



# 6<sup>TH</sup> BRICS Young Scientist Forum Announcement and Call for Abstracts

Hosted by the  
Department of Science and Technology, India

**Date:** 13-16 September 2021

**Theme:** Healthcare, Energy Solutions  
and  
Cyber Physical systems (CPS)

**Venue:** Virtual

## 1. Background

The decision to establish the BRICS (Brazil, Russia, India, China, and South Africa) Young Scientist Forum (YSF) was taken at the 2nd BRICS Science, Technology, and Innovation (STI) Ministerial Meeting held in Brazil in March 2015. The first BRICS YSF was held in Bangalore, India in September 2016. The second one was held in Hangzhou, China in July 2017, while the third one was in Durban, South Africa in June 2019. The fourth BRICS YSF was held in Brasilia, Brazil in 2019. The fifth forum was held during the COVID 19 pandemic and was conducted virtually from Chelyabinsk, Russia in September 2020 with young scientists connecting from all the five countries.

India assumed the BRICS rotational Presidency of 2021. As part of its BRICS STI activities, India will host the 6<sup>th</sup> BRICS Young Scientist Conclave in line with the decision taken at the BRICS STI Jaipur Ministerial in October 2016 that these events will be held on a rotational basis.

The main goals of the 6<sup>th</sup> BRICS YSF are:

- To ensure that BRICS Young Scientists have collaborative and networking opportunities that will help harness their knowledge to resolve common societal challenges through research and innovation.
- To strengthen the advancement of skills and research competencies of youth, primarily below the age of 35 years drawn from Science, Engineering, and other allied disciplines.
- To build BRICS leadership in science, technology, and innovation through creative youth with capacity and capability to accelerate, change individually and collectively through the BRICS Youth Alumni.
- To reinforce BRICS nations' and regional STI policies, youth policies, skill



development and entrepreneurship policies.

## **2. Conference Sub-Themes**

The theme for the 2021 conclave will include Healthcare; Climate Change and Energy Solutions; and Artificial Intelligence, Space and Connectivity as described below:

### **2.1. Healthcare**

Research in the field of healthcare has heightened significance in recent years with the advent of coronavirus and the fast-paced evolution of human lifestyle and standards of living. Healthcare research provides insights and guidance, on managing public health, challenges to healthcare and presents solutions to unanswered questions of medical science and diseases. Current advancements and developments in the field of healthcare and medical research have been possible because of continuous efforts by researchers.

#### *New areas in healthcare research*

The discipline is evolving, urging professionals in the field to constantly investigate and experiment with their findings. Research in this field also allows countries and international organizations to gather data and realize the gaps in healthcare systems around the world.

#### *Old and new areas/risks in healthcare*

The main areas of intervention for research and innovation will be focussed around following themes:

- environmental and social health determinants
- non-communicable and rare diseases
- infectious diseases including poverty-related and neglected diseases
- tools, technologies and digital solutions for health and care including personalised medicine
- next generation influenza vaccines, medicines, genomics
- health care systems

#### *Innovative health technologies*

The aim is to find new ways to keep people healthy, prevent diseases, develop better diagnostics and more effective therapies, use personalised medicine approaches to improve healthcare and wellbeing, and take up innovative health technologies, such as digital ones. BRICS research and innovation in health is about working together across borders, sharing each other's knowledge and resources, and improving our health and care systems together.

### **2.2. Energy Solutions**

The 21st Century human life depends entirely on energy on a day-to-day basis. From waking up to an alarm on a smartphone to sleeping in an air-conditioned room, we cannot live without electricity. The world has not yet found sustainable ways to conserve this energy for future generations. The conventional ways of producing energy have proved to be exceedingly harmful to the earth and have rapidly aggravated the pace of global warming, leading to climate change and other climate-related problems. It is



the need of the hour to decarbonize and conduct research to find adaptable, convenient, sustainable, and cheap means to produce energy.

New research across the world has been focusing on the innovation and affordability on energy sector. The BRICS countries need to share such ideas and explore ways and means to pursue collaborative research on making health affordable for all, through innovation.

Some of these areas include the following: Renewable Energy System (RES) including Solar Energy Research; Building Energy Efficiency; Clean Coal Research; Clean Energy Material; Smart Grids Research; Methanol Economy Research; Clean Fuel Research; Hydrogen Research; and Carbon Capture, Utilization and Storage (CCUS).

### **2.3. Cyber Physical system (CPS)**

CPS is the next-generation computing system under the category of embedded systems. It makes use of smart computational techniques that are related to both computational units and the physical world. This implies that CPS uses computation, communication, and controls to interact with real-world systems.

#### Cyber security, IoT and Data Science

The Data Science, IoT and cyber security are fundamental and basic pillars on which CPS are normally built. The economic and societal potential of such systems is vastly greater than what has been realized, and major investments are being made worldwide to develop the technology. Despite the fact that the drivers for CPS come from different sectors, the technology gaps in the sectors stem from a common set of fundamental challenges. The key cross-cutting platform technologies needed to overcome these challenges and accelerate the development of CPS applications in all sectors.

#### Research and Innovations in CPS

The research and innovation in this theme may cover the areas as given below but not limited to and their application in different sectors:

Modelling, Analysis and Synthesis Techniques, Mobile computing and devices for CPS, Cloud computing and distributed systems to support scalability and manage complexity of CPS Analysis, verification, and synthesis of hybrid systems, Data Science & Technologies for CPS, Simulation of CPS applications, Security and privacy of CPS, Networking systems for CPS applications Experimental prototypes of CPS', Use case and user study of CPS, Sensors and actuators for CPS, applications Cyber-physical multimedia systems and applications, Wearable cyber-physical systems and applications, Emerging applications in CPS, including social space, crowd sourcing, art, healthcare and human computer interactions.

### **3. Eligibility**

This call is open to early career researchers who are based in South Africa. Applicants should meet the following criteria to participate:

- South African citizenship or permanent resident status
- Be under the age of forty (40)
- Be a doctoral, post-doctoral candidate or a young scientist in possession of a PhD



- Have research interests in the thematic areas listed
- Commit to be present for the duration of the conference
- Submit an abstract that will be the basis for a presentation at the conference

**Note:** The applicants who have already participated in the previous editions of BRICS Young Scientist Conclaves are **NOT** eligible to apply. Candidates working in private companies are also **NOT** eligible to apply.

In addition to the abstract, submit a short motivation (1 page at most) as to why you should be chosen and what you will do with the skills, networks and experience gained at this event. The chosen young scientists' presenters should not simply focus on their research or thesis but should engage with the topic and answer its requirements. Presentations that provide possible recommendations are preferable. These should address challenges that are common to BRICS countries that need attention from the perspective of the young scientists. The meeting format is a Forum which is a discussion group, where ideas related to a subject 'under discussion' can be raised and evaluated on a (more-or-less) equal and informal basis. A newsletter reflection writeup for ASSAf will be required from each of the attending young scientists.

#### **4. Forum Participation and Application**

As a nominating partner, the Academy of Science of South Africa (ASSAf) in collaboration with the Department of Science and Innovation (DSI) invites the submission of abstracts for oral presentations in one of the sub-themes outlined above. The attached application form, together with candidate's CV and short motivation as indicated above should be completed and uploaded on this link - <https://cutt.ly/VmHALI9> by **Friday, 6 August 2021**. There is no registration fee to attend the forum. Further information about the forum and related logistics will be circulated to the successful applicants. Please note that emailed applications will **NOT** be considered.