

## Newsletter of IGSTC

Volume 2 | Issue 1 | Jan - Apr 2018



# ABOUT IGSTC

IGSTC has entered the new year 2018 with a lot of activities and new initiatives to be carried out during this year. From this year onwards, IGSTC newsletter will be published every four months instead of quarterly publications. IGSTC continues to foster R & D landscapes through its programmes and initiatives in the key areas of Advanced Manufacturing, Sustainable Energy/Environment, Biotechnology, Biomedical Technology, Smart Cities, etc. Some of the projects in these areas have accomplished noteworthy results and technology transfer for commercialization is the next eventual step.

Project SIBAC: Next-generation dynamic Scheimpflug imaging and biomechanical analytics for in vivo quantification of corneal viscoelasticity under the Call 2014 has achieved significant breakthrough in corneal biomechanics and imaging techniques. Project group has filed several patents and published their findings/results in leading ophthalmology journals.

Four out of six projects under Call 2016 in the thematic area of Smart Cities have been started in this quarter. Projects outcomes will further the research in this area and will support city administrators and before planners for making cities smart in both India & Germany. Call 2018 under the flagship programme "2+2 projects" will be launched tentatively in June 2018 with the thematic areas Sustainable Production & Clean and Green Technologies.

IGSTC mandate is to facilitate and promote Indo-German bilateral collaborations in applied science, research and technology. Keeping this in view, a revamped "Open Workshop Call" was launched in July 2017 to create platforms for substantive interactions between scientists/researchers from academia and industry. First Indo-German workshop under this call was held along with the "International Workshop on Ecological Processes and New Technologies for Sustainable Development" in February 2018 and was a great success.

This year IGSTC intends to start new funding mechanisms and strategic initiatives to foster public-private partnership and nurture collaborations between young and mid-career scientists and technologists.

## Editorial Team

-----

### Editor

P V Lalitha

### Associate Editor

Saquib Shaikh

## inside

**02**

About IGSTC

**03**

2+2 Projects

**12**

German President Frank-Walter Steinmeier's Talk at Delhi University

**13**

105<sup>th</sup> Indian Science Congress

**14**

Workshops

**16**

Talks & Meetings

# 2+2 PROJECTS

## SPOTLIGHT: SIBAC PROJECT

### PROJECT TITLE

SIBAC: Next-generation dynamic Scheimpflug imaging and biomechanical analytics for in vivo quantification of corneal viscoelasticity

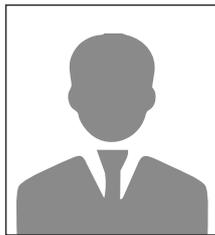
### PROJECT CONSORTIUM



**Abhijit Sinha Roy**  
Narayana Nethralaya  
Foundation, Bangalore



**Everette Nelson**  
VIT University, Vellore



**Shyam Vasudevrao**  
Forus Health, Bangalore



**Eberhard Spoerl**  
University of Carl Gustav  
Carus, Dresden



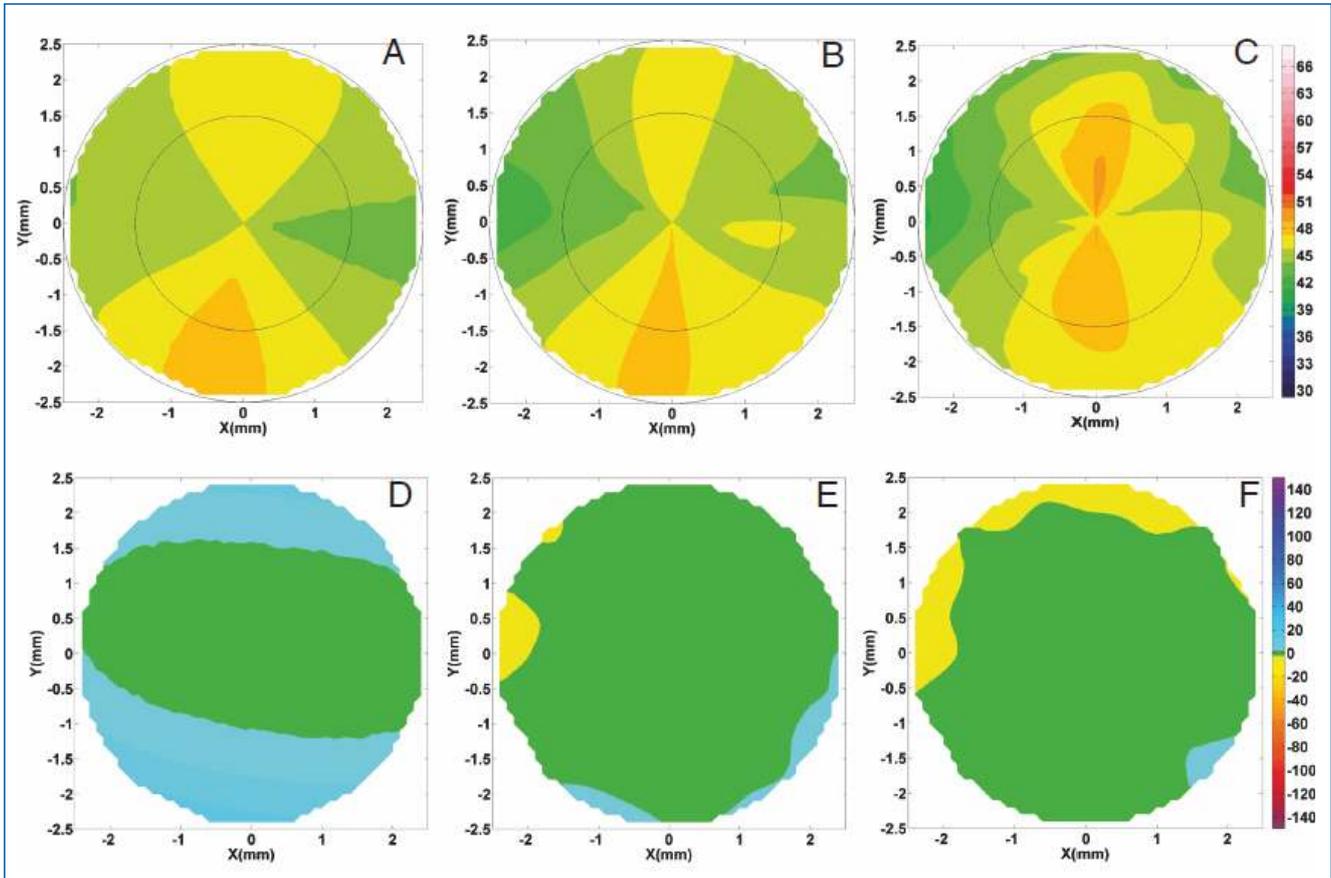
**Sven Reisdorf**  
OCULUS Optikgeräte  
GmbH, Dresden

### PROJECT SUMMARY

This project aims to develop a next generation dynamic Scheimpflug imaging device and biomechanical software analytics for in vivo quantification of corneal viscoelasticity. The specific aims of the project are to develop this device with high temporal resolution and location specific based corneal deformation measurement in response to air-puff, to develop fast computational algorithm for inverse estimation of biomechanical properties, and to validate the device and software in ex vivo and in vivo human subjects, both in normal and disease conditions. Biomechanics of the cornea also plays an important role in determination of intraocular pressure, which is still the primary determinant of ocular hypertension. Thus, disease diagnostics and treatment planning require knowledge of biomechanical properties of the cornea. Advanced

corneal tomography with optical coherence tomography and Deep learning to link corneal tomography and advanced finite element simulations to predict biomechanical outcomes after refractive surgery are the technologies being developed by the project consortium. Project group is the first to demonstrate that corneal tomography using optical coherence tomography far exceeds the current features of conventional imaging techniques. By linking corneal tomography with high speed dynamic Scheimpflug imaging, project intends to provide a comprehensive package to provide accurate biomechanical outcomes after refractive surgery and corneal crosslinking. Project partners have been very successful in filing patents and publishing the results in leading ophthalmology journals.





Axial curvature and aberrations of a severely keratoconic cornea derived from Pentacam (Oculus Optikgeräte GmbH, Wetzlar, Germany) and optical coherence tomography (OCT). Axial curvature of (A) anterior corneal surface from Pentacam, (B) air–epithelium surface from OCT, and (C) epithelium–Bowman’s layer interface from OCT. Aberrations of (D) anterior corneal surface from Pentacam elevation data, (E) air–epithelium surface from OCT elevation data, and (F) epithelium–Bowman’s layer interface obtained from OCT elevation data. Photo courtesy: Noncontact OCT for Corneal Topography/Matalia et al

## PATENTS FILED

**Title of Invention:** Quantification of Bowman’s layer for diagnosis of disease and prognosis of treatments in the human cornea, Filed by Narayana Nethralaya Foundation, 2015. Application ID: 6 5 3 9 / C H E / 2 0 1 5 , PCT/IB2016/057422

**Title of Invention:** A system and method of artificial intelligence and tomography imaging of human cornea. Filed by Narayana Nethralaya Foundation, 2017. Application ID: 201741008796, TEMP/E1/8968/2017CHE

**Title of Invention:** A method to quantify the quality of corneal donor tissue for transplantation using tomography imaging. Filed by Narayana Nethralaya Foundation, 2017. Application ID: TEMP/E1/15839/2017CHE.



## PROJECT MONITORING - CALL 2014 PROJECTS

The Meeting of the Project Monitoring Committee to review the progress of the IGSTC projects under the Call 2014 was held on 19th February 2018 at IGSTC, Gurgaon. The Monitoring was chaired by Prof Rinti Banerjee, IIT Bombay and Prof Alok Ray, IIT Delhi. Projects and their consortium partners are as follows:

### PROJECT TITLE

SIBAC: Next-generation dynamic Scheimpflug imaging and biomechanical analytics for in vivo quantification of corneal viscoelasticity

### PROJECT INVESTIGATORS

Abhijit Sinha Roy Narayana Nethralaya Foundation, Bangalore	Everette Nelson VIT University, Vellore	Shyam Vasudevrao Forus Health, Bangalore	Eberhard Spoerl University of Carl Gustav Carus, Dresden	Sven Reisdorf OCULUS Optikgeräte GmbH, Dresden
---	--	---	--	--

### PROJECT TITLE

MIDARDI: Microfluidic based detection of microbial communities and antibiotic responses in the management of diabetic foot ulcers

### PROJECT INVESTIGATORS

K Satyamoorthy Manipal University, Manipal	Dhananjaya Dendukuri Achira Labs Pvt. Ltd, Bangalore	Thomas Otto Fraunhofer ENAS, Chemnitz	Frank Bier Fraunhofer IZI, Potsdam-Golm	Joerg Nestler BiFlow Systems GmbH, Chemnitz
--	--	---	---	---

### PROJECT TITLE

Sound4All: Re-engineering high-end audiometric devices for robust and affordable audiological testing

### PROJECT INVESTIGATORS

Dinesh Kalyanasundaram IIT Delhi, New Delhi	Kapil Sikka AIIMS, New Delhi	Amit Chirom AIIMS, New Delhi	Samarjit Chakraborty TU Munich, Munich	Thomas Resner PATH GmbH, Germering
--	---------------------------------	---------------------------------	---	---------------------------------------



The Indian institutional and industrial partners presented the progress of the project for the last 24 months before the Monitoring Committee. The Committee reviewed the progress of all three projects and was highly satisfied with the progress of the projects and appreciated the outcomes & deliverables achieved in the project. SIBAC project has filed three patents related to corneal biomechanics and imaging. Sound4All has already developed the prototype of audiometric device and is ready for next stage of development.



## CALL 2017 - FIRST-STAGE PROPOSAL REVIEW

The IGSTC Call 2017 for 2+2 grant applications was launched on 23rd October 2017 with 13th February 2018 as deadline for submission. The 2+2 funding scheme is oriented towards applied science and development. Applicants have to build consortia with at least four partners (Indian and German industry partner as well as an Indian and German research partner). This time, the Call was in the overall thematic area "Advanced Manufacturing and New Materials" with four subtopics:

- Industry 4.0 (new human-machine interaction processes / digital and cloud manufacturing)
- Machine building (low cost sub-systems / components for improved precision, reliability, productivity)
- Process technologies for new materials including nanomaterials
- Light weight design and processes

To underline the applied science focus of IGSTC the "Technology Readiness Level" (TRL) was introduced in this year's call. The project idea should already be around TRL 4 when submitting a proposal. TRL is a measurement – originally introduced by NASA – to estimate the maturity of a technology or service.

The Scientific Committee meeting for evaluating the first stage applications was held on 20 March 2018 through a joint Video Conferencing with a total of 10 experts from both the countries. The committee discussed all eligible proposals and finally recommended 16 proposals to advance to the second stage.

The selected teams are requested to elaborate their project idea in a more detailed proposal. The second step of the evaluation by the Joint Scientific Committee will be done during the last week of May 2018 in Bonn. The applicants are invited to present their project proposals before the Joint Scientific Committee.

## CALL 2016 - PROJECT AWARDS

Four out of six projects approved under the Call 2016 in the overall thematic area of Smart Cities were started. The projects will be for three years with the possibility of a 2 years extension after a competitive evaluation. The total funding sanctioned for the projects stands at Rs 327.3 million / € 4.67 million. Projects will develop next generation technologies and framework for existing and future smart cities in India & Germany. Project details are as follows:

### PROJECT TITLE

**ECO-WET: Efficient coupling of water and energy technologies for smart sustainable cities**

### PROJECT INVESTIGATORS

**Naran Pindoriya**  
IIT Gandhinagar

**Sriniwas Singh**  
MMM University of  
Technology, Gorakhpur

**Mr ArvindKumar Rajput &  
Ms Janki Jethi**  
Gujarat International  
Finance Tec-City Company  
Limited (GIFTCL), Gandhinagar

**Markus Duchon**  
fortiss GmbH, Munich

**Daniel Ackermann**  
Sonnen GmbH, Wildpoldsried

#### Project Brief

Coupling of cross commodity infrastructure and integration of energy storage is a challenge for smart cities. This project focusses on water management and energy efficiency for smart cities. The project will develop integrated advanced energy storage technology and renewable energy sources to enable the coupling and modularization of electricity and water infrastructures. A software platform that allows real-time monitoring, analysis and controlling based on the IEC 61499 industrial standard with the grounding of systems engineering techniques and optimization techniques for energy-efficient management of both water and electricity in the purview of the infrastructural constraints in the smart sustainable cities is also envisaged.

### PROJECT TITLE

**SMART & WISE: Smart and reliable water and wastewater infrastructure systems for our future cities in India and Germany**

### PROJECT INVESTIGATORS

**B S Murthy**  
IIT Madras

**Ashok Natrajan**  
Tamil Nadu Water  
Investment Company Ltd,  
Chennai

**Theo Schmitt &  
Heidrun Steinmetz**  
TU Kaiserslautern

**Martina Scheer**  
Ingenieurbuero Scheer,  
Oberstdorf

**Gerald Angermair**  
tandler.com GmbH,  
Buch am Erlbach

#### Project Brief

The overall project goal is to support the implementation of reliable and sustainable water and wastewater infrastructure systems (WIS) with added value for smart cities. Systematic planning methods and tools will be developed to face current and future challenges on three levels; conventional, advanced and smart WIS. E.g. automated planning based on mathematical optimisation to improve conventional sewerage system planning with incomplete planning data base. Application of developed methodologies and tools will be demonstrated in pilot studies in India (Coimbatore) and Germany (Giessen, Lindenberg, Aulendorf).



## PROJECT TITLE

IDC-Water: Integrated diagnostics of contaminants in water supply and management system

## PROJECT INVESTIGATORS

**Debiprosad Roy Mahapatra**  
IISc Bangalore

**J Manjula**  
Bigtec Labs Pvt. Ltd,  
Bangalore

**Rudolf J. Schneider**  
BAM, Berlin

**Michael Voetz**  
sifin diagnostics GmbH,  
Berlin

### Project Brief

Project proposes to develop a system for monitoring water quality in terms of specific bacterial cell/DNA and pharmaceutical residues. The system will consist of the following components. (1) an in-line water sample collection and enrichment compartment. (2) a system of microfluidic cartridges for bacteria cell capture, culture, amplification and detection in a short period of time. (3) a system of micro-fluidic cartridges for capture and detection of pharmaceutical residues in short period of time. (4) an integrated board that hosts all the compartments 1-3, reagent supply units, detection units and performs automated diagnostic tasks and a similar counterpart with micro-PCR for off-line diagnostics. (5) a software framework to operate the integrated system, analyze the data collected over time and provide an appropriate early warning. System will be designed in such a way that it can be installed in the water pipelines in the water treatment plant settings and in building infrastructure settings for remote monitoring.

## PROJECT TITLE

Bio-CuInGe: Biotechnology for the recovery germanium, indium and copper from industrial copper dust waste

## PROJECT INVESTIGATORS

**T R Sreekrishnan**  
**S K Ziauddin Ahammad**  
IIT Delhi

**G Venkat Saravanan**  
Lakshmi Life Sciences  
Coimbatore

**Katrin Pollmann**  
Helmholtz Zentrum  
Dresden Rossendorf, Dresden

**René Kermer**  
GEOS Ingenieurgesellschaft  
mbH, Halsbrücke

### Project Brief

Germanium (Ge) and Indium (In) are important elements for high-tech industry and their future supply is not assured. Copper (Cu) dust waste from smelters hold Ge and In, however, there is no technology for their recovery from these dusts. Further, the large volume of the produced Cu dust waste is challenge for Cu smelters. This project proposes to develop environmental friendly and commercially viable technology for the recovery of In and Ge while decreasing the volume of Cu dust waste. The project encompasses preferential (bio)leaching of Ge and In from Cu smelter dust waste by optimizing various parameters followed by selective sorption. This project will apply the highly selective and sensitive siderophore and peptide based biosorptive biocomposites to recover In<sup>3+</sup>, and Ge<sup>4+</sup> from the leachate. This approach will also be applied to the waste from Cu metal powder and mould manufacturing for recovery of Cu. The project, for the first time, will attempt bioflotation for recovery of Cu mineral from Cu smelter dust with the help of biosorptive biocomposites.



## METNETWORK WORKSHOP

The third workshop of the 2+2 project METNETWORK - Nanostructured hybrid transparent network electrodes for large area visibly transparent solar cells between University of Bayreuth, CENS Bangalore, Papierfabrik Louisenthal and Tata Steel took place at the Papierfabrik Louisenthal, Germany from 12th to 13th April 2018. The main objectives of the project are 1) to examine the feasibility of printing methods; 2) to develop large area TCE metal network; 3) to synthesize the metal network TCE on flexible substrates such as PET or PEN or paper; 4) to test the feasibility of alternative metalation method based on solution processing techniques and/or incorporating graphene and 5) to integrate these TCEs in large-area solar cells suitable for window applications.

In addition to the participants from the respective partner institutes and companies Director, IGSTC participated in the meeting which discussed all the relevant ongoing experiments and joint work. After detailed discussions, the participants also visited the different labs at Papierfabrik for printing, sputtering and laminating large area R2R flexible substrates such as paper and PET.

The main findings of the last year research were:

- For realizing metal network with low sheet resistance for application in large area devices, it is required to use highly conducting filling materials such as AZO or PEDOT/PSS in the islands of the network and TiO<sub>2</sub> is not conducting enough,
- To increase the conductivity of the metal mesh itself without increasing the metal fill factor, one has to increase the height of the network, which may cause problems in thin film devices,
- The ongoing optimization of the synthesis of graphene needs to be continued to get highly conducting and more pure graphene on glass substrate and
- The successful fabrication of metal network on a PET foil by R2R process, which is already accomplished, requires further optimization regarding adhesion and lift-off of the template for large area processing on flexible substrates.



Participants holding Al metal network on a PET foil fabricated by R2R process at Papierfabrik Louisenthal as scaling up of the processes developed and optimized by CENS and University of Bayreuth

## DP-FORGE - PROJECT CONCLUSION MEET

The project consortium was partnered by IIT Madras & Tata Consultancy Services (Indian side) and RWTH Aachen & Simufact Engineering GmbH (German side). This project aimed at the development of an energy efficient production of forged components (eg. gears) from micro-alloyed dual phase steel with reduced distortion. The material and production design was realized by means of a generic Integrative Computational Materials Engineering (ICME) framework. ICME is a framework that helps in reducing the time and cost required to take materials from discovery to application. It is an emerging field that combines new and existing methods from a broad range of scientific disciplines to design and develop new materials, components, structures, processes, and systems concurrently [1]. The importance of ICME, its state of the art, key elements, challenges and roadmap for future is being addressed in the NASA report titled 'Vision 2040: A Roadmap for Integrated, Multiscale Modeling and Simulation of Materials and Systems' which was published in March, 2018 [1]. The DP-Forge project members, Prof. Ulrich Prahl and Mr. Deepu Mathew John are contributors to this report. The DP Forge project is the first ICME project in India. Idea of the project was conceived during Indo German workshop on ICME (2012) organized by IGSTC and TCS in Pune. Under the project, the first ICME Lab in India was established at IIT Madras, headed by Prof. G Phanikumar. The lab currently hosts more than 30 students of IIT Madras, who work together in a collaborative environment.

The DP-Forge project was concluded during February 2018. The final project meet was held at TCS, Pune, during which the final results of the project were discussed. The experimental validations for the project at component level were carried out at RWTH, Aachen and the results were highly promising. The mechanical properties for the newly developed material is currently on par with the existing standard material and offers less distortion compared to the existing materials. The simulations for the material at various length scale, carried out at IIT Madras and Simufact were validated and were found to agree with experiments very well. These validated simulations will be integrated using the ICME platform (TCS-PREMAP), which is developed at the Tata Research Development and Design Centre (TRDDC), TCS research, Pune.

The project was presented at various venues including NIST (National Institute of Standards and Technology), Ohio State University and AK Steel in USA and had got wide appreciation. The results from the project was presented at various international and national conferences including TMS ICME 2017 (USA), MSE Congress 2016 (Germany), NMD ATM 2017 (India) and HT&SE 2016 (India). It was also listed under the ICME initiatives across the world that was collected as a part of survey conducted during the 'NASA Vision 2040' workshop conducted at Michigan, USA. Four peer-reviewed publications have come out so far from the project. The results from the project were appreciated by some of the gear manufacturers in India and it is hoped that the continuation of the work could impact the gear manufacturing industry in India.



**References:** [1] Vision 2040: A Roadmap for Integrated, Multiscale Modeling and Simulation of Materials and Systems, 2018 (<https://ntrs.nasa.gov/search.jsp?R=20180002010>)

## MIDARDI - PROJECT MEET

2+2 project MIDARDI: Microfluidic based detection of microbial communities and antibiotic responses in the management of diabetic foot ulcers is partnered by Manipal University and Achira Labs from Indian side and Fraunhofer ENAS, Chemnitz; Fraunhofer IZI, Potsdam-Golm and BiFlow Systems GmbH, Chemnitz from German side. Project aims developing a microfluidic based lab on chip for rapid and accurate detection of different types of bacteria, their virulence/fitness factors and antibiotic resistant genes that may contribute to dominance of certain types in Diabetic Foot Ulcer settings. The detection module would aid clinicians in decision-making process to improve specific outcomes that would concomitantly improve wound healing per se in DFU scenario. Further it would provide a better understanding of the underlying microbial communities to develop treatment regimens to suit responses to individuals' lifestyle modifications.

The project meeting was held in Bangalore and Manipal from March 21st to March 28th, 2018. The German partners Dr. Joerg Nestler, Biflow Systems GmbH, Chemnitz; Dr. Andreas Morschhauser, Fraunhofer

Institute for Electronic Nanosystems, Chemnitz and Dr. Harald Peter, Fraunhofer Institute for Cell Therapy and Immunology, Potsdam visited Achira Labs Bangalore and School of Life Sciences, Manipal to discuss the progress of the project. In Bangalore, the discussions were carried out on the development of cartridge and the detection modules to be incorporated into the cartridge design. There were also discussions on electrical interface and pump control algorithms. In Manipal, the discussions were carried out on cartridge assembly and testing. The protocols followed for hybridization and other assay related modules were discussed. It was decided at the meeting that one researcher from Manipal will visit Germany to perform specific experiments related to assay steps that will be carried out in cartridge. Dr. Joerg Nestler also gave a talk in Manipal on "Highly-integrated Lab-on-a-chip Systems for Diagnostics and beyond". The visit was highly productive, and it was decided to have biweekly discussions to monitor the progress of the project and successful completion of the deliverables within the stipulated period.



# PRESIDENT FRANK-WALTER STEINMEIER'S TALK AT DELHI UNIVERSITY

As part of the state visit of German President Frank-Walter Steinmeier and his wife, Elke Büdenbender to India from 22nd – 26th March 2018, President Steinmeier delivered a talk at Delhi University (North Campus) on 23rd March 2018. The topic of the talk was "India and Germany – Ideas and Perspectives" and was highly received by the audience. President stressed on modify the more co-operation in the face of new challenges faced in the international arena. Talk focused on democratic institutions, bilateral science co-operation, freedom of speech etc. The full text of the speech can be found at [here](#)



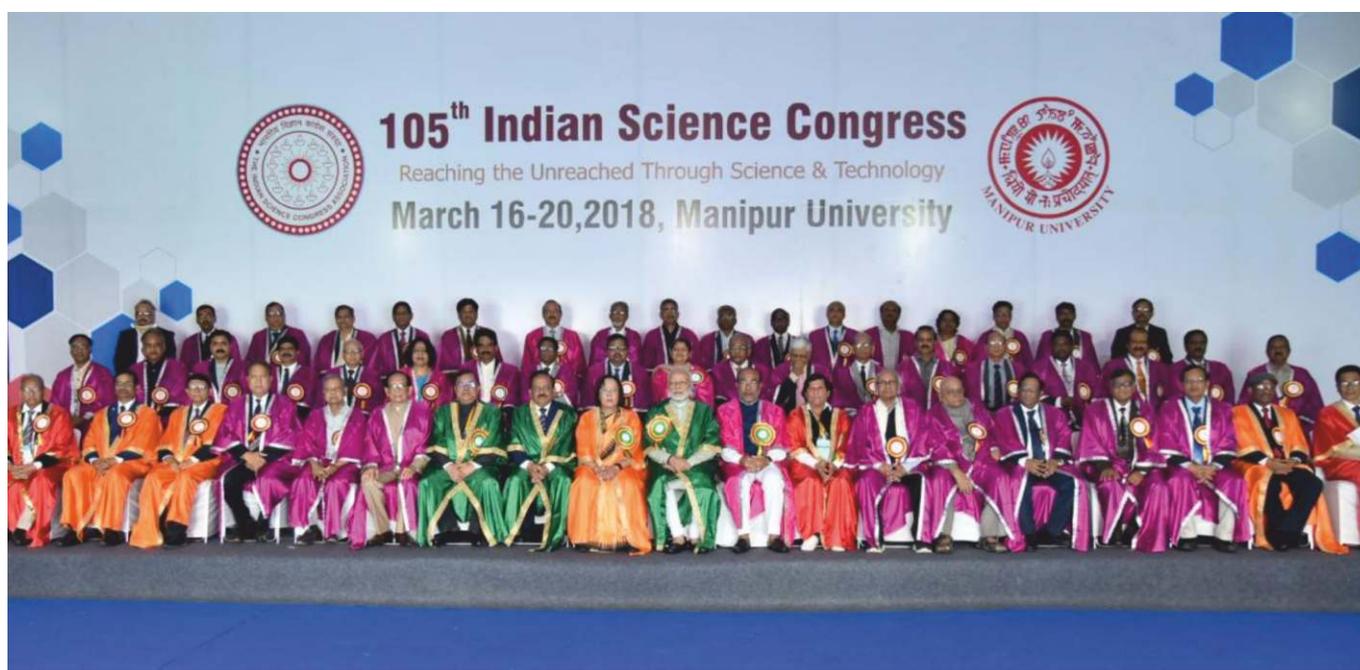
(© Bundespresseamt/Jesco Denzel)

# 105<sup>th</sup> INDIAN SCIENCE CONGRESS

The 105th edition of the prestigious Indian Science Congress was held at Manipur University, Imphal from 16th - 20th March 2018. The theme of the congress was "Reaching the Unreached through Science & Technology". This Congress focused on translational science for promoting affordable sustainable innovation. During the five days, thrust was given on various science disciplines, which has reached to the society. In a way, discussions were on science for all, Science and Technology Fostering Inclusive Societal Development and Science & Society: Bridging the Gap through Innovations. A technology-based start-up conclave was also showcased inviting the top-class innovators and entrepreneurial researchers.

Prime Minister Modi inaugurated the Science Congress. Prime minister urged the scientists to spend more time with students addressing the inaugural session of the Congress. The Prime Minister stated that the time is ripe to redefine 'R&D' as 'Research' for the 'Development' of the nation - that is 'R&D' in the real sense.

Union Minister of Science & Technology, Dr. Harsh Vardhan said that the Government's aim is to deliver the benefits of Science & Technology to the last man in the society. Dr. Vardhan pointed out that reaching the unreached and inclusion of the excluded are important components of this Government. Director, IGSTC participated in the event.



# WORKSHOPS

## International Workshop on Ecological Processes and New Technologies for Sustainable Development

Indo-German workshop was held along with the "International Workshop on Ecological Processes and New Technologies for Sustainable Development" from 21 – 25 February 2018 in Jaipur. This was the first workshop to be supported by IGSTC under the new "Open Workshop Call". The coordinators for the workshop were Prof Sanjay Mathur, University of Cologne and Prof A. S. Khanna, IIT Bombay. The workshop was embedded within the two well-established events namely the 19th International Symposium on Eco-materials Processing and Design (ISEPD 2018) and Expo on Environment-friendly Surface Engineering Technologies (EXPO) - an industry exhibit on greener and eco-friendly processing and engineering technologies. With over 400 international participants of the ISEPD & EXPO, the bilateral Indo-German workshop maximized the synergy of discussions between partners from industry and academia. Within the overarching theme of "Material Technologies for Sustainable Development", the Indo-German workshop established a novel platform integrating two of the most critical facets of materials science and engineering, namely materials innovation and sustainability manifested in

the concepts of nanotechnology and ecological pathways towards materials development as well reduction of materials usage. This interdisciplinary Indo-German forum with selected international experts discussed the necessity to identify, develop, assess and integrate novel materials for sustainable energy solutions. A panel of internationally renowned scientists put forward their thoughts on forming new scientific alliances and cooperation among scientists from India, Germany and abroad to tackle the materials challenges for new technologies. Some of the topics discussed at the workshops were innovative materials synthesis procedures with ecological merit; Remediation of waste materials for energy applications; Cutting edge concepts for energy generation and storage; Heterogeneous catalysts for electrochemical processes; From black to green - towards optimal use of resources; Technology Readiness: the crucial role of cost-effectiveness and sustainability.

Director, IGSTC was the Guest of Honor at the opening ceremony of workshop and introduced IGSTC to the audience.





## Scientific Impact and Future Efforts

With over 200 international participants, the bilateral Indo-German workshop was optimally positioned to maximize the synergy of discussions between partners from industry and academia. The active involvement of major German institutions (Fraunhofer Institute for Ceramic Technologies and Systems, IKTS, Dresden; Helmholtz Zentrum Berlin; Technical University Darmstadt; Max-Planck Institute Erlangen, Karlsruhe Institute of Technology, Carl Zeiss AG, Germany, INMATEC Technologies GmbH, Germany, Materials Alliance Cologne GmbH and University of Cologne) and Indian partners (Indian Institute of Technology, Bombay; Indian Institute of Science, Bangalore, Indian Institute of Technology, Delhi, Malviya National Institute of Technology, Jaipur, Manipal University, Jaipur, Indian Association for Cultivation of Science, Dayalbagh Educational Institute, Agra; Indian Institute of Technology, Banaras; Indian Institute of Technology Jodhpur) guaranteed the alignment of this event along the mission of IGSTC and the expected outcome is expected to foster the bilateral ties at various levels.

## Humboldt Kolleg on Climate Change and Energy Options

Humboldt Kolleg on 'Climate Change and Energy Options' was held at Aurangabad, Maharashtra during February 02-04, 2018 by Alexander von Humboldt (AvH) Foundation. This Kolleg also included 2nd Regional Network Meeting of Asian Alumni of the International Climate Protection Fellowship Programme of AvH Foundation. It is important for each country to make its citizens aware of the phenomenon and prepare them to respond appropriately to strike a balance between the growing demand for energy and environmental degradation which was the genesis of Kolleg. Various technical sessions on Climate Change and Energy options related topics low carbon future, Hydrogen - An environment friendly carrier etc. were brainstormed during the Kolleg. Scientist/researchers belonging to diverse disciplines like physical sciences, chemical sciences, biological sciences, materials sciences, performing arts, humanities, journalism and media participated in the event. In addition, college students, AvH Fellows, Senior officials from various Govt of India Organizations, DAAD and German Consulate also participated.

Director, IGSTC was invited to give talk on IGSTC under the session on 'Scopes in Germany' to the esteemed audience. Director presented the various IGSTC programmes, schemes for collaborations between Indian & German researchers.



# TALKS & MEETINGS

## IDC-WATER PROJECT MEET

The project "Integrated diagnostics of contaminants in water supply and management system (IDC-Water)" was approved for implementation under the Call 2016 in the overall thematic area of Smart Cities. Project aims to develop a system for monitoring water quality in terms of specific bacterial cell/DNA and pharmaceutical residues. Following are the project consortium partners:

## PROJECT INVESTIGATORS

**Debiprosad Roy Mahapatra**  
IISc Bangalore

**J Manjula**  
Bigtec Labs Pvt. Ltd,  
Bangalore

**Rudolf J. Schneider**  
BAM, Berlin

**Michael Voetz**  
sifin diagnostics GmbH,  
Berlin

Director, IGSTC had a meeting with German academic and industrial partners on 5th January 2018. He met with the German PI Rudolf J. Schneider at BAM, Berlin. Discussions focused on the project objectives, outcomes and methodologies to successfully to implement the objectives. Further, he made a presentation about IGSTC to different heads of BAM. Also, there was lab visits to different departments like Chemical and Optical Sensing, Process Analytical Technology, Inorganic Reference Materials, Structure Analysis, Protein Analysis and Biophotonics.

There was also a meeting with the Managing Director and Head of R&D of sifin diagnostics GmbH, Berlin, the German Industrial partner of the project. Presentations from sifin about their contribution and pathway for achieving the goals were made. Director also presented an overview of IGSTC programmes and activities for successful industrial collaboration.

## INDIAN AMBASSADOR MEET

Director, IGSTC paid a courtesy visit to the Indian Ambassador Mrs Mukta Tomar at Indian Embassy, Berlin on 9th January 2018 and the Ambassador was kind enough to spare her valuable time. Ambassador discussed on promoting IGSTC activities through Indian Embassy forum and through CII and FICCI. Also present at the meeting was Science Counselor R Madan.

## TU MUNICH TALK

Director, IGSTC gave a talk on the programmes and activities of IGSTC at TU Munich on 1st March 2018. Scientists, Researchers and students from TU Munich participated. He also had a meeting Prof. Samarjit Chakraborty, Professor of Electrical Engineering and head of the Institute for Real-Time Computer Systems (RCS) at TU Munich to discuss the progress/outcome of the 2+2 Projects, "Sound4All" and "AUTOSAFE".

## CONSUL-GENERAL MUNICH MEET

Director had a meeting with Mr Sugandh Rajaram, the Consul General, Indian Consulate, Munich on 12<sup>th</sup> March 2018. Discussion focused on the activities of IGSTC. Consul-General expressed his interest to promote IGSTC activities among the Presidents of Bavarian Universities and in Business Houses.

## BAYFOR TALK

Director, IGSTC had a meeting with Bavarian State Funding Industry – BayFOR Munich on 13<sup>th</sup> March 2018. The meeting was coordinated by BayIND Managing Director, Ms. Wiebke Doerfler. The meeting started with a presentation from the CEO & Director of BayFOR, Mr. Martin Reichel. Director, IGSTC gave a talk on IGSTC programmes and activities. Researchers/managers from Bavarian Universities participated in the programme.

## HOF UNIVERSITY TALK

Director, IGSTC gave a talk on IGSTC programmes at Hof University of Applied Sciences, Hof on 10<sup>th</sup> April, 2018. President of the university, Prof. Juergen Lehmann welcomed the Director and the talk was attended by faculty members and young researchers of the university. This was followed by a lab tour at the Muenchberg campus.

## UNIVERSITY OF BAYREUTH TALK

A talk on IGSTC programmes was delivered by Director, IGSTC at University of Bayreuth, Bayreuth on 11<sup>th</sup> April 2018. University of Bayreuth hosts the 2+2 project METNETWORK. Director also had a meeting with the project group and discussed on project objectives, progress, etc.

## FRAUNHOFER IKTS MEET

As a follow-up of the Indo-German Workshop held in Jaipur, Director, IGSTC visited Fraunhofer Institute for Ceramic Technologies and Systems, Dresden on 17<sup>th</sup> April 2018. Prof. Alexander Michaelis, Institute Director; Prof Sanjay Mathur, University of Cologne and Mr. Siddharth Mayur, h2e Power Systems Inc. participated in the meeting. The meeting focused on the bilateral Indo-German dialogue on technology transfer, and identified the opportunities offered by IGSTC for reinforcing the collaborative efforts, and to enhance the match-making between partners from academia and industry.





## **Indo-German Science & Technology Centre**

### **IGSTC Secretariat**

Plot No. 102, Institutional Area  
Sector - 44, Gurgaon - 122003, India  
Tel: +91-1244929400

### **German Project Office**

German Aerospace Center (DLR-PT)  
Heinrich-Konen-Str. 1, 53227 Bonn, Germany  
Tel: +49-22838211407

---

E-mail: [info.igstc@igstc.org](mailto:info.igstc@igstc.org)