INDO-U.S. SCIENCE AND TECHNOLOGY FORUM

CATALYZING INDO-U.S. SCIENCE & TECHNOLOGY COOPERATION

IUSSTF

ANNUAL REPORT 2019-20

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IUSSTF
Indo-U.S. Science and Technology Forum

INDO-U.S. SCIENCE AND TECHNOLOGY FORUM
Fulbright House, 12 Hailey Road, New Delhi 110 001, India
www.iusstf.org

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From the Executive Director's Desk

It gives me great pleasure to present the Annual Report of the Indo-U.S. Science and Technology Forum (IUSSTF) for the Indian financial year 2019-20. While I joined the organisation as Executive Director midway through the financial year, I have had the opportunity to see first-hand the impact of IUSSTF's investments on individuals, institutions, and the Science and Technology ecosystem.

Established as a binational, autonomous entity by the two governments in 2000, IUSSTF's mission is to promote long-term scientific collaborations between India and the United States. Over the past 20 years, IUSSTF has developed a vibrant portfolio covering four broad programmatic areas: Scientific Networks, Research and Development, Innovation and Entrepreneurship, and Visitations and Fellowships.

Scientific Activities: Under the Scientific Networks portfolio, IUSSTF's flagship programs- Bilateral Workshops and the Virtual Network Centers - continue to receive outstanding submissions from top institutions in the U.S. and India. The awards support joint projects in cutting-edge areas across different science and engineering domains, including astronomy, biological sciences, medicine, manufacturing, and materials. These long-standing programs provide a platform that enables U.S. and India scientists to interact and develop joint research collaborations.

The U.S. India Science and Technology Endowment Fund (USISTEF), established by the two governments in 2010, continues to support joint entrepreneurial activities that lead to commercialization of technology. What makes the Endowment Fund unique is its' focus on projects that leverage cutting-edge science and technology to develop products/ solutions to address societal challenges. The 10th Call for Proposals was announced in September 2019, and the response from the community has been overwhelming. The program has had a significant impact over the years, both in terms of the development of new devices and technologies, as well as in sustaining partnerships between U.S. and Indian innovators.

IUSSTF's Research and Development portfolio includes three major programs that address critical challenges in the areas of energy and sustainability.

- **Indo-U.S. Joint Clean Energy Research & Development Centre (JCERDC):** The "UI-ASSIST: U.S.-India collAborative for smart diStribution System wIth Storage"

project is addressing critical issues related to Smart Grids and Energy Storage. This program serves as an exemplar of bilateral research collaboration and public-private partnerships, leveraging expertise from both sides to accelerate research and develop innovative solutions.

- **PACEsetter Fund (PSF)**: 2019 saw four awards announced under the PACEsetter Fund Round II program, an initiative to accelerate the commercialization of innovative off-grid clean energy products and business models. The Fund is supported by the Ministry of New and Renewable Energy and the U.S. Embassy in India.
- **Research Initiative for Real-time River Water and Air Quality Monitoring (WAQM)**: The program funded by the Department of Science and Technology, Govt. of India (DST) and Intel® has made four awards to support the development of end to end water and air quality monitoring systems using smart, networked, low cost and low power sensor nodes.

Finally, IUSSTF manages a number of Visitation Programs supported by various federal agencies and foundations. These programs provide opportunities for graduate students and junior faculty to gain exposure and conduct research at top institutions in the United States and India, helping build research capacity in critical areas and fostering long-term collaborations. These are prestigious awards, as reflected in the number and quality of applications received.

The Annual Report provides a snapshot of IUSSTF's activities. Behind every picture, every number in a chart, and every graph you will find a compelling story about a new discovery, an innovative technology-based solution addressing a societal challenge, or a young scientist's journey into the world of research. We invite you to peruse our newsletter, CONNECT, to learn more about our awardees and their work.

COVID-19 and Beyond: The IUSSTF and USISTEF Boards met in Washington, DC in February, 2019. Both Meetings included a strategic planning and visioning exercise to identify challenges and opportunities in a rapidly-evolving S&T landscape. The IUSSTF GB approved the launch of a new multi-year initiative on Artificial Intelligence. However, by early March, countries around the world were battling the COVID-19 pandemic and taking drastic measures to combat the rapid spread of the virus. The IUSSTF team responded quickly to the crisis, developing plans for COVID-19 initiatives that would harness the combined talents and expertise of the Indian and U.S. S&T communities. These initiatives will be launched in the coming months.

As IUSSTF celebrated its 20th anniversary, it is truly remarkable to see how the organization has grown over the years. My predecessors have done an outstanding job, creating a vibrant portfolio that encompasses the entire science to innovation pipeline. As we look to the future and an evolving S&T landscape, IUSSTF must embrace change by committing to, and implementing, a bold, strategic vision that will ensure the organization continues to play a pivotal role in strengthening the S&T partnership between the world's two largest democracies.

I would like to express my deepest gratitude to our Board Members, partners, stakeholders and well-wishers who have been part of IUSSTF's journey over the years – I look forward to your continued support! Finally, I would be remiss if I did not acknowledge the outstanding IUSSTF Team- a group of dedicated, hard-working, passionate individuals who believe in the organization and its mission. I am honoured to serve as the Fourth Executive Director and look forward to writing the next chapter in the organization's history.

Dr. Nandini Kannan
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 Nature of Support)

I. **IUSSTF Core**

- Bilateral Workshops/Training Programs/Symposia
- Indo-U.S. Virtual Networked Centres
- 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
- PACEsetter Fund
- Real Time River Water and Air Quality Monitoring
- Bhaskara Advanced Solar Energy Fellowship
- 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 Fellowship
- Graduate Research Opportunities Worldwide
- Khorana Program for Scholars
- Initiative for Research & Innovation in Science
- S.N. Bose Scholars Program

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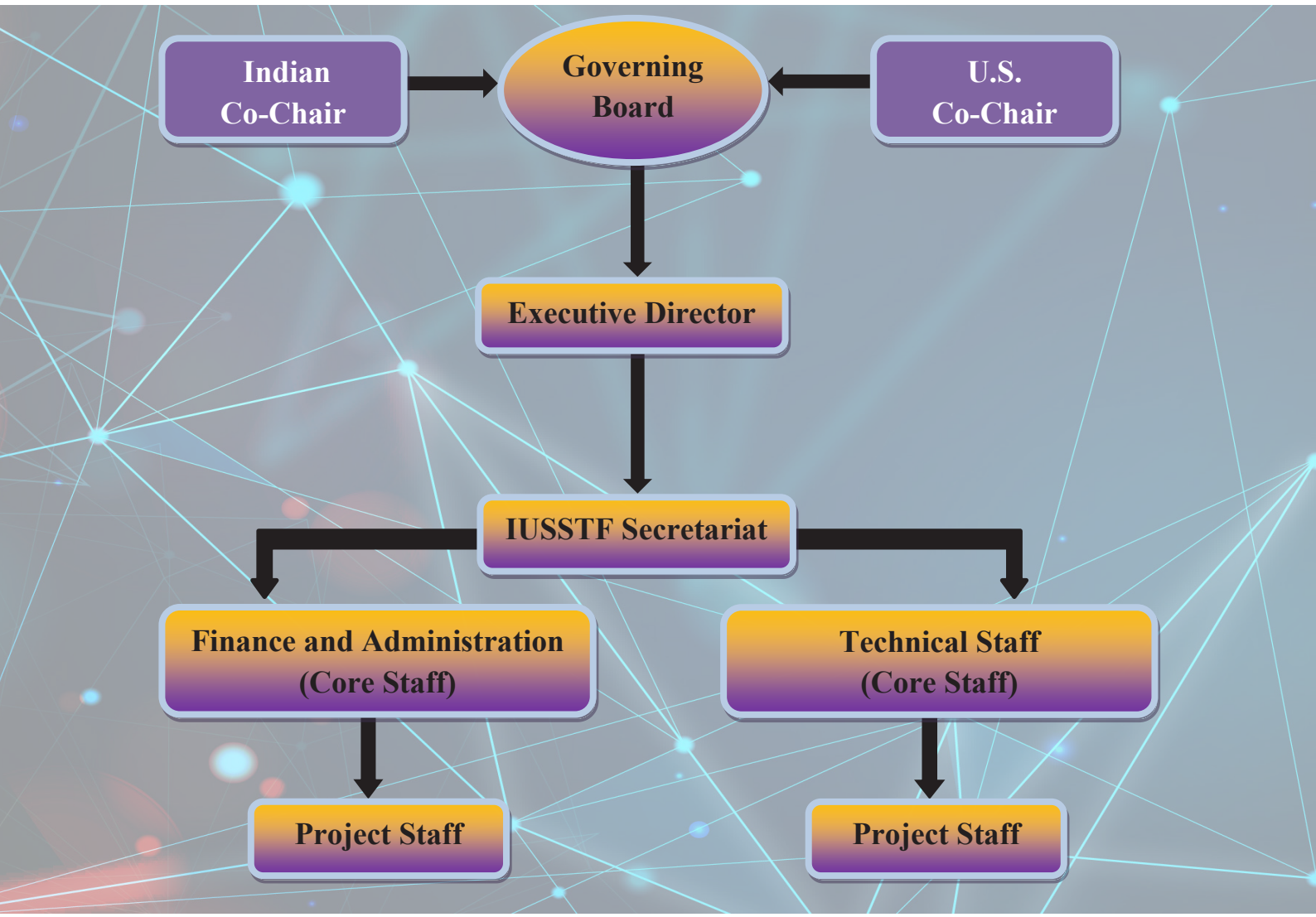
GOVERNANCE
STRUCTURE

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
Dept of Science & Technology, Govt. of India

Jonathan Margolis
Co-Chair
Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State

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

R. Ramanan
Atal Innovation Mission (AIM), NITI Aayog, Govt. of India

Elizabeth Urbanas
U.S. Dept. of Energy

Mark Coles
National Science Foundation

Alka Sharma
Department of Biotechnology, Govt. of India

Sandeep Verma
Science and Engineering Research Board (SERB), Govt. of India

F. Gray Handley
National Institutes of Health

Kumud Srinivasan
Intel® Corporation

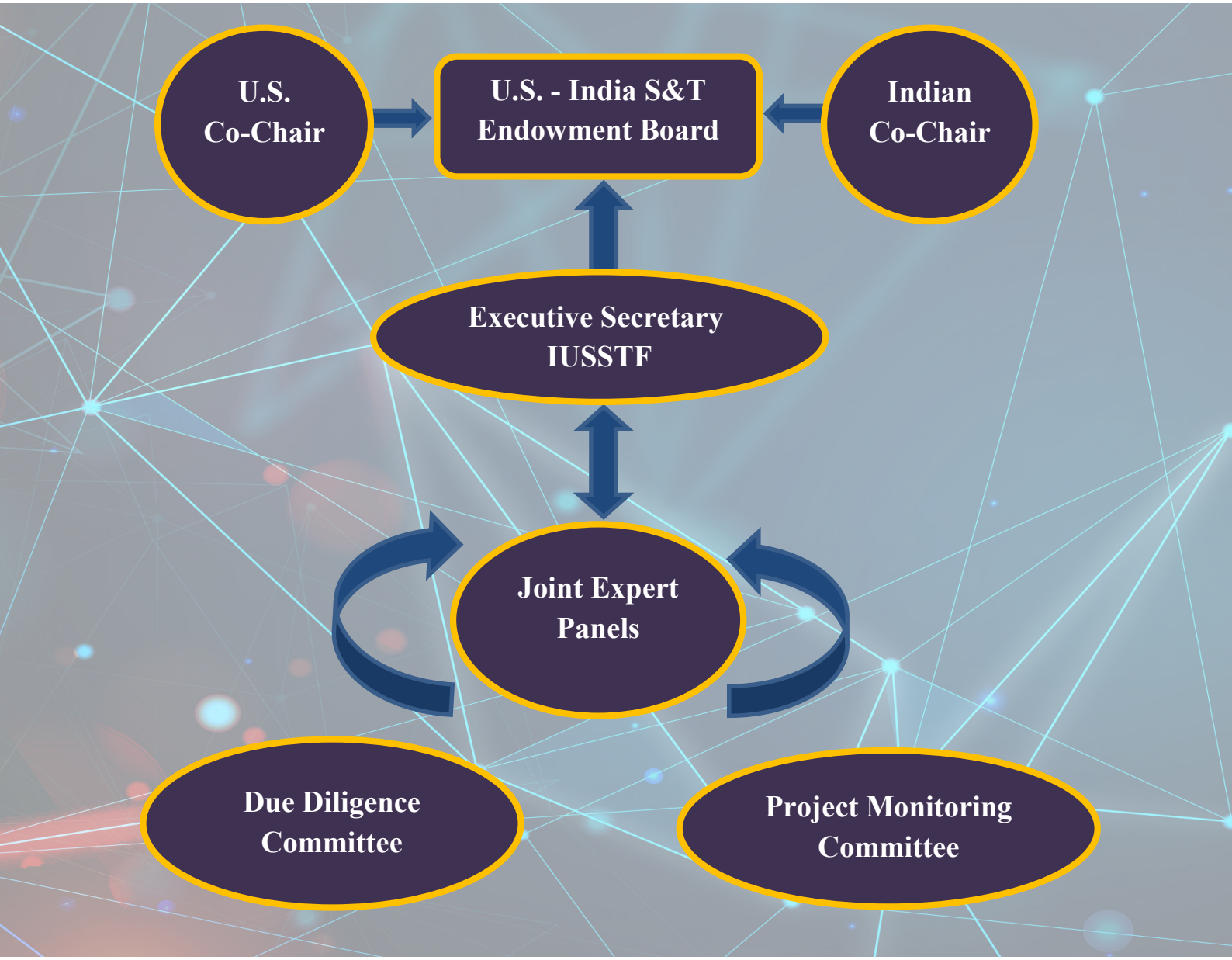
Subhasis Chaudhari
Indian Institute of Technology (IIT) – Bombay

Debjani Ghosh
NASSCOM

Aseem Ansari
St. Jude Children's Research Hospital, Memphis

Amita Gupta
Johns Hopkins University

Functional Structure for USISTEF



USISTEF Board

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

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

H.K. Mittal
Dept. of Science & Technology (DST), Govt. of India

Rajesh Ranjan
Ministry of External Affairs, Govt of India

Mojdeh Bahar
U.S. Department. of Agriculture

Shyam Sunder
National Institute of Standards and Technology (NIST)

V. Premnath
National Chemical Laboratory (NCL)

Shirshendu Mukherjee
Programme Management Unit (PMU) supported by DBT-BIRAC-BMGF-Wellcome Trust

Constance C. Arvis
Office of Science and Technology Cooperation (OES/STC), U.S. Department of State

Ranjan Gupta
National Institute of Health

Anantapadmanabhan Anantaram Sarma
Formerly associated with SIDBI Venture Capital Ltd., Mumbai

Mr. Naveen Tiwari
InMobi, Glance, TruFactor

Peter T. Dabrowski
Tano Capital/Tano Ventures

Ms. Holly Flanagan
Gabriel Investments

Mini Shaji Thomas
National Institute of Technology (NIT), Tiruchirappalli

Tania Fernandez
DreamCatcher Ventures; Midissia

Somshubhro (Som) Pal Choudhury
Bharat Innovation Fund Bengaluru

IUSSTF Staff Members

Dr.Nandini Kannan
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
Senior Admin Officer

Program Staff

Babulal Chaudhary
Program Officer

Pushpa Iyer
Program Officer

Priya Thomas
Program Officer

Aasitha Aporva
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 • Held	 23 19
2	**Virtual Networked Centers** • Awarded • Ongoing	 10 28
3	**USISTEF 10th Call** • Applications Received • Eligible Applications • Shortlisted Projects	 256 249 13

- ***Strategic Initiatives: New Partnership***
  IUSSTF signed an MoU for "Solar Decathlon India" with DOE . The *Alliance for an Energy Efficient Economy (AEEE)* and the *Indian Institute for Human Settlements (IIHS)* are the lead implementing organizations for the Solar Decathlon India.

- ***Executive Director, IUSSTF***
  Dr. Nandini Kannan took over the reins of the Indo-U.S. Science and Technology Forum (IUSSTF) from Dr. Rajiv Tayal and assumed charge as Executive Director on 02nd September 2019.

SECTION I

SCIENTIFIC NETWORKS

Scientific Networks

IUSSTF-funded collaborations provide a platform for young and early-career scientists to interact and network with their counterparts, who could potentially become both 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:

	Numbers			
	2017-18	2018-19	2019-20	Cumulative (2001-2020)
Bilateral Workshops/ Training Schools	**18**	**19**	**23**	404
Virtual Networked Centers	**13**	**10**	**10**	100

Any similar Generic Image

Bilateral Workshops/Training Programs

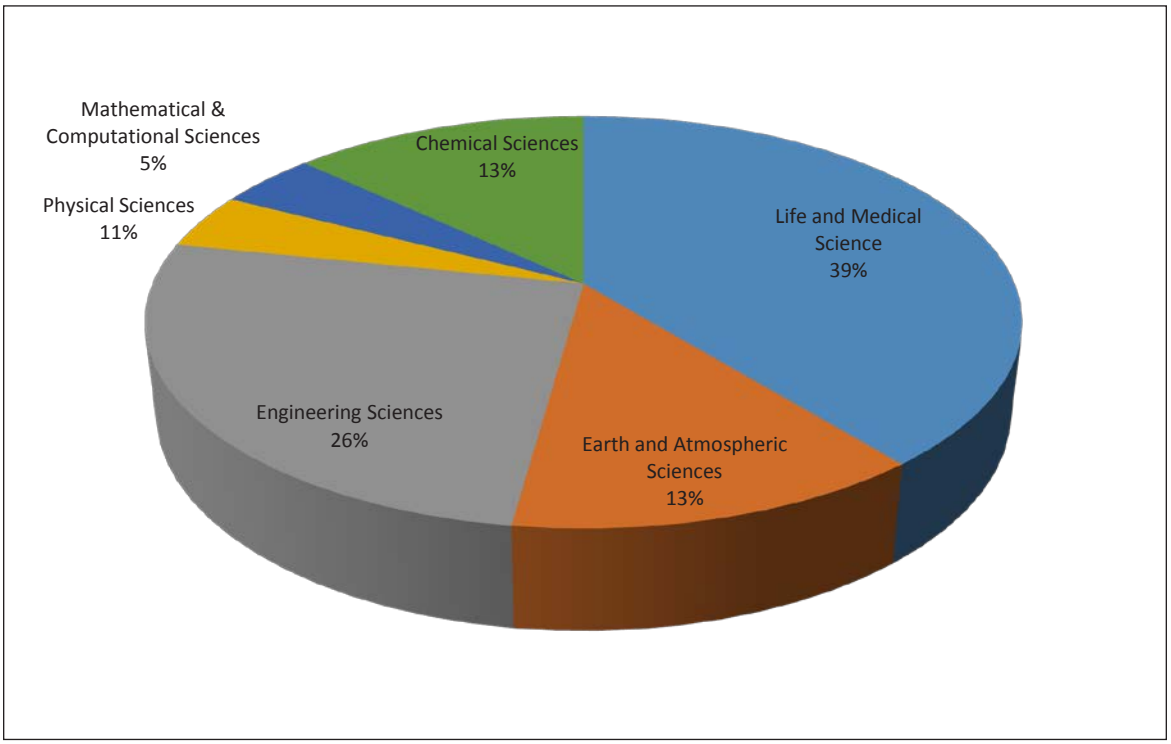
Bilateral Workshops are targeted to promote interactions between Indian and American scientists and engineers from academia, laboratories and industry with the explicit aim to develop sustained linkages. Proposals are peer-reviewed both in India and the United States. The review parameters include novelty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

Nineteen bilateral workshops were selected for support during the year 2019-20 (List provided as *Annexure I)*. The list of Workshops that were awarded earlier but were held during the year 2019-20 are placed at *Annexure II*. The data pertaining to the last three years is presented below.

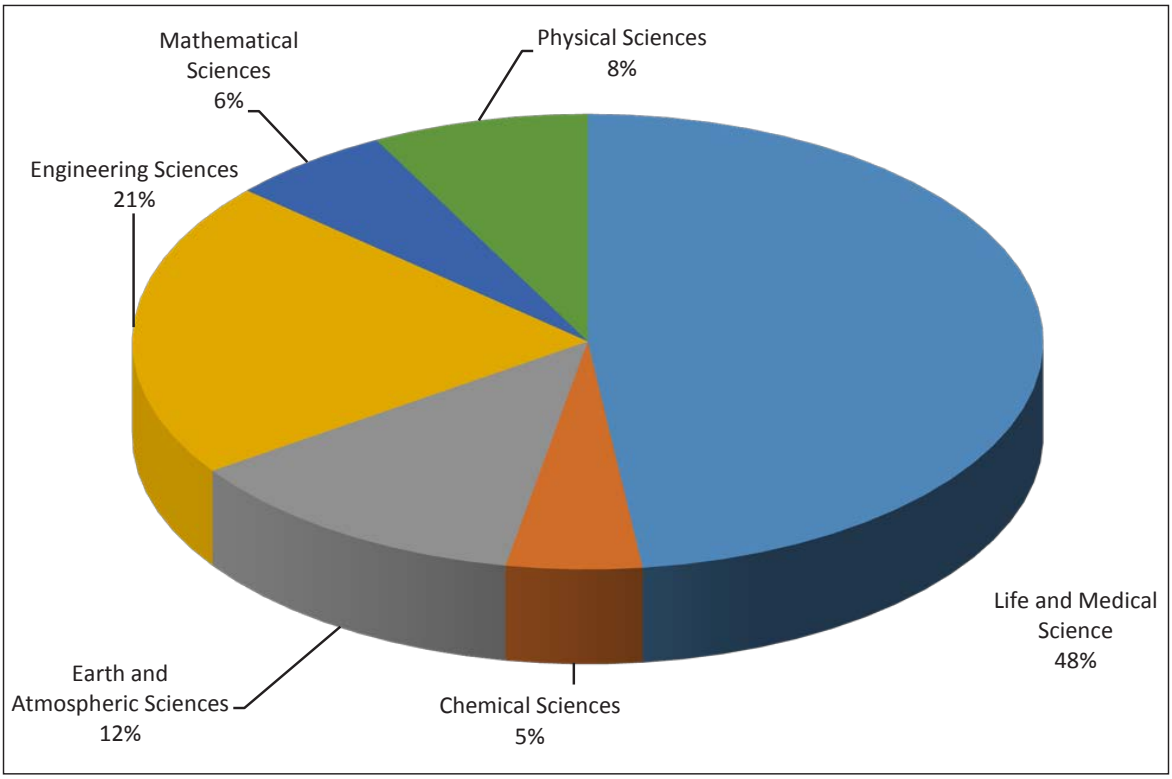
		2017-18	2018-19	2019-20
No. of Applications Received		47	**40**	**44**
No. of Awards		18	**19**	**23**
Funding	(INR/ Million)	20.9	**16.05**	**15.05**
	(USD/ Million)*	0.30	**0.23**	**0.21**

**1USD=70INR*

Workshops: Area-wise Distribution (2019-2020)



Workshops: Area-wise Distribution (2015-2020)



Virtual Networked Centres

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:

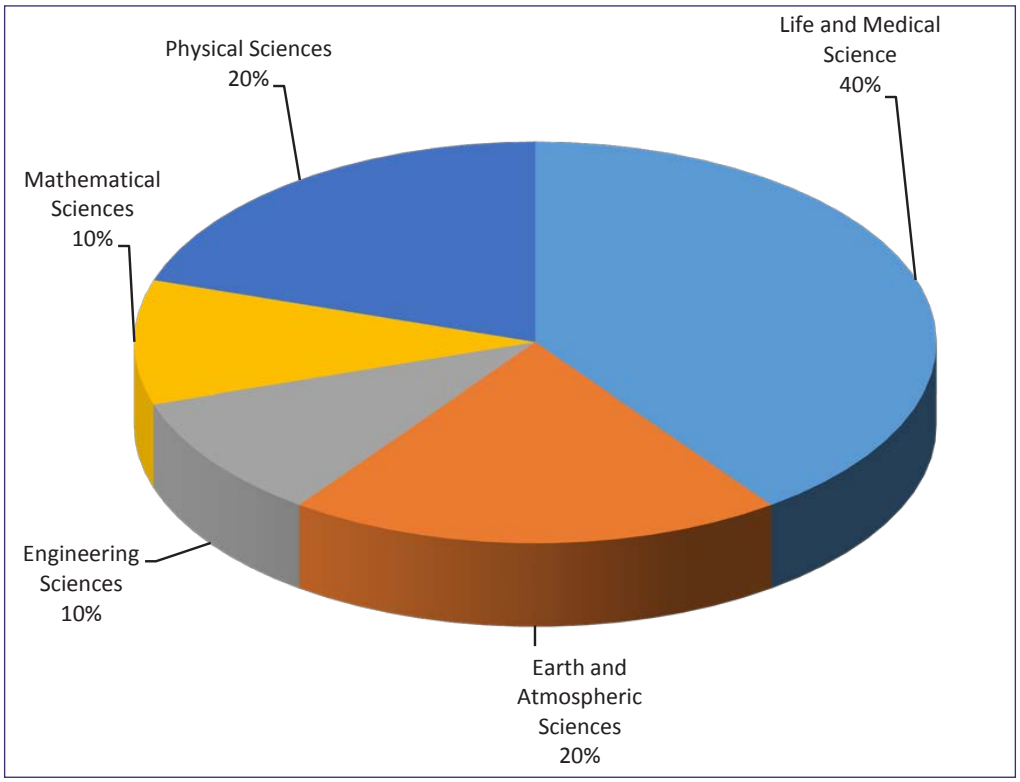
- ***Knowledge R & D Networked Centres:***
  - » Partners: R&D labs and academia partnership (2+2)
  - » Provide opportunities for integrating research and education
- ***Public-Private Networked Centers:***
  - » Partners: Academia/ R&D lab - Industry partnership (2+2)
  - » Promote pre-commercial R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

Thus far, 100 Virtual Centres have been supported. 10 Joint centers were awarded during the year 2019-20, (list provided as *Annexure III*). The data for the last three years is presented below:

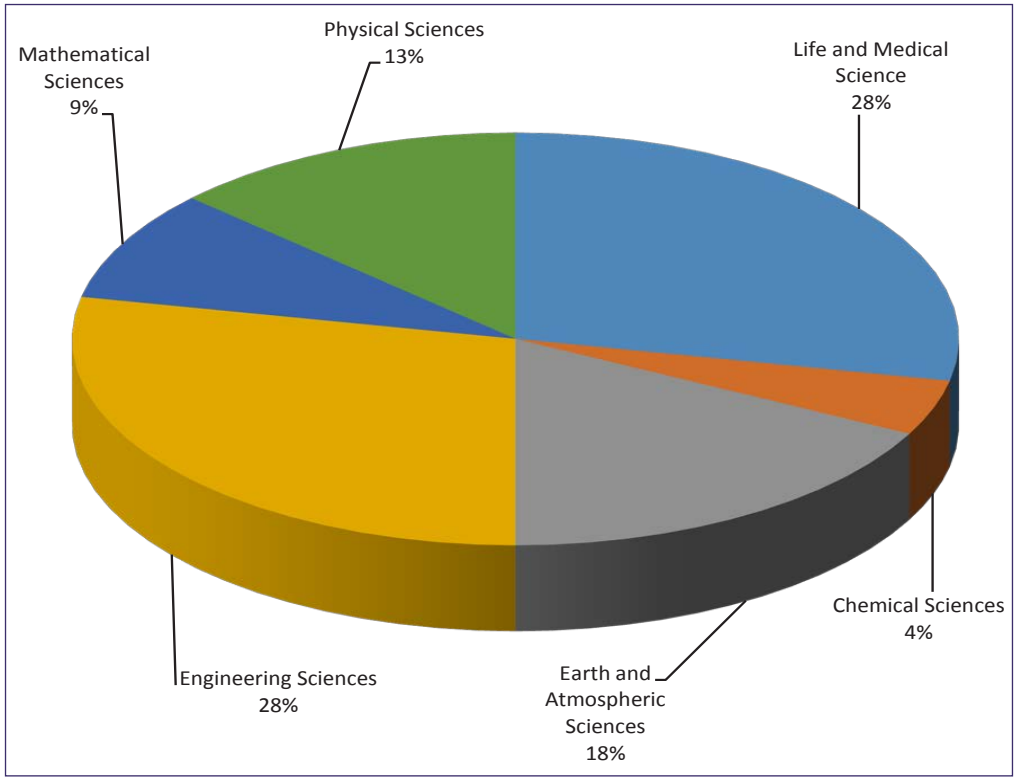
		2017-18	2018-19	2019-20
No. of Applications Received		56	61	44
No. of Awards		13	10	10
Funding	(INR / Million)	48.72	34.70	34.70
	(USD/ Million)*	0.70	0.47	0.49

**1USD= 70 INR*

Area-wise Distribution : 2019-2020



Area-wise Distribution: Last Five Years (2015-2020)



Virtual Centres- Institutional Engagement (2019-20)

India	USA
• National Institute of Oceanography, Regional Centre, Visakhapatnam • National Institute of Oceanography, Goa • Indian Institute of Technology Indore • Indraprastha Institute of Information Technology Delhi • The Energy and Resources Institute, New Delhi • International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi • University of Lucknow, Lucknow • University of Delhi, Delhi • Indian Institute of Science Bangalore • Tata Institute of Fundamental Research, Mumbai • Indian Institute of Technology, Madras • Indian Institute of Technology, Kharagpur • Physical Research Laboratory, Udaipur • Indian Institute of Astrophysics, Bangalore • Indian Institute of Science Education and Research, Pune • Jawaharlal Nehru University, New Delhi • National Institute of Immunology, New Delhi • Chennai Mathematical Institute, Chennai • International Centre for Theoretical Sciences, Bengaluru • Indian Institute of Technology, Gandhinagar • Indian Institute of Technology Bombay	• NOAA Pacific Marine Environmental Laboratory, Seattle • NOAA Atlantic Oceanographic and Meteorological Laboratory, Miami • University of Nebraska Lincoln • University of California, Davis • Michigan State University, Michigan • Washington University, St. Louis • Oregon State University, Corvallis • Cincinnati Children Hospital Medical Center, Cincinnati • Georgia Institute of Technology, Atlanta • University of California, Berkeley • Stanford University, Palo Alto • Clemson University, Clemson • NASA Goddard Space Flight Center, Greenbelt, Maryland • The University of Alabama, Huntsville • SLAC National Accelerator Laboratory, California • The Pennsylvania State University, Pennsylvania • Johns Hopkins University, Baltimore • Institute for Advanced Study, Princeton • University of South Carolina, Columbia

SECTION II

INNOVATION & 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 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 IUSSTF's 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 with a tangible societal impact 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 38 joint U.S. India Entrprenuerial Projects through 9 calls.

Highlights:

- The **20th Meeting** of the **U.S.-India Science and Technology Endowment Board (USISTEB)** was held on 27th February 2020 in Washington D.C. under the Co-Chairmanship of **Mr. Sanjeev Kumar Varshney**, Adviser & Head, International Bilateral Cooperation, 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). ED, IUSSTF presented an overview of the Endowment Fund's activities over the past year. The Board also deliberated upon strategic and new models of collaboration going forward.

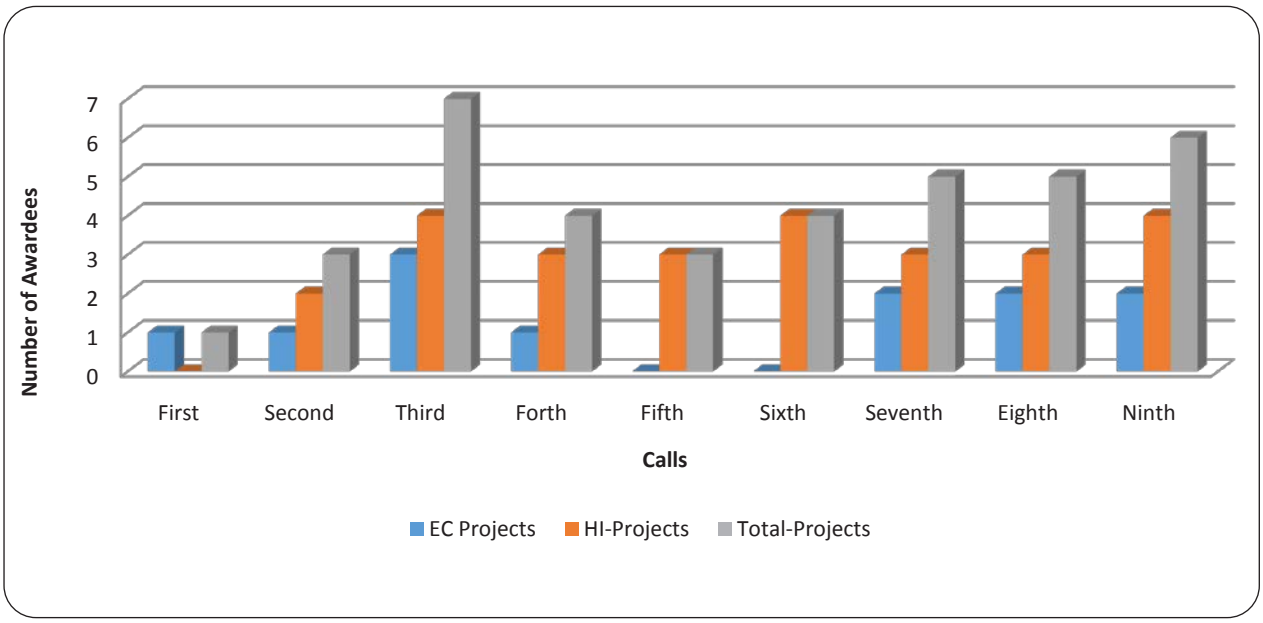
- The **10th Call for Proposals** under the USISTEF Program was announced in September 2019 with a deadline in end-October 2019. As a part of outreach for the 10th call, the Secretariat reached out to potential applicants through a multi-pronged strategy that included regular updates on the IUSSTF and USISTEF webpage; newspaper advertisements; and, emailers to IUSSTF's extensive list of stakeholders. Additionally, to enhance outreach and visbility, the Secretariat has also reached out to agencies and partners to help circulate the information within their networks for wider outreach.
- In response to the 10th Call for Proposals IUSSTF received **256 applications – 134** in the Healthy Individuals (HI) category and **122** in the Empowering Citizens (EC) category. As the first step, all **256** applications were screened internally by IUSSTF to check for compliance with the eligibility criteria. Following this, **133** applications in the HI category and **116** applications in the EC category were shortlisted for review by the **Joint Experts Panel (JEP)**. The JEP shortlisted **40** proposals in the EC category and **52** in the HI category for Stage-I. Detailed proposals were then reviewed by the JEP and **11** applications in EC Category and **12** applications in HI category were invited for in-person presentations to the Joint Experts Panel (JEP) at Washington DC on 24th February 2020 (EC) and 25th February 2020 (HI) respectively. The JEP shortlisted 13 projects listed in *Annexure IV* (6 in EC and 7 in HI) for subsequent site-visits and Financial Due-Diligence.
- For the ongoing projects, a Project Committee Meeting (PMC) meeting was held on **1st May 2019 at IUSSTF, New Delhi** to review the progress of six USISTEF Projects under the previous calls. The list of projects reviewed during the meeting are listed as *Annexure V.*
- Four projects awarded during the previous calls have been successfully closed. *Annexure VI* lists out the these projects

Overall Status Across all Calls

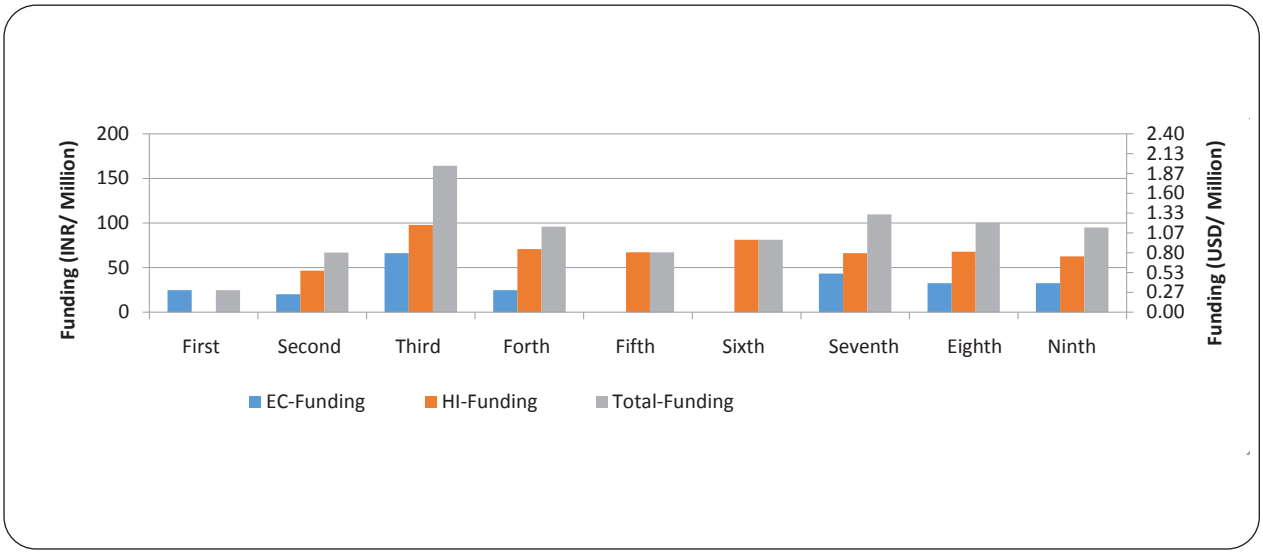
Calls	EC			HI			Total		
	Projects	Funding		Projects	Funding		Projects	Funding	
		(INR/ Million)	(USD/ Million)*		(INR/ Million)	(USD/ Million)*		(INR/ Million)	(USD/ Million)*
First	1	24.92	0.36	0	0	0.00	1	24.92	0.36
Second	1	20.32	0.29	2	46.51	0.66	3	66.83	0.95
Third	3	66.34	0.95	4	97.72	1.40	7	164.06	2.34
Forth	1	24.8	0.35	3	70.96	1.01	4	95.76	1.37
Fifth	0	0	0.00	3	67.31	0.96	3	67.31	0.96
Sixth	0	0	0.00	4	81.28	1.16	4	81.28	1.16
Seventh	2	43.3	0.62	3	66.23	0.95	5	109.53	1.56
Eighth	2	32.7	0.47	3	67.9	0.97	5	100.6	1.44
Ninth	2	32.5	0.46	4	62.5	0.89	6	95	1.36
Total	**12**	**244.88**	**3.50**	**26**	**560.41**	**8.01**	**38**	**805.29**	**11.50**

*1USD= 70 INR

Award Status - In Numbers

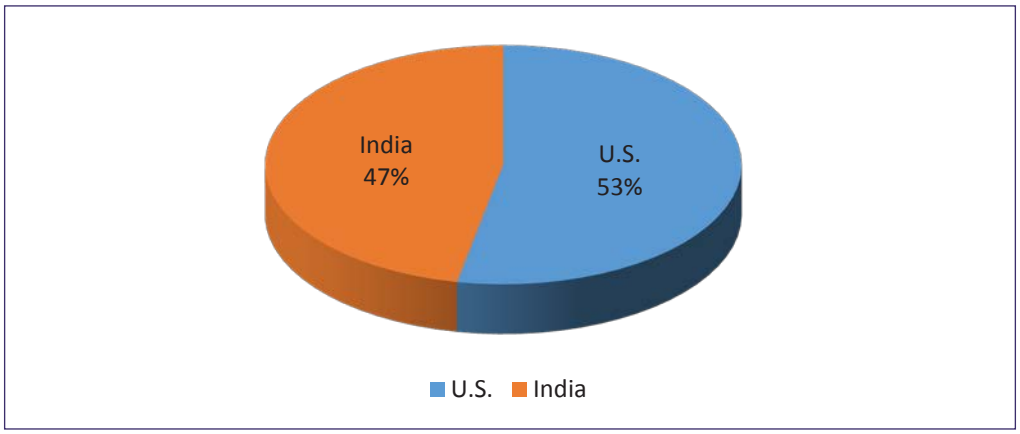


Award Status - Funding

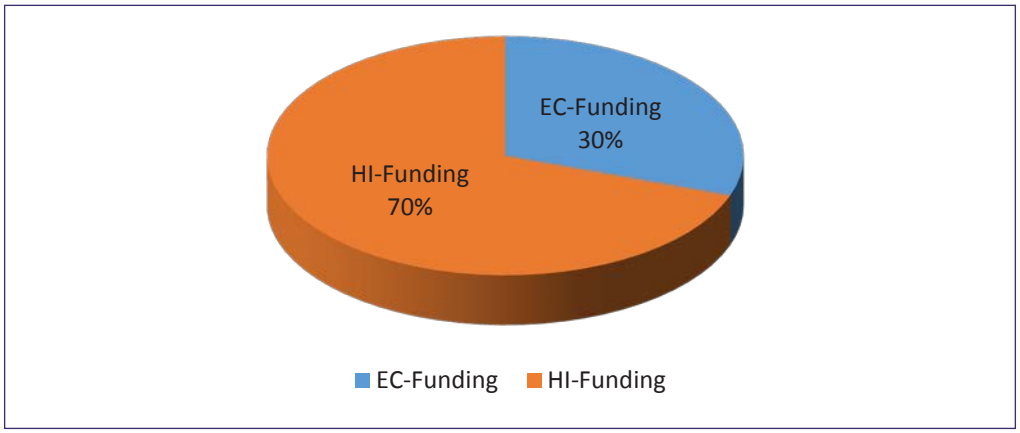


In Pictures : Dr. Anurag Agarwal (CSIR-Institute of Genomics & Integrative Biology, New Delhi) and Dr. Ashutosh Sabharwal (Cognita Labs LLC, Houston) collaborated to develop the world's first handheld, low-cost, portable Forced Oscillation Technique (FOT) device - PulmoScan - a next generation smart airway diagnostic device, with an assistive coaching tablet application and a cloud support. USISTEF Board Member Dr. Shirshendu Mukherjee (DBT– BMGF-Wellcome Trust-BIRAC, Program Management Unit) and IUSSTF Principal Science Officer Dr. Nishritha Bopana try out the device at IUSSTF.

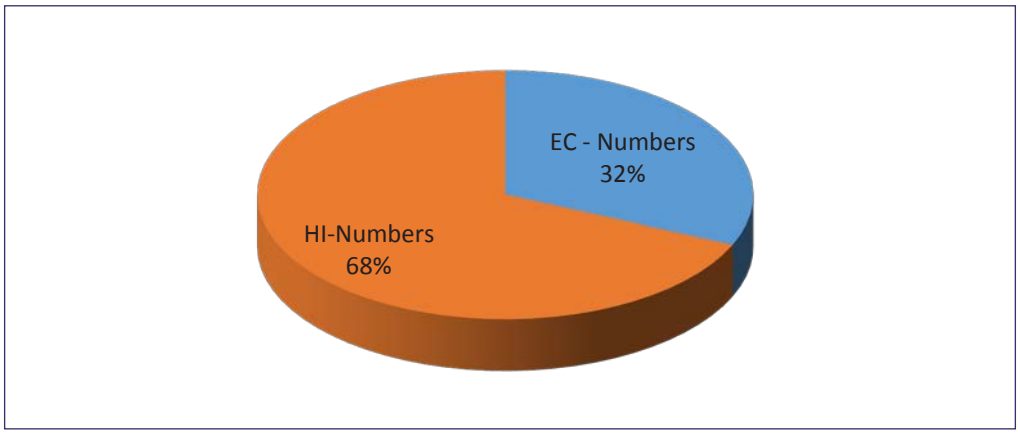
Overall Fund Distrubution (Country-wise)



Overall Fund Distrubution (Area-wise)



Overall Fund Numbers (Area-wise)



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:

Out of the 25 women entreprenuers short-listed in 2018, 10 were selected for the Silicon Valley Experiential Visit. The WEQ 2018 Silicon Valley Visit from 6-10 May 2019 was an action packed week covered by a wide range of experienced valley professionals. The week enabled the women to make valuable contacts and sharpen their entrepreneurial outlook.

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

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 were 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:

- A nationwide call for applications, for both University Challenge and Open Innovation Challenge, was launched for the 2019 edition of IIGP 2.0 on 19th February 2019.
- This edition of the program received 18060 registrations and 9530 applications cumulatively. There were 5282 applications for the Open Innovation Challenge (OIC) and 4248 applications for the University Challenge (UC). Of the 9530 applications, 2482 were complete applications divided into 1641 for the OIC and 841 for the UC, respectively.
- The Top 40 teams shortlisted were invited to the UC Down select Competition at IIT Bombay on 28-29 June, 2019. The teams pitched their ideas to a jury of 7-8 members in two separate tracks. The top 20 teams were declared as the winners of the 2019 edition of the IIGP 2.0 University Challenge (listed in *Annexure VII*).
- The shortlisted top 50 teams from the Open Innovation Challenge (OIC) 2019 and the top 15 winning teams of the University Challenge (UC) 2018 were invited to be

part of the seven-day long residential boot camp at IIM Ahmedabad from 30th June – 6th July 2019. Of these, 48 teams from OIC 2019 and 15 teams from UC joined the boot camp. Four out of the 15 teams were selected to present their innovation and business idea along with the innovators in Open Innovation Challenge track for the final pitching in New Delhi for the award of INR 25 Lacs each.

- 42 teams qualified (38 teams from the Open Innovation Challenge 2019 & 4 teams from the University Challenge 2018) for the Innovators Competition, organized and implemented by FICCI in New Delhi on 16-17 July 2019. The Top 16 teams were declared winners of the Open Innovation Challenge 2019 (listed in *Annexure VIII*).
- At a grand awards ceremony, held at Hotel Taj Palace, New Delhi on 17th July 2019, the Top 20 winners of the University Challenge and the Top 16 winners of the Open Innovation Challenge were felicitated, in the presence of the Chief Guest, Prof. Ashutosh Sharma, Secretary, Department of Science and Technology, Govt. of India.
- 13 of the Top 16 winners of the IIGP 2.0 Open Innovation Challenge 2019 as well representatives from the programme stakeholders and implementation partners visited Boston, Washington D.C. and Maryland with a sub-set also visiting Austin from 11-20 November 2019.

SECTION III

RESEARCH AND DEVELOPMENT

Research and Development

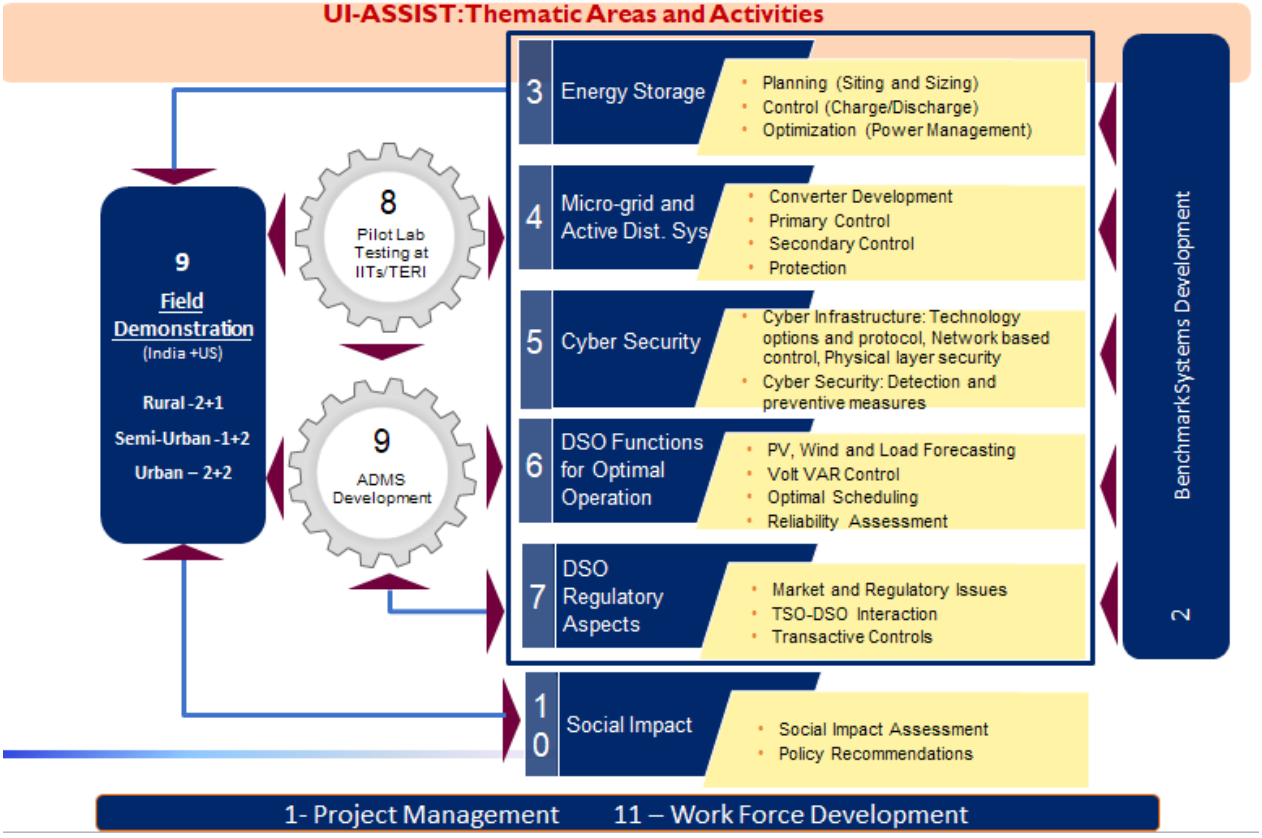
IUSSTF supports a broad portfolio of R&D programs in key strategic areas that are of mutual interest to both countries. The current portfolio includes flagship programs like the **Joint Clean Energy Research and Development Centre (JCERDC) on Smart Grid and Energy Storage**; **PACEsetter Fund** and the DST-Intel® **Real Time River Water and Air Quality Monitoring Initiative**.

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. Phase I of the program began in the year 2012 with IUSSTF as the implmenting 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. Phase I of the program brought together more than 100 Indian and U.S. academic and industrial partners to work jointly in the space of clean energy research.

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**. The U.S. Department of Energy and the Government of India (through the Ministry of Science and Technology) each committed $1.5 million per year over a five year period (with 50% cost share coming in from the consortium partners). 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.

"***UI-ASSIST: U.S.-India collAborative for smart diStribution System wIth Storage***" led in India by Suresh C. Srivastava from the Indian Institute of Technology (IIT) Kanpur and in the United States by Noel Schulz from Washington State University, Pullman, was selected and awarded in September 2017 under the initiative.



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.

Institutional Engagement: UI-ASSIST

India	USA
• **Indian Institute of Technology Kanpur, Kanpur (IITK)** • Indian Institute of Technology Delhi (IITD) • Indian Institute of Technology Madras (IITM) • Indian Institute of Technology Roorkee (IITR) • Indian Institute of Technology Bhubaneswar (IITBBS) • The Energy and Resources Institute, New Delhi (TERI) • NTPC Energy Technology Research Alliance (NETRA), Greater NOIDA • Power Grid Corporation of India Limited (PGCIL), Gurgaon • UP Power Corporation Limited (UPPCL), Lucknow • BSES Rajdhani Power Ltd., New Delhi	• **Washington State University, Pullman, WA** • Massachusetts Institute of Technology, Cambridge, MA (MIT) • Texas A&M University, College Station, TX (TAMU) • Hawaii Natural Energy Institute, Honolulu, HI (HNEI) • National Renewable Energy Laboratory (NREL) • Pacific Northwest National Laboratory (PNNL) Lawrence Berkeley National Lab, Berkeley, CA (LBNL) • Snohomish County Public Utility District No 1., Everett, WA (SnoPUD) • Burns and McDonnell, Kansas City, MO (Burns & Mc) • ETAP, Operation technology, Inc., Irvine, CA (ETAP) • National Rural Electric Cooperative Association, Arlington, VA (NRECA) • AVISTA Utilities, Spokane, WA (AVISTA) • Venkata Consulting Solutions Inc. • Clean Energy Solutions • GE

UI-ASSIST Highlights:

1	Papers published in Journals	19
2	Papers presented at Symposia/ Conferences	40
3	Joint Workshops conducted	3
4	Scientists/Faculty Exchange visits undertaken	12
5	Researcher/Student Exchange visits undertaken	4

Events:

- The third joint meeting-cum-workshop of the UI-ASSIST, involving India and US consortia members, was held at New Delhi during 18-19 December 2019.

- The Second Project Monitoring Committee meeting was held on 22 July 2019 at IIT Delhi.

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 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:

- Based on recommendations of the Steering Committee, IUSSTF convened Project Review and Site Inspection to evaluate projects supported under PSF (Round I). A team comprising of subject expert, representatives from Ministry of New and Renewable Energy (MNRE) and the US Embassy reviewed the following projects in November 2019, January and February 2020:
  - "*Powering agriculture: Community based solar pumps*" led by M/s Environment Conservation Society (Switch ON), Kolkata
  - "*Microgrid remote monitoring & control*" led by M/s Customized Energy Solutions (CES) India Pvt Ltd., Pune
  - "*Creation of an innovative market maker debt provider (incorporated as cKers Finance Private Limited) to catalyze growth of market players in Decentralized Renewable Energy (DRE) based energy access projects*" led by M/s cKers Finance Private Limited Pvt. Ltd., New Delhi
  - "*High rate biomethanation of organic waste for generation of power for off-grid applications*" led by M/s Ahuja Engineering Services Pvt Ltd (AES), Secunderabad
  - "*Waste to energy innovation at small-scale*" led by M/s Grassroots Energy Inc., Massachusetts (Lead partner) and M/s SEWA Bharat, New Delhi
- After a rigorous, multi-tier screening, four projects were selected for support (Annexure IX). Shri Anand Kumar, Secretary, MNRE and Mr. Kenneth Ian Juster, the U.S. Ambassador to India co-chaired a felicitation ceremony for these projects on September 20, 2019 at MNRE, New Delhi.

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 was to develop tools and constituent blocks than 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 the Indo-US S&T Forum. Under the WAQM call, four projects were awarded in 2017 (*Annexure IX*), of which two each have been funded under 'Air' and 'Water' Quality Monitoring categories respectively.

Highlights:

- The third and the fourth Project Monitoring Committee Meetings were held at New Delhi on 26th June 2019 and 4th December 2019 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.
- Following this, in order to monitor on-ground progress of the projects led by IIT Kanpur under the WAQM Program - one each in Air and Water – members of the Project Monitoring Committee along with DST, Intel and IUSSTF officials conducted a site-visit at Kanpur on 5th December 2019.
  - » Members visited the Bithoor Bridge near IIT-Kanpur where a prototype of the online river monitoring system i.e. the NSVS system has been installed on the River Ganges. The team demonstrated the manner in which data would be obtained from the deployed sensors integrated within the buoy.

» Experts visited the IIT-Kanpur campus where the team demonstrated the low-power networking-based device built by the SATVAM consortium. Members then visited one of the twelve nodes deployed across the IIT-K campus. Team showcased the real-time air quality data collected from campus deployment on the dashboard and analytics demo.

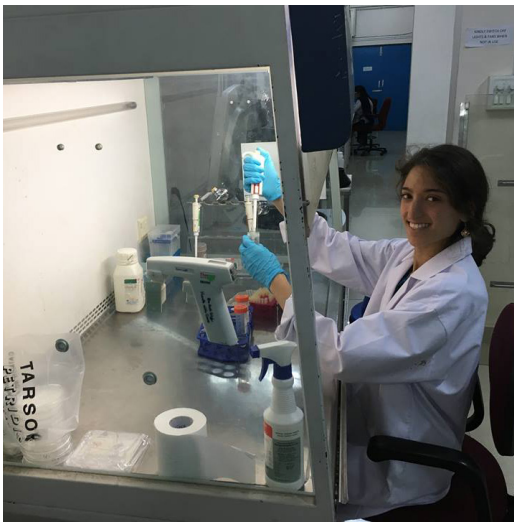
SECTION IV

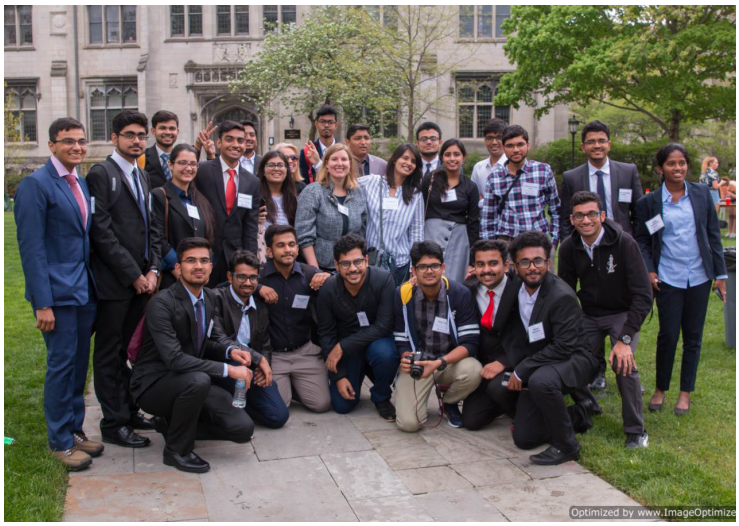
VISITATIONS AND FELLOWSHIPS

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 Fellowship
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 Efficien-cy	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	Up to 5 Professorships
10	Research Internships in Science and Engineering		All areas of Science and Technology	Up to 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
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)/ ISEF *(Refer to Annexure X)*	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

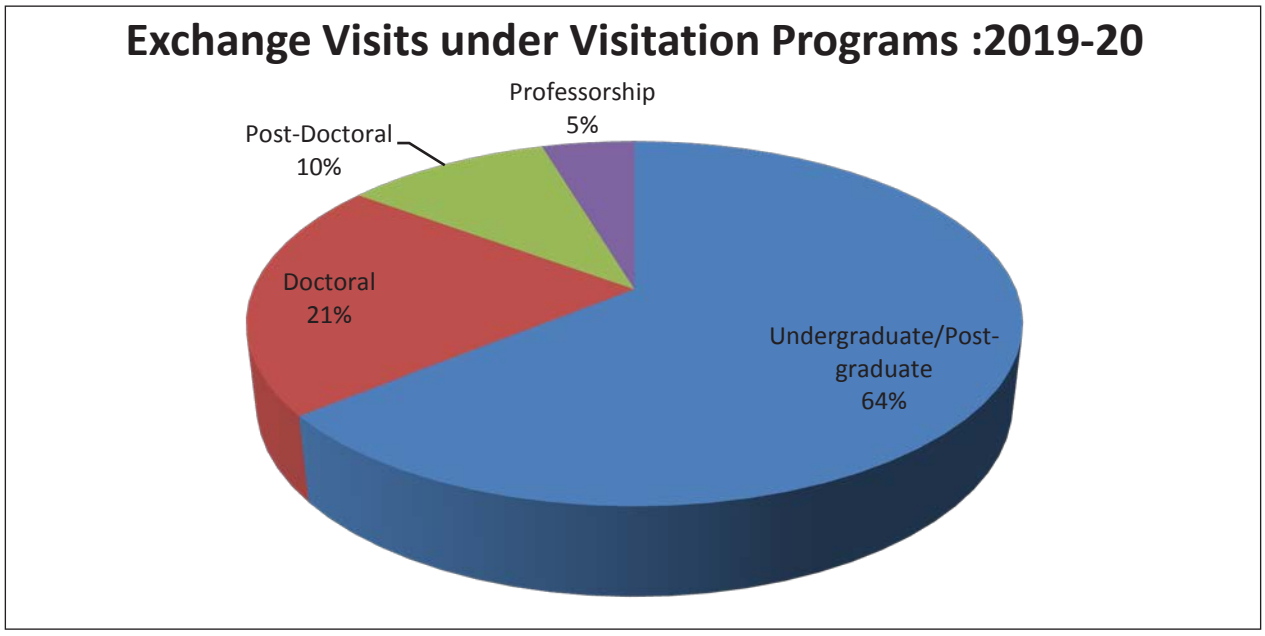
Direction of Exchange	Numbers
India to U.S.	
• Undergraduate/Post-graduate	118
• Doctoral	37
• Post-Doctoral	16
• Professorship	4
Sub-Total	175
U.S. to India	
• Undergraduate/Post-graduate	7
• Doctoral	4
• Post-Doctoral	4
• Professorship	5
Sub-Total	**20**
Total Number of Exchanges in 2019-20	**195**

Distribution across Institutions

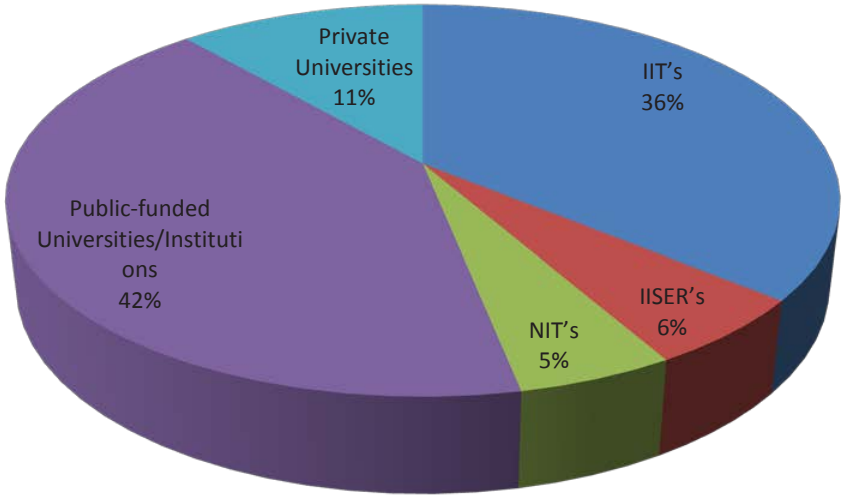
Host Institution	Numbers
• American	82
• Indian	14
Total	**96**

Top Host Institutions

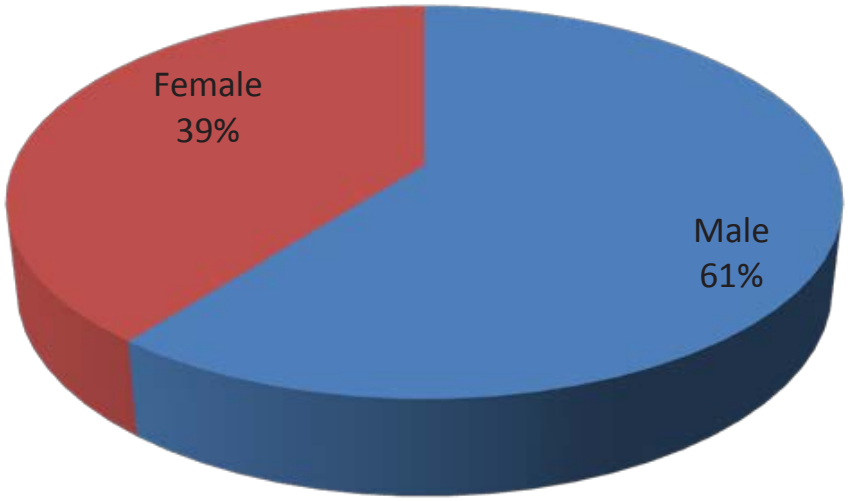
U.S.	INDIA
• Carnegie Mellon University (CMU) • Harvard University • Johns Hopkins University • Lawrence Berkeley National Laboratory • Massachusetts Institute of Technology • Northwestern University • Pennslyvania State University • Princeton University • Purdue University • Stanford University • Texas A&M University • University of California, San Diego • University of Chicago • University of Illinois, Urbana Champaign • University of Nebraska Lincon • University of Southern California • University of Wisconsin Madison • Yale University, New Haven	• Ashoka Trust for Research in Ecology and the Environment (ATREE), Bengaluru • Bhaskaracharya College of Applied Sciences, University of Delhi • ICAR-Central Institute for Research on Buffaloes, Haryana • Indian Institute of Astrophysics, Bangalore • Indian Institute of Science, Bangalore • Indian Institute of Technology Bombay • Indian Institute of Technology- Kharagpur • Indian Institute of Technology-Kanpur • Jawaharlal Nehru University, New Delhi • National Centre for Biological Sciences • Tata Institute of Fundamental Research (T.I.F.R.) • The University of Trans-disciplinary Health Sciences and Technology (TDU), Bengaluru • University of Delhi South Campus, New Delhi • YRG Centre for AIDS Research and Education



Indian Parent Institutions of Interns/Fellows who travelled in 2019-20



Gender Distribution



SECTION V

PROMOTION, SHOWCASING, OUTREACH AND EVENTS

Promotion, Showcasing and Outreach

- Dr. Nandini Kannan assumed charge as Executive Director of the Indo-U.S. Science and Technology Forum (IUSSTF) on 02nd September 2019.
- Dr. Nandini Kannan (Executive Director, IUSSTF) and Mr. Daniel R. Simmons (Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy) signed an MoU for "Solar Decathlon India". The Alliance for an Energy Efficient Economy (AEEE) and the Indian Institute for Human Settlements (IIHS) are the lead implementing organizations for the Solar Decathlon India. It aims to provide a platform to collaborate on science and technologies for fostering innovation towards sustainable economic development, while encouraging the use of renewable energy sources, and towards promoting the design of buildings that are energy efficient and self-reliant in energy usage.

Events

- Under the Indo-U.S. Genome Engineering/Editing Technology Initiative (GETin) program, a day-long Interactive **Indo-U.S. GETin Conclave** was organised on 9th January 2020 by the Indo U.S. Science & Technology Forum (IUSSTF) in association with the Department of Biotechnology (Funding Partner) at the National Institute of Plant Genome Research (NIPGR), New Delhi. The Conclave provided an opportunity to the Awardees to present their research highlights, overall professional & personal experiences, future plans, skills and practices learned during their GETin tenure.

The Conclave also brought leading Indian researchers and experts working in this niche area to share their insights and provide valuable advice to the Interns and Fellows. The Expert Panel provided DBT and IUSSTF with a detailed assessment of the strengths of the program as well as suggestions for improvement. The conclave had over 40 participants that included GETin Interns, Fellows and Indian Host mentors of the Visiting Fellow, a distinguished panel of Genome experts (DBT GET-TEC), NIPGR representatives, DBT officials, and the IUSSTF team.

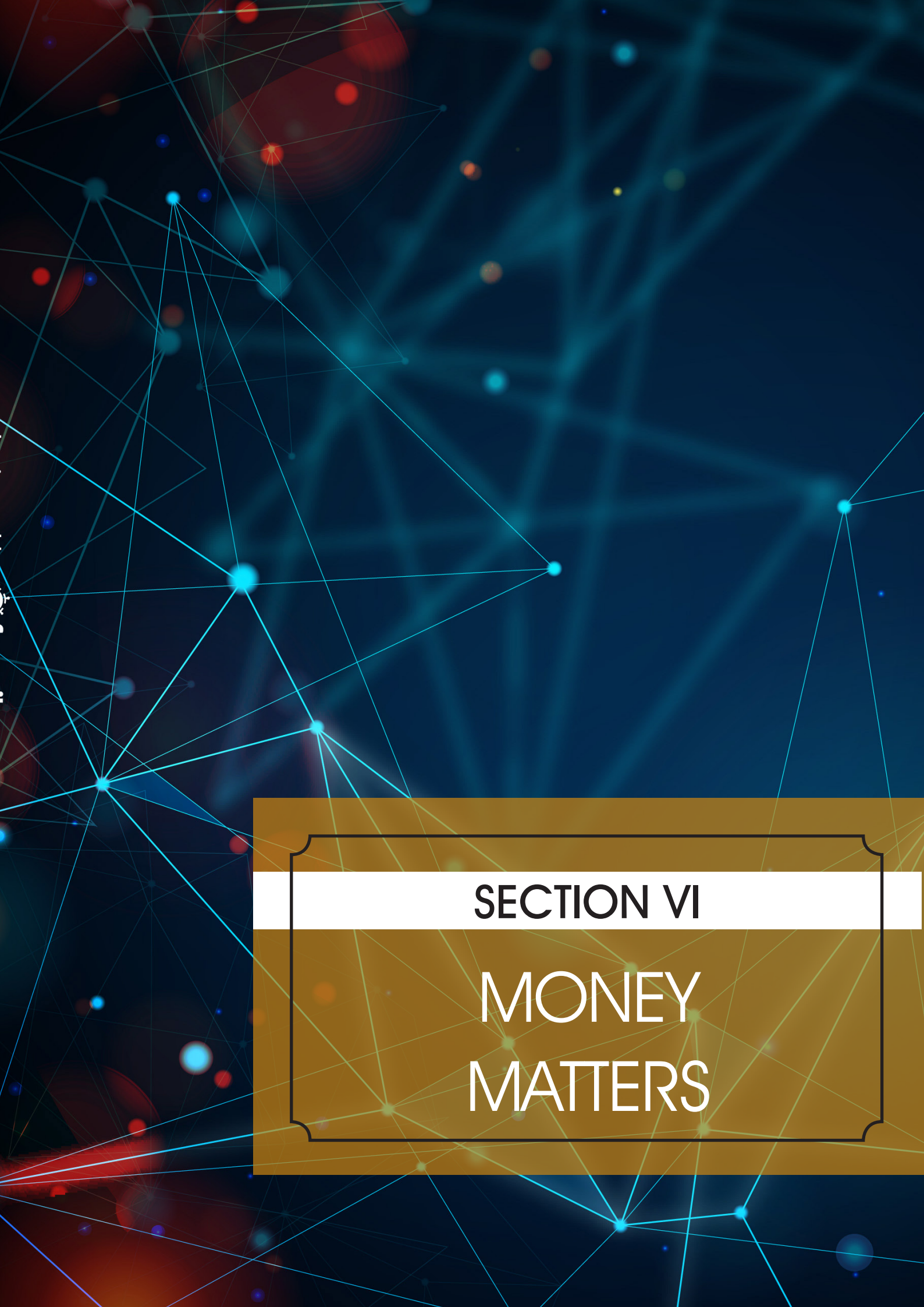
- In an effort to assess the impact of the Indo-U.S. Fellowship for Women in STEMM (WISTEMM) program, IUSSTF in association with the Department of Science and Technology (Funding Partner) organized a day-long Interactive WISTEMM Workshop with the First Batch Awardees on October 18, 2019 at the IUSSTF Office, New Delhi. The workshop aimed to have an overview of WISTEMM program performance by interacting with WISTEMM Interns & Fellows of the first batch. The Interns and Fellows briefed about their research highlights, tangible outcomes and best practices learnt and skills that leveraged after their return to India. They also shared their experiences and personally and spoke about their future plans. Participants included 17 WISTEMM (out of 20) Interns & Fellows of the First Batch, a distinguished panel of the Selection Committee, the U.S. Embassy delegates, DST officials and the IUSSTF team.

- A team of 25 bright young innovators were complimented and wished for winning laurels for the country at Flag-off ceremony held in New Delhi in April 2019. The Chief guest Prof. K.VijayRaghavan, Principal Scientific Advisor to Govt of India, and other dignitaries Dr. Nisha Mendiratta, Head, NCSTC, Department of Science and Technology, Government of India, Dr. Anjan Ghosh, Global Director Corporate Affairs, Intel Corporation and Dr. Rajiv K. Tayal, Executive Director, Indo-US S&T Forum including the audience were quite impressed with the projects showcased at the event, most of which were aimed at providing workable solutions for societal problems.

- The 2019 Khorana-Bose Scholars Orientation Program was held on May 18, 2019 at the University of Chicago. The event was co-hosted by WINStep Forward and the University of Chicago. 48 Khorana and S.N. Bose Scholars awarded by IUSSTF attended the event. The Event was attended by Ms. Pushpa Iyer, Program Officer at IUSSTF. The Orientation focused on establishing connections among Scholars, program administrators, and introducing Scholars to programs that synergize with the Khorana and Bose Programs. Representatives from multiple groups and departments on and off campus were keen to share the role their organizations could play in future Scholarly pursuits.

Board Meetings

- The **Twentieth Governing Board (GB)** Meeting of the Indo-U.S. Science & Technology Forum (IUSSTF) was held on 28th February 2020 at Washington D.C. The meeting began with the participation of Professor Ashutosh Sharma , Secretary, Department of Science & Technology, Govt. of India (Indian Co-Chair) via DVC. Subsequently, Mr. Sanjeev Kumar Varshney, Head IBCD, Department of Science & Technology, Government of India took over the proceedings as the acting Indian Co-Chair. The U.S. Co-Chair was Dr. Jonathan Margolis, Deputy Assistant Secretary, Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State. The two sides were appreciative of the work accomplished by IUSSTF and spent the day deliberating on the way forward for the organization as well as the creation of more fruitful partnerships together.
- The Twentieth Meeting of the **U.S.-India Science and Technology Endowment Board (USISTEB)** was held on 27th February under the Co-Chairmanship of Mr. Sanjeev Kumar Varshney, Adviser & Head, International Bilateral Cooperation, 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).



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)

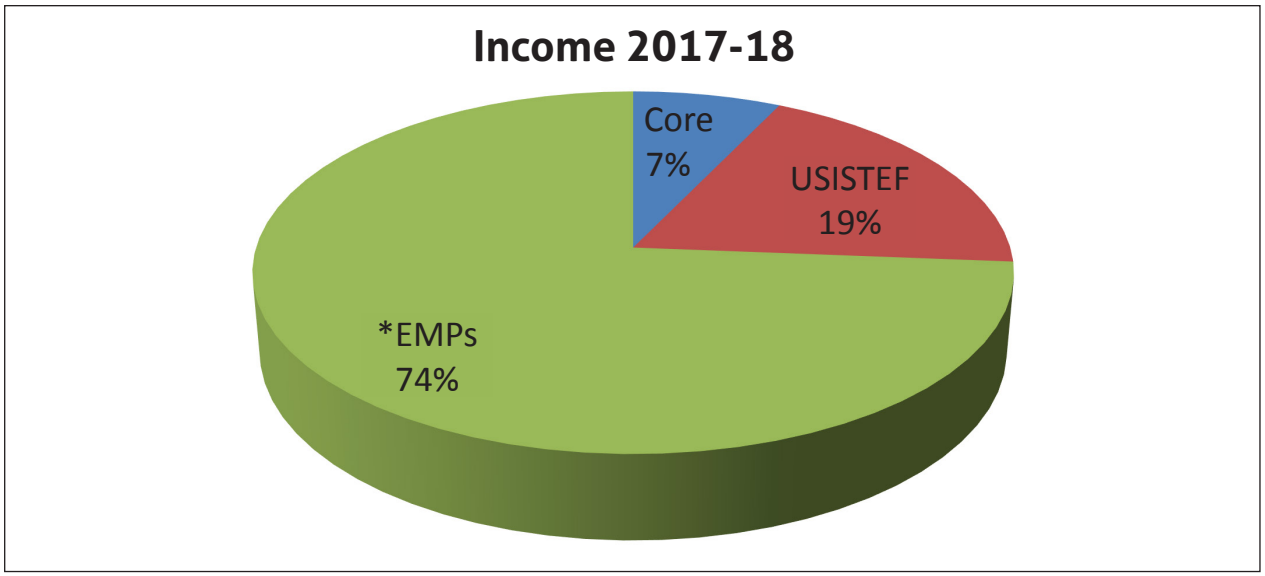
The support from the U.S. Government comes by way of annual interest on two separate Endowments (IUSSTF and USISTEF), to which the Indian Government provides matching grants annualy.

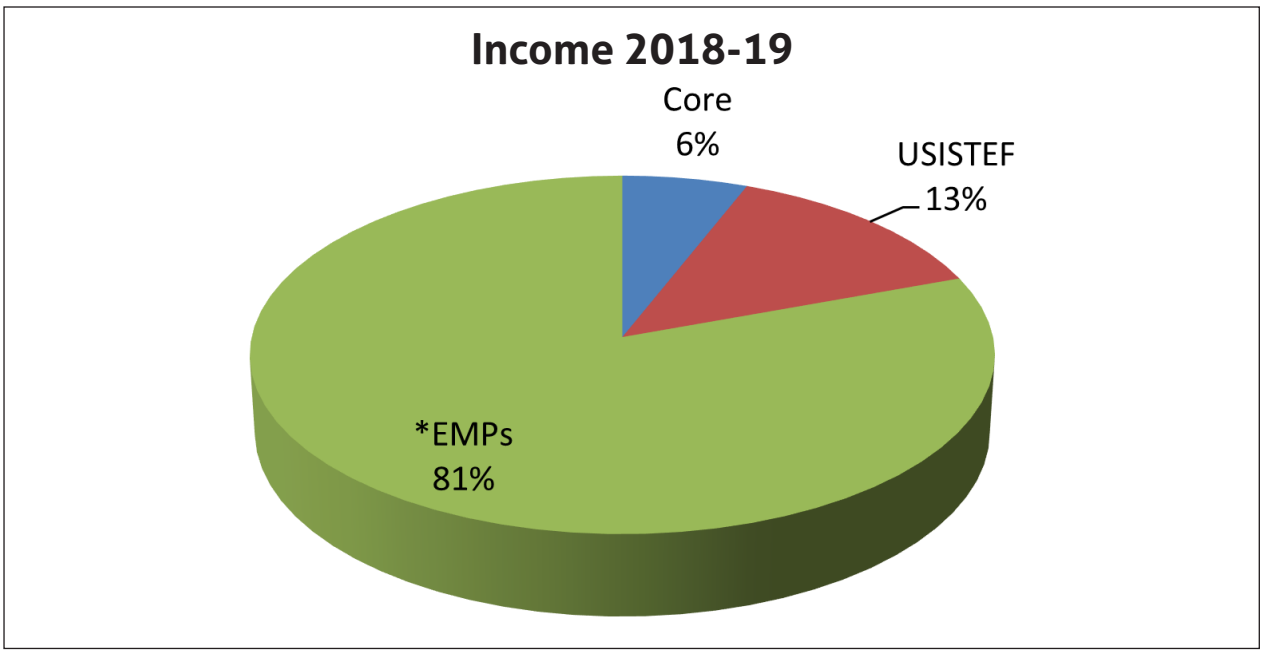
Support for the EMPs is received from various federal agencies such as DST, DBT, MNRE, SERB and Industries like Intel® and Lockheed Martin. Such support is provided in the project mode for the implementation of specific program(s), against a nominal management fee.

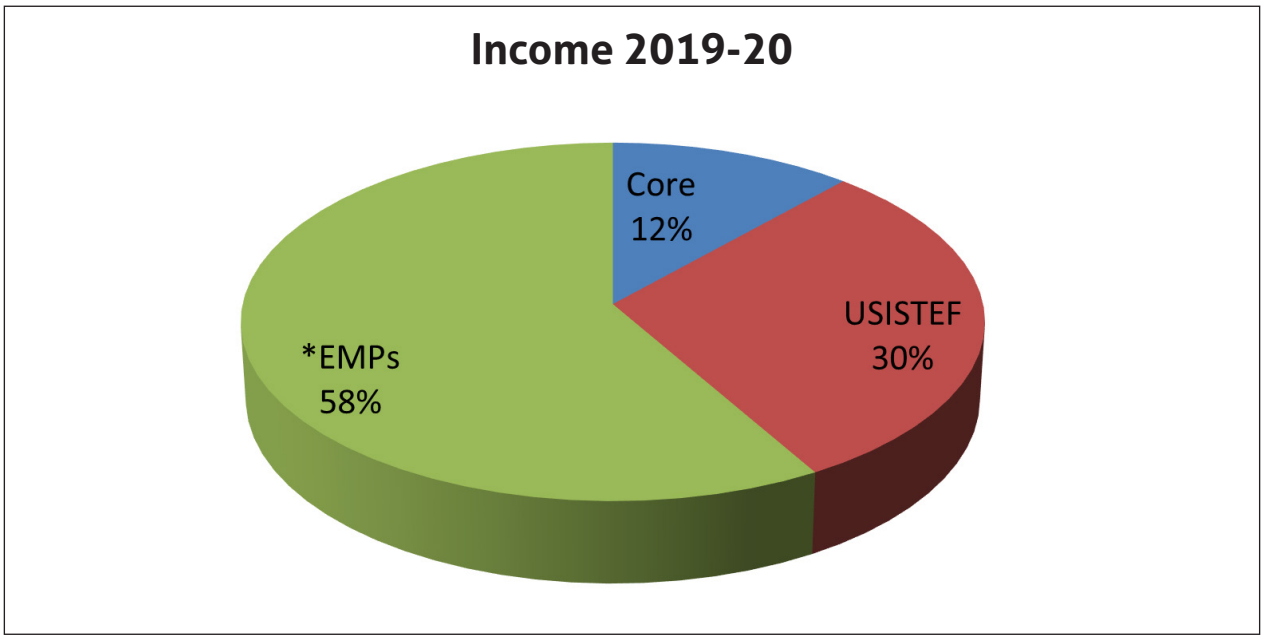
(A) Overall Income (2017-2020)

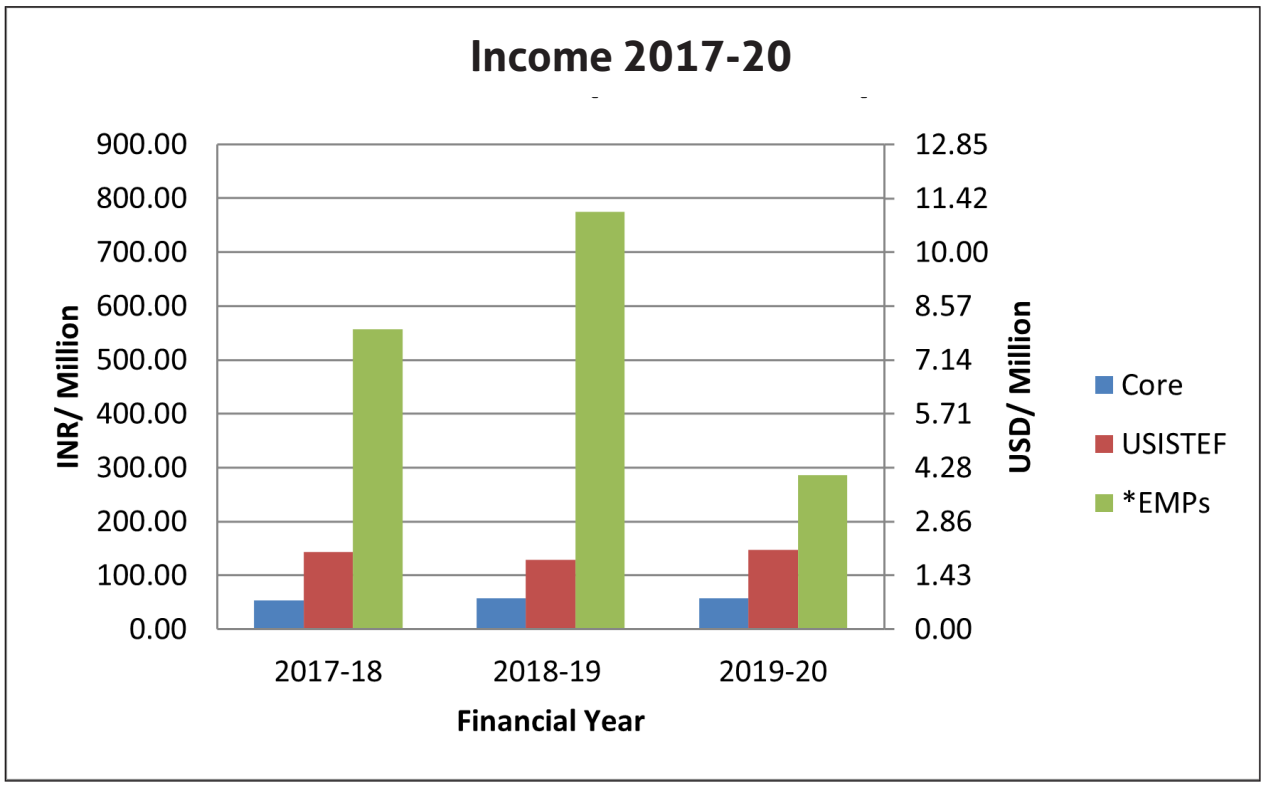
S. No	Head	2017-18		2018-19		2019-20	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Core	54.32	0.78	57.61	0.82	57.05	0.79
2	USISTEF	143.93	2.06	129.49	1.85	147.10	2.04
3	*EMPs	557.18	7.96	774.88	11.07	285.66	3.97
TOTAL		**755.43**	**10.79**	**961.98**	**13.74**	**489.81**	**6.80**

*1USD= 70 INR; *EMPs includes the grants received during the fiscal year*





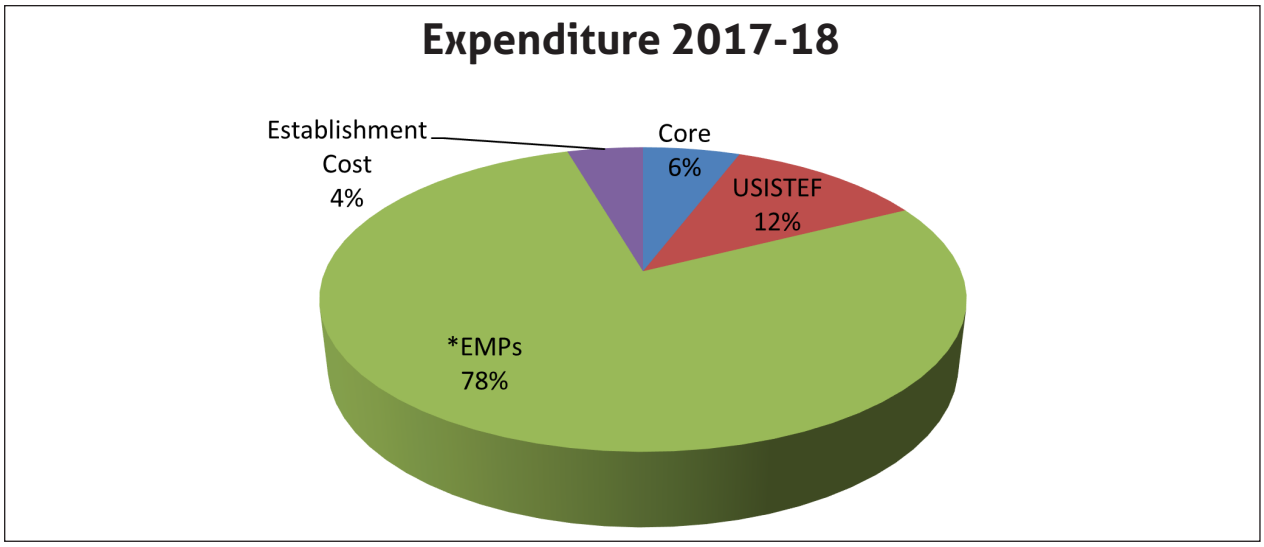

Income 2019-20
Core
12%
USISTEF
30%
*EMPs
58%

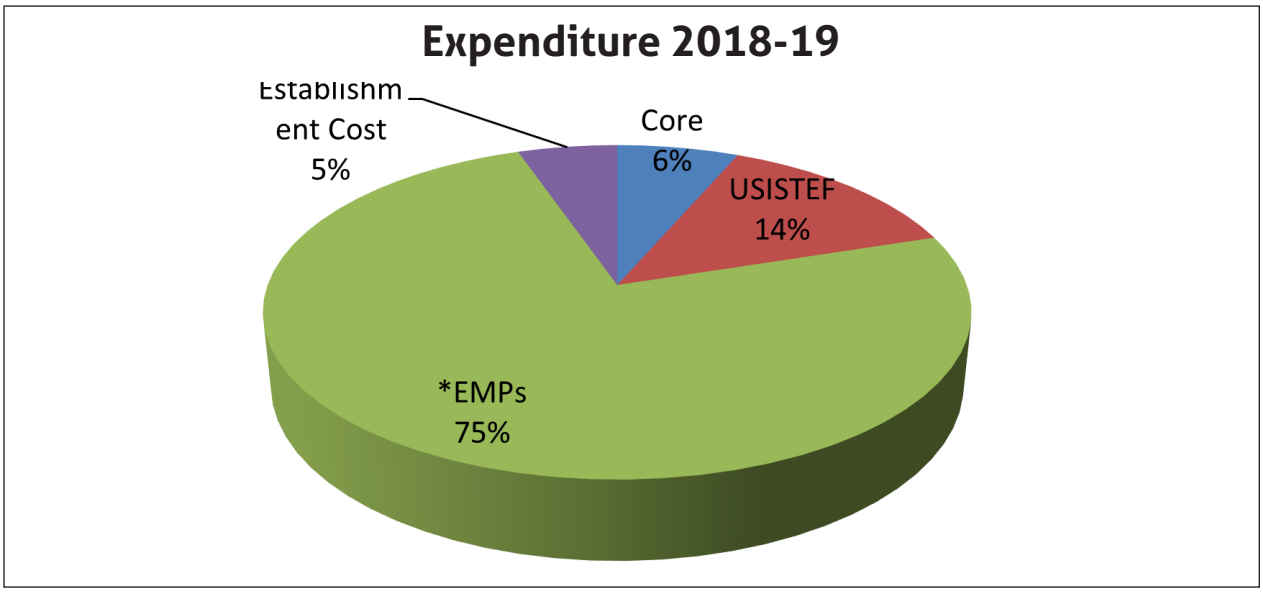

Income 2017-20
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
INR/ Million
12.85
11.42
10.00
8.57
7.14
5.71
4.28
2.86
1.43
0.00
USD/ Million
2017-18
2018-19
2019-20
Financial Year
Core
USISTEF
*EMPs

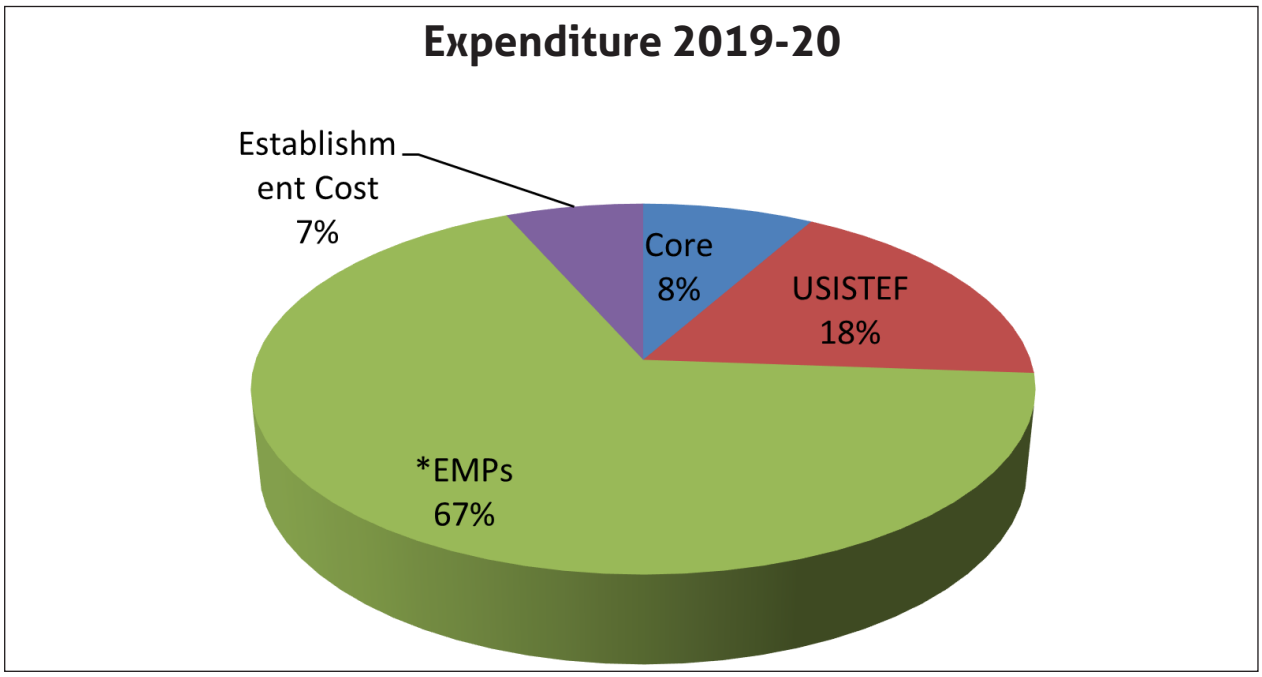
(B) Overall Expenditure (2017-2020)

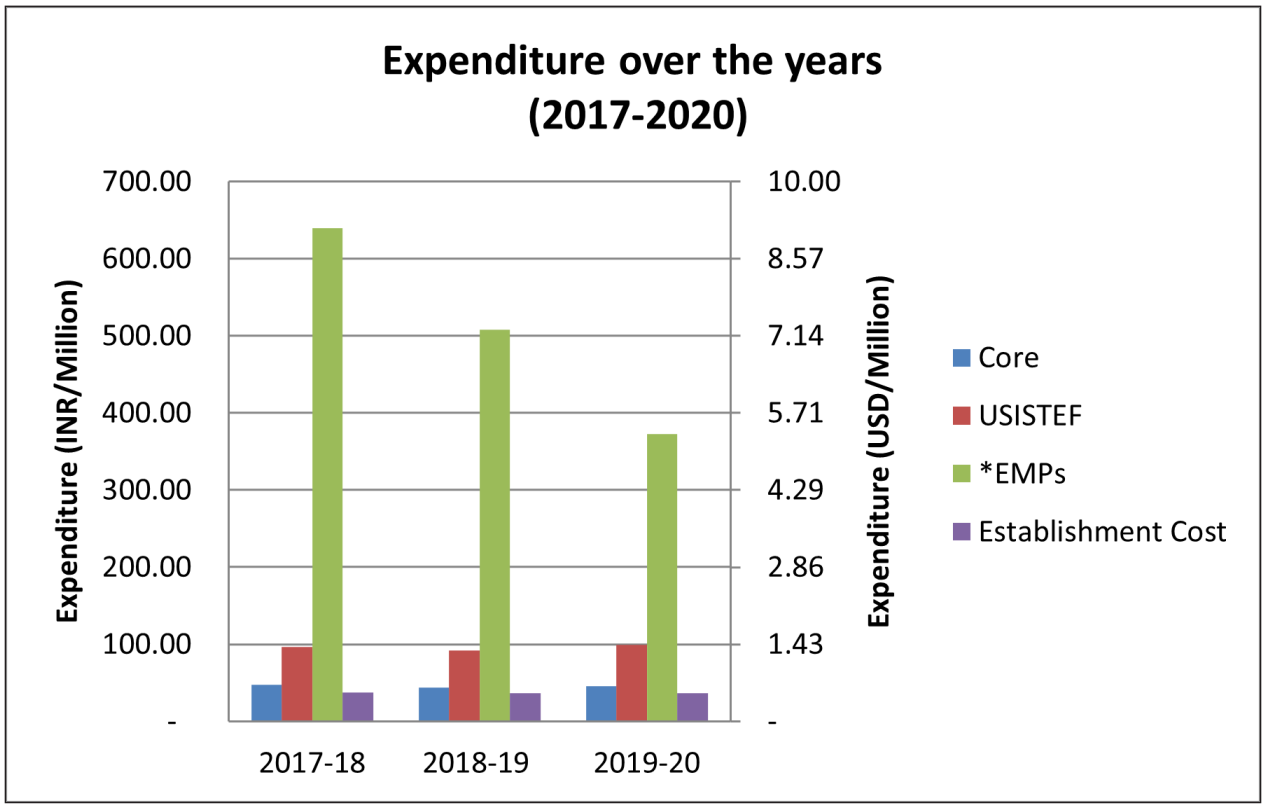
S.No	Head	2017-18		2018-19		2019-20	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Core	47.65	0.68	44.18	0.63	45.59	0.63
2	USISTEF	96.82	1.38	92.22	1.32	99.47	1.38
3	*EMPs	639.50	9.14	507.65	7.25	372.94	5.18
4	Establishment Cost	37.14	0.53	36.12	0.52	36.75	0.51
TOTAL		**821.11**	**11.90**	**680.17**	**9.86**	**554.75**	**7.70**

*1USD= 70 INR, *EMPs includes the grants expended during the fiscal year*





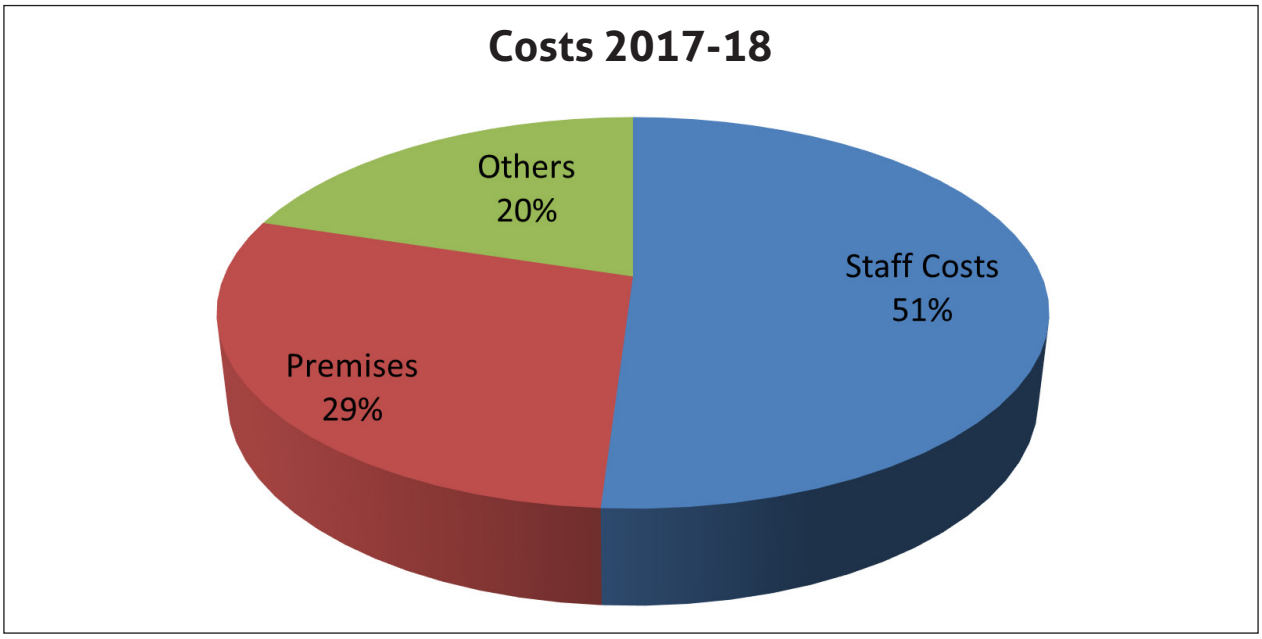

Expenditure 2019-20
Establishment Cost 7%
Core 8%
USISTEF 18%
*EMPs 67%

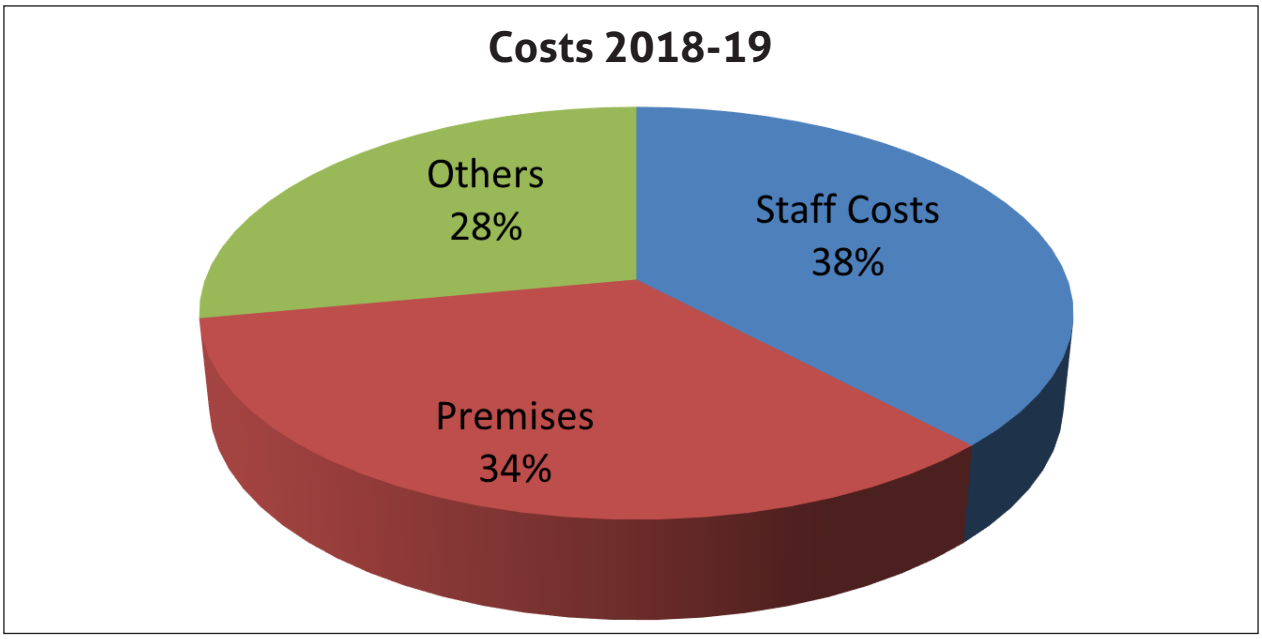

Expenditure over the years (2017-2020)
Expenditure (INR/Million)
700.00
600.00
500.00
400.00
300.00
200.00
100.00
-
10.00
8.57
7.14
5.71
4.29
2.86
1.43
-
Expenditure (USD/Million)
2017-18
2018-19
2019-20
Core
USISTEF
*EMPs
Establishment Cost

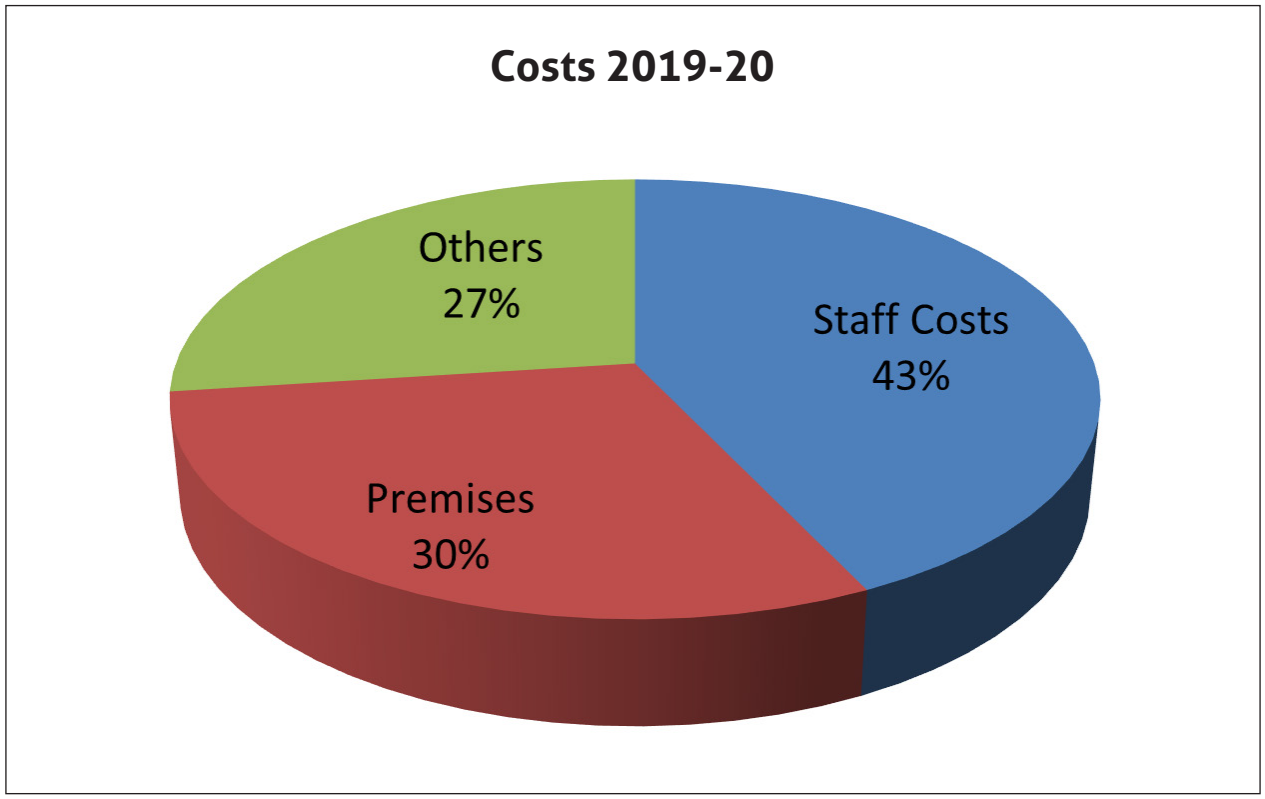
(C) Establishment Cost (2017-2020)

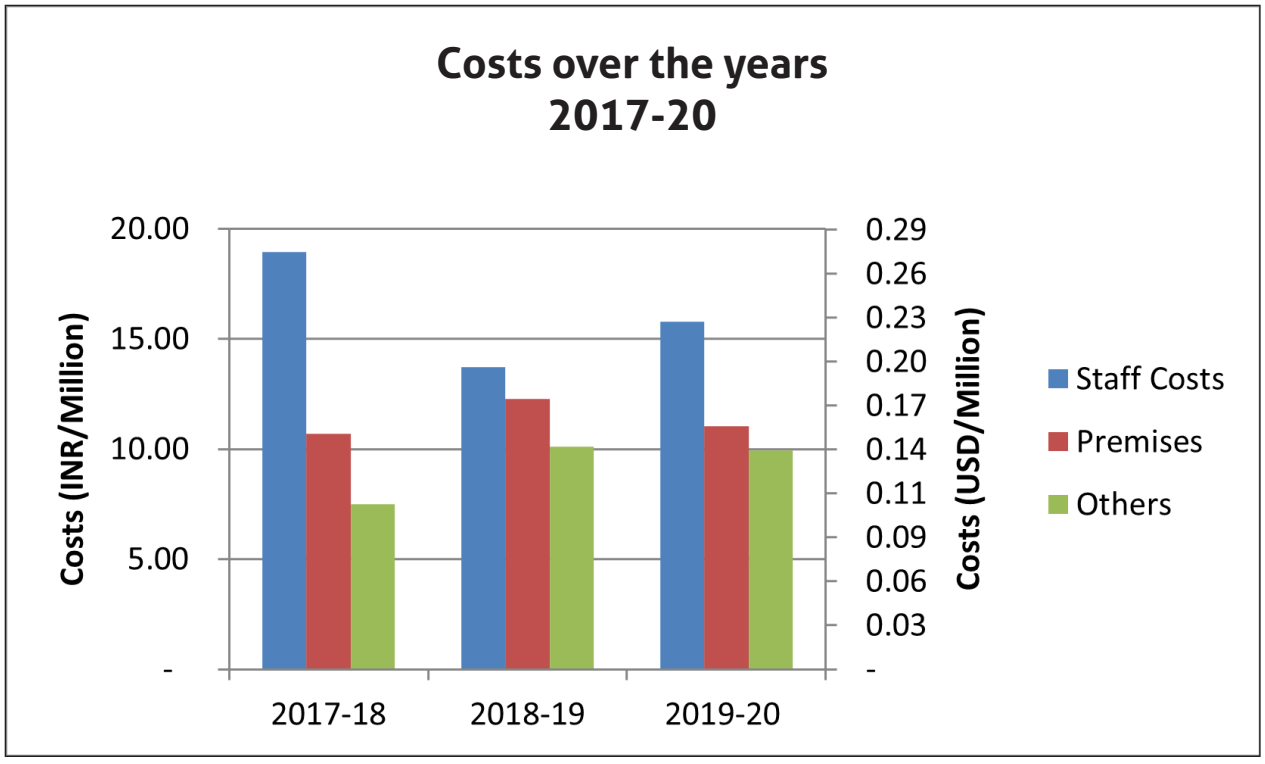
S. No	Head	2017-18		2018-19		2019-20	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Staff Costs	18.95	0.27	13.72	0.20	15.77	0.22
2	Premises	10.70	0.15	12.29	0.18	11.04	0.15
3	Others	7.49	0.11	10.11	0.14	9.94	0.14
TOTAL		**37.14**	**0.53**	**36.12**	**0.52**	**36.75**	**0.51**

1USD= 70 INR





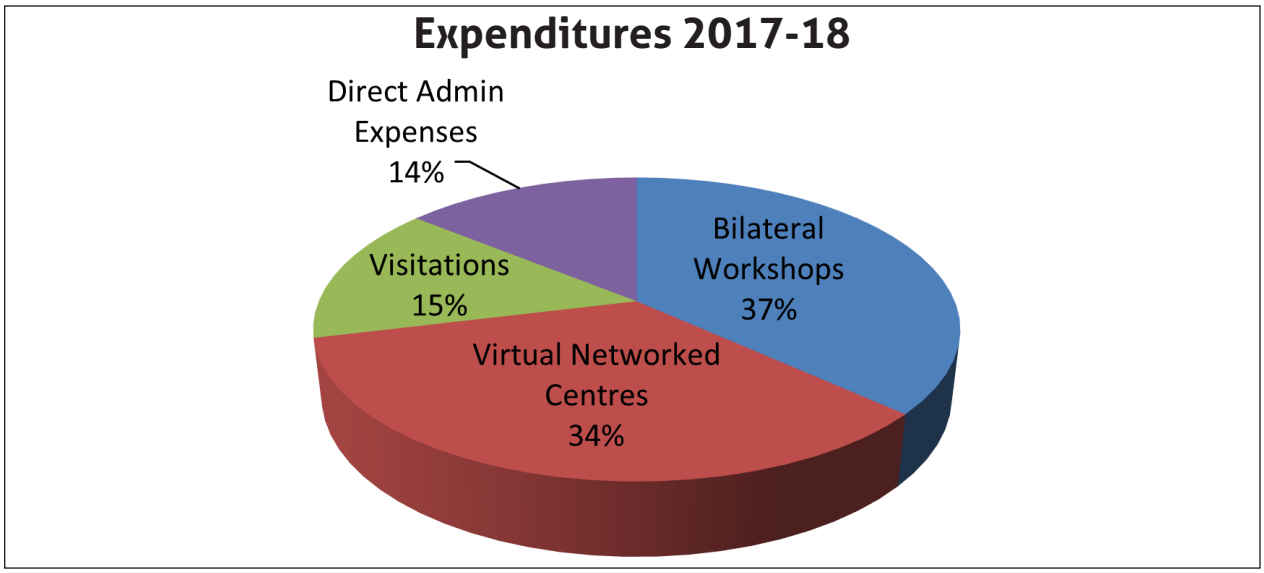

Costs 2019-20
Others
27%
Staff Costs
43%
Premises
30%

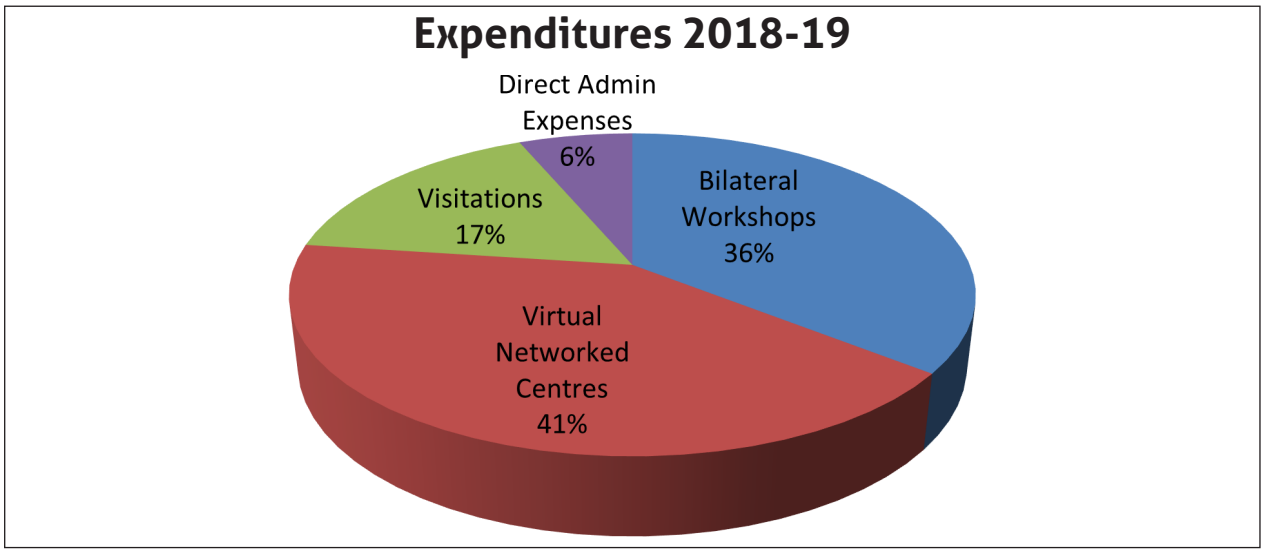

Costs over the years
2017-20
Costs (INR/Million)
20.00
15.00
10.00
5.00
-
0.29
0.26
0.23
0.20
0.17
0.14
0.11
0.09
0.06
0.03
-
Costs (USD/Million)
2017-18
2018-19
2019-20
Staff Costs
Premises
Others

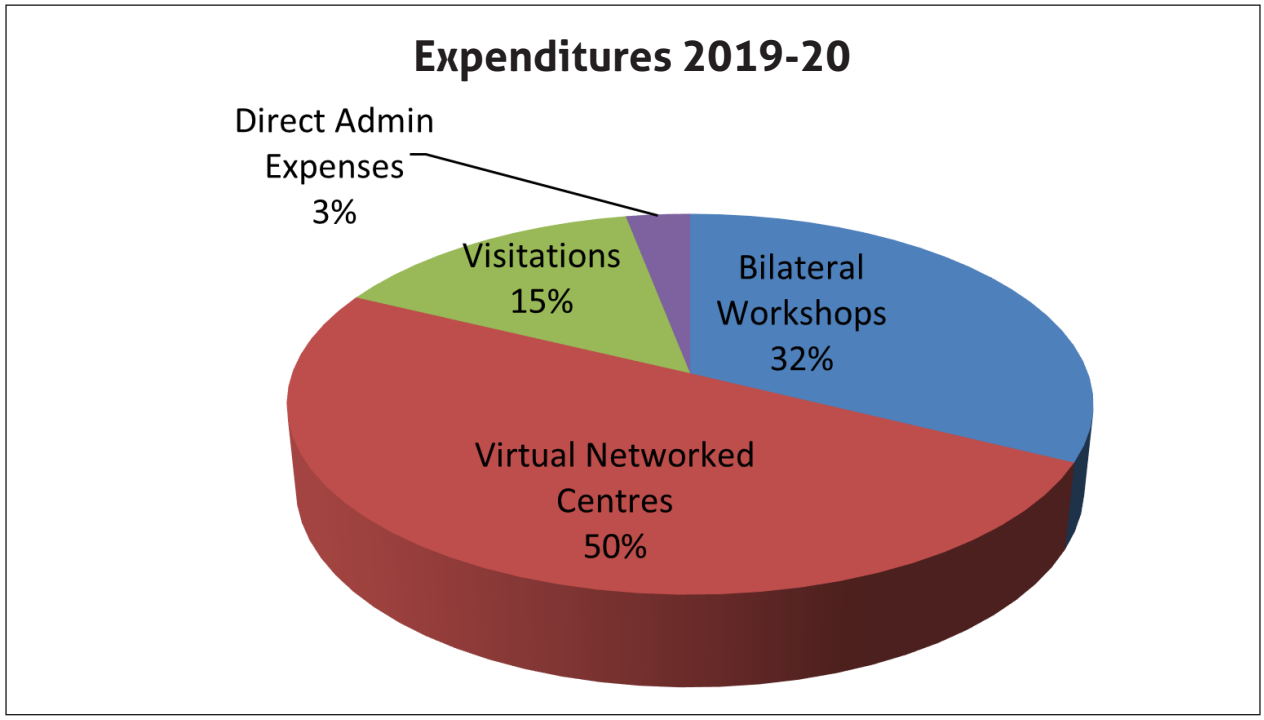
(D) Expenditures - IUSSTF Core Programs (2017-2020)

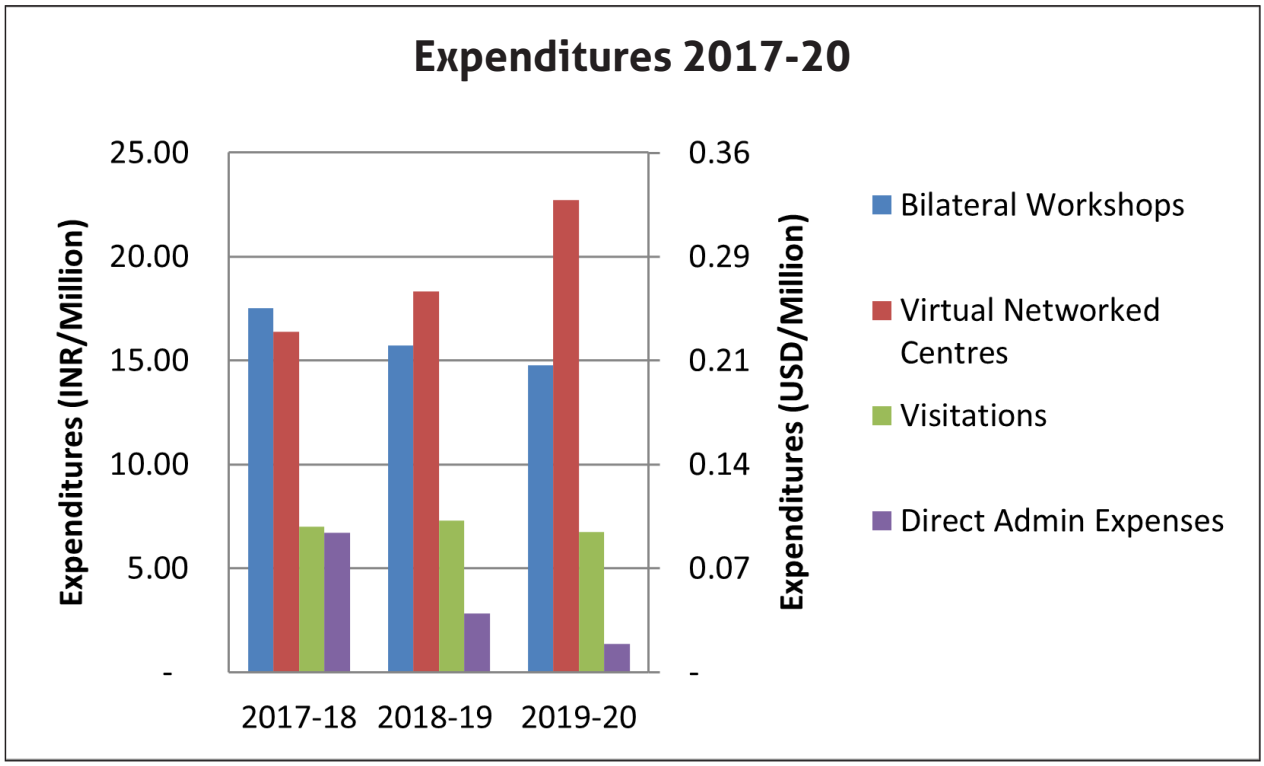
S. No	Head	2017-18		2018-19		2019-20	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Bilateral Workshops	17.52	0.25	15.73	0.22	14.76	0.21
2	Virtual Networked Centres	16.39	0.23	18.33	0.26	22.72	0.32
3	Visitations	7.01	0.10	7.29	0.10	6.74	0.09
4	Direct Admin Expenses	6.73	0.10	2.83	0.04	1.37	0.02
	a) Governing Body Meetings	*3.10*	*0.04*	*2.70*	*0.04*	*0.74*	*0.01*
	b) Foundation Day Expenses	*2.07*	*0.03*	-	-	-	-
	c)Outreach Expenses etc	*1.56*	*0.02*	*0.13*	*0.00*	*0.63*	*0.01*
TOTAL		**47.65**	**0.68**	**44.18**	**0.63**	**45.59**	**0.63**

**1USD= 70 INR*





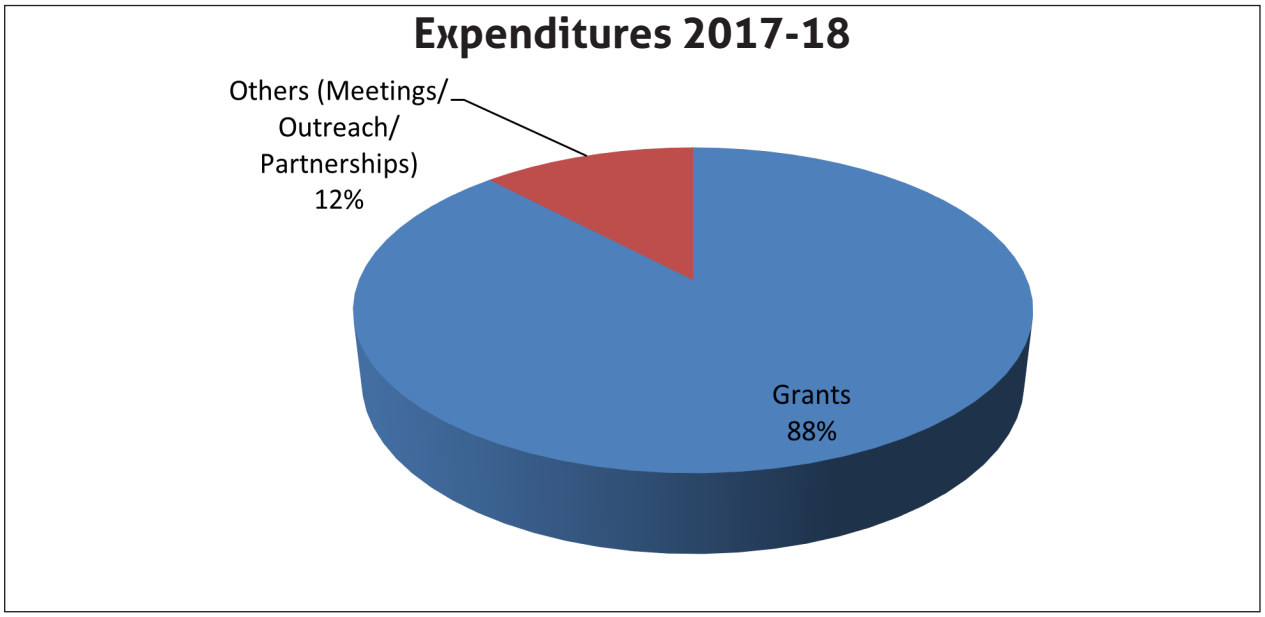

Expenditures 2019-20
Direct Admin Expenses 3%
Visitations 15%
Bilateral Workshops 32%
Virtual Networked Centres 50%

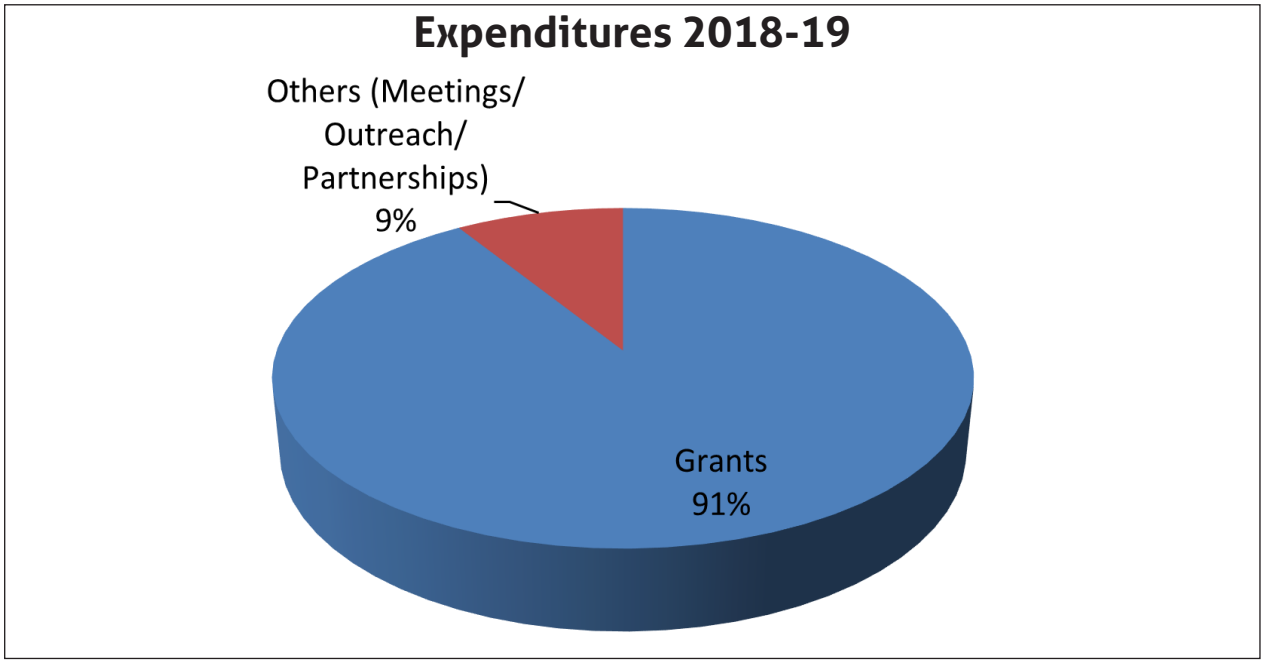

Expenditures 2017-20
25.00
20.00
15.00
10.00
5.00
-
0.36
0.29
0.21
0.14
0.07
-
Expenditures (INR/Million)
Expenditures (USD/Million)
2017-18
2018-19
2019-20
Bilateral Workshops
Virtual Networked Centres
Visitations
Direct Admin Expenses

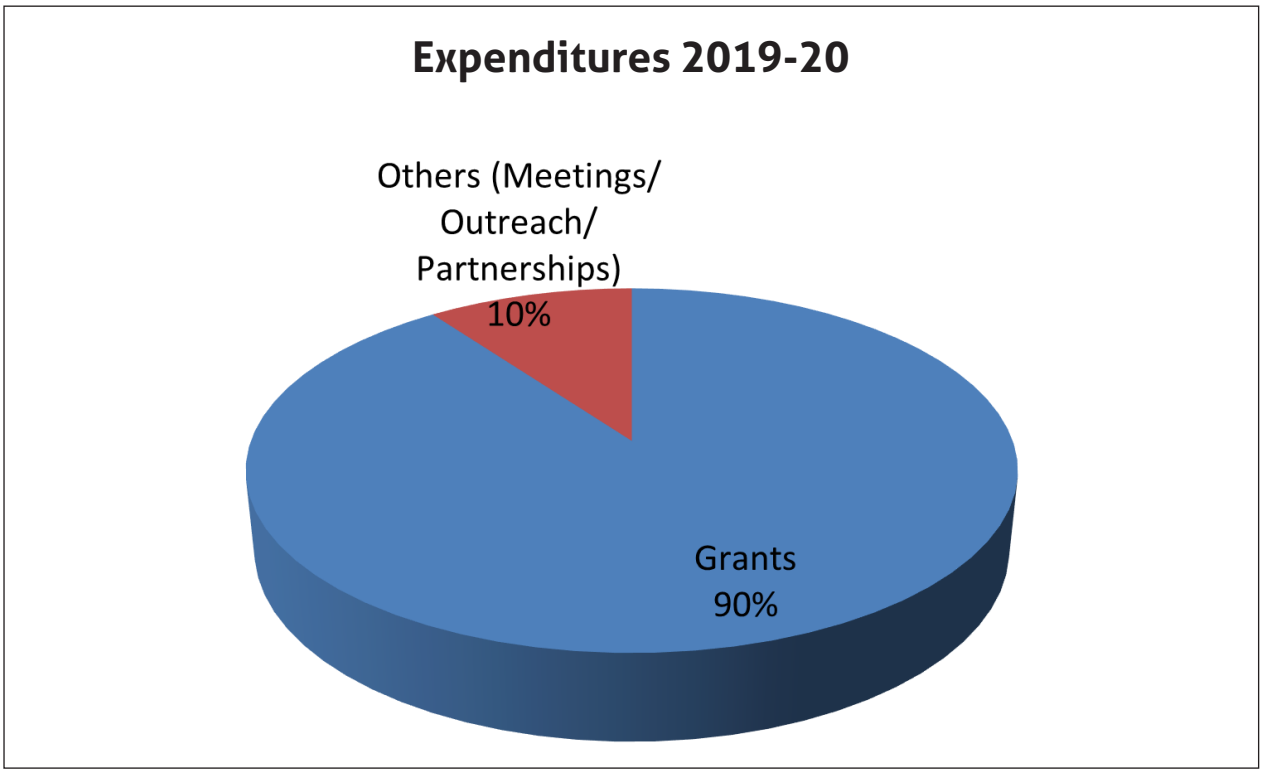
(E) Expenditures - USISTEF (2017-2020)

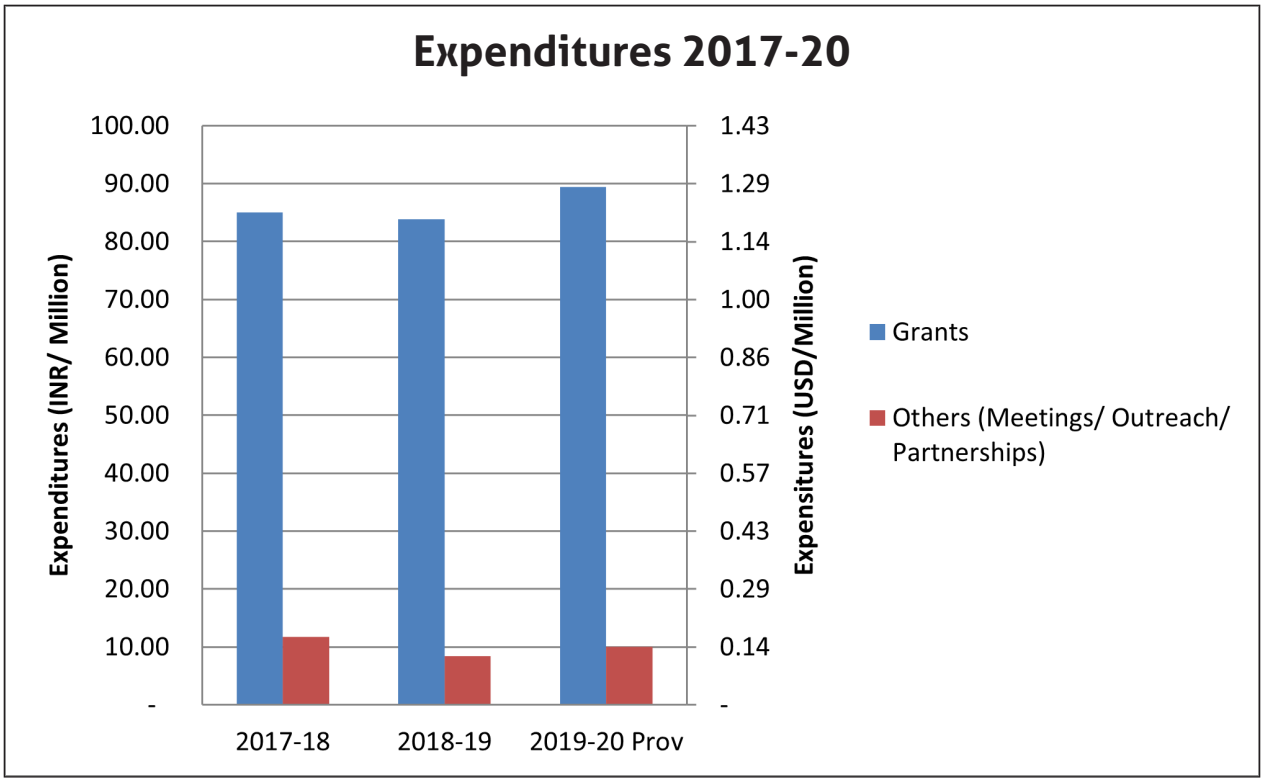
S. No	Head	2017-18		2018-19		2019-20 Prov	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	Grants	85.05	1.22	83.86	1.20	89.45	1.24
2	Others (Meetings/ Outreach/ Partnerships)	11.77	0.17	8.36	0.12	10.02	0.14
TOTAL		**96.82**	**1.38**	**92.22**	**1.32**	**99.47**	**1.38**

1USD= 70 INR





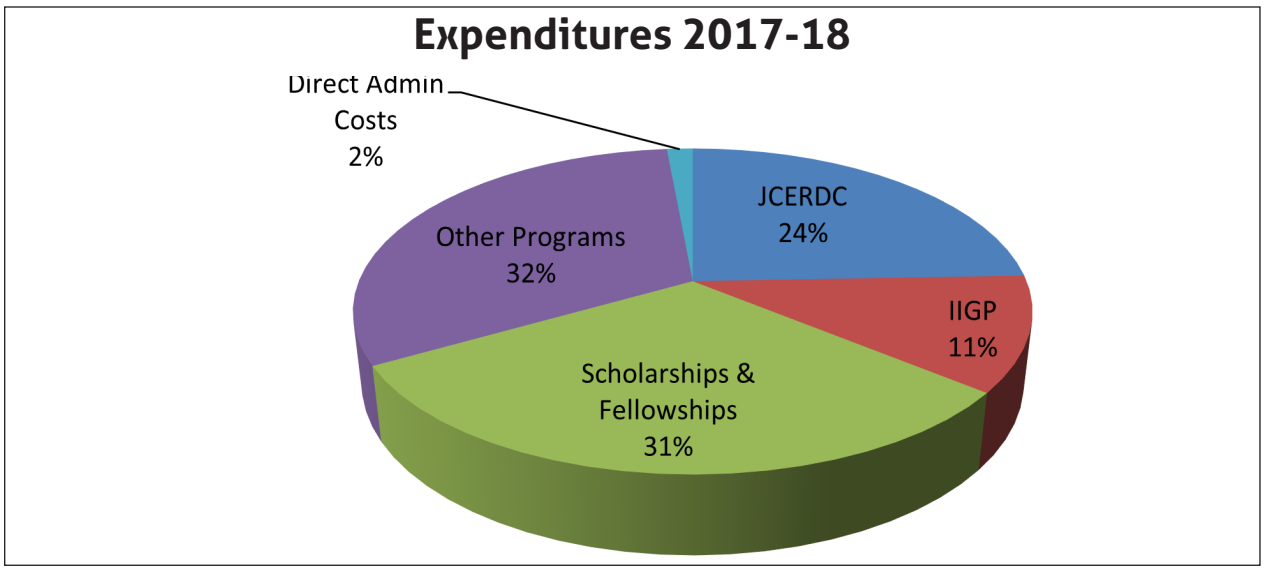

Expenditures 2019-20
Others (Meetings/ Outreach/ Partnerships) 10%
Grants 90%

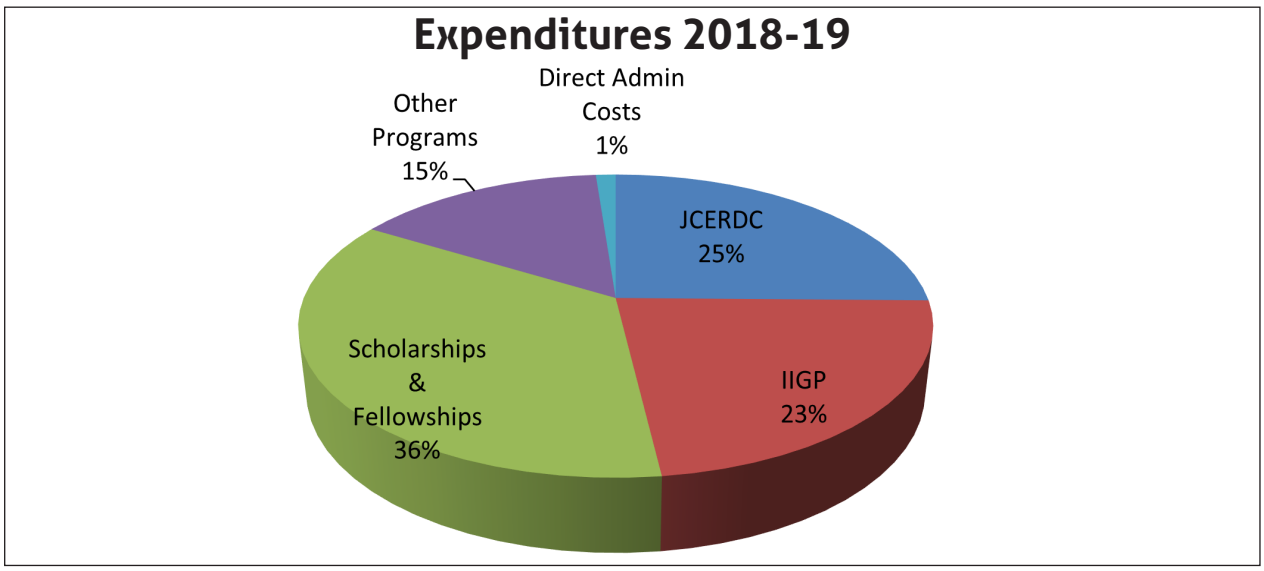

Expenditures 2017-20
Expenditures (INR/ Million)
Expensitures (USD/Million)
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
-
1.43
1.29
1.14
1.00
0.86
0.71
0.57
0.43
0.29
0.14
-
2017-18
2018-19
2019-20 Prov
Grants
Others (Meetings/ Outreach/ Partnerships)

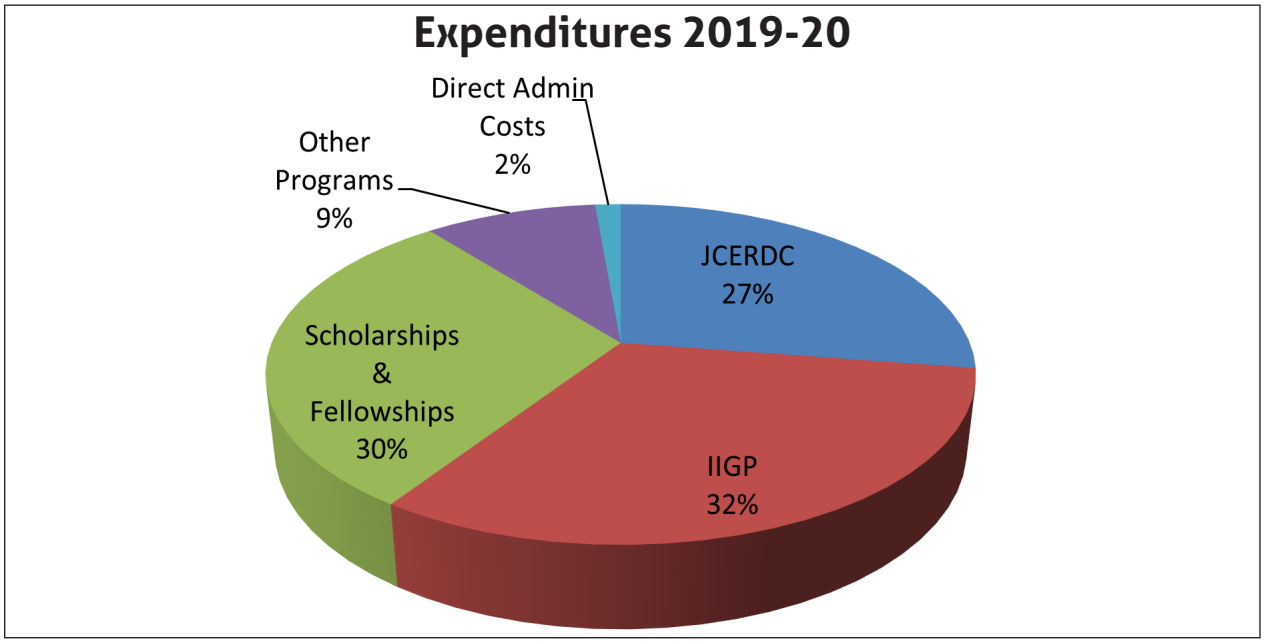
(F) Expenditures - Extra Mural Programs (2017-2020)

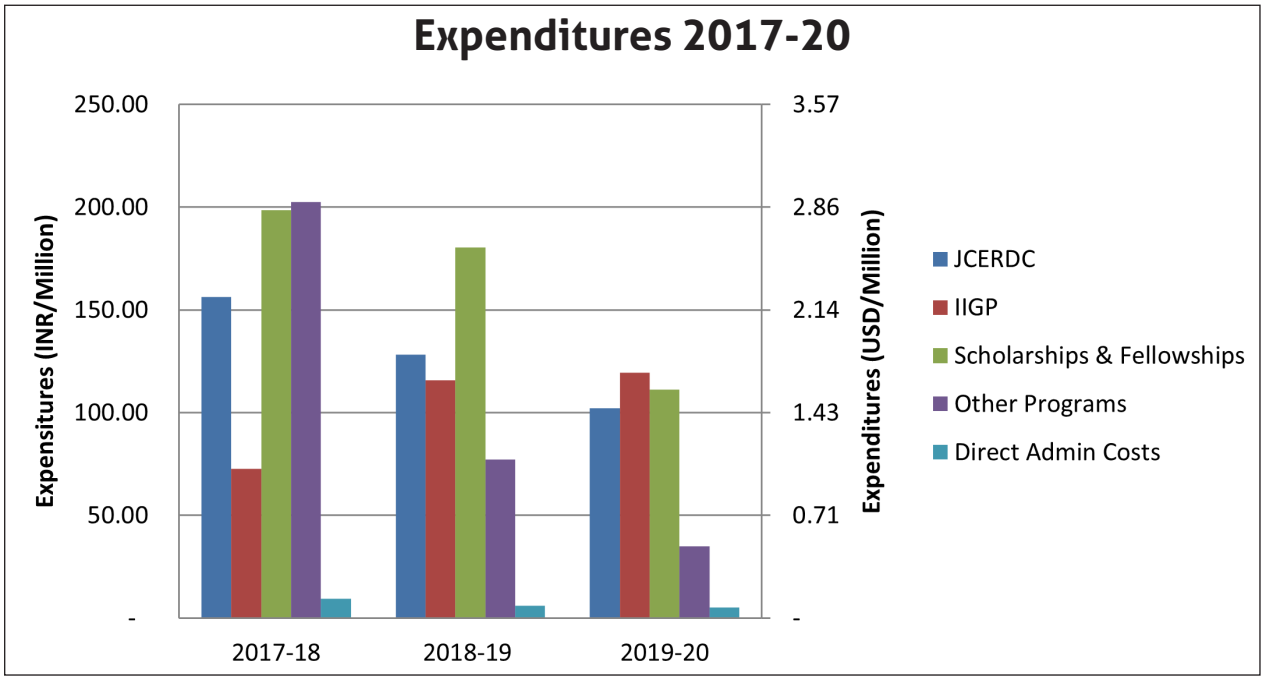
S. No	Head	2017-18		2018-19		2019-20	
		(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)	(INR/ Million)	(USD/ Million)
1	JCERDC	156.25	2.23	128.22	1.83	102.09	1.42
2	IIGP	72.70	1.04	115.82	1.65	119.43	1.66
3	Scholarships & Fellowships	198.56	2.84	180.32	2.58	111.23	1.54
4	Other Programs	202.60	2.89	77.16	1.10	35.01	0.49
5	Direct Admin Costs	9.39	0.13	6.13	0.09	5.18	0.07
TOTAL		**639.50**	**9.14**	**507.65**	**7.25**	**372.94**	**5.18**

**1USD= 70 INR*






Expenditures 2019-20
Direct Admin Costs 2%
Other Programs 9%
JCERDC 27%
Scholarships & Fellowships 30%
IIGP 32%


Expenditures 2017-20
250.00
200.00
150.00
100.00
50.00
-
3.57
2.86
2.14
1.43
0.71
-
Expensitures (INR/Million)
Expenditures (USD/Million)
2017-18
2018-19
2019-20
JCERDC
IIGP
Scholarships & Fellowships
Other Programs
Direct Admin Costs

SECTION VII

ANNEXURE

Annexure I

Workshops Awarded (2019-2020)

S. No	Proposal Title	Indian Lead	US Lead
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, NY
10	*Sensor technology for next generation IoT*	**Shankar Kumar Selvaraja,** Indian Institute of Science, Bangalore	**Mike A Carpenter,** SUNY Polytechnic Institute Albany, NY

S. No	Proposal Title	Indian Lead	US Lead
11	*Data Representation and Organization Techniques*	**Devika P Madalli,** Indian Statistical Institute, Bangalore	**Jane Greenberg,** Drexel University, Philadelphia, Philadelphia, PA
12	*Anomalies 2019*	**Priyotosh Bandyopadhyay,** Indian Institute of Technology, Hyderabad	**Bhupal Dev,** Washington University in St Louis, St Louis, MO
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, Boulder, CO
14	*Nonlocal Models: Mathematics, Computation and Applications*	**Kapil Ahuja,** Indian Institute of Technology, Indore	**Petronela Radu,** University of Nebraska-Lincoln, Lincoln, NE
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, AL
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, Bangalore	**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, California

Annexure II

Workshops Held (2019-2020)

S. No	Name of the Workshop/Training School	Indian PI	US PI	Date & Venue
1	Symposium on Data Representation and Organization Techniques	Devika P. Madalli, Indian Statistical Institute, Bengaluru	Jane Greenberg, Drexel University, Philadelphia	02-04 July 2019, Bengaluru,
2	1st Abdul Kalam Conference: India 2020 Update - Sustainable Growth at Sustainable Cost	S.R. Chakravarthy, Indian Institute of Technology, Madras	Narayanan M. Komerath, Georgia Institute of Technology, Atlanta	11-14 July 2019, Chennai
3	Indo-U.S. Workshop on Anomalies 2019	Priyotosh Bandyopadhyay, Indian Institute of Technology, Hyderabad	Bhupal Dev, Washington University in St. Louis	18-21 July 2019, Hyderabad
4	Indo-U.S. Workshop on Next Generation Logistics and Supply Chains	Bhaskar Bhandarkar, Institution for Innovation, Industrial Engineering and Entrepreneurship India, Navi Mumbai	Bopaya Bidanda (University of Pittsburgh)	05-10 August 2019, Jammu
5	Indo-U.S. Workshop on Nonlocal Models: Mathematics, Computation and Applications	Kapil Ahuja, Indian Institute of Technology Indore	Petronela Radu, University of Nebraska Lincoln	19-23 August 2019, Indore
6	Next-Generation biologically synthesized nanofertilizers for Seed Coating and Foliar Application	Alok Adholeya, The TERI-Deakin Nanobiotechnology Centre, Gurugram	Upendra Singh, International Fertilizer Development Center, Alabama	05-07 September 2019, Gurugram
7	Recent Advances in Advanced Biofuel Technologies Biohydrogen, Fuel Cell & Biobutanol: Understanding the Challenges for Moving Towards Commercialization	Vibha Dhawan, The Energy and Resources Institute, New Delhi	Wei Liao, Michigan State University, East Lansing	05-06 September 2019, Gurugram
8	Indo-U.S. Minimally Invasive Surgery Live Operative Workshop	Siddharth Yadav, VMMC and Safdarjang Hospital, New Delhi	Ashok Kumar Hemal, Wake Forest Baptist Health Urology, North Carolina	21-22 September 2019, New Delhi
9	Translational Research in Genetic Neuromuscular Disorders: Bench to Bedside and Beyond	Prajnya Ranganath, Nizam's Institute of Medical Sciences, Hyderabad	Priya S. Kishnani, Duke University School of Medicine, North Carolina	21-23 November 2019, Hyderabad

S. No	Name of the Workshop/Training School	Indian PI	US PI	Date & Venue
10	India – USA Lecture Series on Aging Aircraft (IULSAA)	S. Gopalakrishnan, Indian Institute of Science, Bengaluru	Lalita Udpa, Michigan State University, East Lansing	27 – 29 November 2019, Bengaluru
11	Symposium on New Insights into the Inflammation, Immunity and Pathobiology of Diseases	Jayasri Das Sarma, Indian Institute of Science, Education and Research, Kolkata	Randall Cohrs, University of Colorado, Denver	4-8 December 2019, Port Blair
12	Frontiers of Excellence in Wide and Ultrawide Bandgap Semiconductors and Electronic Systems	Saurabh Lodha, Indian Institute of Technology Bombay	Siddharth Rajan, Ohio State University, Columbus	14-15 December 2019, Mumbai
13	Metal Additive Manufacturing-Technology Gaps and Research Directions	P. Radhakrishnan, PSG Institute of Advanced Studies, Coimbatore	Jyoti Mazumdar, University of Michigan, Ann Arbor	16-18 December 2019, Coimbatore
14	Synthesis, Characterization and Applications of Nano-Structured Materials	Munish Kumar Gupta, Chandigarh University	Mandeep Singh Bakshi, University of Wisconsin, Green Bay	20-21 December 2019, Chandigarh
15	Integrated hydrochemical modeling for sustainable development and management of water supply aquifers	Karunanidhi D. Sri Shakthi Institute of Engineering and Technology, Coimbatore	Aavudai Anandhi, Florida Agricultural and Mechanical University, Tallahassee	02-04 January 2020, Coimbatore
16	The study of decadal scale droughts and mega-droughts in semi-arid tracts of India and North America	Anoop Ambili, Indian Institute of Science Education and Research, Mohali	Atreyee Bhattacharya, University of Colorado Boulder, Boulder	02-04 January 2020, Mohali
17	Indo-U.S. Workshop on Health Diversity and Disparities	K Thangaraj, Centre for Cellular & Molecular Biology, Hyderabad thangs@ccmb.res.in	Keshav K Singh, The University of Alabama at Birmingham	16-18 January 2020, Hyderabad
18	Transnational Research Needs and Applications of Plant Microbiomes	Annapurna Kannepalli, Indian Agricultural Research Institute, New Delhi annapurna96@gmail.com	Harsh Bais, University of Delaware, Newark	25-27 February 2020, University of Delaware, USA
19	Indo-U.S. Conference on Bioengineering and Regenerative Medicine-2020 (ICBR-2020)	Pradeep Srivastava, IIT Banaras Hindu University, Varanasi	Chenzhong Li, Florida International University, Miami	27- 29 February, 2020, Varanasi

Annexure III

Joint Centres Awarded (2019-2020)

S. No.	Proposal Title	Lead Indian PI	Lead U.S. PI
1	*Acidification and Pteropod Dissolution in the Indian Ocean*	**V.V.S.S. Sarma** National Institute of Oceanography, Visakhapatnam	**Richard A. Feely** NOAA Pacific Marine Environmental Laboratory, Seattle
2	*Center for Secure and Resilient Quantum Optical Networks*	**Vimal Bhatia** Indian Institute of Technology, Indore	**Byrav Ramamurthy** University of Nebraska, Lincoln
3	*Center on Advanced Bio-based Energy and value added Commodity Production: Moving towards next generation feed based Biorefinerie*	**Vibha Dhawan** The Energy and Resources Institute, New Delhi	**Wei Liao** Michigan State University, Michigan
4	*Center in Chronobiology*	**Sangeeta Rani** University of Lucknow, Lucknow	**Erik Herzog** Washington University, St. Louis
5	*Polynomials as an Algorithmic Paradigm*	**Anand Louis** Indian Institute of Science, Bengaluru	**Prasad Tetali** Georgia Institute of Technology, Atlanta
6	*Center for Big Data and the Brain for Precision Mental Health*	**Ramkrishna Pasumarthy** Indian Institute of Technology, Madras	**Vinod Menon** Stanford University, California
7	*Understanding the CME propagation and its internal structure in the interplanetary space to predict Bz*	**Nandita Srivastava** Udaipur Solar Observatory, Physical Research Laboratory, Udaipur	**Natchimuthuk Gopalswamy** NASA Goddard Space Flight Center, Maryland
8	*Centre for Integrative Cancer Biology and Therapeutics*	**Rana P. Singh** Jawaharlal Nehru University, New Delhi	**Sanjay Malhotra** Stanford University, California
9	*Centre for Gravitational-Physics and Astronomy*	**K. G. Arun** Chennai Mathematical Institute	**B. S. Sathyaprakash** Pennsylvania State University, State College
10	*Center for Self-powered Energy Harvesting and Storage Systems*	**Abha Misra** Indian Institute of Science, Bangalore	**Apparao M. Rao** Clemson University, Clemson

Annexure IV

The list of 13 projects shortlisted by the JEP under the Empowering Citizens (EC) and Healthy Individuals (HI) Category

Empowering Citizens

S. No.	Title of the Project	Lead Indian Partner	Lead U.S. Partner
1	*Empowering Energy Frugal, Inexpensive Waste-Less Food Storage and Transport (for Seven Lakh Indian Villages)*	**Anurag Agarwal** New Leaf Dynamic Technologies Pvt. Ltd., New Delhi	**Srinivas Garimella** Georgia Institute of Technology, Atlanta
2	*Eco-friendly Smart Tyres*	**Sameer Panda** TycheeJuno Speciality Tyre Pvt. Ltd. Hyderabad	**Nathan Rich** Isotruss Industries, Provo
3	*JumpToPC: An Affordable Personal Computing Solution for Indian Households*	**Sucheta Baliga** Greenway Grameen Infra Pvt Ltd, Mumbai	**Daniel Frey** Massachusetts Institute of Technology, Cambridge
4	*TranscribeGlass: Affordable Heads-Up Real-time Captioning Device for the Deaf and Hard-of-Hearing*	**Madhav Lavakare** TinkerTech Labs Private Limited, New Delhi	**Kyle Keane** Massachusetts Institute of Technology, Cambridge
5	*Low-Cost and Low-Carbon end-to-end Cold Chain Solution*	**Vishal Singhal** Temperate Technologies Private Limited, Hyderabad	**Eckhard Groll** Purdue University, West Lafayette
6	*To Develop Highly Durable, Water Resistant Crop Residue Based Particle Boards for Furniture Applications*	**Shubham Singh** Craste, NCL Innovation Park, Pune	**Mehdi Tajvidi** The University of Maine, Orono

Healthy Individual

S. No.	Title of the Project	Lead Indian Partner	Lead U.S. Partner
1	*An Affordable Ambulatory 24-Channel Clinical Grade Robotic Video Electroencephalography (VEEG) Solution for the Diagnosis and Monitoring of Neurological & Mental Health Conditions*	**Raja Aditya Kadambi** Mocxa Health Private Limited, Bengaluru	**Simon Griffin** Lifelines Neuro Company LLC, Louisville
2	*Co-Design, Evaluation And Technology Transfer of an Adjustable, Affordable and Transportable Paediatric Postural Support Wheelchair for India*	**Soikat Ghosh Moulic** Mobility India, Bengaluru	**Anand Mhatre** University of Pittsburgh Pittsburgh
3	*An Affordable, Non-Invasive Multiplexed Platform to Rapidly Detect High Risk Oncogenic HPV Strains in Self-Collected Samples (Point of Care, Field Deployable, Highly Multiplex, Genital/ Urinary Samples)*	**Nikhil Phadke** GenePath Diagnostics India Pvt. Ltd, Pune	**Steven Benner** Firebird Biomolecular Sciences, LLC, Alachua

S. No.	Title of the Project	Lead Indian Partner	Lead U.S. Partner
4	*Prospective Cohort Study of Nemocare Raksha*	**Pratyusha Pareddy** Nemocare Wellness Pvt. Ltd., Hyderabad	**Anoop Rao** Stanford University, Stanford
5	*Aum Voice Prosthesis*	**Vishal U.S. Rao** Innaumation Medical Devices Private Limited, Bengaluru	**Brian Kamradt** Geometric Technologies Inc., Indianapolis
6	*Rapid Diagnostic for Guiding Antibiotics-Based Treatment Decisions in < 1 Hour for Sepsis*	**Nikhil Acharya** Nepune Business Solutions, Chennai	**Rajesh Krishnamurthy** 3i Diagnostics, Inc., Germantown
7	*Smart CPAP for Low-Resource Settings*	**Sreedharan NG** Syrma Technology, Chennai	**Krista Donaldson** D-Rev, San Francisco

Annexure V

List of Projects reviewed by the Project Monitoring Committee held on 1st May 2019 at IUSSTF, New Delhi

S. No.	Call	Title of the Project	Indian Partner(s)	U.S. Partner(s)
1	**8th Call**	*Blood Test for All Forms of Active Tuberculosis (TB) for Commercialization in India*	**Sarman Singh** All India Institute of Medical Sciences, Bhopal **Vivek Chandra** NextGen InVitro Diagnostics (P) Ltd, New Delhi	**Imran Khan** University of California, Davis, Sacramento, CA
2	**8th Call**	*Low Cost Companion Diagnostic Test for Predicting Benefit of Adjuvant Chemotherapy in ER+ Breast Cancer*	**Vani Parmar** Tata Memorial Centre, Mumbai	**Anant Madabhushi** Case Western Reserve University, Cleveland, OH **Mark Lloyd** Inspirata, Inc., Tampa, FL
3	**8th Call**	*Test4Safety: Detection of Adulteration in Commonly Consumed Liquids*	**Deepa Bhajekar** D Technology Pvt. Ltd., Mumbai	**Deepak Mehrotra** Oak Analytics Company, Agoura Hills, CA
4	**8th Call**	*VECTRAX: an Efficacious Long Lasting Semiochemical Based Attract and Kill Formulation for Management of Mosquito Vectors of Human Diseases*	**Markandeya Gorantla** ATGC Biotech Pvt. Ltd., Secunderabad	**Agenor Mafra-Neto** ISCA Technologies, Riverside, CA
5	**6th Call**	*Non-Stress Fetal Heart Rate Monitoring Tool for Ante-natal Check-up*	**Balaji Teegala** Brun Health Private Limited, New Delhi	**Ivan Tzvetanov** Berkeley, CA
6	**5th Call**	*Handheld Forced Oscillation Device for Improved Detection and Monitoring of Airway Diseases*	**Anurag Agarwal** CSIR-Institute of Genomics & Integrative Biology (IGIB), New Delhi	**Ashutosh Sabharwal** Cognita Labs and Rice University, Houston **Gaurav Patel** Cognita Labs LLC, Houston

Annexure VI

List of the four USISTEF projects that have been successfully closed

S. No.	Title of the Project	Indian Partner	U.S. Partner
1.	*JaipurBeltTM (Belt System for Body Support)*	***Ganesh Ram Jangir*** Newndra Innovations Private Limited, Jaipur	***Paul Scott*** MedSpark, LLC, San Luis Obispo, CA
2.	*Non-stress fetal heart rate monitoring tool for ante-natal check-up*	***Balaji Teegala*** Brun Health (P) Ltd, New Delhi	***Ivan Tzvetanov*** Berkeley, CA
3.	*Moving Beyond the Pavement: Affordable Mobility for Users around the World*	***Sudhir Mehta*** Pinnacle Industries Ltd., Pithampur, Madhya Pradesh	***Tish Scolnik*** Global Research Innovation and Technology (GRIT), Cambridge, MA
4.	*Transforming Arsenic and Fluoride Crisis in Drinking Water into an Economic Enterprise*	***Abhijeet Gan*** Rite Water Solutions (I) Pvt. Ltd., Nagpur, Maharashtra	***Minhaj Chowdhury*** WIST Inc., Texas

Annexure VII

Winners of IIGP 2.0 – University Challenge 2019

S. No.	Innovation Name	University Name
1.	Contact Lens embedded Oxygen Nanosensors CLeONs) for rapid and sensitive measurement of pO2 in the post lens tear film	Siddganga Institute of Technology
2.	Graphene nanocomposite on carbon strip as electrochemical sensor for detection of Plasmaodium species	Academy of Scientific and Innovative Research (AcSIR)
3.	OsteoCheX – A handheld device to measure bone density from X-ray images	Sethu Institute of Technology (Affiliated with Anna University)
4.	Artificial Intelligence in quick detection of malaria	IIT Bhillai
5.	Rapid prototyping assisted fabrication of patient specific porous metallic implants for load bearing applications	Visvesvaraya National Institute of Technology
6.	Project Smart AgriCopter: The next generation agricultural drone that offers a completely automated and end to end solution to the crop maintenance process	IIT Madras
7.	Highly efficient aluminium fumarate Metal Organic Framework (MOF) based polymeric media for fluoride remediation from groundwater	IIT Kharagpur
8.	Dip bag – A compact herbal water purifier	IIT Kharagpur
9.	Design and development of nano-particle enhanced phase change material based milking cum cooling pail	SRS, ICAR – National Dairy Research Institute
10.	BhuGoal – Predicting Moods of India	Chitkara University

S. No.	Innovation Name	University Name
11.	UAVs for Disaster Management	IIT Madras
12.	Mind controlled prosthetic arm – EEG signals will be used to perform the desired action by a robotic arm	BITS Pilani
13.	Precise and protective agriculture with a cloud based multi-UAS system	IIT Kanpur
14.	Artificial intelligence driven sheep farm management information cum decision support system	Sher e Kashmir University of Agricultural Sciences and Technology of Kashmir
15.	Device for inrush current minimization in three phase transformers	IIT Kanpur
16.	An integrated modular onsite urine treatment unit for the recovery of green fertilizers and water	IIT Madras
17.	Space debris disposal and control mechanism	IIT Kanpur
18.	Real time glare and shadow removal algorithm for image and video enhancement	IIT Kharagpur
19.	Partial Artificial Reflective Surface for Digital Automation: PARDA	Veer Surendra Sai University Of Technology (VSSUT)
20.	Elixar Systems	BITS Pilani

Annexure VIII

Winners of IIGP 2.0 – Open Innovation Challenge 2019

S. No.	Startup	Innovation Title
1.	Terero Mobility Pvt. Ltd.	Cargo Ground Build-up System (CGBS)
2.	Astrogate Labs Pvt. Ltd.	Free-space optical communication terminal for high-speed, low-cost communication for every need
3.	CyCa Oncosolutions Pvt. Ltd.	Transforming cancer drugs from poison to remedy: Reducing toxic side effects of anticancer drugs by delivering through a molecular nanomachine
4.	BNG Spray Solutions Pvt. Ltd.	High fuel efficiency furnace burners
5.	Ossus Biorenewables	OB BioHydraCel biohardware for H-CNG production from O&G (upstream & downstream) effluents
6.	Unbox Robotics Labs Pvt. Ltd.	AI-powered swarm robot system to sort parcels vertically
7.	Nubewell Networks Pvt. Ltd.	Nubewell innovative Tri-O-Core hardware and software solution
8.	C Electric Automotive Drives Pvt. Ltd.	Customized connected electric powertrains that enable light electric vehicle (light EV) manufacturers to shorten their time to market
9.	Kanpur Flowercycling Pvt. Ltd.	Florafoam: A high-performing, mouldable & world's first biodegradable alternative to Earth's fifth biggest pollutant – Styrofoam (expanded polystyrene) made from temple-flowers & farm-stubble
10.	CogniABle (SM Learning Skill Academy for Special Needs Pvt. Ltd.)	Machine learning platform used remotely by non-expert for screening & treatment of Autism & associated disorders
11.	Varta Labs Pvt. Ltd.	Machine learning driven language learning platform for English & Indian languages
12.	Ayu Devices Pvt. Ltd.	Smart stethoscope for early detection of heart & lung disease by analyzing & classifying heart & lung sounds
13.	BeAble Health Pvt. Ltd.	ArmAble: A gamified arm rehabilitation device
14.	Vidcare Innovations Pvt. Ltd.	Mu-sure: An easy to use futuristic blood diagnostics test for anyone anytime anywhere
15.	BiolMed Innovations Pvt. Ltd.	BiolMed is an innovation-driven medical products company. We leverage the materials science of natural silk to develop and sell tissue regeneration products. Our technology is backed by international patents.
16.	Tan90 Thermal Solution Pvt. Ltd. (IIT Madras)	ZeroDnT: Zero Degree and Transportation

Annexure IX

The following four projects providing innovative off-grid clean energy solutions were selected for support with an early-stage grant funding under the PACEsetter Fund (Round II).

S. No.	Project Title	Lead Organization	Other Partnering Organization
1	Development of Unglazed Transpired Solar Air Dryer (UTSAD) with energy management system	Raghavendra Suntech Systems Pvt Ltd (RSSPL), Bengaluru	-
2	Solar dryer based self-employment model for rural tribal communities, women and differently-abled persons	The Energy & Resources Institute (TERI), New Delhi	Society for Energy, Environment and Development (SEED), Hyderabad
3	Rural enterprise model for branded packaged diced and dehydrated vegetables and other dried products using hybrid biomass and solar energy	Society for Economic and Social Studies, New Delhi	-
4	Intelligent solar charge controller for increasing energy output & life cycle batteries and revival of under-performing old SPV & their batteries	Customized Energy Solutions India Pvt. Ltd., Pune	-

Annexure X

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) Bangalore 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, Bangalore	CSIR-Central Electronics Engineering Research Institute (CEERI), Pilani	University of Southern California
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)
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., Bangalore	University of California (UCR), Riverside Michigan State University (MSU), East Lansing Stanford University (SU), Palo Alto New Jersey Institute of Technology (NJIT) Newark

Annexure XI

The Initiative for Research & Innovation in Science (IRIS) and Intel International Science and Engineering Fair (ISEF) 2019

Winners of the Initiative for Research & Innovation in STEM (IRIS) National Science fair get the opportunity to participate and represent India. IRIS is modelled as a public-private partnership between Department of Science and Technology, Government of India (DST) and Intel®, with Indo US Science and Technology Forum (IUSSTF) as the Secretariat.

This year 25 young innovators represented India at the Intel International Science and International Fair (ISEF) **at Phoenix, Arizona USA, from May 12-17, 2019**. Before departure of Team-India to US for competing at ISEF 2019, a Flag-off ceremony was held in New Delhi to wish the very best to these students. The team of budding innovators was complimented for their participating projects by Chief guest Prof. K.VijayRaghavan, Principal Scientific Advisor to Govt of India, and other dignitaries Dr. Nisha Mendiratta, Head, NCSTC, Department of Science and Technology, Government of India, Dr. Anjan Ghosh, Global Director Corporate Affairs, Intel Corporation and Dr. Rajiv K. Tayal, Executive Director, Indo-US S&T Forum. The ceremony was followed by a **Coaching cum mentoring camp** for students**.**

After competing with more than 1800 participating science and research projects from over 81 countries Team India won 6 Grand Awards and 8 special Awards in addition to having 2 minor planets.

Notes

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