

SCIENCE & MATHEMATICS OLYMPIADS

There are five annual international science olympiads in which science students from across the world compete for gold, silver, and bronze medals. The International Mathematics Olympiad was introduced in 1959, followed by Chemistry (1969), Physics (1970), Biology (1990), and Astronomy (1996) olympiads.

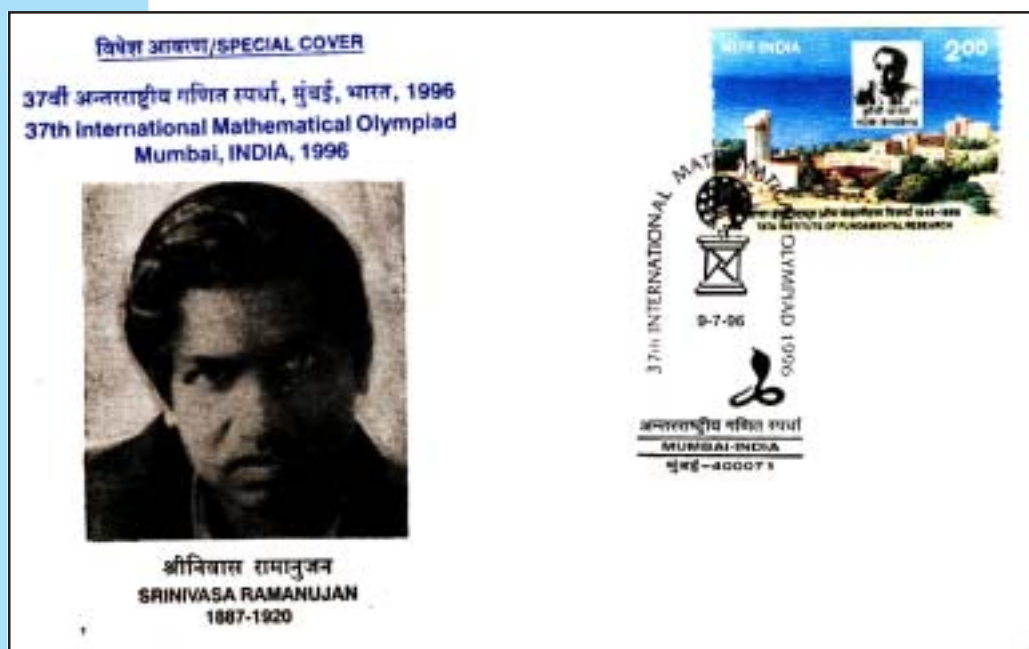
Science Olympiads

In 1997-98, Homi Bhabha Centre for Science Education (HBCSE) (a National Centre of the Tata Institute of Fundamental Research, Mumbai), and the Indian Association of Physics Teachers (IAPT) jointly took initiative in starting the physics olympiad programme. A year later, HBCSE took initiative to extend the programme to chemistry and biology also. IAPT came forward to extend help in the conduct of chemistry and biology examinations also. These initiatives received strong support and encouragement from the Department of Atomic Energy (DAE), Department of Science and Technology (DST) and the Ministry of Human Resource Development (MHRD) of the Government of India. India sent its first team to International Physics Olympiad (IPhO) in 1998, International Chemistry Olympiad (ICHO) in 1999 and International Biology Olympiad in 2000. The good performances of Indian teams right in the first few years of participation helped in the consolidation of the programme.

From July 6-15, 2001, India hosted the 33rd International Chemistry Olympiad in Mumbai. This world event organised by HBCSE has given a further boost to the science olympiad programme in India. The year also saw the best overall performance so far, of the Indian teams in all the four International Olympiads.

The National Olympiad Programme in physics, chemistry and biology is overseen by an Integrated National Steering Committee constituted by DAE, under its Board of Research in Nuclear Sciences (BRNS). The programme is financially supported by BRNS (DAE), DST and MHRD.

Science stream students in Class XI and XII are eligible to participate in these Olympiads. The first stage of the selection process is the National Standard Examinations (NSE) in Physics (NSEP), Chemistry (NSEC), and Biology (NSEB) held across the country at the end of November. A student may appear for any one, two or all the three subjects. The duration of NSEP, NSEC and NSEB are 180, 120, and 90 minutes, respectively. These



Commemorative special cover issued by the Indian Postal Department to mark the 37th International Mathematical Olympiad held in Mumbai in 1996

examinations are the organizational responsibility of Indian Association of Physics Teachers (IAPT) and the Indian Association of Chemistry Teachers (IACT). About 250 students are short listed in each subject on the basis of NSE.

The next stage, the Indian National Olympiads in physics (INPhO), chemistry (INChO), and biology (INBO) are organized by HBCSE in collaboration with IAPT and IACT. They are held in the last week of January or early February.

The duration of the Olympiad examinations is 4 hours for INPhO and INChO and 2 hours for INBO. The short listed students (about 50 in each subject) join the relevant orientation-cum-selection camps of one-week duration, at the end of which 25 students from each of the disciplines are selected as Gold Medalists. Each is given a medal, a certificate, and a book.

The medalists undergo rigorous training in theory and experiment at the annual summer camps in May – June at the HBCSE. Special laboratories have been developed at this centre for the purpose. At the end of the training, top 5 students in physics, top 4 in chemistry and top 4 in biology, are selected for the international Olympiads in respective subjects. HBCSE also organizes pre-departure training and orientation to the Indian teams before they depart for the International Olympiads.

For Olympiad in Astronomy, students up to Class XI in Science stream in two age groups of 15 & 17 years are eligible.

The Astronomy Olympiad programme from the year 2003 – 2004 is implemented by HBCSE in collaboration with the National Council of Science Museums (NCSM). The selection process begins at the participating centres, such as science centres and museums and planetariums across the country. The first stage tests the knowledge of mathematics and physics. About 10 students in each age group from each centre then appear in the Indian National Astronomy Olympiad. About 20 students from each of the two age groups then participate in a 15-day national camp at the Nehru Science Museum, Mumbai. They are exposed to various aspects of observational astronomy, astrophysics and space science. Thereafter, tests are administered to select six to seven students to represent India in the International Astronomy Olympiad.

Mathematics Olympiad

The International Mathematical Olympiads has its origins in the “Etovos”, a Mathematical contest started by Hungary for its High School students in 1894. Some of Hungary’s neighbours followed the example and organised similar mathematical contests.



The students who represented India at the 44th International Mathematical Olympiad (IMO) held in Tokyo, Japan during July 7-19, 2003. IMO is an international competition to discover and encourage mathematically gifted young students.

It took more than half a century for the Olympiad activity to take on an international character. It was in 1959 that Romania hosted the first International Olympiad; it was a somewhat limited affair, participation being confined to a mere seven countries. The participation has grown ten folds and more since the first IMO.

Olympiad activity was initiated in India by the Late Professor P. L. Bhatnagar of the Indian Institute of Science (IISc.) towards the end of the sixties. It was confined largely to Bangalore and nearby areas mainly. Elsewhere in the country (notably Gujrat) similar programmes emerged. In 1986, Prof. J.N. Kapur, then a member of the National Board for Higher Mathematics (NBHM) persuaded the Board to take up the responsibility of coordinating the activities going on in different regions in the country and embark on organising a National Olympiad contest. NBHM decided to enlist the assistance of various regional bodies to organise a regular annual contest for the country as a whole. India has been participating in IMO since 1989.

NBHM also created the 'Olympiad Cell' for looking after Olympiad activity. The cell has now become part of Homi Bhabha Centre for Science Education.

The Mathematics Olympiad Programme in India leading to participation in the International Mathematical Olympiad is organized by the National Board of Higher Mathematics (NBHM) of the Department of Atomic Energy (DAE). It consist of regional and national level olympiads, followed by training and International Olympiad.

Regional Mathematical Olympiad (RMO) is held between September and December each year at 20 different regions in the country. Students of Class XI and Class XII are eligible to appear for RMO. RMO is a 3-hour written test containing about 6 to 7 problems. The Regional Coordinator has the freedom to prepare question paper or obtain the question paper from NBHM. The regions opting for NBHM question paper hold this contest on the first Sunday of December. Certain number of students from each region is selected to appear for the national level examination.

The students selected from the Regional Mathematical Olympiads appear for the the Indian National Mathematical Olympiad (INMO). INMO is a 4-hour written test. On the basis of INMO, the top 30-35 students from all over the country become INMO awardees and receive a Certificate of Merit.



This Logo is based on a verse from the famous work "Leelavati" of the 10th century Indian mathematician Bhaskaracharya. This Logo means: *A peacock stood on top of a pillar, nine cubits (the length of the forearm) in height. At the foot of the pillar was a hole. Seeing a snake at a distance three times the height of the pillar, moving towards the hole, the peacock swooped down on it obliquely. Tell me quickly (oh, Leelavati) at what distance from the hole, the two, moving with equal speed, clashed.*



The Medals awarded at the 37th IMO



The INMO undergo a month long Training Camp during May-June at HBCSE. INMO awardees of the previous year who have satisfactorily gone through postal tuition throughout the year are invited again to a second round of training (Senior Batch). The senior batch participants who successfully complete the Camp receive a prize of Rs. 5,000/- in the form of books and cash. A team of the best six students is selected from the combined pool of junior and senior batch participants of the Training Camp, for participation in the International Mathematical Olympiad, that is held in July each year in a member country of IMO.

IMO consists of two 4 and 1/2-hour written tests held on two days. Students of the Indian team who receive gold, silver and bronze medals at the IMO, receive a cash prize of Rs. 5000/-, Rs.4000/- and Rs. 3000/- respectively during the following year.

Ministry of Human Resource Development finances international travel of the 8-member Indian delegation, while NBHM (DAE) finances the entire in-country programme and other expenditure connected with international participation.

Nurture Programme in Mathematics

The Indian National Mathematical Olympiad (INMO) awardees choosing mathematics for their undergraduate degree course are provided with a scholarship of Rs. 1,000/- per month. They are offered a 4-year programme of training in mathematics through correspondence and periodic contact with a chosen faculty. The programme is also available to INMO awardees who do not pursue undergraduate degree in mathematics but have special interest in the subject. They are offered an annual cash prize of Rs. 9,000/- subject to satisfactory performance in the programme.

Every year the faculty of the IMO-Training Camp selects 15-20 students of Class XII from the Senior Batch for inclusion in this Nurture Programme of NBHM.

All the students of the Indian teams for International Olympiads in mathematics, physics, chemistry and biology automatically qualify for the Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship (Rs. 3,000/- per month + Rs. 6,000/- per annum contingency plus a nurture programme), provided they pursue careers in mathematics or basic sciences. In addition BARC offers pre-selection to their training school to all the students of Indian teams in physics and chemistry, provided they pursue careers in basic science and maintain consistently good academic record up to M.Sc.

Details of these Olympiads are available on the website **www.hbcse.tifr.res.in** or from :

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