

Felicitations of
**INTERNATIONAL OLYMPIAD
MEDALLISTS, 2022**
in the sciences and mathematics

SCIENTIFIC PROGRAMME

09.30 to 11.30 hrs

Expository lectures by eminent scientists

AWARD CEREMONY

12.00 to 13.30 hrs

Thursday, December 22, 2022

The event is organized by

Homi Bhabha Centre for Science Education, TIFR

in association with

Infosys Foundation and the **TIFR Endowment Fund.**

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Homi Bhabha Centre for Science Education
Tata Institute of Fundamental Research

V. N. Purav Marg, Mankhurd, Mumbai – 400 088

<http://www.hbcse.tifr.res.in>

OLYMPIADS IN MATHEMATICS, SCIENCES AND INFORMATICS

The International Olympiads in Mathematics, Physics, Chemistry, Biology, Astronomy and Astrophysics, Junior Science, Earth Science and Informatics are annual academic competitions to stimulate and challenge bright young pre-university students. The aims of the International Olympiads are to promote academic excellence and also to foster friendship among students and teachers of different countries. India started participating in International Olympiads in Mathematics from 1989, in Physics, Chemistry, Biology, Astronomy and Informatics about a decade later, followed by participation in the Earth Science and the Junior Science Olympiads. India has hosted the International Mathematical Olympiad (1996), International Chemistry Olympiad (2001), International Astronomy Olympiad (2006), International Biology Olympiad (2008), International Earth Science Olympiad (2013), International Junior Science Olympiad (2013), International Physics Olympiad (2015) and International Olympiad on Astronomy and Astrophysics (2016).

Homi Bhabha Centre for Science Education (HBCSE), Tata Institute of Fundamental Research (TIFR) is the nodal agency for implementing the Olympiad programme in Mathematics, Physics, Chemistry, Biology, Astronomy and Astrophysics, and Junior Science. The Olympiad programme in the five science subjects is overseen by a National Steering Committee. The Indian Olympiad programme typically involves three stages of selection. The first stage selects a few hundred students from among tens of thousands who appear for the preliminary examinations all over the country. The first stage of the science Olympiads is carried out by the Indian Association of Physics Teachers (IAPT) with support from teacher associations of chemistry and biology. In the mathematics Olympiads carried out under the aegis of the National Board of Higher Mathematics (NBHM), the first stage is conducted by the Mathematics Teachers' Association, India (MTAI) and the second stage is decentralised.

The higher stages in the five science subjects and mathematics are carried out by HBCSE with support from teachers and scientists nationwide. The second stage (third stage for mathematics) is the Indian National Olympiads – the most challenging contests in mathematics and sciences at the pre-college level held in the country. Between 35 and 50 national Olympiad winners in each subject undergo training and testing every summer at HBCSE, after which the Indian teams are selected to represent the country at the International Olympiads.

The Earth Science Olympiad programme is carried out by the Geological Society of India (GSI), the camp being held at Bengaluru or Chennai. The Junior Astronomy Olympiad is under the supervision of the National Council of Science Museums (NCSM) with the training camp being held at NCSM centres. The Informatics Olympiad programme is carried out by the Indian Association for Research in Computing Science (IARCS), the training camp being held at The International School, Bengaluru.

The Science Olympiad programme in India is funded by the Board of Research in Nuclear Sciences (BRNS) of the Department of Atomic Energy (DAE), the Department of Science and Technology (DST) and the Ministry of Education (MoE). The Mathematics Olympiad programme is funded by NBHM (DAE) and MoE. The Astronomy Olympiad programme is funded by the Department of Space (DOS), DAE, and NCSM. The Informatics Olympiad is funded by Indian Association for Research in Computing Science (IARCS), Sasken Technologies Ltd, TCS iON (a division of Tata Consultancy Services), CodeChef (a not-for-profit educational initiative of Unacademy) and Chennai Mathematical Institute. The Earth Science Olympiad programme is funded by the Ministry of Earth Sciences (MoES).

Felicitations of International Olympiad Medallists, 2022

Indian students have been doing consistently well at the International Olympiads. In 2022 the performance was: Mathematics – 1 Gold, 5 Bronze; Physics – 1 Gold, 4 Silver; Chemistry – 4 Silver; Biology – 1 Gold, 3 Silver; Astronomy and Astrophysics – 3 Gold, 2 Silver; Junior Science – 6 Gold; Informatics – 2 Silver, 2 Bronze; Earth Science – 9 Gold (including 4 for team project), 4 Silver, 6 Bronze . All 42 students who participated in various Olympiads, won either a gold, silver or bronze medal. Unfortunately, India could not participate in the International Olympiad in Astronomy (Junior) this year due to disruption in the national programme related to COVID-19 pandemic. Our Olympiad students are comparable with the best in the world and we are justifiably proud of them.

ACKNOWLEDGEMENTS

In 2002, Infosys Foundation instituted awards to Indian medallists in the International Olympiads. The awards consist of a cash prize of Rs 15000, the grant for which has been given to the TIFR Endowment Fund. HBCSE (TIFR) expresses its deep gratitude to the Infosys Foundation for its spontaneous and generous response to the Institute's request for this support. We also thank the TIFR Endowment Fund for their proactive interest in the Olympiad programme.

The Government of India has been generously supportive of the Olympiad programme through its various agencies as listed above. We are thankful for this support and for the support for the Informatics Olympiad by the agencies listed. Finally, it is a pleasure to thank the Indian Association of Physics Teachers, the Association of Teachers in Biological Sciences, the Association of Chemistry Teachers, the Mathematics Teachers' Association (India), Indian Physics Association, National Council of Educational Research and Training, IARCS, GSI, NCSM and the large number of scientists and teachers from different institutions across the country for their enthusiastic collaboration in this exciting activity.

Arnab Bhattacharya

Chair, National Steering Committee
Science and Astronomy Olympiads.

Morning Session

Expository Lectures by Eminent Scientists

Lecture 1 (9:30 to 10:30 hrs)

Prof. Vidita Vaidya

Tata Institute of Fundamental Research, Mumbai



Serotonergic Psychedelics - A Revival

Come tumble down the rabbit hole of serotonergic Psychedelics.

Explore their history from the earliest recorded evidence 6000 years ago to their listing as scheduled drugs of abuse and the recent revival of interest in their potent behavioral effects. I will discuss the signaling pathways and neurocircuits targeted by these compounds and speculate on future breakthrough therapies for mood dysfunction.

About the Speaker

Prof. Vidita Vaidya received her undergraduate training in Life Science and Biochemistry at St. Xavier's College in Mumbai. She obtained her doctoral degree in Neuroscience at Yale University, and after postdoctoral fellowships at the Karolinska Institute and Oxford University, she returned to a faculty position at the Tata Institute of Fundamental Research. She is a fellow of the Indian National Science Academy, National Academy of Sciences and the Indian Academy of Sciences. She received the National Bioscientist Award in 2012, the Shanti Swarup Bhatnagar Award in Medical Sciences in 2015 and the Nature Award for Mentorship in 2019. Her team's work has been recognized by the J.C. Bose Fellowship in 2021 and the Infosys Prize in Life-Sciences in 2022. Her research group is interested in understanding the neurocircuitry of emotion, its modulation by life experience, and the alterations in emotional neurocircuitry that underlie complex psychiatric disorders like depression. She is committed to mentorship, equity, and diversity in STEM.

Morning Session

Expository Lectures by Eminent Scientists

Lecture 2 (10:30 to 11:30 hrs)

Prof. G. Mugesh

Indian Institute of Science, Bengaluru



Artificial Enzymes

Chemical synthesis, the making of new molecules, is at the heart of chemistry. The synthesis of new molecules in a laboratory is not very difficult, but making such molecules with a desired function is challenging. Rational design and synthesis of small molecules, peptides and proteins that mimic the function of human enzymes is important for the development of artificial enzymes with preferred biological activity. Recently, the development of redox active small molecules and nanomaterials attracted significant attention due to their ability to combat redox imbalance in biological systems, which has been associated with diverse diseases, including cancer, cardiovascular diseases and neurodegeneration.

In this talk, different artificial enzymes, including nanozymes, that can combat oxidative stress, maintain the reactive oxygen species (ROS) homeostasis and regulate the redox processes in cellular signaling under disease conditions will be discussed.

About the Speaker

Prof. G. Mugesh leads a group in Chemical Biology, Bioinorganic and Medicinal Chemistry at IISc Bengaluru. After his B.Sc. (Univ. of Madras, 1990), M.Sc. (Bharathidasan Univ., 1993) and Ph.D. (IIT-Bombay, 1998) degrees he received an Alexander von Humboldt postdoctoral fellowship for research at the Technical University, Braunschweig followed by a Skaggs postdoctoral fellowship at the Scripps Research Institute.

Prof. Mugesh has authored more than 160 publications in international peer reviewed journals and guided 35 Ph.D. students. He received several awards and recognitions, which include: Distinguished Alumnus Award of IIT Bombay; Swarnajayanti Fellowship; SASTRA-CNR Rao Award in Chemistry & Materials Science; Shanti Swarup Bhatnagar Award, Infosys Prize in Physical Sciences; etc. Prof. Mugesh is a fellow of the National Academy of Sciences, India (NASI), Indian Academy of Sciences (IAS), Indian National Science Academy (INSA) and the Royal Society of Chemistry (RSC).

Afternoon Session (12:00 – 13:30 hrs.)

Address & Award distribution by

Prof. Sabyasachi Bhattacharya

Director, TCG Centres of Research and Education in Science and Technology (CREST)






About the Chief Guest





Prof. Sabyasachi Bhattacharya, Director of TCG-CREST, is a condensed matter physicist and works primarily on dynamical aspects of disordered, soft and granular systems. Educated at Presidency College, Kolkata, University of Delhi and Northwestern University in the USA, he did post-doctoral research at the Magnet Laboratory at MIT and at the University of Chicago. He spent two decades at the Corporate Laboratories of Exxon Corporation and the NEC Corporation in New Jersey, US before returning to India as Director of the Tata Institute of Fundamental Research in Mumbai.

INDIAN DELEGATION TO THE 63rd INTERNATIONAL MATHEMATICAL OLYMPIAD 2022

The following team represented India at the 63rd International Mathematical Olympiad held at Oslo, Norway from July 6 to July 16, 2022.






Sr. no.	Students	Medals	
1	Pranjal Srivastava National Public School, Koramangala, Bengaluru	Gold	
2	Arjun Gupta Mother Divine Public School, North West Delhi	Bronze	
3	Adhitya Venkata Ganesh Mangudy Sri Chaitanya Techno School, Pune	Bronze	
4	Atul Shatavart Nadig Shri Ram Global School, Bengaluru	Bronze	
5	Vedant Saini Bhavan Vidyalaya, Chandigarh	Bronze	
6	Kaustav Mishra Delhi Public School, Bengaluru	Bronze	

Leaders and Scientific Observers





1	Prof. Niranjana Balachandran Indian Institute of Technology Bombay (IITB), Mumbai	Leader	
2	Prof. Shanta Laishram Indian Statistical Institute, New Delhi	Deputy Leader	
3	Mr. Sutanay Bhattacharya Indian Institute of Science (IISc), Bengaluru	Scientific Observer	
4	Mr. Spandan Ghosh Indian Institute of Science (IISc), Bengaluru	Scientific Observer	

INDIAN DELEGATION TO THE 52nd INTERNATIONAL PHYSICS OLYMPIAD 2022 (ONLINE MODE)

The following team represented India at the 52nd International Physics Olympiad held online and organised by Physics Association of Switzerland from July 10 to July 17, 2022.





Sr. no.	Students	Medals	
1	Deevyanshu Malu KIIT International School, Bhubaneswar	Gold	
2	Harsh Jakhar Bal Niketan Model Sr. Sec School, Chandigarh	Silver	
3	Anilesh Bansal Delhi Public School, Faridabad	Silver	
4	Abhijeet Anand Disha Delphi Public School, Kota	Silver	
5	Dheeraj Kurukunda Narayana Jr College, Hyderabad	Silver	

Leaders and Scientific Observers





1	Dr. Praveen Pathak Homi Bhabha Centre for Science Education (HBCSE), Mumbai	Leader	
2	Prof. Shyamala Bodhane Retired, St. Xaviers' College, Mumbai	Leader	
3	Prof. Arun V. Kulkarni Birla Institute of Technology & Science (BITS), Pilani, Goa	Scientific Observer	
4	Dr. Vivek Bhide Gogate Jogalekar College, Ratnagiri	Scientific Observer	

INDIAN DELEGATION TO THE 54th INTERNATIONAL CHEMISTRY OLYMPIAD 2022

The following team represented India at the 54th International Chemistry Olympiad held online and hosted by China, from July 10 to July 18, 2022.

Sr. no.	Students	Medals	
1	Tanishka Rameshchandra Kabra St. Ann's School, Ahmedabad	Silver	
2	Chinmay Khokar Bhavan Vidyalaya, Panchkula	Silver	
3	Nivesh Aggarwal Sri Guru Harkrishan Sr. Sec. Public School, Chandigarh	Silver	
4	Mahit Rajesh Gadhiwala Scholar English Academy, Surat	Silver	

Leaders and Scientific Observers





1	Prof. Nandita Madhavan Indian Institute of Technology Bombay (IITB), Mumbai	Head Mentor	
2	Dr. Indrani Das Sen Homi Bhabha Centre for Science Education (HBCSE), Mumbai	Mentor	
3	Dr. Shraeddha Tiwari Institute of Chemical Technology (ICT), Mumbai	Scientific Observer	
4	Dr. V. Sudarsan Bhabha Atomic Research Centre (BARC), Mumbai	Scientific Observer	

INDIAN DELEGATION TO THE 33rd INTERNATIONAL BIOLOGY OLYMPIAD 2022

The following team represented India at the 33rd International Biology Olympiad held at Yerevan, Armenia from July 10 to July 18, 2022.

Sr. no.	Students	Medals	
1	Mayank Pandhari National Institute Of Open Schooling, Bengaluru	Gold	
2	Rohit Panda Delhi Public School, Bhilai	Silver	
3	Amritansh Nigam Pragati Public School, Dwarka, New Delhi	Silver	
4	Prachi Jindal Delhi Private School, Dwarka, New Delhi	Silver	

Leaders and Scientific Observers





1	Prof. Ujwala C. Bapat Retired, Department of Botany, St. Xaviers' College, Mumbai	Leader	
2	Dr. Sasikumar Menon Therapeutic Drug Monitoring Lab, Mumbai	Leader	
3	Dr. Dharmendra Shah M. S. University, Baroda	Scientific Observer	
4	Dr. Selvaa Kumar D. Y. Patil University, C. B. D. Belapur, Navi Mumbai	Scientific Observer	

INDIAN DELEGATION TO THE 15th INTERNATIONAL OLYMPIAD ON ASTRONOMY AND ASTROPHYSICS 2022

The following team represented India at the 15th International Olympiad on Astronomy and Astrophysics held in Kutaisi, Georgia from August 14 to August 22, 2022.







Sr. no.	Students	Medals	
1	Raghav Goyal Bhavan Vidyalaya, Panchkula	Gold	
2	Md Sahil Akhtar DPS Ruby Park, Kolkata	Gold	
3	Mehul Borad Narayana Junior College, Hyderabad	Gold	
4	Malay Kedia Seth Anandram Jaipuria School, Ghaziabad	Silver	
5	Atharva Nilesh Mahajan Rankers International School, Indore	Silver	

Leaders and Scientific Observers



1	Prof. Sarita Vig Indian Institute of Space Science and Technology (IIST), Trivandrum	Leader	
2	Prof. Ajit Mohan Srivastava Institute of Physics (IoP), Bhubaneswar	Leader	
3	Dr. Shriharsh Tendulkar Tata Institute of Fundamental Research (TIFR), Mumbai	Scientific Observer	
4	Mr. Tejas Shah Fr. Agnel Multipurpose School & Jr. College, Navi Mumbai	Scientific Observer	

INDIAN DELEGATION TO THE 15th INTERNATIONAL EARTH SCIENCE OLYMPIAD 2022 (ONLINE MODE)





The following team represented India at the 15th International Earth Science Olympiad held online and hosted by Aosta Valley, Italy from August 25 to August 31, 2022.

Sr. no.	Students	Medals	
1	Bhanav Namboodri Bharatiya Vidya Bhavan's Vikas Vidyalaya, Nadakkavu	1 Gold, 2 Silver, 1 Bronze	
2	Jaagrit Gaur LBS Sr. Sec. School, Kota	1 Gold, 1 Bronze and 1 Gold (Team project)	
3	Sonit Sisolekar Paradise English Medium School, Pune	1 Gold, 2 Bronze	
4	Avishi Agrawal Disha Delphi Public School, Kota	1 Gold	
5	Kyishong Bharali Das Sir Mutha School, Chennai	1 Gold, 1 Bronze	
6	Abhijay Singh Khehra Police DAV Public School, Jalandhar	1 Silver and 1 Gold (Team project)	

Felicitation of International Olympiad Medallists, 2022







7	Siddhangana Sahoo DAV Public School, Bhubaneswar	1 Silver, 1 Bronze and 1 Gold (Team project)	
8	Arush Chaudhary Anand Vidya Mandir, Bharatpur	1 Gold and 1 Gold (Team project)	

Leaders and Scientific Observers





1	Dr. Hema Achyuthan Institute of Ocean Management Anna University, Chennai	Mentor	
2	Dr. K. S. Godhavari Geological Society of India, Bengaluru	Mentor	
3	Prof. R. Baskar Indira Gandhi National Open University (IGNOU)	Scientific Observer	
4	Dr. Mithila Verma Ministry of Earth Sciences, New Delhi	Scientific Observer	

INDIAN DELEGATION TO THE 19th INTERNATIONAL JUNIOR SCIENCE OLYMPIAD 2022

The following team represented India at the 19th International Junior Science Olympiad held at Bogota, Colombia from December 2 to December 12, 2022.




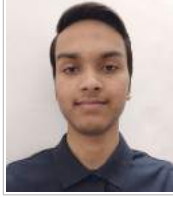
Sr. no.	Students	Medals	
1	Arittra Malhotra Queen Mary's School, Northend, New Delhi	Gold	
2	Rajdeep Mishra Air Force School, Jamnagar	Gold	
3	Devesh Pankaj Bhaiya L. H. Patil English Medium School, Jalgaon	Gold	
4	Vasu Vijay Nalanda Academy, Kota	Gold	
5	Banibrata Majee Defence Laboratories School, Hyderabad	Gold	
6	Avaneesh Bansal Shri Ram Centennial School, Dehradun	Gold	

Leaders and Scientific Observers



1	Prof. Chitra Joshi Retired, Ruia Jr. College, Mumbai	Leader	
2	Dr. Subhojit Sen UM-DAE CEBS, Mumbai	Leader	
3	Dr. Vishal Dev Ashok S.I.E.S. College of Science & Arts, Mumbai	Leader	
4	Prof. J. P. Gadre Retired, Abasaheb Garware College, Pune	Scientific Observer	

INDIAN DELEGATION TO THE 34th INTERNATIONAL OLYMPIAD IN INFORMATICS 2022

The following team represented India at the 34th International Olympiad in Informatics held at Indonesia from August 7 to August 15, 2022.

Sr. no.	Students	Medals	
1	Paras Kasmalkar The Orchid School, Pune	Silver	
2	Kshitij Sodani Delhi Public School, Gurgaon	Silver	
3	Harshin Posina FIITJEE School, Hyderabad	Bronze	
4	Ritul Kumar Singh Delhi Public School, Bokaro Steel City	Bronze	

Leaders and Scientific Observers

1	Prof. Madhavan Mukund Chennai Mathematical Institute, Chennai	Leader	
2	Prof. K Narayan Kumar Chennai Mathematical Institute, Chennai	Deputy Leader	

**Homi Bhabha Centre for Science Education
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Telephone: 91-22-2556 2132, 2507 2204, 2507 2205,
Web: www.hbcse.tifr.res.in

**TIFR Endowment Fund
Tata Institute of Fundamental Research**
Colaba, Mumbai – 400 005

Telephone: 91-22-2278 2500/2669
Web: www.tifr.res.in

Infosys Foundation
Neralu, #1/2 (1878), 11th Main,
39th Cross, 4th T Block, Jayanagar,
Bangalore 560011, Karnataka

Telephone: 91-80-26534653 / 41261700
Web: www.infosys.com/infosys-foundation/

Programme (09:30 – 13:30 hrs)

Scientific Talks (09:30 – 11:30 hrs)

09:30 – 10:30 hrs : Serotonergic Psychedelics - A Revival
Prof. Vidita Vaidya
Tata Institute of Fundamental Research, Mumbai

10:30 – 11:30 hrs : Artificial Enzymes
Prof. G. Mugesh
Indian Institute of Science, Bengaluru

11:30 – 12:00 hrs : Break

Award Function (12:00 – 13:30 hrs)

Welcome : **Prof. Arnab Bhattacharya**
Centre Director, HBCSE

Distribution of awards & Address by Chief Guest : **Prof. Sabyasachi Bhattacharya**
Director, TCG Centres of Research and Education in Science and Technology (CREST)

Vote of Thanks : **Prof. Anwesh Mazumdar**
National Coordinator, Science Olympiads

Venue : Online