



BRICS Young Scientist Forum  
25 Sep—01 Oct

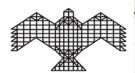
# Bangalore Conclave 2016 Major Recommendations

**Computational Intelligence, Energy Solutions &  
Affordable Healthcare**



Department of Science & Technology  
Government of India, New Delhi

National Institute of Advanced Studies (NIAS)  
Indian Institute of Science Campus, Bengaluru





## BRICS-STI Coordinating Ministries

### Brazil

Ministry of Science, Technology and Innovation (Contact Person: Mr. Danilo Zimbres, Senior International Advisor to the Minister, Ministry of Science, Technology and Innovation)

### Russia

Department of Science and Technology (Contact Person: Dr. Andrey Polyakov, Deputy Director of the Department, Ministry of Education and Science of the Russian Federation)

### India

Department of Science and Technology (Contact Person: Ms. Sadhana Relia, Adviser/Scientist G and Head, International Multilateral & Regional Cooperation Division)

### China

Ministry of Science and Technology (Contact Person: Ms. Wang Rongfang, Coordinator, Division of International Organizations & Conferences, Ministry of Science and Technology)

### South Africa

Department of Science & Technology (Contact Person: Dr. Neville Arendse, Chief Director Overseas Bilateral Cooperation, Department of Science & Technology)

## Bangalore Conclave 2016

### Steering Group

Prof Baldev Raj, Director, NIAS  
(Chairperson)

Prof DD Sarma, IISc, Bengaluru

Prof SS Hasan, Former Director, IIA,  
Bengaluru

Dr Sadhana Relia, DST, New Delhi

Dr RK Sharma, DST, New Delhi

Dr Shubra Priyadarshini, Nature India,  
Gurgaon

Prof Sundar Sarukkai, NIAS, Bengaluru

Prof Anindya Sinha, NIAS, Bengaluru

Prof D Suba Chandran, NIAS, Bengaluru





### BRICS Young Scientist Forum

The core strength of BRICS is its unique and diverse young population that is complemented by the surging scientific and technological prowess in the world. Recognizing this huge opportunities before the youth, BRICS leaders at the Seventh BRICS Summit in Ufa, Russia (2015) endorsed India's proposal to create the BRICS Young Scientist Forum with India as the coordinating country.

In line with the above, India hosted the BRICS Young Scientist Conclave in September 2016, as an integral part of the BRICS Young Scientist Forum initiative. The initiative was approved by the Second BRICS Science, Technology and Innovation Ministerial Meeting at Brasilia in March 18, 2015 on the principles of co-ownership and co-investment by the BRICS countries.

### BRICS Young Scientist Conclave

26-30 September, Bengaluru

The National Institute of Advanced Studies (NIAS) and the Department of Science & Technology (DST) of the Government of India recently hosted the BRICS Young Scientist Conclave in Bangalore. This Conclave aimed to bring together some of the brightest young minds from the





BRICS countries on a single platform, allowing intense scientific exploration, technological innovations and avenues for transformative changes to the most pressing problems of the society.

The Conclave became a platform to harness solutions/ ideas on country-specific problems and common challenges faced by BRICS nations. Three subjects were chosen to be the main themes for the Conclave: Computational Intelligence, Energy Solutions and Affordable Healthcare.

One of the primary objectives of the Conclave was to forge a 'BRICS Scientific Identity' through the establishment of a Pan BRICS network of young talents. This Forum is likely pave the way for creation of a strong future generation of BRICS S&T leadership that can accelerate change. The report titled *BRICS Science and Technology Enterprise Partnership*, released during the Conclave, aims at the above.

The Conclave looked into the issues of Science through a larger perspective; it would include science, technology, social sciences, humanities and will also look at the social impact and its contribution to development.

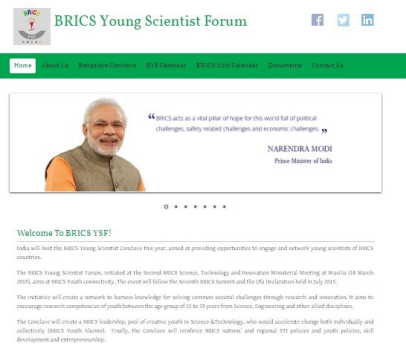
The Conclave also witnessed the young participants coming together to prepare an action plan through a set of recommendations.

A short profile of the participants is on the back inner cover of this document.

Website: [www.brics-ysf.org](http://www.brics-ysf.org)

Facebook: <https://www.facebook.com/BRICS-Young-Scientist-Forum-991742517600200/>

Linked in: [https://www.linkedin.com/in/brics-ysf-bangalore-conclave-567b1312a?trk=nav\\_responsive\\_tab\\_profile](https://www.linkedin.com/in/brics-ysf-bangalore-conclave-567b1312a?trk=nav_responsive_tab_profile)





## Bangalore Conclave 2016

### Major Recommendations

The Conclave participants, as a part of their interactions were divided into groups, with special focus on three Conclave themes: Computational Intelligence, Energy Solutions and Affordable Healthcare.

The groups deliberated on the issues during the Conclave and came up with the following recommendations/inputs for the BRICS Scientist Forum. The groups are working further to convert them into an action plan; these recommendations are to be considered as the first draft, for the purpose of submission to the BRICS S&T Ministerial Meeting to be held at Jaipur during 07-08 October 2016.

#### I. Computational Intelligence

Computational Intelligence (CI) holds the potential to provide breakthrough solutions to many applications of critical importance to the BRICS countries. In all such applications, there



is a repeated need to perform analytics over large-scale, heterogeneous, and multi-modal data. For example, an effective pandemic containment system needs to track and contain a pandemic by integrating human travel and mobility logs, information from social networks, gene sequencing data, and demographic data, among others.

Since many of these datasets are sensitive in nature, the system also needs to be privacy-aware.

Moreover, the system needs to continuously learn and improve over time. Such a system may also be used for disaster alert and response, drug discovery, smart material synthesis, efficient grid management, and many more.

While BRICS countries are rich in traditional knowledge, such valuable knowledge is often fragmented and scattered across numerous sources, thereby reducing overall utility. The continuous learning system proposed above may be used to automatically create a unified repository of traditional knowledge from all BRICS countries and make it widely available.

Development of solutions using computational intelligence will require access to large data

and computing capabilities. This calls for greater resource sharing among BRICS countries. In order to foster collaboration among scientists from BRICS countries, there should be frequent and focused workshops, especially in an emerging areas such as Computational Intelligence.

## II. Energy Solutions

Energy (more specifically electrical power) can be broadly divided into four categories

1. Generation
2. Distribution and Storage
3. Consumption
4. Policies

There are several problems which plague these four sub-domains of Energy and focussed efforts are required to come up with real life solutions. These solutions have to incubate from the labs/universities but should be implemented by the government/regulatory bodies with the support from industry. The following three projects (non-exhaustive list) were proposed by the BRICS YSF Energy Group as collaborative projects

### 1. Optimization of electric power load profiles in BRICS countries

Some of the BRICS nations such as India, South Africa and China are suffering from irregular power supply and power outages due to gaps in power generation and consumption. The problem worsens in peak hours when supply shortage causes the blackout in certain areas especially in rural part of the countries. This causes a distress situation in the inhabitants of the residents and slows down the growth of such regions.

The proposed project is to encourage the power usage among the inhabitants of the country at different times to distribute the peak consumption pattern across the geography and sectors. This project would redistribute the peak load in different times of the day to reduce



the load on grid. The project consists of the following phases to address the problem:

- a. Collect data points to understand the peak consumption patterns of selected high demand areas of the country
- b. Estimating the contribution of various sectors like industry, offices/service sectors, domestic and household etc. towards the consumption of electricity during peak hours



- c. Develop a virtual electricity consumption environment in the cities during different time of the day/night by mathematical/computational model
- d. Optimize the consumption pattern by distributing the demand in different parts of the day
- e. Implement the staggered distribution by encouraging the flexi pricing/cheaper tariffs and linking the consumption units with the time of day



## 2. Gap analysis on country electricity generation and applicability of distributed renewable energy generation in localized areas

Currently, the power generation in BRICS countries is mainly centralized where big (~1 GW) power plants (coal/gas fired) supply the electricity to the end users through grids. However, still there are local communities or rural areas where the grid connection is intermittent or the grid does not exist. Further, the development and installation of small distributed energy solutions in such areas is increasing due to the reduction in price of the solutions and increasing incentives from government. Each of the individual BRICS countries have developed their own indigenous micro-grid/off-grid/distributed energy solutions (conventional and non-conventional energy technologies) and these solutions can be potentially used in other BRICS countries who face similar problems.

The projects aims at doing a GAP analysis on each of the BRICS country's electricity generation and checking the applicability distributed renewable energy generation in localized areas. This analysis would also help to develop solutions to increase the penetration of micro-grid/off-grid/distributed energy solutions in rural areas and therefore contribute towards the national goals.

## 3. Development of Hydrothermal Processing to recover Energy-Water-Fertilizer from Wet Biomass

The total combined Municipal Solid Waste (MSW) for all BRICS nations is close to 1 million tons per day. All the 5 countries are struggling to overcome the ever rising volume of waste. The biggest problem with current technologies is to be able to work upon the bio or a specific section of waste while the available waste have mixed components of all sorts. Hydrothermal Processing is an emerging technology which can treat all the organic waste right from kitchen waste (fruit and vegetable waste with more than 80% moisture content) to waste that is plastic, paper or polymeric in nature and is relatively dry or even metals which can act as catalysts at operating conditions. Such a flexibility makes it universal and independent of geography. In this technology the unsegregated waste is cooked at high temperature and

pressure, close to critical point of water. The proposed technology works upon the principal that water (moisture content) present in waste changes its properties at critical conditions and can dissolve organic matter facilitating the various kinds of reactions for breaking the polymers to monomers and converting them to new components similar to crude oil. Based on its merits, the proposed technology has the potential to treat variety of waste from wet industrial waste to municipal sludge and is considered baseline technology for sludge by Department of Energy, USA. In this process, clean potable water and micronutrients like N,P,K etc. are also recovered.

### III. Affordable Healthcare

#### Role of BRICS nations in healthcare

Despite significant differences in geographic locations and living culture of BRICS nations, they face similar health issues. Although, the fast socio-economic growth in BRICS nations has led to improvement in life expectancy, it has resulted in inequitable distribution of resources leading to differential access to healthcare services and increasing health costs. Further, changes in lifestyle have shown considerable increase in prevalence of non-communicable diseases (NCDs).

These NCDs like diabetes, obesity, cardiovascular ailments and cancer have led to ~28 million deaths in developing countries itself according to WHO statistics [1,2,3]. This growing incidence of NCDs leads to a high financial burden on these countries proving to be a hindrance in economic development. Contrary to the “prosperity diseases” in urban strata, a considerable fraction of rural population suffers from malnutrition especially in children less than 5 years of age. The dearth of proper sanitation facilities and paucity of nutritious food in villages is a major cause of infant and maternal mortality. The rural population in India and South Africa possess the highest numbers of undernourished children in the world according to UNICEF survey [4]. Brazil has recently made significant developments in improving



malnutrition in children [5] and can potentially provide useful insights into the various healthcare strategies that can be adopted in order to enhance treatment of malnutrition. In spite of these deleterious consequences, these chronic diseases attracted less attention as compared to other infectious diseases.

Another set of diseases are caused by infection with





bacteria, viruses, fungi etc. Antibiotics have significantly contributed to increase in average life span especially in areas with poor sanitation. The development of resistance in microbes against these antimicrobials leads to loss of drug efficacy and immediate measures need to be undertaken for prevention. There is a dire need for implementations to increase access, awareness and monitoring health and sanitation in rural areas. In addition, an appropriate usage

of antibiotics should be encouraged in terms of use in agriculture as well as while prescribing it to treat infections. There is an urgent need to discover new antimicrobial compounds with different chemical structures and mechanisms of action to combat resistance. Recent studies have shown that plant products often used in our traditional medicines can be used to handle resistance and for quorum sensing inhibition. An understanding of defense mechanisms in plants by utilizing our traditional knowledge of these herbal medications could provide significant clinical applications. This information can be used to initiate further research across BRICS countries to design novel antimicrobials.

The differences in the lifestyle and environmental conditions of BRICS countries emphasize the need for studying these populations separately to identify unifying as well as differential medical themes to provide efficient healthcare regimes. Further, it is imperative to find health solutions for early diagnosis of these at a stage when it might be reversible by treatment preventing loss of life quality as well as a high health cost burden. Several technological advances in last decade have opened opportunities for different fields of research to design such non-invasive and cost effective diagnostic strategies in order to sustain them from becoming chronic. Coordination between research groups across BRICS countries with complementary skills can help to accelerate development and standardization of these novel treatment methods. These collaborations can help in understanding the efficacy of these treatments across populations in order to provide a global solution.

### **Thematic areas: Providing healthcare**

Under the theme of collaborative efforts for affordable healthcare among BRICS countries, we have divided our aims in two categories as follows:

#### **1. Early Diagnostics**

An early diagnosis of different diseases might help to reduce the overall burden of cost of treatment required during later stages of the disease. Further pro-active and personalized medication is the need of the hour in order to prevent diseased condition. Thus, the criticality of development of these treatments suggests a need for sustainable and logistic strategy for advancement of research collaboration across these nations towards a common goal.



Development of potential biomarkers for early detection as well as progression of non-communicable diseases using non/minimally invasive biomaterials (blood/fecal samples) as mentioned below:  
 (a) Microbiome-based markers  
 Known facts and proof of concept

- Microbes contribute around 90% of cells in humans called our 'human microbiome' and their symbiotic role in maintaining human health has

been established [6,7].

- Traditional culture based microbiology techniques cannot be utilized to identify these unculturable organisms.
- Culture independent methods like metagenomics allow their characterization and understanding their functional potential.
- Dysbiosis of human microbiome has been associated with several diseased conditions [8].
- Constitution of human microbiome changes with dietary patterns, environmental conditions as well as genetics of an individual [9,10].
- Proposed Research for diagnostics and therapeutics across all BRICS countries
- Samples from different geographies should be analyzed to account for differences in microbiome due to changes in lifestyle and dietary patterns. (Personalized medication)
- Samples required for these studies are either non- or minimally-invasive including fecal material, saliva, sputum, blood or skin swabs etc.
- Reduction in cost of sequencing and in silico analysis to identify microbial changes.
- Identification of microbes that can act as early stage diagnostic biomarkers for a disease [11,12].
- Diagnostic kit based on biomarker detection.

(b) Secretome (proteins and metabolites) –based markers

- Blood samples from patients affected with non-communicable diseases, like heart diseases and cancer among BRICS countries
- Examine secretory pool of metabolites and proteins in samples.
- Finding biomarkers for these diseases using these metabolites and proteins
- Affordable diagnostic kit for specific biomarker detection using immunoassay and/or molecular imprinting technology (as demonstrated at BRICS YSF, 2016)



## 2. Therapeutics

In therapeutics, we have categorized our aims in the following parts:

### (a) Disease-specific probiotics

- Cocktails of beneficial symbiotic bacteria act as probiotics leading to improvement in gut health [13].
- Commercially available probiotics are for general gut health and there is a need to develop disease specific probiotics.
- These probiotics can be used as a preventive healthcare regime, which can be used for microbiome management at various stages of life.
- Pro-active healthcare can help curtail costs of treatment incurred for curing these ailments in later stages.

### Why build a BRICS microbiome consortium?

- Initiatives like Metahit (<http://www.metahit.eu/>) and Human Microbiome project cater mostly to western populations [14,15].
- Different dietary/lifestyle patterns necessitate development of a BRICS microbiome consortium.
- The cost effectiveness as well as pro-active nature of microbiome based diagnostics and therapeutics make it a potential candidate for revolutionizing future medicine. Apart from bacterial community, understanding the viral composition (using viromics) and gene expression (through metatranscriptomics) in the dysbiotic gut samples might require fruitful collaborations across countries.

### (b) Fastening wound healing

Using a novel technology (plasma-jet technology as demonstrated at BRICS YSF, 2016), fast and cheap effort in wound healing will be tested as a therapeutic.

### (c) Targeting disease-inducers by genetic engineering

Gene silencing technology (siRNA cassettes as demonstrated at BRICS YSF, 2016) will be adopted to minimize disease-inducers and check its effect on disease prevention.

### (d) Exploring traditional medicines

BRICS nations like India and China are a rich repertoire of traditional medicines. We will adopt the following strategies to explore this repertoire among BRICS countries:

- Cataloging traditional medicines available at BRICS countries and creating a database with their constituents and potential uses.
- Investigating the applicability



- and functionality of a prospective traditional medicine among BRICS countries
- Several traditional medicinal plant products are known to act as inhibitors of resistance mechanisms to antibiotics e.g. efflux pumps, lactamases etc. These products will be explored and used in combination with antibiotics in order to delay onset of antibiotic resistance.
- Antimicrobial potential of several plant products and their minimum inhibitory concentrations would be explored to understand their efficacy as alternative therapy.

#### (e) Healthcare awareness and rural coverage

We aim to spread healthcare awareness among BRICS communities, giving a special emphasis on including rural areas under this programme. We plan to adopt the following strategies towards this aim:

- Submitting a funding proposal to hire healthcare workers to develop a team
- Training the hired workers to run healthcare awareness programmes in different localities, covering rural parts.
- Setting up healthcare camp for localities, providing basic health check-up (blood pressure and sugar monitoring, general eye check-up etc.) along with informing the locals about healthcare parameters

#### (f) Health and sanitation

We aim to reach communities, including rural belts to educate locals about importance of sanitation. Toward that, our aims are as follows:

- Informing the locals about basic parameters of sanitation and their importance in the above-mentioned healthcare camps
- Reaching school students by setting up special classes to educate them about requirements and basic parameters of general healthcare and sanitation

Microbiome markers to reduce infant mortality by handling malnutrition

- Disturbances in gut microbial community show association with malnourishment status of a child [16,17].



- Therapeutic supplements like Ready To Use Therapeutic food and probiotics approved by WHO has also shown an increase in beneficial gut bacteria in their intestinal tract [18].

Bacteria obtained as biomarkers of malnourishment specifically from population within a particular country can help to design personalized and more efficient medications to alleviate the symptoms of malnourishment. Further, these

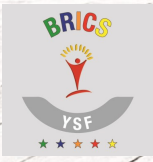


probiotics will be affordable for rural population and lead to significant enhancement in life quality of young children.

### References

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## Bangalore Conclave 2016

25 Sep—01 Oct

25 September 2016

Session-I

Welcome

**Welcome Address:**

**Prof Baldev Raj**

Director, National Institute  
of Advanced Studies  
(NIAS), Bengaluru

**Special Address:  
Interdisciplinary Science  
for Society and Humanity**

**Dr K Kasturirangan**

*Emeritus Professor and  
former Director NIAS;  
Chairman, Karnataka  
Knowledge Commission;  
and former Chairman,  
Indian Space Research  
Organisation (ISRO)*



26 September 2016

Session-II

Introductions



Initial remarks by Prof Baldev Raj

**Special Address: Global Partnerships in  
Scientific Research**

**Prof VS Ramamurthy**

*Professor Emeritus NIAS & Former Secretary,  
Department of Science & Technology,  
Government of India.*

Session-III

**Panel Discussion: Affordable Health Care  
Making Healthcare Affordable: Corporate  
Social Responsibility**

**Mr Dipak Marwah,**

*Executive Director of Strategic Initiatives,*



Samhita

**Traditional Science and Indigenous Knowledge**

**Dr Darshan Shankar,**  
Vice Chancellor of Trans  
Disciplinary University,  
Bengaluru

Special inputs:

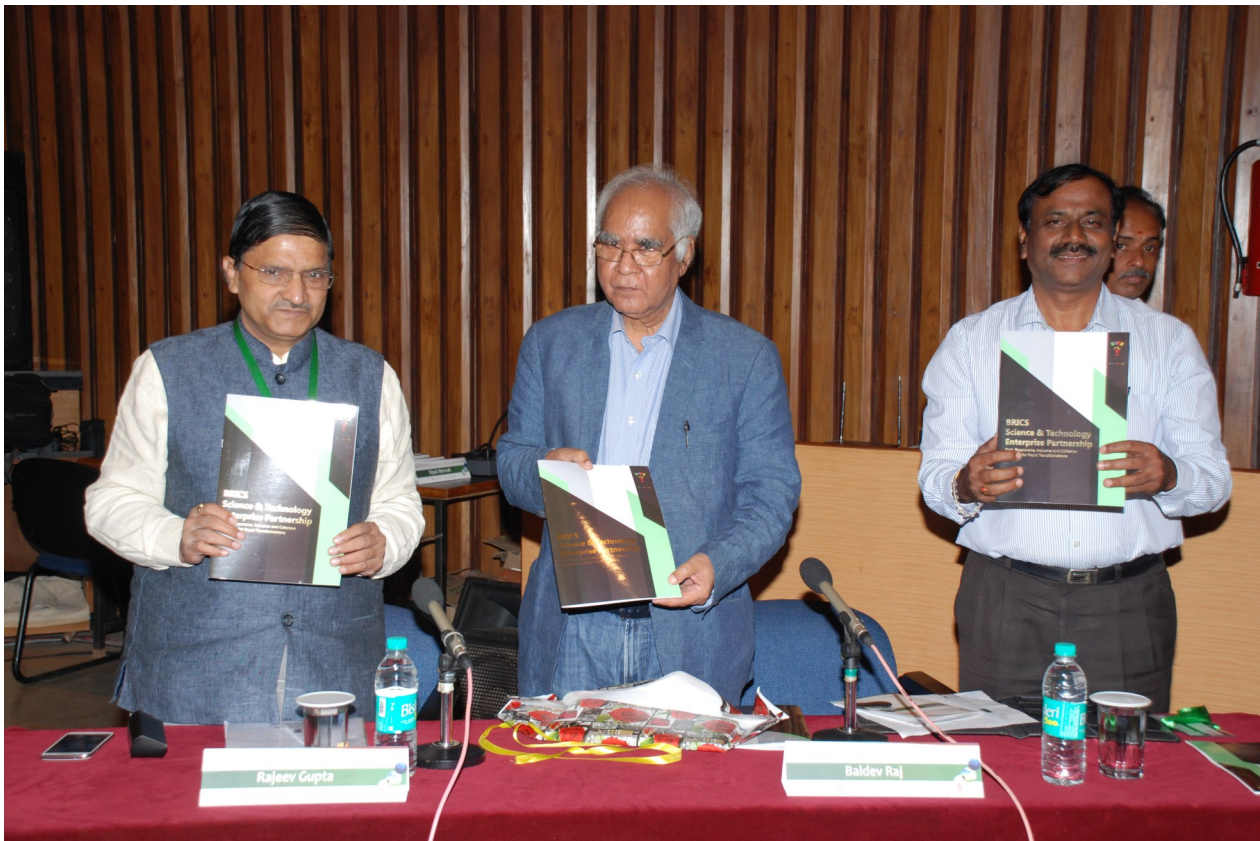
**Prof Yahya Choonara,**  
University of Witwatersrand,  
South Africa &  
**Prof Lian-Wen Qi,**  
China Pharmaceutical  
University, Nanjing, China



Session-IV

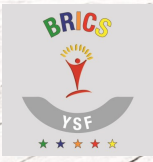
**BRICS Policy Reflections on Youth**

An interaction with **Mr Rajeev Gupta**, Secretary, Department of Youth Affairs, Government of India



Mr Rajeev Gupta releasing the BRICS Science and Technology Enterprise Partnership document





**Session-V: Ideas Hunt-I (Led by Participants)**  
**Preventive and Personalized Healthcare in BRICS countries: Need for Cost-effective Diagnostics/ Therapeutics**

Swadha Anand  
*Tata Consultancy Services, Pune, India*



**Noninvasive Analysis of Metabolomics-based Markers in Plasma for Diagnosis and Progression of Coronary Artery Disease**

Lian-Wen Qi  
*Professor, China Pharmaceutical University, Nanjing, China*



**The Fourth State of Matter (Plasma) in the field of Medicine and Agriculture**

Akshay Vaid  
*Institute for Plasma Research, Gandhinagar, India*

**Creation of Triticum aestivum L. resistant to a Complex of Abiotic Effects by means of a Genetic Engineering**

Timoshenko Anastasia & Spechenkova Nadezda  
*Koltzov Institute of Developmental Biology, RAS, Russia*

**The Use of Liquid Biopsy in Breast Cancer**

Somsubhra Nath  
*Saroj Gupta Cancer Centre and Research Institute, Kolkata, India*



**Affordable Healthcare**

Boitumelo Semete-Makokotlela  
*Executive Director, Council for Scientific and Industrial Research (CSIR) Assistant Professor, South Africa*

**Immunohealorate: A Bio-engineered Immune Boosting and Wound healing Chocolate Formulation for Child Care and Wound Care**

SP Bhuvaneshwaran  
*Indian Institute of Technology, Kharagpur, India*



**Target Specific Molecular Recognition Markers as Prediagnostic Kit**

Nazia Tarannum  
*Assistant Professor, CCS University, Meerut, India*

**Exploring Lab-on-a-CD Device for the Investigation of Hematological Disorders.**

Shantimoy Kar  
*Senior Research Fellow, IIT, Kharagpur*





27 September 2016

Session-VI

**Panel Discussion: Computational Intelligence**

**Multiobjective Optimization and Clustering**

**Dr Sanghamitra Bandyopadhyaya**,  
Director, ISI, Kolkata

**Simulations for Knowledge-based Discovery of Materials for Energy and Environment**

**Dr Umesh Waghmare**,  
Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru



Special inputs:

**Prof. Fulufhelo Nelwamondo**,  
Council for Scientific and Industrial Research (CSIR), South Africa &

**Mr. Nishant Kumar Agrawal**, Scientist, TCS, Mumbai



Session-VII

**Special Address: Energy Foresights, Security and Sustainability**

Prof Baldev Raj

Session-VIII

**Panel Discussion: Energy Solutions**

**Global Renewables Development: Opportunities and Challenges**

**Dr Molefi Motuku**, Deputy CEO, Research and Development of the Council for Scientific and Industrial Research (CSIR), South Africa

**Thermoelectric Waste Heat to Electricity**

**Generation**

**Dr Kanishka Biswas**, Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru

Special inputs

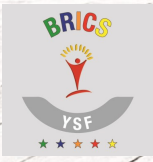
**Prof Li Yangyang**

Deputy Director, China Coal Research Institute, Beijing &

**Mr Dronov Alexey**,

National Research University of Electronics Technology, Russia





**Session-IX**  
**Ideas Hunt-II**

**Explore Secrets in Combustion and Pursue Controllable Design/Utilization of Fuels**

Dr. Yuyang Li,  
Associate Professor, Shanghai Jiao Tong University, Shanghai, China

**Lithium-Ion Battery Materials for Energy Storage**

Regina Rapela Maphanga,  
Senior Researcher, University of Limpopo  
South Africa

**Fuel Cell Technology in Transportation and other Applications**

Kui Jiao, Professor,  
Tianjin University, China

**Multi-purpose Highly-efficient Microturbine**

Gornovskii Artem & Kosach Lev,  
Moscow State University of Mechanical Engineering, Russia

**Hydrothermal Processing: Key to Sustainable Energy**

Anu Dhar,  
Senior Engineer, Process, Reliance Industries Limited, Mumbai, India

**Energy Solutions**

Weiwei LUO  
Yunnan Academy of Scientific and Technical Information, Kunming, China

**System to Minimise Electricity Usage during peak times**

Sphumelele Ndlovu,  
PhD Candidate, Hartebeeshoek Radio Astronomy Observatory (HARTRAO),  
South Africa



**Distributed Renewable Energy Solutions: Applications in Telecom Towers and Rural Areas**

Prabal Goyal,  
Energy Engineer, IIT New Delhi & Ecole Polytechnique, Panchkula, India

**The Functional Nanomaterials for Energy Generation, Conversion and Storage Portable Devices**

Dronov Alexey,  
National Research University of Electronics Technology, Russia







Session-X

**S&T & Diplomacy**

**Special Address: Collaborating for the Future**

**Amb Shyam Saran**

Former Secretary, Ministry of External Affairs, India

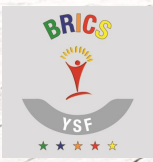
**Special Address: S&T and Diplomacy: Some Perspectives**

**Dr Bhaskar Balakrishnan**

Former Indian Ambassador, Ministry of External Affairs, India







28 September 2016

Session-XI

**Special Address: Machine Learning in Cancer Biology**

**Dr M Vidyasagar** (through Skype)

Department of Bioengineering, University of Texas, Dallas, USA

0945-1100 hrs: Session-XII

**Special Address**

**Additive Manufacturing of Materials: A New Paradigm**

**Prof Bikramjit Basu**

Materials Research Centre, Indian Institute of Science, Bengaluru

**Doing More with Less: Pan-BRICS Scientists Opportunity**

**Mr K Venkataramanan**

Former MD & CEO, Larsen & Toubro (L&T)

Session-XIII

**Ideas Hunt-III**

**Nanoscale energy transport in advanced energy storage**

Zheng Bo

Professor, Zhejiang University, China

**Routes of Clean energy and environment protection in China after COP21 Paris and G20 2016**

Li Yangyang

Deputy Director, China Coal Research Institute, Beijing, China

**Humanoid robots for use full application in nuclear energy sector**

Y V Nagaraja Bhat

Scientific Officer, Indira Gandhi Centre for Atomic Research, India

**Towards the development of hydrogen storage technologies**

Henreitta Langmi,

Key Programme Manager, Council for Scientific and Industrial Research (CSIR), South Africa

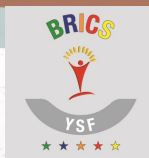
**From Big Text to Big Knowledge**

Partha Talukdar

IISc, Bangalore, India







**High Performance Computing and Big Data Analytics for solving Computational Challenges across Many Domains**

Nishant Kumar Agrawal & Sarmimala Saikia  
*Tata Consultancy Services, India*

**A New Type of Urban Transport**

Yamaev Renat  
*OAO "Moslift", Russia*

**Machine Intelligence Framework for Human Action Recognition in Infrared Imagery: Towards smarter and safer homes and cities**

Aparna Akula  
*CSIR-Central Scientific Instruments Organisation, Chandigarh, India*



**Cosmic Ray Modulation: A Multidisciplinary, Ab initio Approach**

Nicholas Eugene Engelbrecht  
*Center for Space Research, North-West University, South Africa*



**Session-XIV**

**Workshop: BRICS STI Enterprise**

**Led by Dr P Goswami**

*Director, National Institute of Science, Technology and Development Studies (NISTADS), New Delhi*

1530-1600 hrs

**Session-XV**

**Young Indian Trailblazers**

**Space Technology and its Usage: The Next Giant Leap for Private Enterprise?**

**Mr Rahul Narayan**

*Founder, Team Indus, Bengaluru*



**Musical Ambassador for Change**

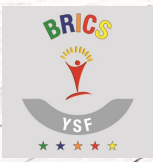
**Mr Ricky Kej**

*Grammy Winning Composer & Conservationist*

**Rich in Ideas, but Making Films in Poverty**

**Mr Pawan Kumar**

*Film Director, Bengaluru*



**Session-XVII: Valedictory**

**Special Address: BRICS Policy Reflections**

**Prof Ashutosh Sharma**

Secretary, Department of Science and Technology, Government of India, New Delhi



**Special Address: A Scientific Identity for BRICS**

**Prof. K VijayRaghavan**

Secretary, Department of Biotechnology, Government of India, New Delhi

**Valedictory Address**

**Dr VK Saraswat**

Member, NITI Aayog, Government of India, New Delhi

**Session-XVIII**

**Group Presentations**

Computational Intelligence, Energy Solutions and

Affordable Healthcare Led by Participants

**30 September 2016, Friday**



Session-XIX  
Tour of Hampi

**Session-XX  
Tour of JSW Vijayanagar Steel Plant**  
**Special Address:**

**Mr Sajjan Jindal**

Chairman, Managing Director of JSW Group

Interaction with Senior Executives

Tour of the JSW Vijayanagar Steel Plant





## Bangalore Conclave 2016 Participants

**Akshay Vaid**, Institute for Plasma Research,  
Gandhinagar, India

**Anu Dhar**, Senior Engineer, Process, Reliance  
Industries Limited, Mumbai, India

**Aparna Akula**, CSIR-Central Scientific  
Instruments Organisation, Chandigarh, India

**Boitumelo Semete-Makokotlela**, Executive  
Director, Council for Scientific and Industrial  
Research (CSIR), South Africa

**Bongi Mkhize**, Deputy Director, Department  
of Science and Technology, South Africa

**Chong Shen**, Hainan University, Haikou,  
China

**Dronov Alexey**, National Research University  
of Electronics Technology, Russia

**Gornovskii Artem**, Moscow State University  
of Mechanical Engineering, Russia

**Henreitta Langmi**, Key Programme Manager,  
Council for Scientific and Industrial Research  
(CSIR), South Africa

**Kosach Lev**, Moscow State University of  
Mechanical Engineering, Russia

**Kui Jiao**, Professor, Tianjin University, China

**Li Yangyang**, Deputy Director, China Coal  
Research Institute, Beijing, China

**Lian-Wen Qi**, Professor, China  
Pharmaceutical University, Nanjing, China

**Molefi Motuku**, Deputy CEO, Research and  
Development of the Council for Scientific and  
Industrial Research (CSIR), South Africa

**Natasha Ross**, Lecturer, University of the  
Western Cape, South Africa

**Nazia Tarannum**, Assistant Professor, CCS  
University, Meerut, India

**Nicholas Eugene Engelbrecht**, Center for

Space Research, North-West University,  
South Africa

**Nishant Kumar Agrawal**, Tata Consultancy  
Services, India

**Partha Talukdar**, IISc, Bangalore, India

**Prabal Goyal**, Energy Engineer, IIT New  
Delhi & Ecole Polytechnique, Panchkula,  
India

**Regina Rapela Maphanga**, Senior  
Researcher, University of Limpopo, South  
Africa

**Sarmimala Saikia**, Tata Consultancy Services,  
India

**Shantimoy Kar**, Senior Research Fellow, IIT,  
Kharagpur, India

**Somsubhra Nath**, Saroj Gupta Cancer Centre  
and Research Institute, Kolkata, India

**SP Bhuvaneshwaran**, Indian Institute of  
Technology, Kharagpur, India

**Spechenkova Nadezda**, Koltzov Institute of  
Developmental Biology, RAS, Russia

**Sphumelele Ndlovu**, PhD Candidate,  
Hartebeeshoek Radio Astronomy  
Observatory (HARTRAO), South Africa

**Swadha Anand**, Tata Consultancy Services,  
Pune, India

**Timoshenko Anastasia**, Koltzov Institute of  
Developmental Biology, RAS, Russia

**Weiwei LUO**, Yunnan Academy of Scientific  
and Technical Information, Kuming, China

**Y V Nagaraja Bhat**, Scientific Officer, Indira  
Gandhi Centre for Atomic Research, India

**Yahya Choonara**, Professor, University of  
Witwatersrand, South Africa

**Yamaev Renat**, OAO "Moslift", Russia

**Yuyang Li**, Associate Professor, Shanghai  
Jiao Tong University, Shanghai, China

**Zheng Bo**, Professor, Zhejiang University,  
China



## BRICS Young Scientist Forum Bangalore Conclave 2016

25 Sep—01 Oct

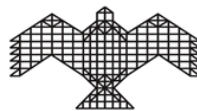


सत्यमेव जयते

### Department of Science and Technology

India is one of the top-ranking countries in the field of basic research. Indian Science has come to be regarded as one of the most powerful instruments of growth and development, especially in the emerging scenario and competitive economy. The Department of Science & Technology plays a pivotal role in promotion of science & technology in the country.

The department has wide ranging activities ranging from promoting high end basic research and development of cutting edge technologies on one hand to service the technological requirements of the common man through development of appropriate skills and technologies on the other. DST accordingly (a) Develops S&T policies, (b) Strengthens human resources and institutional capacities, (c) Enables development & deployment of technologies, (d) Creates opportunities for societal interventions through S & T & (e) Establishes and engages in mechanisms of international science, technology and innovation cooperation, partnerships & alliances at bilateral, regional and multilateral levels. These approaches that reflect its mission ensure a holistic systemic influence, immediate, medium and long term relevance/ gains. It enables cross cutting impacts across sectors to sustain growth/ development and synergies to optimize on time, human, institutional and financial resources.



### National Institute of Advanced Studies (NIAS)

National Institute of Advanced Studies (NIAS) was conceived and founded in 1988 by the late Mr. JRD Tata, who sought to create an institution to conduct advanced multidisciplinary research. Housed in a picturesque green campus in Bangalore the Institute serves as a forum to bring together individuals from diverse intellectual backgrounds. They include administrators and managers from industry and government, leaders in public affairs, eminent individuals in different walks of life, and the academicians in the natural and life sciences, humanities, and social sciences.

NIAS has an active programme of public lectures, regional, national and international conferences, symposia and seminars organized independently or jointly with other institutions that focus on topical areas of research and public concern. NIAS aims to integrate the findings of scholarship in the natural and social sciences as well as technology, the humanities and arts through multi-disciplinary research on the complex issues that face Indian and global society, and to assist in the creation of new leadership with broad horizons in all sectors of society by disseminating the conclusions of such research through appropriate publications and courses as well as through dialogues with leaders and the public.



**Welcome To BRICS YSF!**  
India will host the BRICS Young Scientist Conclave this year, aimed at providing opportunities to engage and network young scientists of BRICS countries.  
The BRICS Young Scientist Forum, initiated at the Second BRICS Science, Technology and Innovation Ministerial Meeting at Brasilia (18 March 2015), aims at BRICS Youth connectivity. The event will follow the seventh BRICS Summit and the YFU Declaration held in July 2015.  
The initiative will create a network to harness knowledge for solving common societal challenges through research and innovation. It aims to encourage research competencies of youth between the age group of 22 to 35 years from science, engineering and other allied disciplines.  
The Conclave will create a BRICS leadership, pool of creative youth in science & technology, who would accelerate change both individually and collectively (BRICS Youth Alumni). Finally, the Conclave will reinforce BRICS' national and regional STI policies and youth policies, skill

Website: [www.brics-ysf.org](http://www.brics-ysf.org)

Facebook:

<https://www.facebook.com/BRICS-Young-Scientist-Forum-991742517600200/>

Linked in:

[https://www.linkedin.com/in/brics-ysf-bangalore-conclave-567b1312a?trk=nav\\_responsive\\_tab\\_profile](https://www.linkedin.com/in/brics-ysf-bangalore-conclave-567b1312a?trk=nav_responsive_tab_profile)