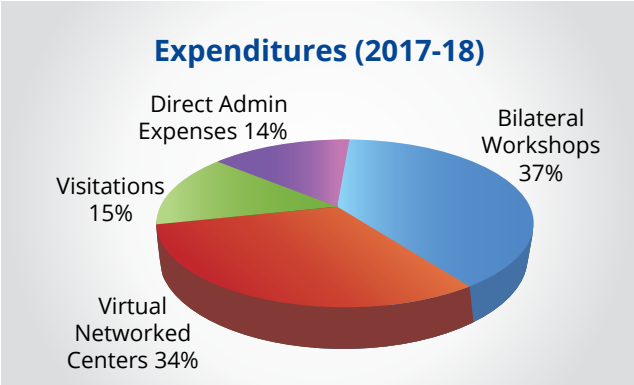


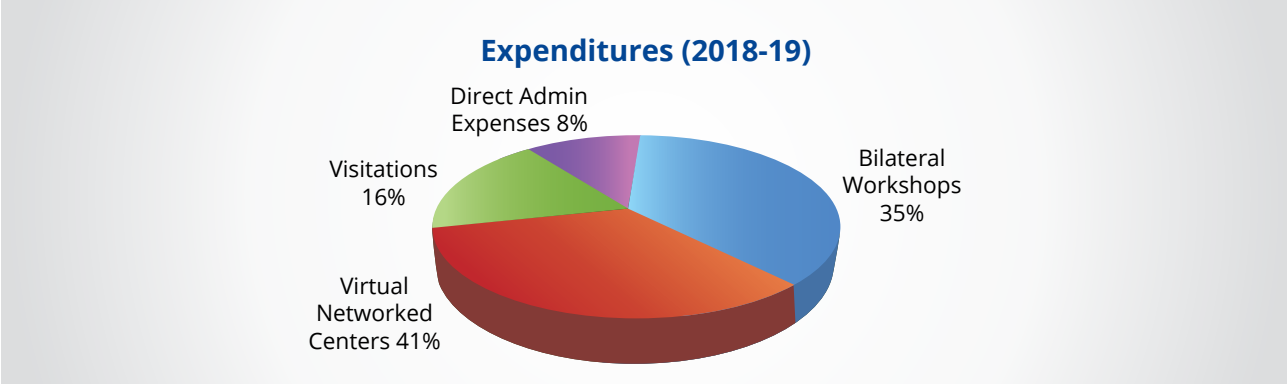
(D) Expenditures - IUSSTF Core Programs (2016-2019)

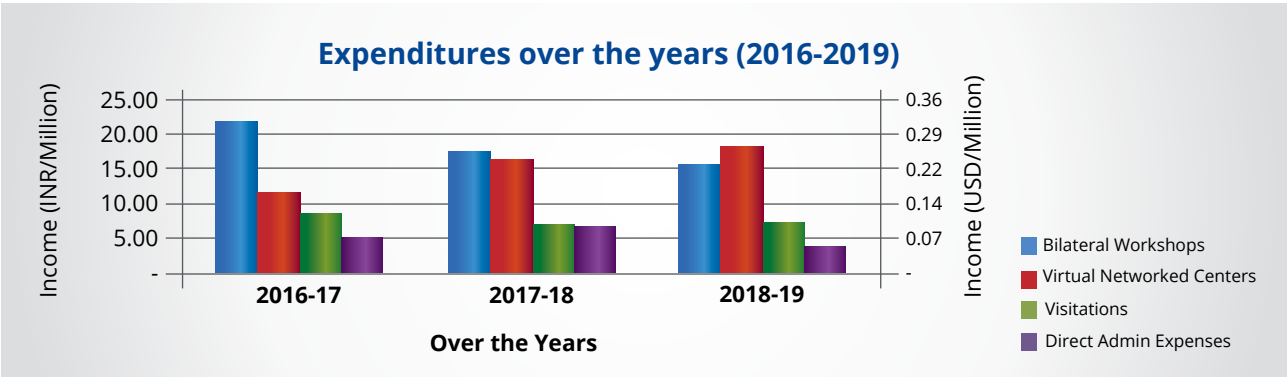
S.No.	Head	2016-17		2017-18		2018-19	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Bilateral Workshops	21.87	0.32	17.52	0.25	15.73	0.23
2	Virtual Networked Centers	11.78	0.17	16.39	0.24	18.33	0.27
3	Visitations	8.54	0.12	7.01	0.10	7.29	0.11
4	Direct Admin Expenses	4.87	0.07	6.73	0.10	3.83	0.06
	a) Governing Body Meetings	*3.78*	*0.05*	*3.10*	*0.04*	*2.70*	*0.04*
	b) Foundation Day Expenses	*-*	*-*	*2.07*	*0.03*	*-*	*-*
	c) Outreach Expenses etc.	*1.09*	*0.02*	*1.56*	*0.02*	*1.13*	*0.02*
	TOTAL	**47.06**	**0.68**	**47.65**	**0.69**	**45.18**	**0.65**

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*





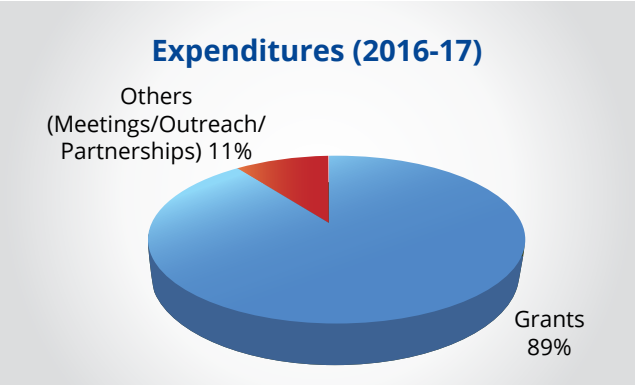


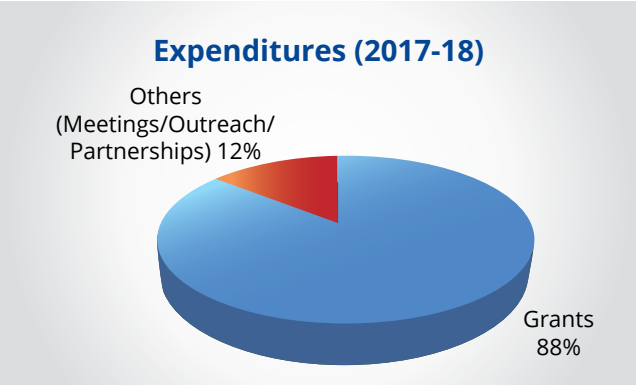


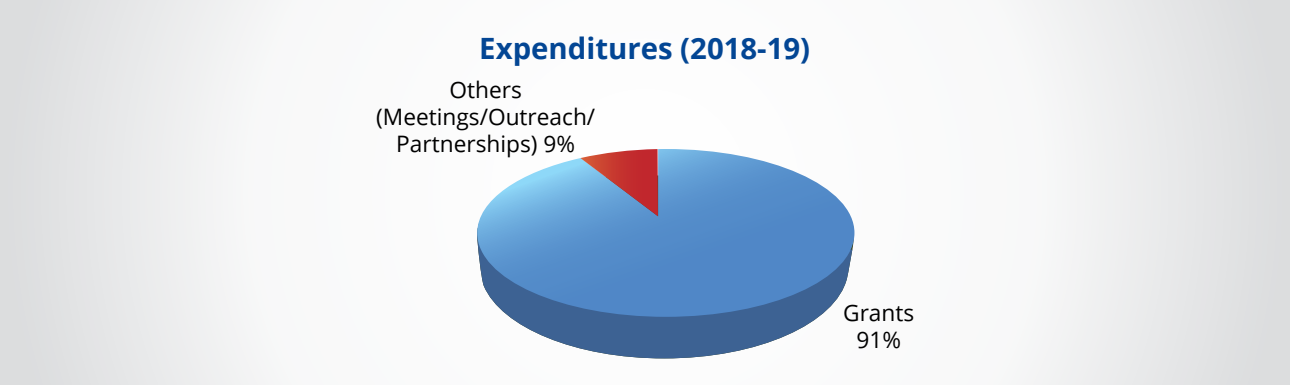
(E) Expenditures - USISTEF (2016-2019)

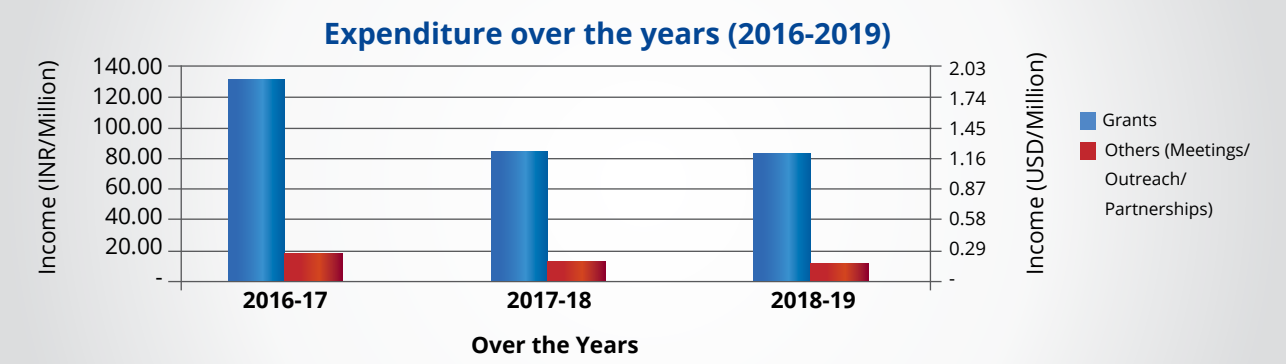
S.No.	Head	2016-17		2017-18		2018-19	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Grants	130.66	1.89	85.05	1.23	83.86	1.22
2	Others (Meetings/ Outreach/ Partnerships)	16.93	0.25	11.77	0.17	8.36	0.12
	TOTAL	**147.59**	**2.14**	**96.82**	**1.40**	**92.22**	**1.34**

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*





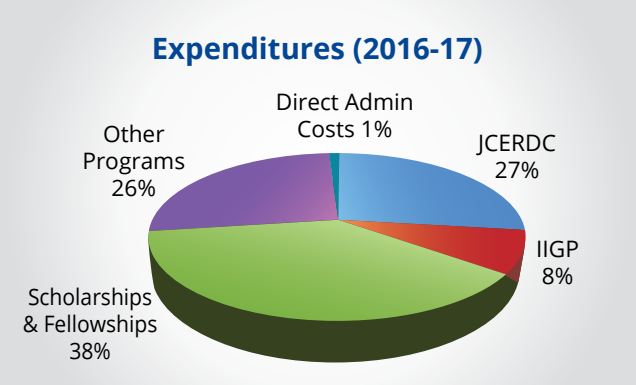


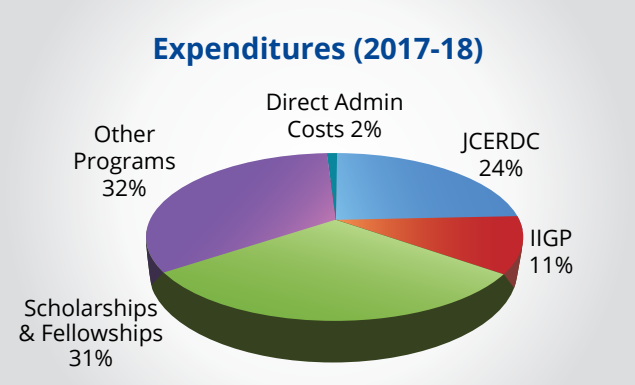


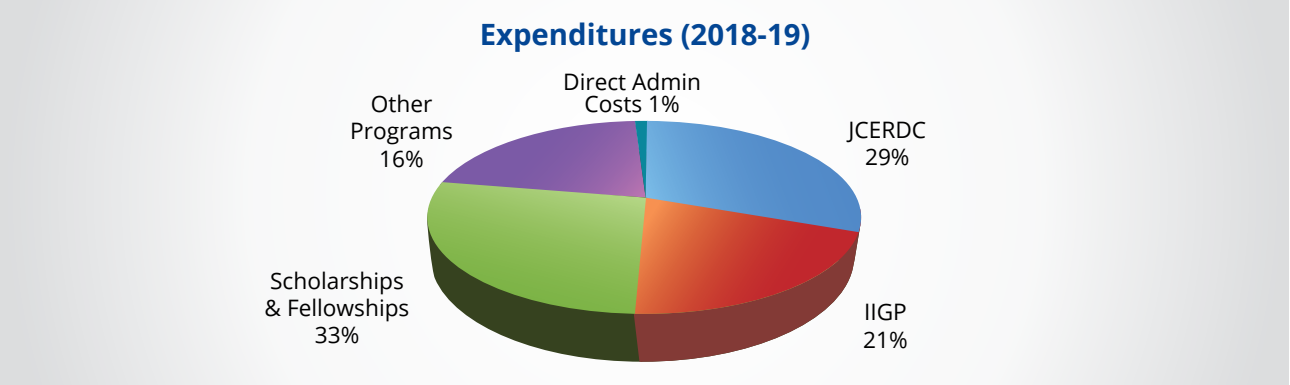
(F) Expenditures - Extra Mural Programs (2016-2019)

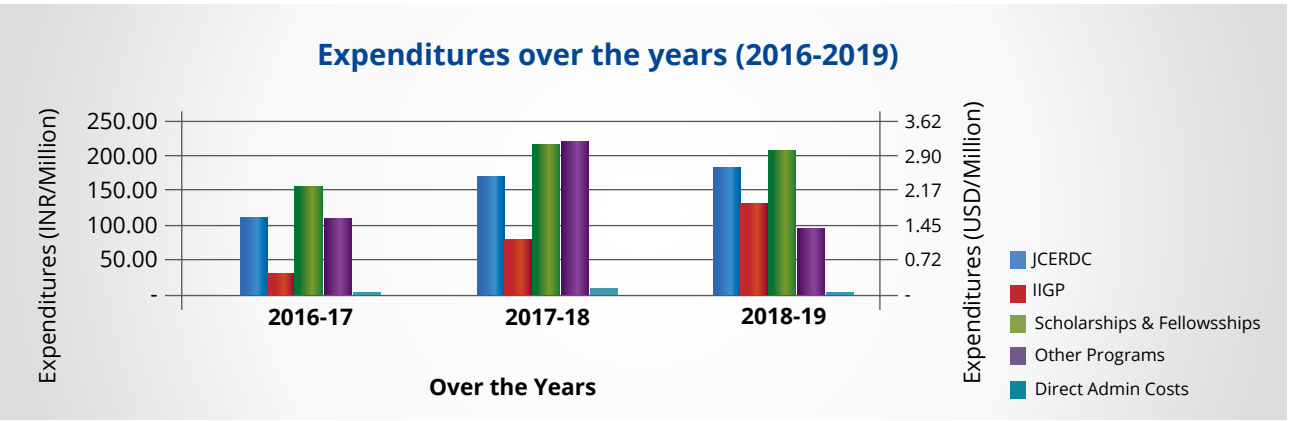
S.No.	Head	2016-17		2017-18		2018-19	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	JCERDC	103.51	1.50	156.25	2.26	168.85	2.45
2	IIGP	30.94	0.45	72.70	1.05	121.65	1.76
3	Scholarships & Fellowships	144.46	2.09	198.56	2.88	192.80	2.79
4	Other Programs	100.26	1.45	202.60	2.94	90.33	1.31
5	Direct Admin Costs	3.87	0.06	9.39	0.14	6.13	0.09
	TOTAL	**383.04**	**5.55**	**639.50**	**9.27**	**579.76**	**8.40**

**1USD= 69 INR ; The exchange rate is as per values on 31st March 2019.*









SECTION-VII

ANNEXURES

Annexure I

Workshops Awarded (2018-19)

S. No	Proposal Title	Indian PI	U.S. PI
1	*Live Operative Training Workshop and Recent Updates on Urology Malignancies*	**Niraj Kumar** Safdarjang Hospital and Vardhman Mahaveer Medical College, New Delhi	**Murugesan Manoharan** Miami Cancer Institute Baptist Health South Florida, Miami
2	*Advancing Environmental Health Science Research and Translation in India through Community-based Participatory Research*	**Rajesh Tandon** Participatory Research in Asia, New Delhi	**Edith Parker** University of Iowa, Iowa City
3	*Nano/Micro 2D-3D Fabrication, Manufacturing of Electronic–Biomedical Devices & Applications*	**Kenneth Gonsalves** Indian Institute of Technology, Mandi	**Nan Marie Jokerst** Duke University, Durham
4	*15th EEG workshop and Masterclass for Epilepsy Surgery*	**P. Sarat Chandra** All India Institute of Medical Sciences, New Delhi	**Ashwini Sharan** Thomas Jefferson University, Philadelphia
5	*Advanced Instrumentation and Computational Techniques for Nuclear Reactor Safety*	**Suneet Singh** Indian Institute of Technology Bombay, Mumbai	**Hitesh Bindra** Kansas State University, Manhattan
6	*Understanding Cell Biology through Proteomics and Metabolomics*	**Srikanth Rapole** National Centre for Cell Science, Pune	**John R Yates III** The Scripps Research Institute, La Jolla
7	*Symposium on Allergy and Asthma*	**Randeep Guleria** All India Institute of Medical Sciences, New Delhi	**Ruchi Gupta** Northwestern Feinberg School of Medicine, Chicago
8	*Multiscale Simulation and Mathematical Modeling of Complex Biological Systems*	**Arnab Bhattacherjee** Jawaharlal Nehru University, New Delhi	**Anatoly B Kolomeisky** Rice University, Houston
9	*Bioacoustics*	**Robin Vijayan** Indian Institute of Science Education and Research, Tirupati	**Holger Klinck** Cornell Lab of Ornithology, Cornell University, Ithaca

Contd.

S. No	Proposal Title	Indian PI	U.S. PI
10	*Sensor technology for next generation IoT*	**Shankar Ku. Selvaraja** Indian Institute of Science, Bengaluru	**Mike A Carpenter** SUNY Polytechnic Institute, Albany
11	*Data Representation and Organization Techniques*	**Devika P Madalli** Indian Statistical Institute, Bengaluru	**Jane Greenberg** Drexel University, Philadelphia
12	*Anomalies 2019*	**Priyotosh Bandyopadhyay** Indian Institute of Technology, Hyderabad	**Bhupal Dev** Washington University in St Louis
13	*The study of decadal scale droughts and mega-droughts in semi-arid tracts of India and North America*	**Supriyo Chakraborty** Indian Institute of Tropical Meteorology, Pune	**Atreyee Bhattacharya** University of Colorado, Boulder
14	*Nonlocal Models: Mathematics, Computation and Applications*	**Kapil Ahuja** Indian Institute of Technology, Indore	**Petronela Radu** University of Nebraska-Lincoln
15	*Next Generation Biologically Synthesized Nanofertilizers for Seed Coating and Foliar Application*	**Alok Adholeya** The Energy and Resource Institute, Gurgaon	**Upendra Singh** Fertilizer Development Center, Muscle Shoals
16	*Next Generation Logistics & Supply Chains*	**Bhaskar Bhandarkar** Indian Institute of Industrial Engineering, Navi Mumbai	**Bopaya Bidanda** University of Pittsburgh, Pittsburgh,
17	*India- USA Lecture Series on Aging Aircrafts*	**S. Gopalakrishnan** Indian Institute of Science, Bengaluru	**Lalita Udpa** Michigan State University, East Lansing
18	*New Insights into the Inflammation, Immunity and Pathobiology of Diseases*	**Jayasri Das Sarma** Indian Institute of Science Education and Research, Kolkata	**Randall J Cohrs** University of Colorado School of Medicine, Aurora
19	*GROWTH winter school and conference on Transient Astronomy*	**Varun Bhalerao** Indian Institute of Technology Bombay, Mumbai	**Mansi Kasliwal** California Institute of Technology, Pasadena

Annexure II

Workshops Held (2018-19)

S. No	Proposal Title	Date and Venue	Indian PI	US PI
1	*Functional Materials (ISFM-2018): Energy and biomedical applications*	13-15 April 2018, Chandigarh	**Raju Kumar Gupta** Indian Institute of Technology, Kanpur	**Vikas Berry** University of Illinois at Chicago
2	*Coastal Groundwater Dynamics: Combining Future Climate Change and Human Development*	07-09 June 2018, Puducherry	**K. Srinivasamoorthy** Pondicherry University	**Saugata Dutta** Kansas State University, Manhattan
3	*5th Bengaluru Cognition Workshop*	17-29 June 2018, Bengaluru	**Balaji Jayaprakash** Indian Institute of Science, Bengaluru	**Thomas D. Albright** Salk Institute for Biological Studies, La Jolla
4	*Indo-U.S. Workshop on 3D Printing: A Solution for Medical Devices*	17 August 2018, Thanjavur	**S. Swaminathan** SASTRA University, Thanjavur	**Sangamesh G. Kumbar** University of Connecticut, Farmington
5	*Live Operative Training Workshop and Recent Updates on Urology Malignancies*	18-19 August 2018, New Delhi	**Niraj Kumar** Safdarjang Hospital and Vardhman Mahaveer Medical College, New Delhi	**Murugesan Manoharan** Miami Cancer Institute at Baptist Health South Florida, Miami
6	*Nano/Micro 2D-3D Fabrication, Manufacturing of Electronic–Biomedical Devices & Applications*	31 October to 2 November 2018, Mandi	**Kenneth Gonsalves** Indian Institute of Technology, Mandi	**Nan Marie Jokerst** Duke University, Durham
7	*Water-Food-Energy-Climate nexus: A perspective towards a sustainable future*	16-21 November 2018, Varanasi	**Rajeev Pratap Singh** Banaras Hindu University, Varanasi	**Shannon L. Bartelt-Hunt** University of Nebraska-Lincoln
8	*15th National EEG workshop and Masterclass for Epilepsy Surgery: A collaborative Indo-American workshop*	21-23 November 2018, Varanasi	**P. Sarat Chandra** All India Institute of Medical Sciences, New Delhi	**Ashwini Sharan** Thomas Jefferson University, Philadelphia
9	*GROWTH winter school and conference on Transient Astronomy*	03-08 December 2018, Mumbai	**Varun Bhalerao** Indian Institute of Technology, Bombay	**Mansi Kasliwal** California Institute of Technology

Contd.

S. No	Proposal Title	Date and Venue	Indian PI	US PI
10	*Indo-U.S. Training Program & Workshop on Cancer Proteogenomics*	06-11 December 2018, Mumbai	**Sanjeeva Srivastava** Indian Institute of Technology Bombay, Mumbai	**D.R. Mani** Broad Institute of MIT and Harvard, Cambridge
11	*Understanding Cell Biology through Proteomics and Metabolomics*	10-11 December 2018, Pune	**Srikanth Rapole** National Centre for Cell Science, Pune	**John R. Yates III** The Scripps Research Institute, La Jolla
12	*Indo-U.S. Symposium on Allergy and Asthma*	15-16 December 2018, New Delhi	**Randeep Guleria** All India Institute of Medical Sciences, New Delhi	**Ruchi Gupta** Northwestern Feinberg School of Medicine, Chicago
13	*Advanced instrumentation and computational techniques for Nuclear Reactor Safety*	15-19 December 2018, Mumbai	**Suneet Singh** Indian Institute of Technology Bombay, Mumbai	**Hitesh Bindra** Kansas State University, Manhattan
14	*Indo-U.S. Symposium on Multiscale Simulation and Mathematical Modeling of Complex Biological Systems*	30 January-01 February, 2019, JNU, New Delhi	**Arnab Bhattacherjee** Jawaharlal Nehru University, New Delhi	**Anatoly B Kolomeisky** Rice University, Houston
15	*Advancing Environmental Health Science Research and Translation in India through Community-based Participatory Research*	26-28 February, 2019, PRIA, New Delhi	**Rajesh Tandon** Society for Participatory Research in Asia, New Delhi	**Edith Parker** University of Iowa City
16	*Indo-U.S. Training Program on Bioacoustics*	14-20 March 2019, IISER Tirupati	**Robin Vijayan** Indian Institute of Science Education and Research, Tirupati	**Holger Klinck** Cornell University, Ithaca
17	*Sensor technology for next generation IoT*	15-16 March, 2019, IISc Bengaluru,	**Shankar Kumar Selvaraja,** Indian Institute of Science, Bengaluru	**Mike A Carpenter** SUNY Polytechnic Institute, Albany

Annexure III

Joint Centers Awarded (2018-19)

S. No.	Proposal Title	Lead Indian PI	Lead U.S. PI
1	*Center for Distributed Deep Learning Framework for Classification*	**Ashish Ghosh** Indian Statistical Institute, Kolkata	**Lance Fiondella** University of Massachusetts, Dartmouth
2	*Center for Nanomagnetics for Energy Efficient Computing, Communications and Data Storage*	**Anjan Barman** S. N. Bose National Center for Basic Sciences, Kolkata	**Supriyo Bandyopadhyay** Virginia Commonwealth University, Virginia
3	*Center for Time and Length Scale Dependent Flow*	**P. Sudharshan Phani** International Advanced Research Centre for Powder Metallurgy and New Materials, Hyderabad	**Erik G Herbert** Michigan Technological University, Houghton
4	*Center for Development of Sustainable Materials for Soil Remediation*	**Devendra Narain Singh** Indian Institute of Technology, Bombay	**Arvin Farid** Boise State University, Boise
5	*Center for Optimizing System Performance and Energy in Multi-sensor Visual Perception Systems*	**M. Balakrishnan** Indian Institute of Technology, Delhi	**Anish Arora** The Ohio State University, Columbus
6	*Centre for Sensor Science and Technology*	**Shankar Kumar Selvaraja** Indian Institute of Science, Bengaluru	**Mike A Carpenter** SUNY Polytechnique Institute, New York
7	*Center for Conservation and Restoration of Threatened Deer Species Through Conservation Breeding, Conservation Genetics and Community Development*	**Khursheed Ahmad** Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Srinagar	**William J. McShea** Smithsonian Conservation Biology Institute, Virginia
8	*Center for Cellular Reprogramming in Regenerative Medicine*	**Sujata Mohanty** All India Institute of Medical Sciences, New Delhi	**Chandan K. Sen** Indiana University, Indianapolis
9	*Center for Transition metal carbide nanomaterials for Energy Storage Application*	**Subhash Singh** National Institute of Technology, Jamshedpur	**Sanjay K Behura** University of Illinois, Chicago
10	*Centre for Rational Engineering of Quantum Materials*	**Srimanta Middey** Indian Institute of Science, Bengaluru	**Jayakanth Ravichandran** University of Southern California, Los Angeles

Annexure IV

Details of USISTEF Projects to be Awarded under the Ninth Call (2018-19)

The following Six projects were recommended for support:

1. **Low-cost, Anti-counterfeiting labels**	
Indian Partner	**U.S. Partner**
Deepak Gupta (Indian Institute of Technology, Kanpur) **Pranav Asthana** (Transpacks Technologies Pvt. Ltd., Indian Institute of Technology, Kanpur)	**Sudhanshu Bahadur** (University of California, Berkeley).
Low-cost, anti-counterfeiting labels that are tamper-proof, cannot be cloned and can be used to verify the authenticity of the product using a low-end smartphone, without requiring any form of communication.	

2. **ArmAble: An Interactive Arm Training Rehabilitation Device**	
Indian Partner	**U.S. Partner**
Habib Ali (BeAble Health Pvt. Ltd., Indian Institute of Technology Hyderabad)	**Ramana Kumar Vinjamuri** (Stevens Institute of Technology, Hoboken)
Low-cost rehabilitation device that allows for intensive, interactive and engaging therapy with a full range of motion with appropriate multi-sensory biofeedback, and tracking capabilities. The device would enable individuals with upper-limb impairment to perform game-based bilateral and unilateral rehabilitation for restoring motor function.	

3. **MIRACLE Dialysis - Wearable Alternate Kidney**	
Indian Partner	**U.S. Partner**
Gowrishankar Wuppuluru (Padmaseetha Technologies Pvt. Ltd., Chennai)	**Beth Kolko** (Shift Labs, Seattle)
Wearable, simple and safe, anytime/anywhere Peritoneal Dialysis Cycler (PDC). Use of Recyclable Membranes (a patent applied nanotechnology cum proprietary chemicals based urea/creatinine clearance) is anticipated to cut costs down to INR 10,000 per month per patient.	

4. Commercialization of advanced multi-layer wound dressing, for accelerated healing and infection prevention of Indian	
Indian Partner	**U.S. Partner**
Vijay Viswanathan (MV Hospital for Diabetes and Prof M. Viswanathan Diabetes Research Centre, Chennai)	**Ashwinraj Karthikeyan** (InMEDBio LLC, Neenah)
A clinic-ready, safe, cost-effective and comprehensive wound-care dressing designed to prevent infection and accelerate the wound-healing process for diabetic foot ulcer patients.	

5. Lab-on-a-strip (LOS): Towards Multi-analyte Screen Printed Biosensor Strips	
Indian Partner	**U.S. Partner**
Vinay Kumar (PathShodh Healthcare Pvt. Ltd., Bengaluru)	**Erik Sventeckis** (GSI Technologies, Burr Ridge)
A lab-on-a-strip (LOS) to enable chemical analysis for multiple tests, on a low-cost screen-printed electrode for Hb and Serum Albumin test for Anemia and Malnutrition screening; Serum Albumin and Glycated Albumin test for Advanced Diabetic Nephropathy management; and, Microalbminuria and Urine Creatinine test for early screening of Chronic Kidney Disease.	

6. GaN based High Power LNA for 5G Applications	
Indian Partner	**U.S. Partner**
Yogesh Singh Chauhan (Indian Institute of Technology, Kanpur)	**Amitava Das** (Tagore Technology Inc., Arlington Heights)
The goal of this project is to develop the LNA using both Gallium Nitride (GaN) and Gallium Arsenide (GaAs) technologies. Novelty in this approach is the use of GaN and GaAs technologies in a cost-effective way on a module. The aim is to develop low-cost 5G small cell front end, so that it can be widely deployed in cities and small towns.	

Annexure V

WEQ: Winners 2018

S.No.	Name and Affiliation
1	Anushka Shetty, Founder, Plop chat, Bengaluru
2	Kalyani Khona, Founder & CEO, Inclov, Delhi
3	Neha Satak, Founder & CEO, Astrome, Bengaluru
4	Pallavi Gupta, Founder, Espresso Labs, Delhi
5	Radhika Patil, Founder & CEO, Cradlewise, Bengaluru
6	Shampa Choudhury, Founder & CEO, Citility, Bengaluru
7	Shruthi Reddy, Founder & CEO, Anthyesti, Kolkata
8	Surabhi Das, Founder & Chief Legal Officer, Ziroh Labs, Bengaluru
9	Suruchi Rao, Founder, Ossus Biorenewables, Bengaluru
10	Tarusha Mittal, Founder & COO, Ethx.co, Delhi

Annexure VI

Make Tomorrow for Innovation Generation: Top 10 Project Awards

S.No.	Project Title	Participants	Name of School
1	Smart Electroplater	Shiv Tyagi	PPJ Saraswati Vihar, Nainital, Uttarakhand
2	Smoke Purifier	Rohit Sharma & Abhinav Dogra	Trinity Public School, Banjar, Kullu, Himachal Pradesh
3	Cardio-band	Manjur Ahmed & Md, Amaan	Kendriya Vidyalaya AFS Borjhar, Guwahati, Assam
4	LPG Leakage Detector	Vishal Ranjan	DAV Public School Koyla Nagar, Dhanbad, Jharkhand
5	Smart Solar Tracker Light With Motion Detector	Mehar Thakur & Bhanu Prakash Singh	Sanowar Valley Public School, Kullu, Himachal Pradesh
6	Ennioa	Soumyadeep Sahu	DAV Public School ,unit – VIII, Bhubaneswar, Odisha
7	IOT Based Smart Stretcher	Satyam Singh & Sushant Yadav	Hiralal Ramniwas Inter College, Khalilabad, Uttar Pradesh
8	Agriculture Data Collecting Bot	Anshuman Nigam & Bharat Jain	Seth Anandram Jaipuria School, Kanpur, Uttar Pradesh
9	Fashionable & Helpful - Women's Jewellery As Self-defence	Happy Singh & Kashish Aswal	Purkal Youth Development Society, Dehradun, Uttarakhand
10	Floor Cleaning Robot	Madhubrata Mohapatra & Sehnaaz Begum	Kendriya Vidyalaya, Dhenkanal, Orissa

Annexure VII

WAQM Program: Awardees

S No.	Project Title	Indian Lead PI (Name and Affiliation)	Other Partner(s)	U.S. Partner(s)
Air Quality Monitoring				
1.	Streaming Analytics over Temporal Variables from Air quality Monitoring (SATVAM).	**Sachchida Nand Tripathi** Indian Institute of Technology, Kanpur	Indian Institute of Technology, Bombay (IITB) Indian Institute of Science (IISc) Bengaluru Respirer Living Sciences Pvt. Ltd., Mumbai	Duke University, Durham
2.	High resolution air quality monitoring and air pollutant data analytics.	**Amrutur Bharadwaj** Indian Institute of Science, Bengaluru	CSIR-Central Electronics Engineering Research Institute (CEERI), Pilani	University of Southern California, Los Angeles
Water Quality Monitoring				
3.	Design and Development of Aquatic Autonomous Observatory (Niracara Svayamsasita VedhShala - NSVS) for in situ Monitoring, Real Time Data Transmission and Web based Visualization.	**Bishakh Bhattacharya** Indian Institute of Technology, Kanpur	Kritsnam Technologies, Kanpur	Woods Hole Oceanographic Institution (WHOI), Falmouth
4.	Integrated low cost water sensors for real- time river water monitoring and decision-making.	**Arun Kumar** Indian Institute of Technology, Delhi	National Institute of Science and Technology (NIST), Berhampur National Environmental Engineering and Research Institute (NEERI), Nagpur Centre for Materials for Electronics Technology (CMET), Pune University of Hyderabad, Hyderabad Asiczen Technologies India Pvt. Ltd., Bhubaneswar SunMoksha Pvt. Ltd., Bengaluru	University of California (UCR), Riverside Michigan State University (MSU), East Lansing Stanford University (SU), Palo Alto New Jersey Institute of Technology (NJIT), Newark

Annexure VIII

The Initiative for Research & Innovation in Science (IRIS) and Intel International Science and Engineering Fair (ISEF) (2018-19)

ISEF 2018

25 young and bright innovators went on a special science & technology journey from **14–18 May 2018** to the United States of America. During the week, TEAM India participated and competed at the Intel® International Science and Engineering Fair (ISEF), Pittsburgh, USA, the world's largest pre-collegiate high school science research competition; and became part of a week-long exposure trip to science, research and technology based activities in museums, university, science centre in Pittsburgh in addition to meeting officials from Indian Embassy and visiting Columbia University at New York.

TEAM India is made up of students who are winners at the **Initiative for Research and Innovation in Science (IRIS) 2017** a research based science fair initiative for school students held in India annually. IRIS is a public – private partnership heralded by the Department of Science & Technology (DST), Intel and Indo-US Science and Technology Forum (IUSSTF) for empowering the next generation of innovators.

At a ceremony held at New Delhi, TEAM India was flagged off by **Prof. Ashutosh Sharma,** Secretary, Department of Science & Technology, **Mr. Chander Mohan,** Head - NCSTC, Department of Science and Technology, Government of India, **Dr. Rajiv K. Tayal,** Executive Director, Indo-US Science & Technology Forum and **Mr. Kishore Balaji,** Director, Intel South Asia. Before the departure of Team – India for US, students got an opportunity to meet the Hon'ble Union Minister of Science & Technology and Earth Sciences and Environment & Forests **Dr. Harsh Vardhan** at the Technology Day event held on 11th May 2018 at Vigyan Bhawan along with Secretary, DST; Secretary, DBT; Secretary, TDB and DG-CSIR.

ISEF was held from 14 -18 May 2018 at Pittsburgh, USA wherein after competing with more than 1800 participating science and research projects from over 81 countries. Team India won 5 Grand Awards, 9 special Awards, 1 Honourable mention in addition to having 4 planets named after them.

Awards & Recognitions Team India -Intel ISEF 2018 Grand Awards

Team India - Intel ISEF 2018 Grand Awards					
S. No.	**Category**	**Project**	**Award**	**Name of Student**	**School**
1	Plant Sciences	The Plant Doctor - An Artificial Intelligence Based Collaborative Platform for Plant Disease Identification and Tracking for Farmers	4th Place Grand Award - US$500	Kaushik Kunal Singh	Inventure Academy, Bengaluru
2	System Software	Machine Learning Approach to Cancer Identification	4th Place Grand Award - US$500	Shinjini Ghosh	South Point High School, Kolkata
3	Translational Medical Science	An Inexpensive Solution for Visual Acuity Testing in Preverbal Children using Deep Convolutional Neural Networks	3rd Place Grand Award - US$1000	Ishita Mangla	Delhi Public School, R K Puram, New Delhi
4	Earth & Environment	Cost effective, Real-time monitoring of pollution in water bodies using a portable floating device	2nd Place Grand Award - US$1500 (Planet)	Pranav Shikarpur & Sidharth Vishwanath	Bangalore International Academy, Bengaluru
5	Translational Medicine	An Economical Early detecting and dosage monitoring tool for PEM	2nd Place Grand Award - US$1500 (Planet)	Swasthik Padma &Mohd. Suhail	Vivekananda Pre-University College & St Aloysius Pre-University College, Mangalore
6	Systems Software	Connecting doctors for good using a Peer to Peer Lung Cancer Detection Program	Association of Computing Machinery- US$3000	Parth Raghav -	K.R.Mangalam World School, New Delhi
7	Systems Software	Connecting doctors for good using a Peer to Peer Lung Cancer Detection Program	King Abdulaziz Foundation -US$1000	Parth Raghav	K.R.Mangalam World School, New Delhi
8	Plant Sciences	The Plant Doctor - An Artificial Intelligence Based Collaborative Platform for Plant Disease Identification and Tracking for Farmers	China Association of Science US$1200	Kaushik Kunal Singh	Inventure Academy, Bengaluru
9	Plant Sciences	The Plant Doctor - An Artificial Intelligence Based Collaborative Platform for Plant Disease Identification and Tracking for Farmers	- Samvid Education Foundation	Kaushik Kunal Singh	Inventure Academy, Bengaluru
10	Plant Sciences	The Plant Doctor - An Artificial Intelligence Based Collaborative Platform for Plant Disease Identification and Tracking for Farmers	USAID - US$5000	Kaushik Kunal Singh	Inventure Academy, Bengaluru

Team India -Intel ISEF 2018 Special Awards					
S. No.	**Category**	**Project**	**Award**	**Name of Student**	**School**
11	Mathematics	Solving a Mathematical Mystery: Schinzel's Conjecture	Mu Alpha Theta - US$1500	Sacheth Sathya-narayan	National Public School, Chennai
12	Bio Medical Engineering	Non-invasive self detection of asymptomatic acute myocardial infarction using BioElectrics: A translational investigation of transcutaneous blood analysis	Samvid Education Foundation - US$500	Akash Manoj	The Ashok Leyland School, Hosur, Tamil Nadu
13	Translational Medical Science	An Inexpensive Solution for Visual Acuity Testing in Preverbal Children using Deep Convolutional Neural Networks	Scholarship from University of Amazon	Ishita Mangla	Delhi Public School, R K Puram, New Delhi
14	Earth & Environment	Cost effective, Real-time monitoring of pollution in water bodies using a portable floating device	USAID - US$5000	Pranav Shikarpur & Sidharth Vishwanath	Bangalore International Academy, Bengaluru
15	Translational Medicine	An Economical Early detecting and dosage monitoring tool for PEM	Samvid Certificate of honourable mention	Mohd. Suhail & Swasthik Padma	Vivekananda Pre-University College & St Aloysius Pre-University College, Mangalore

IRIS 2018

Initiative for Research and Innovation in STEM (IRIS) encourages young minds in and around the nation to take on scientific research that brings out the best from the country. The public-private partnership program between Department of Science & Technology (DST), Intel and Indo-US S&T Forum (IUSSTF) promotes and nurtures young Indian innovators and recognizes outstanding projects in the field of STEM thereby providing a platform to be at global stage through Intel International Science & Engineering Fair (ISEF) held in USA every year.

At the three-day national fair held in New Delhi, a total of 78 projects selected through a two level evaluation process from 1500 online applications received from across India, were showcased by 106 students vying for the IRIS Grand Awards. An expert jury comprising of 25 judges, including members of the IRIS Scientific Review Committee, and external Judges from the Scientific Community selected the top 20 projects.

IRIS 2018 was held at the Sam Manekshaw Centre, from 02-04 December 2018 which saw the brightest young innovators from across the country showcasing their projects. These 20 winner Projects with a total of 25 students will represent India at the Intel ISEF in Phoenix, Arizona, USA in May 2019.

Team IUSSTF

Indo-U.S. Science & Technology Forum
Fulbright House, 12 Hailey Road
New Delhi-100 001

www.iusstf.org

Follow us on: