

The Symposium ended with three special lectures: (1) Calvin Miller (Vanderbilt University, USA) on 'Granite and rhyolite, and the ongoing debate on volcanic-plutonic connections'. (2) William J. Collins (Curtin University, Western Australia) on '100 years of granite petrology'. (3) Peter Ulmer (ETH Zürich) on 'Results of experimental approach on granite formation by differentiation from basaltic magma'.

A mid-conference field trip was conducted in the Ivrea-Verbanò Zone (IVZ) on 13 September 2023. The IVZ in the Southern Alps (Italy) is considered the most complete, time-resolved, crust-upper mantle archive of transcrustal magmatic system in the world. Scientists participated in the fieldwork and mentioned that the IVZ is a valuable guide and treasure trove to understand the processes that shaped much of the continental crust.

Finally, the bidding and voting for the next Hutton Symposium was held. It was decided to hold the Eleventh Hutton Symposium in India in 2027.

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## MEETING REPORT

### BRICS Young Scientists and Innovators Forum\*

Science, technology and innovation (STI) are the foundation of societal progress. It plays a crucial role in enhancing the quality of life, promoting economic growth and addressing global challenges.

The BRICS (Brazil, Russia, India, China and South Africa) Young Scientists (YS) and Innovators Forum is a network addressing societal challenges through research and innovation. It has boosted R&D in science and engineering by fostering a creative youth pool. The Forum, a vital platform for scientists and innovators, focuses on skill development, climate change and societal future. It hosts the Young Innovators Prize (YIP), recognizing beneficial innovations. The Forum also aims to facilitate the exchange of ideas among young scientists from BRICS countries, promote creative solutions to socio-economic problems, foster scientific cooperation and promote interconnectedness for sustainable development. The 2023 8th BRICS Young Scientists conclave, attended by over 200 delegates, covered themes like climate change and the future of education and society.

In the inaugural talk, Sanjeev Kumar Varshney (Department of Science and Technology (DST), Government of India (GoI)) stressed the need to invest in youth for the future, noting the influence of BRICS and G20 nations, which represent 42% of the global population, on science,

technology and the economy. B. Arindam (DST, GoI) highlighted the BRICS YIP for its role in fostering innovation. Other key speakers from BRICS emphasized the importance of investing in science and youth and the significant role of BRICS and G20 nations in shaping global STI and economy<sup>1,2</sup>.

In this conclave, India was represented by 24 delegates (21 Young Scientists (YS) and 3 Young Innovators (YI)). Under Theme-I (Climate change and environmental sustainability), a total of 11 YS made presentations. S. Vazeed Pasha (National Institute of Advanced Studies (NIAS), Bengaluru) discussed using earth observation data and modelling to monitor phyto-mass dynamics and invasive alien plant species, emphasizing integrated approaches for environmental sustainability and climate change. A. Kothakota (CSIR-National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram) discussed the value of agricultural biomass, highlighting the development of sustainable materials as alternatives to plastics and leather. V. Gayathri (Vellore Institute of Technology (VIT)) presented her patented technology for efficient deployment of renewable energy sources, which is now in the process of global commercialization. A. Gurubalan (Indian Institute of Technology, Bombay) emphasized the need for sustainable space cooling and heating technologies, particularly for BRICS countries due to their developing economy. M. M. Khan (National Institute of Technology, Srinagar) focused on waste treatment to improve the efficiency of foundry and chemical industries, aligning with the Indian

Government initiatives and UN Sustainable Development Goals (SDGs). S. Muthu Kumar (Birla Institute of Technology (BIT), Mesra) discussed the bioleaching process for recovering precious metals from e-waste using an eco-friendly microbial method. M. C. Naveen (International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad) highlighted the need for cost-effective, energy-efficient engineering solutions in the Industry 4.0 era, showcasing accomplishments like energy-efficient nozzles. M. Prasun (IIT Kharagpur) focused on next-gen power converters and motor drives, presenting prototypes of efficient SiC inverters for e-mobility. G. Pushpa (VIT) discussed cost-effective tile development for sustainable energy generation, emphasizing hybrid energy generation approaches. S. Shivangi (SRM Institute of Science and Technology, Kattankulathur) presented insights into the resilience of mangroves to sea-level rise, highlighting their crucial role in coastal ecosystem resilience. Sumit Dhawane (Maulana Azad National Institute of Technology, Bhopal) proposed sustainable solutions to convert onsite CO<sub>2</sub> into green fuels, suggesting BRICS collaboration to address climate change and meet UN SDGs.

Under Theme-II (The future of education, mindset and skillset), five presentations were made. T. Devanshi (IIT Kharagpur) emphasized the importance of psychology in entrepreneurship and mental health concerns among entrepreneurs. L. Pallavi (B. V. Raju Institute of Technology, Medak) discussed adaption-based teaching techniques and effective industry-academia-oriented

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\*A report on the Eighth BRICS Young Scientists Forum under the theme 'BRICS and Africa Partnership for Mutually Accelerated Growth, Sustainable Development, and Inclusive Multilateralism' held at Gqeberha (Port Elizabeth), South Africa, from 31 July to 3 August 2023.

course curriculum delivery using emerging technologies, viz. SOTA implementations for better outcomes. N. Nishita (Guru Gobind Singh Indraprastha University, Delhi) presented her work on green synthesis of waste-derived nanocomposites for microplastic elimination from urban aquatic systems. K. Shafali (Amity University, Noida) highlighted the need for large budget allocations in higher education and the importance of evaluating extracurricular activities and expenditures. J. Thangaraja (VIT) emphasized the role of science and engineering in future education and skill sets. He presented an educational app, BIOPRED, for predicting biodiesel properties and a smartphone application to capture combustion flame characteristics.

Under Theme-III (The future of society), there were five presentations. N. Ankur (IIT Jodhpur) emphasized the potential of artificial intelligence (AI) in improving transportation, envisioning efficient and sustainable systems. K. Jithin (Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram) spoke on the impact of medical device innovations on primary healthcare, showcasing an external pneumatic compression device. S. Joshi (Birla Institute of Technology and Science, Pilani) proposed a preventive dia-

gnostic kit using AI and 5G for accessible healthcare, aiming for a healthier society. M. Vijaykumar (Anna University, Chennai) discussed stabilizing cyber-physical systems against multiple attacks using an observer-based secured feedback control approach. S. Sarbjeet (All India Institute of Medical Sciences, New Delhi) emphasized the need for cost-effective, indigenously developed biomedical devices in BRICS nations, highlighting collaborative initiatives like medical device start-ups and innovation hubs. There were three YI presentations. R. Pai Avinash (International and Inter University Centre for Nanoscience and Nanotechnology, MG University, Kottayam) proposed using biomass-derived materials to suppress electromagnetic pollution, with potential for commercialization in BRICS nations. D. Prodyut (IIT (BHU), Varanasi) discussed transforming rice husk and straw into bio-based materials, contributing to a sustainable circular economy. K. P. Shubham (CSIR-Central Scientific Instruments Organisation, Chandigarh) presented a task on converting single-use plastic bottles into functionalized materials for various sustainable applications. Several presentations were made in the different parallel technical sessions. Buti Manamela, The South African Depu-

ty Minister of Higher Education, Science and Innovation, delivered the closing remarks at the conclave. He said, 'The BRICS Young Scientists Forum has become an important global platform for critical reflection by young scientists, researchers, innovators and entrepreneurs on some of the most urgent challenges of our times.'

1. <https://brics-ysf.org/sites/default/files/BRICS-YSF2023-Participants-List.pdf> (accessed on 7 December 2023).
2. [https://www.youtube.com/watch?v=HzvRe-Hz8YII&ab\\_channel=DepartmentofScienceandInnovationSA](https://www.youtube.com/watch?v=HzvRe-Hz8YII&ab_channel=DepartmentofScienceandInnovationSA) (accessed on 7 December 2023).

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