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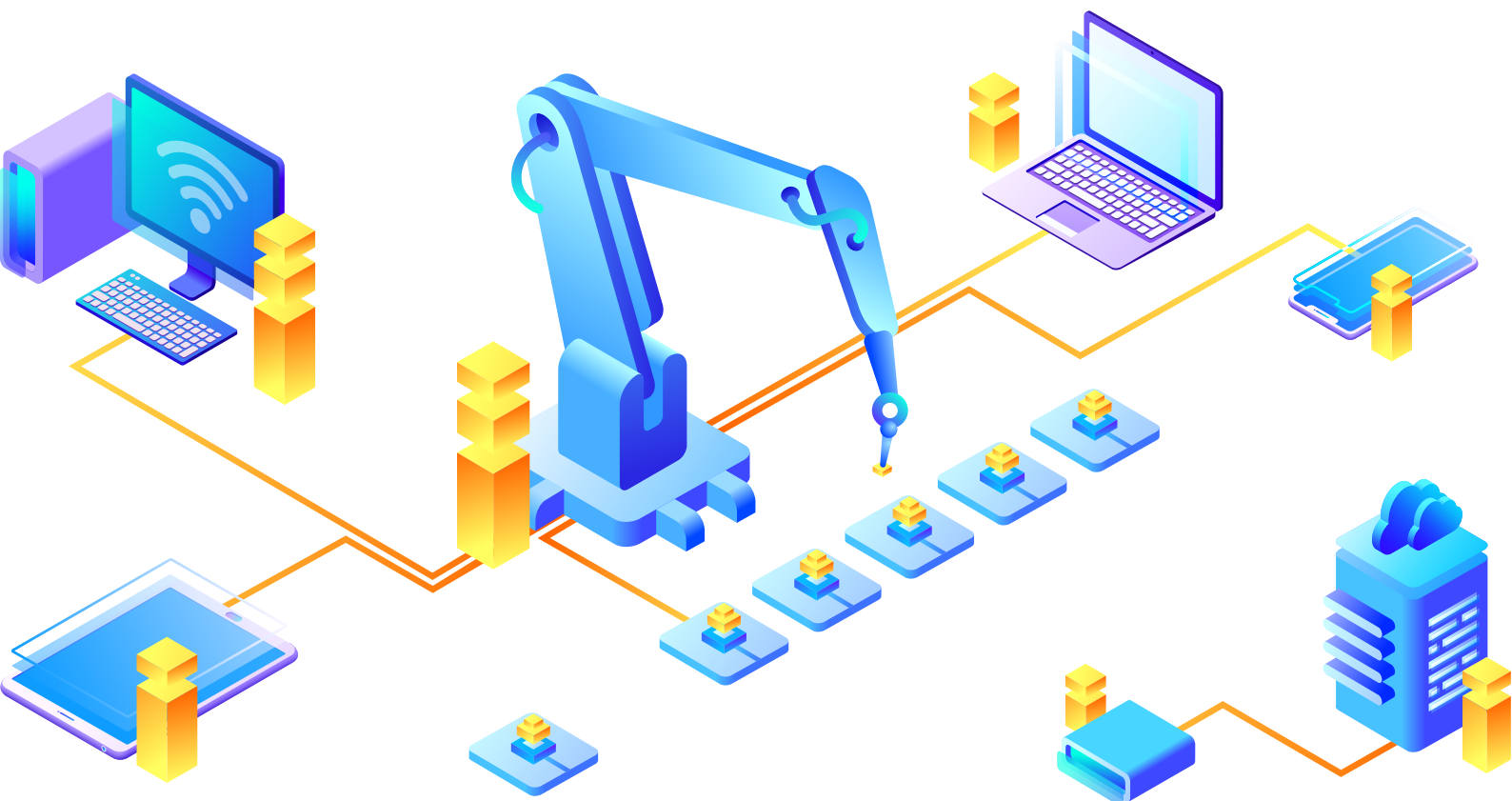
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## About IGSTC

COVID-19 pandemic has hit the world and upended the normal way of life. Now more than ever, the need for scientific interventions to halt the march of COVID-19 or any other future pandemic is required. A new normal for work from home has emerged and radically transformed the workplace for many. Social distancing, masks and all other non-pharmaceutical interventions are necessary to stop the spread of COVID-19 and it will also help in flattening the curve so that the healthcare system is not overwhelmed. As universities and industries are under lockdown, most of IGSTC projects are affected. IGSTC is supporting and releasing grants to projects and providing all necessary support to PI's to guide through this times.

IGSTC is in its 10th year of establishment in Year 2020. It has been a very progressive and productive decade in the history of Indo-German bilateral cooperation. With a doubling in funding, the flagship program 2+2 projects have transformed into a very efficient industry-academia partnership and Workshop programme has networked hundreds of researchers across India & Germany.

IGSTC has given extension for three projects under Call 2014 for phase 2 funding who have shown promising results and reached a significant TRL. The aim in Phase 2 for these projects is to bring a product/service close to commerciality. Sound4All a project partnered by TU Munich, IIT Delhi, AIIMS Delhi and Path GmbH are in advanced stages of developing prototype of affordable hearing aids. SIBAC project partnered by Narayana Nethralaya, Bangalore and Oculus Optikegrate GmbH is in development of a software tool for predictive modeling of corneal deformation with air-puff applanation. The MIDARDI consortium partnered by Manipal University, Achira Labs, Fraunhofer IZI & ENAS and BiFlow Systems GmbH has been developing a microfluidic based lab-on-a-chip for rapid (<1hour) 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.

Four projects under Call 2016 in the thematic areas of Smart Cities underwent monitoring. The project investigators presented to the review committee their progress. A rigorous review for future funding and extension was done.

# STEEL4LTC

High Strength Spring Steels with Reduced Low Temperature Creep for Light Weight Designs

## Project Investigators



**Koteswararao V. Rajulapati**  
University of Hyderabad (UoH)



**G. Balachandran**  
JSW Steels Salem Works (JSW)



**Robert Brandt**  
Universität Siegen (USI)



**Steffen Klapprott**  
Muhr und Bender KG (MUB)

Down-sizing and light weight design of all automotive components especially in chassis area is underway. Higher stress acts on spring material due to its light weight design. The springs being used currently may not withstand very high stresses. Hence, there is a pressing need for the development of advanced spring steels. The main focus of this Indo-German consortium is to develop a new steel grade with enhanced Ultimate Tensile Strength (UTS) with adequate ductility and improved low temperature creep (LTC) resistance and high cycle fatigue (HCF) resistance. The ultimate target of the project is developing and commercializing the high strength spring steel components.

The consortium partners have had their first networking meeting at Mubea in Weißensee, Germany during 19-22, February 2020. A plant tour consisting from wire rod production to prototype component testing was organized by the MUB during the network meeting.

Subsequently, Followed that, the partners have discussed the current progress of the project and chalked out the plans for the future.

The project was started on 1st June 2019. JSW has delivered the first batch of raw material (SAE 9254) in the form of wire rods. MUB has reworked the wire rods, provided by JSW into straight bars. This was done at “Mubea Automotive Components India” in Pirangut, India. The straightened bars are dispatched to USI and UoH for material to carry out investigations. USI proposed “Micro-plasticity” as a LTC controlling mechanism based on the experimental knowledge & thorough review of existing LTC theories. Currently, USI is involved in formulating the mechanical tests, i.e. Thermography tests in order to verify and validate the newly proposed hypothesis of LTC. UoH has carried out initial microstructural investigations on the provided material and evaluated its room temperature tensile properties.





Participants (left to right): Mr Remalli (USI), Prof Brandt (USI), Mr Heßland (MUB), Prof Rajulapati (UoH), Dr Sambandam (JSW), Mr. Klapprott (MUB).

# PPAM

## Metal Powder Production for Additive Manufacturing

### Project Investigators



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**Suman Chakraborty**  
IIT Kharagpur



**Suvankar Ganguly**  
Tata Steel Ltd., Jamshedpur



**Cameron Tropea**  
TU Darmstadt



**Hans-Jürgen Odenthal**  
SMS group GmbH

For laser powder bed fusion (LPBF) a fine metal powder is solidified in layers using a focused laser beam. The properties of the product depend strongly on the uniformity of size and consistency of the powder particles. This project addresses the production of steel powder using a close-coupled atomization and strives to better understand and model the process to achieve a uniform size and porosity

of the powder particles. Improved quality, lower cost and an expanded product design parameter space can be expected.

The second progress meeting was hosted by IISc in Bengaluru on 24-25 February 2020. All Indian and German project partners attended the meeting. Project goals, deliverables and progress were discussed in the meeting.



Annual project progress meeting at IISc in Bengaluru (Feb. 2020)

# IDC-Water

Integrated diagnostics of contaminants in water supply and management system

## Project Investigators



**D Roy Mahapatra**  
IISc Bangalore



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



**Rudolf J. Schneider**  
BAM, Berlin



**Michael Voetz**  
Sifin diagnostics GmbH, Berlin

In this 2+2 project, an integrated hardware platform with different microfluidic assays for pathogen cell/DNA and pharmaceuticals will be developed as an IoT device for remote monitoring of water quality.

In India, water-related diseases account for around 80% of premature deaths. The most common and widespread health risk associated with drinking water is from microbial contamination. The organisms causing water contamination, are many, out of which E. coli, Salmonella, Shigella, and Rotavirus are being targeted in this project for their detection. In this 2+2 project, an integrated hardware platform with different microfluidic assays for pathogen cell/DNA and pharmaceuticals will be developed as an IoT device for remote monitoring of water quality. Target specification for detection of the pathogen would be less than 100 cells in one CFU/mL and for nano-molar concentration of target DNA

detection is within an hour. Target standards for the detection of pharmaceuticals will be 100 ng/L in 10 min.

IDC-Water project partner meeting was held on 9-10 March 2020 in Bangalore, India. The meeting was focused on reviewing some of the key developments regarding product prototype and assay test results. Major decisions regarding the process flow for the assays were taken. The meeting on the 1st day also included a visit to the micro-PCR device and cartridge packaging and test facilities at the Bigtec lab. A laboratory demonstration of the preliminary version of the prototype was reviewed by the partners at IISc lab facility. Further plan of coordinated effort towards integrating various functionalities for the assays on the common integrated platform hardware was discussed. IISc team has been working on the prototype component fabrication, refinement of detection hardware,



and addressing performance issues. Bigtec team is currently focusing its effort on the development of a PCR assay for the detection of total bacteria and target pathogens such as shigella, salmonella, and E. coli with selective primer/probe with high specificity. Test results regarding linearity and limit of detection for shigella and salmonella were presented by Bigtec during the meeting. German partners BAM and Sifin are currently focusing on diclofenac (a widely used analgesic) and amoxicillin (an important antibiotic) immunochemical detection technique development using magnetic beads and column-based immunoaffinity chromatography. The discussions at the meeting in this regard were aimed at planning the way forward toward incorporating various design elements into immunoassay based on the new results achieved.



IDC-Water project team members at the networking meeting at IISc Bangalore.



# ECO-WET

Efficient coupling of water and energy technologies for smart sustainable cities

## Project Investigators



**Naran Pindoriya**  
IIT Gandhinagar



**Srinivas Singh**  
MMM University of Technology Gorakhpur



**Arvind Rajput**  
GIFTCL, Gandhinagar



**Janki Jethi**  
GIFTCL, Gandhinagar



**Markus Duchon**  
Fortiss GmbH, Munich



**Julia Singer**  
Sonnen GmbH Wildpoldsried

## Project Meeting and Workshop at IIT Gandhinagar

The consortium meeting for ECO-WET project was held on 4th- 6th February 2020 at Indian Institute of Technology (IIT) Gandhinagar, Gujarat, India. The meeting was attended by the project partners, IIT Gandhinagar, GIFT City, and MMMUT Gorakhpur from the Indian side, fortiss GmbH and Sonnen GmbH from the German side. The meeting was kicked-off with a short discussion on the project status and

detailed discussions on use-cases. The project partners visited the use-cases at the sewage treatment plant (STP), the water treatment plant (WTP) and the street lighting facility at Gyan Marg, GIFT city. During the meetings and visits the partial deployment of hardware at testbed were visited. Moreover, the project timeline was revisited with contributions and milestones from each partners.



ECO-WET consortium meeting



Two-day workshop on “Energy Management for Smart Sustainable Cities” was held on February 5-6, 2020 at IIT Gandhinagar, Gujarat, India. The aim of the workshop was to disseminate the knowledge and experiences from ECOWET project. Project partners from both the countries participated and delivered lectures to disseminate the findings with the Master and early stage Ph.D. students who are at early phase of their research career. At least 30 members attended the two days workshop. Technical field visit to the testbed at GIFT city was arranged for all the workshop participants to showcase the usecases, partial installation of hardware and battery energy storage systems.



ECO-WET workshop participants

# Call 2016: Project Monitoring

The Meeting of the Project Monitoring Committee to review the progress of the IGSTC projects under the Call 2016 was held on 2nd March 2020 at IGSTC Gurgaon. The Monitoring was chaired by Prof P P Mujumdar, IISc Bangalore and Dr T Kluge ISOE Frankfurt. The Indian & German 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 four projects and was satisfied with the progress of the projects and appreciated the outcomes & deliverables achieved in the project.

Project Title	Indian Partners	German Partners
ECO-WET: Efficient coupling of water and energy technologies for smart sustainable cities	<b>Dr Naran Pindoriya</b> IIT Gandhinagar  <b>Prof Srinivas Singh</b> MMM University of Technology Gorakhpur  <b>Mr Arvind Rajput</b> <b>Ms Janki Jethi</b> GIFTCL, Gandhinagar	<b>Dr Markus Duchon</b> fortiss GmbH, Munich  <b>Ms Julia Singer</b> Sonnen GmbH, Wildpoldsried
IDC-Water: Integrated diagnostics of contaminants in water supply and management system	<b>Prof D Roy Mahapatra</b> IISc Bangalore  <b>Dr J Manjula</b> Bigtec Labs Pvt. Ltd., Bangalore	<b>Dr Rudolf J. Schneider</b> BAM, Berlin  <b>Dr Michael Voetz</b> sifin diagnostics GmbH Berlin
SMART & WISE: Smart and reliable water and wastewater infrastructure systems for our future cities in India and Germany	<b>Prof B S Murty</b> IIT Madras  <b>Mr. Ashok Natarajan</b> Tamil Nadu Water Investment Company Ltd. Chennai	<b>Prof Ulrich Dittmer</b> TU Kaiserslautern  <b>Dr Martina Scheer</b> Ingenieurbuero Scheer Oberstdorf  <b>Mr. Gerald Angermair</b> tandler.com GmbH Buch am Erlbach
Bio-CuInGe: Biotechnology for the recovery of germanium, indium and copper from industrial copper dust waste	<b>Prof T R Sreekrishnan</b> <b>Dr S K Ziauddin Ahammad</b> IIT Delhi  <b>Mr G Venkat Saravanan</b> Laksmi Life Sciences Coimbatore	<b>Dr Katrin Pollmann</b> Helmholtz Zentrum Dresden Rossendorf, Dresden  <b>Dr René Kermer</b> GEOS Ingenieurgesellschaft mbH Halsbrücke





Monitoring meeting

## German Co-Chair's visit to IIT Delhi

Ms Kathrin Meyer, Head of Division Cooperation with Asia and Oceania, Federal Ministry of Education and Research, Germany and IGSTC German Co-Chair visited IIT Delhi on 24th February 2020. Dr Ulrike Wolters, Member Secretary IGSTC/BMBF; Dr Martin Goller, Head, German Project Office, IGSTC and Dr P V Lalitha, Sr. Scientific Officer, IGSTC/DLR were part of the delegation. Prof T.R. Sreekrishnan, Department of Biochemical Engineering and Biotechnology, IIT Delhi welcomed the delegation and gave a short introduction about IIT Delhi and its research activities. Subsequently, project investigators of three IGSTC projects in IIT Delhi presented their project activities. The delegation had detailed interaction and discussions with the project partners on their views to improve the IGSTC grant giving processes. Ms Meyer was appreciative of the project activities and their progress.



IGSTC delegate visit to IIT Delhi

# Multi-WAP Phase 2 Due-Diligence Meeting

Project Multi-WAP partnered by Lionex GmbH, IIT Madras, ChemBioSens Pvt Ltd and TU Braunschweig had been approved for phase 2 funding extension. The aim of DEMO-Multi-WAP is to bring to the market a device and ready-to-use test kits ('plug & play' cartridges) for waterborne pathogens detection. As evidenced by the success of the Multi-WAP project, there is a clear unmet need to move the technology from TRL 4 (current status) to TRL 6-7 at the end of DEMO-Multi-WAP project. The platform is a multiplexed, rapid, label-free, and real-time method for continuous monitoring multiple waterborne pathogens present in water samples at low cost and high sensitivity (>90%).

The Due-Diligence Committee consisting of Scientific Committee member Prof D D Sarma, IISc Bangalore met in IIT Madras on 30th January 2020 as part of the due diligence process to finalise the exact financial requirements of the 2+2 project for the Indian partners of the consortium. Other members from IGSTC/DST present in the meeting were Mr Sanjeev Kumar Varshney, Head, IBCD, DST & Co-Chair, IGSTC; Dr Chadaram Sivaji, DST & Director in-Charge, IGSTC and Dr P V Lalitha, Senior Scientific Officer, IGSTC.



Due-Diligence Meeting



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