

Newsletter of IGSTC Volume 2 | Issue 3 | Sept-Dec 2018

About IGSTC

As the year 2018 closes by, IGSTC had significant activities and achievements in the year to improve upon and further strengthen the growing Indo-German industrial research partnership. 16 projects under the flagship scheme of 2+2 are being supported through IGSTC in various areas of national priorities for India and Germany. The revamped Open Workshop Call received great momentum and several workshops under it will be held in coming months to create platforms for productive interactions among scientists and policy-makers of the two countries. A new programme IGSTC-CONNECT Plus in association with Humboldt Foundation was launched to support short-term research stays in India and Germany.

This quarter saw several activities in respect of 2+2 scheme. Call 2018 was launched in October in the thematic area of Sustainable Production (Sustainable chemical process technologies); Clean and Green Technologies with sub-topics on Technologies to reduce/mitigate air and water pollution; Solid waste management. Six projects under Call 2015 were reviewed to ascertain their progress and deliverables. Projects under Call 2017 have undergone due-diligence procedure for finalising their budget requirements.

IGSTC organized interactive sessions in Indian Institute of Science Education and Research (IISER) and Agharkar Research Institute (ARI), Pune on various aspects of writing a good 2+2 project proposal. In November, an Indo-German Workshop on Intelligent Mobility was organised in IIT Kharagpur in collaboration with TU Munich on electric mobility and its associated technologies.

Going forward in 2019, there are major events scheduled for IGSTC. In January Governing Body Meeting of IGSTC will be convened in Germany. A major workshop, Helmholtz-Indian Platform on Science, Technology, Education and Research (HIPSTER) will be organized in February in India to create a platform connecting young scientists of the Helmholtz institutes with Indian counterparts.

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SMART & WISE

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 (IITM)



Ashok Natrajan Tamil Nadu Water Investment Company Ltd., Chennai (TWIC)



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Project Summary

Overall project goal is to support the implementation of reliable and sustainable water and wastewater infrastructure systems with added value in terms of smart cities. The main targets of the project are to develop planning methods and tools to face current and future challenges on the three linked levels of conventional, advanced and smart water and wastewater infrastructures. The methods and tools will be sampled in pilot areas in India (e.g. Coimbatore) and Germany.

The first bilateral project meeting in India was held during 7-23 December 2018. Main events were a two-day-meeting at IITM and TWIC in Chennai followed by two days meetings with officials and site visits in Coimbatore. On December 14th to 15th, the project team worked on a training and pilot case workshop at IITM. Project partners spent the time from December 16th to 23rd on further detailed discussions. In all meetings, water and wastewater infrastructure planning processes, boundary conditions and appropriate sustainable approaches in India and Germany were discussed fruitfully and in detail.



Smart & Wise project meeting on December 10th 2018 in Chennai

The team visited chief officials, technical officials of various organisations to prepare the work on the pilot study in Coimbatore. The Commissioner of Coimbatore City, Dr K. Vijayakarthikeyan, IAS, assured every possible support for the pilot study. The project targets an integrated planning approach where water supply, wastewater treatment and urban drainage planning are combined. Consequently, responsible departments of the Coimbatore City Municipal Corporation were involved; the SMART & WISE team met with engineers from various departments including Smart City department. Further, the team visited the Tamil Nadu Water Supply and Drainage Board (TWAD Board). All organisations agreed to cooperate with the SMART & WISE team regarding data and information exchange and future discussions of the intermediate and consideration of the final results.

SMART & WISE team met the NGO Sirtuthuli, various companies and participated in the City level Planning workshop for Coimbatore on GIZ-supported urban projects on December 14th in Coimbatore.

The training and pilot case workshop introduced the project team members to the software platform that will be used for the development of the sustainable water planning tool. Details of Indian and German planning conditions and proceedings were exchanged intensively.

The detailed discussions amongst the five consortium partners has helped to focus and prioritize the specific tasks to be carried out. Understanding of the boundary conditions, regulations specific to each country and data availability will help to formulate the objectives and constraints in the planning models.



Smart and Wise team visits TWAD Board on December 13th 2018 in Coimbatore

MULTI-WAP

Project Title

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

Project Investigators V V Raghavendra Sai IIT Madras, Chennai V I Bishor ubio Biotechnology Systems Pvt Ltd, Cochin **Claus-Peter Klages** TU Braunschweig Braunschweig **Mahavir Singh** Lionex GmbH Braunschweig

Project Summary

The main objective of this collaboration is to develop costeffective fiberoptic biosensor for multiplexed detection of microbial pathogens in water (up to seven waterborne pathogens).

The second annual meeting of partners involved in the 2+2 project "Multi-WAP" was held on 4th - 5th December 2018, at ubio Biotechnology Systems Pvt. Ltd, Cochin, Kerala, India. The meeting was followed by short visit and technical meeting at the Indian Institute of Technology Madras (IITM), Chennai, India.

Project Partners from Germany, Dr Ayssar Elamin, Lionex GmbH, Braunschweig and Dr Vitaly Raev from the Institute for Surface Technology (IOT), Technische Universität Braunschweig met with Dr V. I. Bishor, ubio and Dr V. V. Raghavendra Sai, IITM. The first meeting at ubio focused on presentation and discussion of progress and plans for the next months of the different work packages viz. fiber optic probes and array sensor system development (IITM); surface plasma treatment and functionalization (IOT); production of specific antibodies for WAPs (Lionex) and some others. The technical meeting at IITM discussed the fabrication, assembly and calibration of firstgeneration Lab-Prototype instrument in order to be ready for the last phase of evaluation.



Project partners From L to R: Dr Ayssar Elamin, Lionex GmbH, Braunschweig; Dr V. I. Bishor, ubio and Dr Vitaly Raev, Technische Universität Braunschweig; Dr V. V. Raghavendra Sai, IITM, Chennai

In the recent project period, IITM has made progress as per the proposed work packages in the project. A more efficient 3rd generation automatic fiber bending machine is developed to fabricate U-bent fiber optic probes. The optimization of procedures for plasma treatment and gas phase silanization of silica fibers in order to obtain stable and homogeneous functionalized surfaces was studied during the second year of the project. The dependences of amino-functionalization effectiveness and reproducibility on reaction conditions (esp. gas compositions during pretreatment and silanization, treatment time and temperature) were investigated on model objects and together with Mr Divargar Murugan, who was delegated from the group of Dr Sai, IITM to IOT from October 10 to December 10, 2018 on U-bent silica fibers. Main outcome of these experiments was the finding that the usual wetchemical approach for fiber silanization pretreatment in strongly oxidizing media ("Piranha" or chromate solution) and silanization in a chemically unstable solution of the silane may be replaced by a short exposure to an atmospheric-pressure plasma followed by gas phase silanization. This result is of major importance for an eventual production of silanized fibers in the industry. Results of these studies were reported by Dr Raev during the recent project meetings at Cochin and Chennai in December 2018. ubio started establishing the protocol for validating of the model and final arrays antibodies from Lionex. In this period Lionex developed a new and novel anti-non-pathogenic E. coli and several final arrays biomarkers and antibodies.

MIDARDI

Project Title

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

Project Consortium:



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

The project aims at developing a microfluidics-based labon-a-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 bacterial types in DFU 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.

Chronic non-healing diabetic foot ulcers (DFU) are a common complication of diabetes exacerbated by microbial colonization. Current treatment employs an empirical approach that involves administration of antibiotics based on clinical presentation and microbiological testing. With increasing speed and decreasing cost of DNA sequencing technologies, MIDARDI team can now develop better alternatives to the classical treatment strategies.

In September 2018, a two-week technical collaborative visit was organised between BiFlow and Achira in Bangalore to integrate BiFlow's self-pumping cartridge technology to the instrument developed by Achira and to resolve any workflow related issues that could affect cartridge performance. During the first week of the visit, the two teams worked together to improve the software and the overall workflow. Following this, microfluidic cartridges were assembled and filled, and timing, flow rates and sequence of flows were implemented in the software and validated by successful pumping experiments.



Figure 1: (clockwise from top left) Assembling the cartridges; Testing software workflow with BiFlow cartridge and electronics; demonstrator prototype showing touch screen display and user interface to the right. The cartrdige and adaptor - marked by red rectangle – sit below the optics cube. The X and Y stages with stepper motors are also shown; The Achira and BiFlow teams in the lab

This workshop was part of extensive preliminary analysis carried out towards final stages of prototype preparation and preceded by a six-weeks stay of a researcher from Manipal University in Germany in July/August 2018 dedicated to the biochemical aspects of the project. The first two weeks were spent at Fraunhofer IZI in Potsdam on jointly carrying out assays and the whole biochemical work flow at lab-scale. The second two weeks at BiFlow in Chemnitz focused on the usage of BiFlow's microfluidic cartridges. The last two weeks were finally spent at Fraunhofer IZI-BB in Potsdam again, where together with the researchers from BiFlow and Fraunhofer ENAS the transfer of the assay to the microfluidic cartridges was established to run assays in a fully integrated way.



Figure 2: July 2018: Running an assay in the cartridge at Fraunhofer IZI-BB in Potsdam using BiFlow evaluation kit (left); Joint experimental session with engineers from BiFlow and Fraunhofer ENAS in Potsdam

Conferences attended

Jnana A, Vigneshwaran, Varghese VK, Chakrabarty S, Murali TS and Satyamoorthy K. Poster presentation entitled "Diabetic foot ulcer infections: Study of microbial diversity using next generation sequencing approach" at the 87th conference of Society of Biological Chemists (India) held at Manipal Academy of Higher Education, Manipal, Karnataka during 25-27 November 2018. Murali TS, Jnana A, Vigneshwaran, Varghese VK, Chakrabarty S and Satyamoorthy K. Oral presentation entitled "Microbial spectrum of diabetic foot ulcers – an NGS approach" at the 87th conference of Society of Biological Chemists (India) held at Manipal Academy of Higher Education, Manipal, Karnataka, India during 25-27 November 2018.

ECO-WET

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



Arvind Kumar Rajput GIFTCL, Gandhinagar



Janki Jethi GIFTCL, Gandhinagar







Daniel Ackermann Sonnen GmbH Wildpoldsried

Project Summary

Besides of the regular Telco meeting of all the partners of the consortium, the progress meeting of the ECO-WET project Indian partners of consortium, IIT Gandhinagar, GIFT City and MMMUT Gorakhpur, was held in GIFT City, Gandhinagar on 13th December 2018.

The meeting started with short discussion about project activities and use cases. The first deliverable document illustrating the detailed use cases and specifications was reviewed. Moreover, the agenda for the forthcoming project progress meeting of all the partners of the consortium, which is planned during January 23-25, 2019 at GIFT City Gandhinagar, was also drafted in that meeting.



ECO-WET Project team

Research article - Conference proceeding

Naran Pindoriya, Markus Duchon, Pragya Kirti Gupta, Venkatesh Pampana, S N Singh, Jakob Giza, Bastian Hackenberg, Arvind Kumar Rajput, and Janki Jethi, "Intelligent Hardware-Software Platform for Efficient Coupling of Water-Energy Nexus in Smart Cities: A Conceptual Framework", Mobility IoT 2018 - 5th EAI International Conference on Smart Cities within SmartCity360° Summit, Guimarães, Portugal, 21-23 Nov. 2018.

LOWCOSTEPS

Project Title

LowCostEPS: Low-cost emergency power system based on printed smart supercaps



Project Summary

On 4-5 October 2018, LowCostEPS project team had a working meeting in Mumbai to update project results and discuss the design of the final prototype. Prof Anil Kumar hosted the meeting with two days intensive discussions at the Department of Chemistry at IIT Bombay. This Indo-German project is developing a fully printed Supercapacitor for special applications in energy storage.



From L to R: Prof Anil Kumar, IIT Bombay; Murali Nanjundaiah, SLN Technologies; Prof Arved Hübler, TU Chemnitz; Dr Thomas Weißbach, TU Chemnitz



CALL 2015: PROJECT MONITORING MEETING

The Meeting of the Project Monitoring Committee to review the progress of the IGSTC projects under the Call 2015 was held on 10th September 2018 at IGSTC, Gurgaon. The Monitoring Committee was chaired by Prof D D Sarma, IISc Bangalore and Prof K M Paknikar, ARI Pune. The Indian institutional and industrial partners presented the progress of the project for the last 24 months to the Monitoring Committee. The Committee reviewed the progress of all six projects and was satisfied with the progress of the projects and appreciated the outcomes & deliverables achieved in the projects.

Project Title

METNETWORK

Nanostructured hybrid transparent network electrodes for large area visibly transparent solar cells

Fec-Online

Online-indication of pathogen-like pollution in water by fecal pigment analysis

WaterChip

DNA Biochip for on-site water pathogen detection including viability and antibiotic resistance testing

Multi-WAP

Multiplexed, label-free fiber optic biosensor array system for waterborne pathogen detection

LowCostEPS

Low-cost emergency power system based on printed smart supercaps

CANDECT

Cluster-composite nanofibre membranes for rapid, ultra-trace detection of waterborne contaminants

Project Consortium

G. U. Kulkarni, CeNS S.K. Choudhary, Tata Steel Ltd Mukundan Thelakkat, Univ. of Bayreuth Ralf Liebler, Papierfabrik Louisenthal GmbH

A. K. Mishra, IIT Madras Pragati Yadav, Spectro Analytical Labs Wido Schmidt, DVGW Technologiezentrum Wasser Christian Moldaenke, bbe Moldaenke

Ashutosh Kumar, Ahmedabad Univ. Somesh Mehra, ABC Genomics Wolfgang Fritzsche, Leibniz Institute of Photonic Technology Bernd Giese, Food GmbH

V. V. R. Sai, IIT Madras V. I. Bishor, Ubio Biotech Systems Claus-Peter Klages, TU Braunschweig Mahavir Singh, Lionex GmbH

Anil Kumar, IIT Bombay Anil Muniswami, SLN Technologies Arved Hubler, TU Chemnitz Ulf Ender, Grunperga Papier GmbH

Thalappil Pradeep, IIT Madras Kamalesh Choudhuri, Inno Nano Research Pvt Ltd Andrea Iris Schäfer, Karlsruhe Institute of Technology Hansjörg Fader, Fader Umwelttechnik



Monitoring Committee from L to R : Prof K M Paknikar, ARI Pune; Prof D D Sarma, IISc Bangalore Project investigators presenting their project

CALL 2017: DUE-DILIGENCE MEETING

Joint Scientific Committee recommended seven projects for funding against Call 2017 for 2+2 projects in the overall thematic area of Advanced Manufacturing and New Materials.

Funding of the selected consortiums follows national funding rules of India and Germany. The German partners undergo a similar evaluation process performed by the DLR project management agency. The Due-Diligence Committee consisting of Scientific Committee members Prof Sanjay Dhande, Director (Rtd.), IIT Kanpur and Prof D D Sarma, IISc Bangalore met in Gurgaon on 22nd October 2018 as part of the due diligence process to finalise the exact financial requirements of the 2+2 projects against IGSTC Call 2017 for the Indian partners of the consortium.



Due-Diligence Committee from L to R : Prof D D Sarma, IISc Bangalore; Prof Sanjay Dhande, Director (Rtd.), IIT Kanpur



PI's presenting the project

All the seven projects were presented by the Indian PIs (combined by both institutional and industrial partners) to the Committee and discussed the proposals vs funding requirements in detail for finalizing the financial requirements. The budget evaluation was made based on scientific work-packages, expected deliverables and experimental sample sizes. Finally, the Committee recommended the financial plans for the projects.

WORKSHOPS

INTERACTIVE SESSIONS AT IISER AND ARI, PUNE

In order to publicise and inculcate good writing skills for project proposals of industrial nature of IGSTC programmes among scientists and technologists, IGSTC conducted an Interactive Session on project proposal writing at Indian Institute of Science Education and Research (IISER) and Agharkar Research Institute (ARI), Pune on 16th November 2018.

The Session briefed on the guidelines for applying for its projects/programmes. In this half-day session, the IGSTC team discussed about current and upcoming programmes, guidelines on how to submit a good proposal. Prof Sanjay Dhande, Director (Rtd.), IIT Kanpur opened the session and gave the plenary speech on how to write successful grant proposals.



Prof Sanjay Dhande, Director (Rtd.), IIT Kanpur delivering the plenary session

Dr P. V. Lalitha, Sr. Scientific Officer, IGSTC giving the 2+2 proposal session



Audience at ARI, Pune

Director, IGSTC addressed the gathering giving a brief of current and upcoming programmes and detailed information on IGSTC's 2+2 Calls, Workshops & other new programmes. Dr P. V. Lalitha, Sr. Scientific Officer, IGSTC gave a presentation on guidelines to submit a good proposal. A highly interactive Q & A perplexed on different modalities of grant proposals, how to include industry into the proposal, how to have a synergy between academia-industry & several other discussion areas. Cohort consisting of scientists from IISER, ARI, NCL, Bharat Forge, Mahindra, TCS and several others from different research institutes & R & D labs of industry participated in the workshop at IISER & ARI.

WORKSHOPS

INDO-GERMAN WORKSHOP ON INTELLIGENT MOBILITY

In an effort to evolve and give direction to the emerging intelligent mobility landscape in India, IIT KGP and the Technical University of Munich (TUM), Germany organized a two-day workshop at IIT KGP on October 29th- 30th, 2018. This workshop is being held in the context of the newly-established Indo-German Collaborative Research Center on Intelligent Transportation Systems, which is currently a joint Center of IIT KGP and TUM, located within the IIT KGP campus, but seeks to involve multiple Indian and German academic and industry partners in the future. The workshop was supported by the Indo-German Science and Technology Center (IGSTC) and the German Federal Ministry of Education and Research (BMBF).



Prof P.P. Chakraborty

Prof Pallab Dasgupta

Prof Samarjit Chakraborty

Director, IGSTC addressed the gathering giving a brief of the current and upcoming programmes. This workshop brought together various transportation experts from Indian and German academia and industry - such as TUM, IIT KGP, TU Berlin, TU Chemnitz, IIT BBSR, IIT Patna, ISI Kolkata, TH Ingolstadt, Siemens, Bosch, Infineon, Intel, TCS, Ola Cabs, - as well as policy makers and law enforcement agencies, who discussed potential solutions in the domains of Intelligent Solutions for Transportation Integration, Technologies for Electric Vehicles and Batteries, and Systems & Software Challenges in next generation vehicular technologies. While many Indian cities have a variety of transportation modalities ranging from metro trains to autorickshaws, India also has unique transportation challenges and vast opportunities that are of huge interest to both German scientists and the German industry. In order to meaningfully address such challenges, a close cooperation between Indian and German institutions is of mutual interest.

"Future transportation solutions in India or other Megacities must be developed with a holistic view of the wide milieu of options available in cities, and integrated end-to-end solutions will make public transport more reliable and comfortable, and reduce the dependency on private vehicles" opined Prof Samarjit Chakraborty of TU Munich, who along with Prof Pallab Dasgupta from IIT KGP were the main initiators of the new Indo-German Collaborative Research Center on Intelligent Transportation Systems. "The focus of innovation today is in intelligent software for safety, driver assistance, comfort and entertainment. Combining the software and AI expertise of India with the manufacturing leadership of Germany can bring about transformational benefits to both countries. At this Center and with appropriate collaborations with industry partners in India and Germany, we are looking forward to shaping our research goals and schemes for long-term sustainability of the Center," remarked Prof Pallab Dasgupta, who is also the Dean of Sponsored Research & Industrial Consultancy, at IIT KGP.

WORKSHOPS



Plenary Session



Group Photo of the workshop participants

India, with its Smart Cities Mission, aims to develop 100 smart cities in the near future. Intelligent and integrated green transportation systems will be a key component of these cities. This would not only bring forward challenges in integrating the wide milieu of transportation options in Indian cities but might also require designing new transportation systems for addressing the huge demand for public and private transportation in Indian cities. At the Indo-German Center, experts from various industries of the two countries, traffic control, policy makers, and Indian and German academics would work together towards finding India-centric solutions for these challenges, along with new business opportunities. In addition to new automotive technologies by combining German engineering and Indian software skills, the research in this center could potentially revolutionize management, analysis, and intelligent services in transportation, including fleet management, vehicle-to-infrastructure interactions, and cloud-based vehicle health monitoring, by combining technologies from the domains of wireless networks, smart sensing, smart wayside infrastructures, Al and machine learning.

Indo-German Collaborative Research Center on Intelligent Transportation Systems aims to establish collaborations at both academic and industry levels between Germany and India for developing next generation transportation technology suitable for Indian cities and to create an ecosystem in India that is conducive for the German and Indian Industry.

CONFERENCES, TALKS & MEETINGS

IGSTC AT DBT-WELLCOME TRUST

Wellcome Trust-DBT India Alliance set up between the Department of Biotechnology (DBT) under the Ministry of Science and Technology and the Wellcome Trust celebrated 10 years of their joint partnership in an event in New Delhi on 12-14 November 2018. The Wellcome Trust is an independent charity funding research to improve human and animal health. Established in 1936 and with an endowment of around £15 billion, it is the largest nongovernmental source of funds for biomedical research in the United Kingdom. The aim of setting up the fellowship jointly with Wellcome Trust was to create a system comparable to the best in the world, taking India on the path of becoming a leader in key areas of biomedical research. Speaking on the occasion President of India, Shri Ram Nath Kovind said that as the partnership between the Department of Biotechnology and the Wellcome Trust completes its first decade, this is an opportune moment for the India Alliance to draft its priorities for the next phase. At present, through science and technology, humans wield unimaginable power over the future of our planet. We therefore have a responsibility like never. And scientists, particularly bio-scientists, are our soldiers and generals in the battle to safeguard our planet, our species and our future.



From L to R: Dr Renu Swarup, Secreatry, DBT; Dr Harsh Vardhan, Hon'ble Union Minister for Science & Technology; Shri Ram Nath Kovind, President of India; Dr K. Vijay Raghavan, Principal Scientific Adviser to Govt. of India; Sir Jeremy James Farrar, Director, Wellcome Trust - photo courtesy - DBT-Wellcome trust/PIB

Dr P. V. Lalitha, Sr. Scientific Officer, IGSTC participated in panel discussion on Bilateral Research in India. Panel discussed on the different bilateral research activities happening in India and pondered upon strengthening future collaborations.



Panel discussion on Bilateral Research in India

CONFERENCES, TALKS & MEETINGS

ATMP 2018 CONFERENCE

International conference on Advances in Textile Materials and Processes [ATMP- 2018] was held by Uttar Pradesh Textile Technology Institute, Kanpur in collaboration with Knowledge Incubation for TEQIP of Indian Institute of Technology, Kanpur on 19-20 November 2018 at IIT Kanpur. Director, IGSTC was on the advisory committee of the conference. Director gave a talk on Indo-German bilateral programmes administered by IGSTC to strengthen Indo-German research partnership.

IGSTC AT GITA FOUNDATION DAY

7th Foundation day of Global Innovation & Technology Alliance (GITA) was held no 29th November 2018. Global Innovation & Technology Alliance (GITA) is a "not-for-profit" Section-8 Public Private Partnership (PPP) company promoted jointly by the Technology Development Board (TDB), Department of Science & Technology (DST), Government of India and the Confederation of Indian Industry (CII). IGSTC participated in the Country session of Germany at the event. Director, IGSTC talked on the industrially relevant programmes and initiatives of IGSTC, and further answered queries from a multitude of industrialists



Photo Courtesy - GITA twitter handle

CET BHUBANESHWAR TALK

Director, IGSTC had an interactive session with students of the College of Engineering & Technology, Bhubaneshwar under Technical Education Quality Improvement Programme (TEQIP) on 12th November, 2018. He also apprised the audience about the various activities of IGSTC and how IGSTC programmes are helping in strengthening Indo-German research partnership. Several faculty members and research scholars were part of the event.

INDIAN AMBASSADOR MEETING

Her Excellency Ms Mukta Tomar, Indian Ambassador to Germany invited Director, IGSTC and Dr Martin Goller, German Project Office Head on 4th December 2018 for a short exchange of views. Mr R Madhan, Science Counsellor, Indian Embassy was also present in the meeting. Deliberations focused on the Future Roadmap of Indo-German S&T relations, building up a database of Indo-German collaborations in the past, present & future.

IGSTC-CONNECT PLUS FELLOW



Dr Anup Kumar Keshri Assistant Professor Dept. of Metallurgical and Materials Engineering Indian Institute of Technology, Patna

Research Summary

The prime objective of the current work is to fabricate plasma sprayed zirconate coating over zirconium (Zr) carbon nanotube (CNT) reinforced additively manufactured NiCrAl substrate, for enhancing the performance and durability of the existing turbine blade at elevated temperature.



Title of the Project

Plasma sprayed thermal barrier coating over Zr/CNT reinforced additively manufactured NiCrAlY substrate

Host Institute

Prof Thomas Niendorf, Institute for Materials Technology, Univversitat Kassel, Germanv

Visit Period

11th -21st December 2018



Dr Keshri acknowledges that because of IGSTC-CONNECT Plus fellowship he got a wonderful opportunity to collaborate with Prof Niendorf at University of Kassel. This fellowship provided the opportunity to work on the joint project and tackle the scientific problem with the help of sophisticated instrument available in both the institute i.e. University of Kassel and IIT Patna

DST-MPG FELLOW



Dr Anshu Sharma Women Scientist & Principal Investigator Department of Physics Indian Institute of Technology Delhi Hauz Khas, New Delhi, India

Dr Anshu Sharma, Indian Institute of Technology Delhi was awarded Max Planck India Mobility Grant in January 2015 to undertake research "Structure and Dynamics of Functionalized and Catalysts Modified Carbon Nanotubes for Charge and Mass Transport Applications" at Max Planck Institute for Structure and Dynamics of Matter, Hamburg, Germany. This was her

2nd visit for the same. This proposed work is focused on trying to exploit the unique properties of carbon nanotubes for hydrogen storage, one of the most pressing problems in modern science if we are ever to cultivate a hydrogen economy and become environmentally neutral in our footprint. It is an interesting twist of fate to actually study structural changes that occur during electron transport and molecular functionalization. The key point of this proposal is to explore carbon nanotubes as means to functionalized materials (electron bridges) and possible supports for novel catalysts to give an atomic level view of catalysis, one of the most important chemical processes, yet one of the most difficult to understand. This proposal also focuses on structural changes important for modifications aimed at hydrogen storage. During her visits she also visited Dr Michael Hirscher, Hydrogen Storage Group at Max Planck Institute for Intelligent Systems, Stuttgart and Department of Nanotechnology, Helmholtz Zentrum, Geesthacht, Hamburg for hydrogen adsorption measurements on pure SWNTs and platinum loaded MWNTs and SWNTs.



List of Publications from MPI-DST mobility grant:

- Impact of Magnetically Aligned CNT/PC Nanocomposites for Hydrogen Gas Separation Applications. MRS Advances. 1(42), (2016) 2873-2880", "Synthesis of SWNT/Pt nanocompositesfor their effective role in hydrogen storage applications. AIP Conference Proceeding. 1953 (2018) 030148
- 2. Silver Doped Graphitic Carbon Nitride for the Enhanced Photocatalytic Activity towards Organic Dyes. Journal of Nanoscience and Nanotechnology. 19(2019) 1-8

DST-MPG FELLOW



Dr Subbulakshmi Chidambaram UGC-Assistant Professor Dept. of Biochemistry and Molecular biology Pondicherry University, India E: csubbulakshmi@gmail.com

Dr Chidambaram recevied "Max Planck - India Mobility Grant" in June 2014 when she was in Vision Research Foundation, Chennai. Later, she moved to Pondicherry Central University and completed all 4 visits as per the provisions of the award. The project dealt with cell biological and proteomic aspects of retinal neurodegeneration. One of the interesting outcomes of this collaboration was characterization of the proteome of human intraschisis fluid from X-linked retinoschisis (XLRS), a vitreoretinal degenerative disorder causing vision deterioration due to structural defects in the retina. The triggering point of retinal split (schisis) and its progression leading to blindness is largely unknown still. During the second visit of the grant (May 2015), project team analyzed the peptides in intraschisis fluid obtained during surgical intervention of XLRS patients, using Q-Exactive plus hybrid guadrupole-Orbitrap mass spectrometry housed at MPIBPC, Goettingen. Functional annotation revealed three primary canonical pathways to be associated with the schisis fluid

Host

Prof Reinhard Jahn's lab, Dept. of Neurobiology, Max Planck Institute for Biophysical Chemistry, Goettingen, Germany

Project title

Dissecting the Regulatory role of Adiponectin signaling in Human Retinal Synaptic Vesicle Trafficking under Physiological and Pathological conditions

proteome which are involved in immune and inflammatory responses. Project team successfully reported the first proteome profile of human retinoschisis fluid in the journal 'Clinical Proteomics' which has been highlighted in the recent updates of Human Eye Proteome Project (EyeOme). The MPGmobility grant also lead to a novel finding that a germline specific non-coding RNA binding protein family, PIWIL4 is elevated in the vitreous humor of proliferative diabetic retinopathy patients. In addition, the technical expertise acquired on the isolation of post synaptic density and synaptic vesicle fraction from murine models has been a great methodological tool for exploring the basic mechanisms of synaptic exocytosis in retinal neurons. Dr Chidambaram would also like to emphasize the extensive brain storming sessions in the lab, participation in conferences and scientific networking during the visits which has created a strong platform for further active collaborations with other research groups in Germany.



Biological Process





- Enzyme Activity
- Molecular Function Unknown
- Signaling Activity
- Transcription and translation activity
- Transporter activity
- Extra cellular matrix structural constituent
- Defense immunity protein activity
- Cell adhension molecule activity
- Binding activity
- Structural molecule activity
- Structural constituent of cytoskeleton
- Others



- Extracellular Cytoplasm
- Nucleus
- Others
- Exosomes
- Plasma membrane
- Lysosome
 - Integralto membrane Endoplasmic reticulum
- Cytoskeleton Golgi aparatus
- Mitochondrion

List of Publications from MPI-DST mobility grant:

- Sivagurunathan S, Raman R and Subbulakshmi Chidambaram* (2018). PIWI-like protein, HIWI2: A novel player in proliferative diabetic retinopathy. Experimental Eye Research, 177:191-196. DOI:10.1016/j.exer.2018.08.018.
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- Sudha D, Kohansal-Nodehi M, Kovuri P, Manda SS, Neriyanuri S, Gopal L, Bhende P, Subbulakshmi Chidambaram*and Arunachalam JP* (2017). Proteomic profiling of human intraschisis cavity fluid. Clinical Proteomics, 14:13. (*equal corresponding authors)
- Sivagurunathan S, Palanisamy K, Arunachalam JP and Subbulakshmi Chidambaram* (2017). HIWI2 regulates tight junction proteins in retinal pigment epithelial cells through modulation of AKT/GSK3 signaling pathway. Molecular and Cellular Biochemistry, 427(1-2):145-156.



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