



BRICS Young Scientist Forum, Alumni Conclave 2018

Bangalore, 2-4 December 2018

BRICS Alumni Outreach Research Institutes: IISC Campus



DST– Centre for Policy Research and Materials Research Centre

BRICS YSF Alumni Conclave

December 2018



International Strategic and Security Studies Programme (ISSSP)
National Institute of Advanced Studies (NIAS)



About

BRICS YSF Alumni Conclave was held in Bangalore in December 2018. Part of the alumni network is the outreach activities. The team of alumni had three outreach activities so far. Part of it was the visit to the DST Centre for Policy Research and the Materials Research Centre in the Indian Institute of Science Campus. They had close interactions with the researchers and faculty at both the institutes. Here is a report of the visit.

DST- Center for Policy Research

The Centre for Policy Research is supported by an expert advisory group from Indian Institute of Science to take decisions on various administrative, research and funding matters.

During its initial stages, the Centre focused on building a strong foundation & expertise in Scientometrics, identified a few leading scientometricians and information scientists to establish a DST-CPR team at IISc.

The team led by Prof. Subbiah Arunachalam (a globally renowned scientometrician) developed a methodology for data-collecting and a general framework for studying the research performance of Indian institutions in various scientific disciplines. Based on the same methodology, performance of India in Chemistry research during 2006-2015 has been analyzed and the findings are published in Current Sci-



ence. The findings attracted some attention both from researchers and the popular media. During the FY 2017-18, the team rolled-out this methodology for studying the research performance of some of the major disciplines, such as, engineering, materials, astrophysics and mathematics.

In addition to research performance evaluation of scientific disciplines, the scientometrics team works closely with PSA to GOI, Prof. Vijay Raghavan on national policy for preprints and postprints, and contribute in promoting Open Access in India. Also, the team works closely with the Clarivate Analytics technical team to improve their InCites platform on issues such as data discrepancy, distribution of journals into different quartiles and clubbing all IITs (and many CSIR labs) together. This is important as this would help not only our team, but all the users of InCites worldwide in terms of getting relevant as well as more accurate data.

With the induction of DST-STI policy fellows, the Centre has seen an expansion not just in the team size but also in the research areas. The Centre currently studies topics such as R&D Statistics, STI Indicators, Industrial R&D policy, Government Science Advice, Science Diplomacy, Responsible Research and Innovation, Technology Assessment, Public Engagement in Science and Women in Science. For the up coming year's DST-STI-PFP scheme, the Centre floated an expression of interest call and sent out a letter of consent to some of the shortlisted candidates whose project

matched/had complimenting interest with Centre's research focus.

As part of outreach from the BRICS Alumni team, we visited the Centre for Policy Research. Where the team got to interact with Prof Subbiah Arunachaland Prof T A Abinandanan.

Prof. S. Arunachalam is globally known for his expertise in Scientometrics and their use for assessing the research impact on a wide scale ranging from individuals and departments to institutions and countries. His interests includes scientometrics, science policy, information science, public understanding of science, openness in scholarly communication, ICT for Development and rural knowledge centres and improving information access, both for scientists and for the rural poor. T A Abinandanan is also Chairman for Department of Materials Engineering at IISc. His research interests are in modelling and simulations of microstructures and their evolution during phase transformations, sintering, grain growth, and high-temperature deformation.



Materials Research Centre

Materials Research Centre (MRC) was established as the Materials Research Laboratory in 1978 to pursue research and provide education in the interdisciplinary field of Materials Science and Technology. It was renamed as the Material Research Centre in 1987.

Currently the Centre has 9 active faculty members, 3 emeritus faculty members and 5 associate faculty members from other departments, including one honorary professor.

The Materials Research Center is well served with equipment for processing and characterization of the materials. The equipment listed could either be central facilities (marked CF) or associated with the laboratories of individual faculty members. {Prof. S. B. Krupanidhi (SBK), Prof. K.B.R. Varma (KBR), Prof. S. A. Shivashankar (SAS), Prof. Arun M. Umarji (AMU), Dr. N. Ravishankar (NR), Dr. K. K. Nanda (KKN) and Dr. Srinivasan Raghavan (SR)}.

Apart from departmental facilities the students also have access to institute and national facilities such as the characterization facilities in the Institute Nano-Science Initiative.

Some of their facilities include:

Molecular Beam Epitaxy: MBE system from Omicron NanoTechnology, having 6 different effusion cells (for Ga, In, Al, As, Zn, Si) and N₂ plasma source, equipped with in-situ RHEED (Reflection High Energy Electron Diffraction) and variable temperature STM (Scanning Tunneling Microscope) and AFM (Atomic Force Microscope) (SBK).

Laser for pulsed laser deposition of thin films: Lambda Physik COMPex series 201 and 102 Excimer Laser coupled to 3 multi-target ablation chambers for growth of complex oxide thin films and artificial superlattices (SBK).

Metal organic chemical vapor deposition reactor: MOCVD (CVD Corp.) reactor for growth of GaAs based solar cells heterostructures (SBK).

RF Sputtering system/Multi-Magnetron DC sputtering system (SBK).

Thermolyne High Temperature Furnace: Muffle furnace with a maximum operating temperature of 1700°C. (KBR)

Lenton Glass Melting Furnace: Maximum operating temperature 1700°C. (KBR)

Induction furnace: (KBR)



Czochralski single crystal puller: (KBR)

Atomic Layer Deposition System (ALD): The system is a multi channel (5 channels), multi gas (N_2 , O_2 , H_2 , and Ar) low pressure state of the art atomic layer CVD deposition system built indigenously. The system has two cold-wall deposition reaction chambers viz. vertical and horizontal. The substrate temperatures are achieved by localized susceptor heating. The gas control and purge sequences are all computer controlled, electronically interfaced and actuated by pneumatic valves. The multi channel configuration allows doping and performing complex compound reactions with 5 different chemical complexes in a single deposition process (SAS).

Prof Bikramjit Basu, who is also an alumnus of the BRICS YSF Bangalore Conclave, is a professor at this lab. He has been pursuing research on multifunctional ceramics over more than a decade, and successfully engineered biomaterials that impact areas such as healthcare, renewable energy and aerospace. The knowledge and experience re-

quired to work in these inter-disciplinary areas are his undergraduate education in Metallurgy, doctoral training in engineering ceramics and independent research career in Materials Science.