

Newsletter of IGSTC  
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# ABOUT IGSTC

IGSTC had a vibrant and successful year with significant achievements in 2017. 14 joint projects in 2+2 mode were supported in emerging areas of sustainable energy, advanced manufacturing, biomedical devices and biotechnology, water and wastewater technologies, nanotechnology and embedded system & ICT during the year. The total project investment (both Indian and German) can be estimated **as INR 700 million or 9.3 million Euros** and is involving 56 project partners from academia and industry from India/Germany. The projects are at various stages of development.

Keeping in view the strategic initiatives of India & Germany – especially the two initiatives “100 Smart Cities” and “Zukunftsstadt”, six new projects in thematic area of Smart Cities were approved for implementation to further the research and provide key support in water management and sanitation system, energy efficiency and waste management to the city administrators implementing the Smart Cities mission.

A first of its kind lab in India on “Integrated Computational Materials Engineering (ICME)” has been developed at IIT Madras under the aegis of “2+2 Programme”. The consortium members for the lab are **IIT Madras, TCS, RWTH Aachen and Simufact Engineering**. The lab is involved in cutting-edge research in the field of metallurgy and material science. The lab has developed many tools for accelerating the research in India for material modelling using computational tools.

Network of **IIT Delhi, AIIMS Delhi, Elkon, TU Munich and Path Medical GmbH** working on project “Re-engineering high-end audiometric devices for robust and affordable audiological testing” has successfully developed a prototype based on oto-acoustic emissions (OAE) principle. The prototype will be available soon for testing. This will help in addressing hearing screening technology that can be used by laypersons and uses equipment that is affordable, so that hearing screening can be done at primary schools by school teachers or at small primary healthcare centers in villages.

IGSTC will continue to foster innovation and competitiveness through its existing flagship programme and with soon to be launched new initiatives in the coming year.

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# 2+2 PROJECTS

## RESERVES - Review meet

### PROJECT TITLE

**Resource and energy reliability by co-digestion of veg-market and slaughterhouse waste (RESERVES)**

The project aims to demonstrate the feasibility of sustainable resource and energy reliability by co-digestion of veg-market and slaughterhouse waste in India and its potential for global realization.

The project partners of CLRI (Dr S V Srinivasan) and ISAH (Prof. Dirk Weichgrebe) met during 10 - 12 October in Chennai to review the progress and to discuss on how to go forward. The team also briefed the CEO of Ramky Enviro Engineers as well as the Chairman of the Ramky Group. Initial discussions were held on the potential plant manufacturers in Chennai. The team discussed on the performance of laboratory extruder developed by Lehmann GmbH (German industrial partner) for biogas yield tests for meeting the project objectives.

Prior to the review meeting, ISAH and CLRI conducted a four day training workshop during 3 - 6 October for the operational personnel (both from RAMKY and CLRI). The purpose of the workshop was to train them in the practical handling and maintenance of the upcoming pilot plant at CLRI campus and the Koyambedu Biogas Plant in Chennai. Some of the topics discussed were basics of anaerobic treatment; overview of established biogas technologies; major safety, health and risk requirements for biogas plants.

### PROJECT CONSORTIUM

Indian Partners  
CSIR-CLRI, Chennai  
Ramky Enviro Ltd, Chennai

German Partners  
Leibniz University, Hannover (ISAH)  
Lehmann GmbH, Pohl

The results on the project were presented by ISAH and CLRI on the 15th IWA International Conference on Anaerobic Digestion in Beijing in October 2017. The IWA AD conference is considered as one of the most regarded and recognized professional events on anaerobic digestion globally. This enabled the team to foster a close knowledge exchange, as well as receiving feedback and comments on the project steps from the most renowned experts in the field.

# Multi-WAP - Project meeting

## PROJECT TITLE

**Multiplexed, label-free fiber optic biosensor array system for waterborne pathogen detection (Multi-WAP)**

Following their kick-off meeting in Chennai in November 2016, the first annual meeting of partners was held on November 16-17, 2017 in Braunschweig, Germany. The main objective of this collaboration is to develop cost-effective sensor equipment for simultaneous detection of up to seven waterborne pathogens that are prevalent on the Indian sub-continent.

The partners from India, Dr V. I. Bishor, ubio Biotechnology Systems and Dr V. V. Raghavendra Sai, IIT Madras met with Prof Mahavir Singh and D. Ayssar Elamin of LIONEX GmbH, and Prof Claus-Peter Klages and Dr. Vitaly Raev from the Institute for Surface Technology (IOT), TU Braunschweig.

The meeting focused on discussion of progress and plans for the work packages in the coming months: (1) Fiber optic probes and array system development (IITM), (2) Surface plasma treatment and functionalization (IOT), (3) Production of specific antibodies for WAPs (LIONEX), (4) Validation of antibody-antigen pair (ubio). Recently, a CO<sub>2</sub>-laser-based automated fabrication process for U-bent SiO<sub>2</sub>-fiber-optic probes has been realized to obtain probes with high sensitivity and repeatability. In addition, design for optoelectronic instrumentation for array biosensor was realized for fabrication and proof of concept. Surface activation of SiO<sub>2</sub> by an atmospheric-pressure plasma followed by gas-phase silanization under optimized

## PROJECT CONSORTIUM

### Indian Partners

Indian Institute of Technology Madras,  
Chennai

Ubio Biotechnologies, Cochin

### German Partners

Technische Universitat Braunschweig  
Lionex GmbH, Braunschweig

condition enables a replacement of conventional wet-chemical processing as proven by multi-ATR FTIR and XPS spectroscopy as well as zeta-potential and wetting-angle measurements. Surface derivatization studies are in progress. A first batch of anti-non-pathogenic E. coli and anti-LAM was produced. Purified antibodies were subjected to extensive quality control. Moreover, data reveals that anti-LAM IgM has KD below 10<sup>-9</sup> M which mean this antibody possesses high affinity towards mycobacterium Avium complex LAM. The production of final arrays biomarkers and antibodies is progressing well. The next project meeting will be held at ubio Biotechnology Systems, Cochin in December 2018.

# Sound4All Workshop

## PROJECT TITLE

**Re-engineering high-end audiometric devices for robust and affordable audiological testing (Sound4All)**

On December 16, 2017, All India Institute of Medical Sciences hosted a full-day workshop entitled “Hearing Loss Detection: Status and Future Directions”, Theme: Devices and technology. The workshop was part of the Sound4All, a research project funded by IGSTC. This project aims to develop a hearing screening technology that can be used by laypersons and uses equipment that is affordable, so that hearing screening can be done at primary schools by school teachers or at small primary healthcare centers in villages. The partners spoke about the goals of the project, and the progress made so far, with the aim of collecting feedback and new ideas from a large set of experts. They reported that they have already been able to produce some prototypes.

The workshop was inaugurated by Prof S.K. Kacker, Prof Balam Aeran, AIIMS, Prof Roshan Paul, Director, IGSTC and Prof S.C. Sharma, AIIMS. The audience were addressed by Dr. Kapil Sikka (PI), Dr. Chirom Amit Singh (Co-PI), Dr. S.C. Sharma,

## PROJECT CONSORTIUM

**Indian Partners**  
Indian Institute of Technology Delhi, New Delhi  
All India Institutes of Medical Sciences (AIIMS), New Delhi  
Elkon Private Limited, Mumbai

**German Partners**  
TU Munich  
Path Medical GmbH

Dr. Alok Thakkar, Dr. Rakesh, and from IIT Delhi, Dr. Dinesh Kalyansundaram (PI), Vidyasagar, participated via media interaction and lectures. Prof Samarjit Chakraborty (PI) and Director, IGSTC among others addressed the media and responded to the queries.



Representatives from other organizations involved in education/training of audiology were invited as observers at this workshop. The organizations included the Ali Yavar Jung National Institute of Speech and Hearing Disability, Ashtavakra Institute of Rehabilitation Sciences and Research, and professionals from different institutions.

The workshop included lectures and discussions followed by a panel discussion and

media interaction by Doordarshan. Presentation of device prototype and live discussion was there. In order to take full advantage of the wide range of perspectives, the presentations were brief, and the focus of the day was on creating awareness about deafness, need of early detection and interventions, treatment and other solutions, increased collaboration and to form concrete recommendations for improving current practices.



The workshop ended with the discussion and successful live demonstration of the prototype by Prof. Samarjit Chakraborty, Dr. Thomas Rosner, Mr. Nils Heitmann and Mr. Vidyasagar. The prototype was successfully developed and worked on oto-acoustic emissions (OAE) principle and soon will be available for testing.

The news about the conference was published in Mail Today newspaper on 25th December 2017, titled as AIIMS, IIT-D working on a device for early detection of hearing loss in children. It can be accessed via <http://bit.ly/2n0ljUB>



# AMPLAST - Project meeting

## PROJECT TITLE

**Advanced manufacturing process monitoring using in-line laser thermography (AMPLAST)**

The joint project meeting was held at IIT Madras, Chennai on 19th December 2017 with participants from industry and academia both from India and Germany alongwith Director, IGSTC. The project aims to develop new next generation sensing and measurement technologies that will bring a paradigm change in the ability to control the manufacturing processes in core industries. The development of laser thermography technique will enable defect detection, material property measurement, and process parameter measurement under hostile conditions. The use of non-contact, hostile environment sensing technologies will move the quality assurance into the early manufacturing process, thereby significantly improving the impact to the industries.

Discussion focused on the progress already achieved in the project with respect to

## PROJECT CONSORTIUM

**Indian Partners**

Indian Institute of Technology Madras, Chennai  
Dhvani R & D Pvt. Ltd., Chennai

**German Partners**

Federal Institute for Materials Research and Testing (BAM), Berlin  
InfraTec GmbH, Dresden

deliverables and work packages. A novel method developed for anisotropy measurements in steel accompanied by theoretical modelling and simulations for a validation of the experimental results have been established. Laser-thermographic testing setup was established and characterized allowing measurements under controlled conditions which match realistic production environments is one of the major outcome of the project.



The IITM is discussing with Tata Steel and visited the considered production site. The implementation of the set up and the following measurements are scheduled for the end of January 2018. These measurements will be an important part of the validation of the method in real scenario and therefore are essential to the project agenda.

# TALKS AT INDIAN EMBASSY

## Talk on “Optical Microscopy: the resolution revolution” by Nobel Laureate Dr Stefan Hell

Prof Stefan Hell who was awarded the Nobel Prize in Chemistry in 2014 and currently the Director of Max Planck Institute of Biochemistry, Göttingen delivered a talk on "Optical Microscopy: The Resolution Revolution" at Indian Embassy, Berlin as part of *India at 71* events on 27th October 2017. The talk focused on the role of the optical microscopy applied to various fields of science with an interactive and interesting session with audience participation.



# EXHIBITIONS

## India International Science Festival

The Ministry of Science and Technology, Ministry of Earth Sciences, and Vijnana Bharati (VIBHA) have come together to organize the India International Science Festival (IISF) every year, since 2015 to encourage scientific temper among the masses and to showcase Indian contribution in the field of S&T over the years. The 3rd edition IISF-17 was held in Chennai during 13-16 October 2017 at various venues which included Anna University, CSIR-CLRI, CSIR-SERC, NIOT and IIT Madras.

IGSTC participated in IISF 2017's Mega S & T fair to showcase the achievements of the Centre over the years. IGSTC Booth showcased posters of different projects funded by the Centre covering various areas of S & T viz. biotechnology, advanced manufacturing, biomedical technologies etc. Booth also had live demonstration of prototypes developed under IGSTC funded projects. Booth attracted a large crowd with several top scientists, decision-makers, key government officials, policy makers etc.

visiting and appreciating the work accomplished by IGSTC. Dr R Chidambaram, Principal Scientific Adviser to the Government of India, Prof Ashutosh Sharma, Secretary, DST and several other dignitaries including Directors of various national labs including DRDO labs visited IGSTC booth. One of the most striking features was the participation of several young high-school students who showed a keen interest in understanding the aspects of advanced scientific work done in IGSTC funded projects. This will surely help them in stoking their intellectual curiosity and becoming future scientists.

IGSTC appreciates and acknowledges Prof Krishnan Balasubramanian, IIT Madras; Prof Gandham Phanikumar, IIT Madras and Dr P Srinivasan, CSIR-SERC and their teams for their support at IGSTC booth.



## Humboldt Colloquium "Germany and India - Partners in Education and Research"

Alexander von Humboldt Foundation promotes academic cooperation between excellent scientists and scholars from abroad and from Germany through various funding opportunities.

IGSTC participated in Humboldt Colloquium held in Bangalore during 23-25 November 2017 organised by Alexander von Humboldt Foundation to showcase its activities. IGSTC's various programme portfolio and project achievements were displayed to the audience through poster and information booth making them aware of the funding opportunities in the context of Indo-German partnerships. There were one-to-one discussions with the scientists

about the successful bilateral research partnership and how to build stronger Indo-German collaboration. Approximately 250 participants including 200 Humboldt alumni and 50 early researchers attended the Colloquia.

Today, approximately 1,300 Humboldtians live in India. Many of them hold key positions at universities, research institutes and other institutions throughout the country. The aim of the Humboldt Colloquium was to enable Humboldtians to research network with each other. Colloquia also helped the participants to get familiarize with funding portfolios of various other Indo-German agencies.





## INDO-GERMAN BILATERAL WORKSHOPS IGSTC OPEN CALL

Indo-German Science & Technology Centre invites proposals for organising Indo-German workshops on areas of mutual interest with an aim towards creating platforms for substantive interactions between scientists / researchers from academia and industry. The workshops have to take place in India or in Germany and to be designed around a specific research topic out of thematic areas relevant to both DST and BMBF (preferably those under thematic areas of past and upcoming 2+2 Calls as mentioned at [www.igstc.org](http://www.igstc.org)) with a potential for generating follow up activities including joint projects. Training workshops do not fall under the scope of this call.

### Who can Apply?

Persons holding regular positions in public or private non-profit research organisations, institutions of higher education and universities are eligible to submit applications.

### Type and Extent of Support

- Event costs for typically not more than 25-30 participants (organisational and logistics expenses, catering, printing and publicity, miscellaneous expenses).
- International and domestic airfare for participants including transfer to the airport / venue and return. Only those participants with an active role (oral presentation) will be funded.
- Accommodation (expenses for accommodation in a standard hotel / guest house on actual costs for normally not more than four days).
- One official dinner.

### CONDITIONS

- It is expected that the organisers also contribute to the event. In kind contributions – e.g. venue, personnel – are creditable.
- Event should be held at the organiser's premises and this cost is not covered.
- IGSTC will not pay any daily allowance nor cover any personnel costs.
- IGSTC will not give any travel support to researchers who are not based in India or Germany.
- Participation of industry is expected.
- A detailed draft program including a list of the expected participants has to be submitted along with a brief background document illustrating the importance of the workshop.
- Involvement of young scientists is highly recommended. Travel support will be provided to scientists who are pursuing at least their Ph.D., but access to the workshop for younger scientists working in the locality of the venue should be possible.
- It is expected that the workshop participants belong to various institutions.
- The utilisation of IGSTC format is mandatory for the application.

# NEW IGSTC WEBSITE

IGSTC website with an immersive design and user interface having modern look was made live on 6th November 2017. The website is still under development and many other pages are being made live subsequently. Website can be accessed at [www.igstc.org](http://www.igstc.org)



## Indo-German Science & Technology Centre (IGSTC)

Indo-German Science & Technology Centre (IGSTC) was established by the Department of Science and Technology (DST), Government of India and the Federal Ministry of Education and Research (BMBWF), Germany to foster innovation through Indo-German R&D networking including industrial research partnership in PPP mode.

[Read More](#)

## Ambassador's Visit

Indian Ambassador Mrs Mukta Tomar visits BAM

Ambassador was welcomed by Dr. Ulrich Panne, President of BAM. A short presentation was made highlighting the BAM projects with India and the support from IGSTC.

[Read More](#)

## Mission and Vision

Advance industrial research partnership with mutuality of interest and respect

Develop knowledge networks for industrial sectors to enhance competitiveness

Establish joint knowledge pools to address global challenges

Serve as a nerve centre to promote Indo-German technology partnership

## News and Events

23-Nov-2017  
Humboldt Colloquium "Germany and India - Partners in Education and Research", Bangalore.

13-Oct-2017  
IGSTC participates in IISF 2017 held in Chennai

14-Sep-2017  
Dr Jasper Wieck, Deputy Chief of Mission of the German Embassy New Delhi, visits IGSTC

January 2018						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			



02

Partners meet, Jodhpur on 23 Oct 2017

[View More](#)

## IGSTC 2+2 Projects

Compact Linear Fresnel Reflector Technology (CLFR) for thermal power generation and process heat



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# MEETINGS

## Partners Meet

IGSTC holds Partners Meet every two years for the project investigators (PI) of “2+2 projects”. The premise of the meeting is to network with other scientists and to interact with the IGSTC Governing Board and staff.

This year the Partners Meet was held in the picturesque location of Jodhpur on 23rd October 2017. Around 40 participants including some young researchers and representing 15 projects (completed or at the

verge of completion) participated in the meeting.

Dr Arabinda Mitra (DST), Indian Co-Chair, IGSTC gave the welcome address followed by an inaugural address by Dr Lothar Mennicken (BMBF), German Co-Chair, IGSTC introducing a brief outlook of IGSTC. Dr Roshan Paul, Director briefed the audience about the partners meet and activities of IGSTC.



A full-day session with presentations of 15 projects was held. PIs shared the journey of their projects in brief including inception, achievements and status of the research and collaboration in the projects. PIs also shared their experience of working with and expectations from IGSTC. Some of the projects are ready for next phase of developments including commercialization of technologies.

After the conclusion of Projects presentations there was a Q & A session along with the

Governing Body Members of IGSTC. It was a highly effective session with PIs inputs about the flagship programme “2+2 Projects” and how to take it to the next level. There have been constructive discussions and suggestions on matters relevant to collaborative research. Many valuable suggestions were given by the GB members to the PIs about how to strengthen the existing collaborations and market commercialization of technologies etc.



## Finance Committee/Governing Body meetings

The 3rd Finance Committee (FC) meeting took place on 24th October 2017 in Jodhpur, India. FC comprised of Mr J.B. Mohapatra, Financial Advisor, DST (Indian Co-Chair of FC), Dr. Padmanabhan (ARCI), Dr Gerold Heinrich, DLR-PT (German Co-Chair of FC), Mr Maxmillian Jedemann (BMBF). Dr Roshan

Paul (Director), Mr Sunil Kukreja, Mr Pravin Gupta (Financial consultant), Dr Martin Goller (DLR-PT/IGSTC) and Dr P V Lalitha attended the meeting for IGSTC. Discussion focused on financials, audit report and budget estimates for IGSTC.

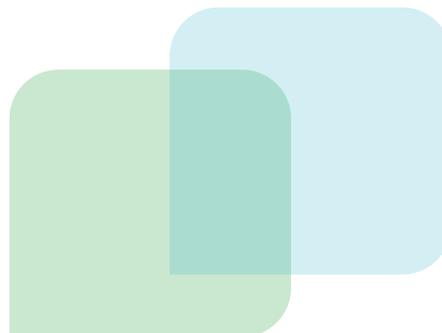


9th Governing Body Meeting took place on 24th/25th October 2017 in Jodhpur, India. The GB comprised of Dr Arabinda Mitra (DST & Indian Co-chair), Prof. Sandeep Verma (IIT Kanpur), Mr J.B. Mohapatra (DST), Ms Ratika Jain (CII), Dr G Padmanabham (ARCI), Dr Lothar Mennicken (BMBF & German Co-chair), Mr Stephan Lanzinger (German Embassy, New Delhi), Prof Eberhard Abele (TU Darmstadt), Dr Clas Neumann (SAP), Dr Gerold Heinrich (DLR-PT) and Mr Maxmillian

Jedemann (BMBF) as special invitee. Dr. Roshan Paul, Dr Martin Goller, Dr P V Lalitha and Mr Sunil Kukreja represented IGSTC in the meeting. GB focused holistically on IGSTC 2 + 2 flagship programme, thematic areas for future grant calls, new programmes to be taken up etc. There was a visit to newly set up IIT Jodhpur organized for the GB members in the afternoon of the 25th October. The members were impressed with the planning of infrastructure being developed for the new campus.

## DG, CSIR meeting

Director had a meeting with Dr Girish Sahni, Director-General of CSIR on 6th October 2017. Discussions focused on collaborations between IGSTC and CSIR. Mr A Chakraborty, former Director, IGSTC and Dr Rama Swami Bansal, Scientist, CSIR were also present in the meeting.



## Lindau Alumni Meeting 2017

The Deutsche Forschungsgemeinschaft (DFG) Office in Delhi hosted the “Lindau Alumni Meeting 2017” during 1-2 December 2017 to celebrate 16 years of DFG-DST collaboration in supporting young Indian researchers to participate in the Annual Lindau Nobel laureates meeting. Ambassador Dr. Martin Ney in his opening speech emphasised the significance of Indo-German Science Cooperation by highlighting the growing attraction of German universities for Indian students and mentioning large Indo-German research projects. Prof. Ashutosh Sharma, Secretary, DST stressed on the importance and benefits of international collaboration in research. The event provided an opportunity for the alumni to network with one another and with high profile guests, to engage with German research funding organisations, universities and research institutes. On the 2nd day of the meet, an info-session on “An Introduction to the German research Landscape” was organized where a presentation on Applied and industrial research by IGSTC was made. It generated a lot of interest to the audience and IGSTC’s efforts were well appreciated.

# DST-MPG Partner Group



## Dr S. Shankaranarayanan

Associate Professor  
Head of Max Planck Partner Group  
Department of Physics  
IIT-Bombay, Mumbai

Dr S. Shankaranarayanan, Associate Professor, Department of Physics, IIT Bombay was awarded Max Planck Partner Group in December 2011 to undertake research on "Cosmology and Gravity" with Max Planck Institute for Gravitational Physics, Potsdam, Germany. At the time of award, Dr Shankaranarayanan was affiliated with IISER Thiruvananthapuram.

The key objective of the Partner Group is to work on novel theoretical ideas in the areas of cosmological inflation, cosmological perturbation theory, horizon thermodynamics, entanglement, quantum gravity and modified gravity. The current research has lead the Partner Group to work on other areas of physics like quantum Phase transitions and quantum Criticality and its interface with black-hole thermodynamics.

The Partner Group has had a total of 13 postdoctoral fellows. 7 postdoctoral fellows are now faculty members in other institutions in India/UK. **41 publications** have arisen out of the Partner Group in highly reputed journals like Nature, Physics review, etc. and conferences.

#### Editorial Team

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## Indo-German Science & Technology Centre

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