

International Science Olympiads: India's contribution

In most of the premier research institutes of India and elsewhere, one of the major complaints relates to the depletion of good students' influx for higher studies in science subjects. One of the main reasons for this trend has been the job market; nowadays everyone wants applications of basic science subjects or degrees in applied sciences. In this scenario, it is becoming difficult for science teachers in schools to lure their pupils to study a science subject as major subject. The craze to study medicine, engineering, business management, or information technology reduces the chances of good students entering the science stream of education. In this regard there have been various attempts to emphasize importance of science education. Conferences such as Indian Science Congress, National Science Day, National Symposia in various science disciplines, winter or summer schools, and efforts by individual scientists/groups of scientists to organize seminars, lectures, workshops, demonstrations, etc. have been the means of arousing interest in science. However, most of these events are normally attended by individuals who have already chosen science stream of education. Before the discipline of study is more or less chosen by students in schools, efforts have to be made to attract the students towards science education and inculcate the natural spirit of enquiry. In this regard, the International Science Olympiads serve as a medium for young children to get interested in science.

The International Science Olympiads are efforts in this direction and are competitions in which students from secondary schools take part while working on theoretical and experimental tasks from different fields of science. They also serve the purpose of forming personal relationships between budding natural scientists from different countries. Each participating country sends a team, consisting of four to six pre-university students depending on the discipline. Any country interested in participating in these Olympiads for the first time has to send an observer for two consecutive years before the country is allowed to participate. Countries can apply for organizing this competition. The international jury decides on the venue for such competitions. In India, the Homi Bhabha Centre for Science Education (HBCSE) is the nodal agency for implementing the olympiad program in

mathematics, physics, chemistry, biology and astronomy.

Historically, the science olympiads started first with International Mathematics Olympiad (IMO) followed by Physics, Chemistry, and more recently by Biology. The newest subject in which the science olympiad is conducted is Astronomy.

The first International Mathematics Olympiad was held in Romania in 1959. India, however, started participating in this event fairly late (1989). The mathematics olympiad program in India is carried out under the aegis of the National Board of Higher Mathematics (NBHM, DAE) with support from the Ministry of Human Resources Development (MHRD). The problems that are given to the students to solve are chosen from various areas of mathematics, such as are included in math curricula at secondary schools. The solution to these problems, however, requires exceptional mathematical ability and excellent mathematical knowledge on the part of the contestants.

India hosted the 37th International Mathematics Olympiad in 1996 in Mumbai, in which about 75 countries participated. In the 45th IMO held at Athens, Greece, during 6–18 July 2004, 85 countries participated: the Indian team secured 14th rank while the Indian contestants secured four silver medals and two bronze medals. Kshipra Bhawalkar (Pune, Silver), Anand Deopurkar (Pune, Silver), Rohit Joshi (Pune, Silver), Vipul Naik (Delhi, Silver), Abhishek Dang (Pune, Bronze) and Anupam Prakash (Ranchi, Bronze) were the members of the Indian team.

The International Physics Olympiad (IPhO) has been organized practically every year since 1967, in different countries. India has been participating in the IPhO since the 29th IPhO held in Reykjavik, Iceland in July 1998. The first stage of the olympiad program in physics in India is carried out entirely by the Indian Association of Physics Teachers (IAPT). IAPT also offers organizational support for the first stage of the olympiad program in Chemistry and Biology.

The 35th IPhO was held at Pohang, Korea. The Indian team participating in this event secured one gold, two silver and two bronze medals; the team consisted of Shubham Mittal (Delhi, Gold), Ajit Kumar Nema (Bangalore, Silver), Kartik Mohta (Nagpur, Silver), Avin

Mittal (Agra, Bronze) and Ankur Goel (Panchkula, Bronze).

The International Chemistry Olympiad (ICHO) was founded in former Czechoslovakia in 1968. The Czechoslovakian committee invited only socialistic countries Poland and Hungary, since the political situation at that time between Czechoslovakia and Russia was extremely tense. Although participation in ICHO was somewhat restrictive in the years 1969–1980, the Chemistry Olympiad has now become an internationally open competition.

India participated for the first time in 1999 at the Chemistry Olympiad held in Thailand. Two years later, in 2001, India hosted the 33rd ICHO. This event, hosted by MHRD, Department of Science and Technology (DST), and Department of Atomic Energy (DAE, BRNS), was organized by HBCSE and TIFR in Mumbai. For the first stage of selection of candidates at the national level, the HBCSE collaborates with the Indian Association of Chemistry Teachers (IACT).

The 36th International Chemistry Olympiad (2004) was hosted by Germany during July 18–27 in the northern coastal town of Kiel. Chinese students dominated this olympiad and it was the only team to earn four Gold medals. The Indian team consisted of Priya Gupta (Delhi, Gold), Vibhav Bukkapatanam (Hyderabad, Silver), Sudeep Uday Kamath (Mumbai, Bronze) and Sushant Sachdeva (Pune, Bronze), as the participants. Incidentally, Priya happens to be the first young girl contestant to win a Gold medal for India in any of the olympiads.

The first International Biology Olympiad (IBO) was held in July 1990 in Olomouc, Czech Republic. India has been participating in this international event since the 11th IBO held at Antalya, Turkey in 2000. The primary selection for IBO is done along with ICHO by IACT. The 15th International Biology Olympiad was held at Brisbane, Australia. The Indian team consisted of Niranjana Khairi (Pune, Silver), Raghav Bansal (Delhi, Silver), S. Mahavir Agarwal (Rourkela, Silver) and Suman Saurabh (Muzaffarpur, Bronze).

The latest of the olympiads, the International Astronomy Olympiad (IAO) was founded on June 7, 1996, by the Euro-Asian Astronomical Society. The Astronomy Olympiad program in India is carried out by

Table 1. International Science Olympiad results for Indian teams in 2004

Subject	Medal tally	Rank*	No. of participating countries
Mathematics (6 participants)	4 Silver 2 Bronze	14	85
Physics (5 participants)	1 Gold 2 Silver 2 Bronze	11	71
Chemistry (4 participants)	1 Gold 1 Silver 2 Bronze	11	60
Biology (4 participants)	3 Silver 1 Bronze	10	40
Astronomy (5 participants)	4 Gold 1 Bronze	1	75

*The ranking is based on aggregate team score; all national ranks are unofficial as the Olympiads are individual events.

HBCSE in collaboration with the Nehru Science Center, Mumbai, of the National Council of Science Museums and is funded by DAE and Department of Space.

The International Astronomy Olympiad for the year 2004 was held in Ukraine during 2–8 October; 75 countries participated and the Indian team topped the contest. The Indian participants, Abhishekh Dang (Pune, Gold), Ved Gund (Pune, Gold), Saptarshi Bandopadhyay (Mumbai, Gold), Ashish Agarwal (Ghaziabad, Gold) and T. V. Raziman (Kerala, Bronze), have won totally four Gold medals and one Bronze medal. Two of the participants stood 2nd and 3rd in the overall ranking. In fact, India has been holding the first or the second rank since the year it started participating in IAO (1999).

India is one among the seven countries (China, USA, Korea, Taiwan, Ukraine, Russia, and India) with the distinction of having each one of the 19 students of the four teams winning a medal in the four

different olympiads in mathematics, physics, chemistry, and biology during 2004 (Table 1). Similarly, all the five contestants in the IAO have won a medal each this year (this has been the case since 1999).

A lot of organizational efforts are involved in identifying the contestants and preparing them for these events. These responsibilities are coordinated by HBCSE with the help of several other organizations. Scientists from a large number of institutions, viz. BARC, TIFR, IITs, IISc, IUCAA, various universities, colleges, etc. help the HBCSE in this purpose.

The Indian olympiad program consists of four stages:

Stage I – An examination held in November/December each year (for physics, chemistry and biology, it is called National Standard Examination) in which around 25,000 students appear at different centers across the country. About 250 students shortlisted in this stage appear for the next stage.

Stage II – The candidates need to face an examination on the pattern of International Science Olympiads. At this level, some 30–35 students are selected.

Stage III – The candidates selected at the previous stage undergo a rigorous training at HBCSE (during summer vacation). At the end of the training period, requisite numbers of candidates are selected for each subject.

Stage IV – Actual participation in the respective International Science Olympiads.

Cash awards and books serve as incentives for the meritorious students who qualify at each stage of this selection procedure. Additionally, the participants of International Science Olympiads in Mathematics, Physics, Chemistry, and Biology automatically qualify for the well-known Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship of DST, provided they continue to study science. The Physics and Chemistry Olympiads' participants are offered direct admission to Bhabha Atomic Research Centre training school provided they pursue under/postgraduate careers in science. However, past statistics show that many medallists actually chose professional courses after their school education, although most of them maintain a strong interest in pure sciences and have a desire to turn to them sometime after their basic professional degree.

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ICTP Science Prizes

The Ramanujan Prize for Young Mathematicians from Developing Countries

The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste has announced the creation of 'Ramanujan Prize for Young Mathematicians from Developing Countries'. The Prize is funded by the Niels Henrik Abel Memorial Fund.

The Prize will be awarded annually to a researcher who has conducted outstanding work in a developing country. (S)he should be less than 45 years of age on 31 December of the year of the award. Researchers working in any branch of mathematical sciences are eligible. The Prize carries a cash award of US\$ 10,000 and travel and subsistence allowance to visit ICTP for a meeting, where the prizewinner will be

required to deliver a lecture. The Prize will usually be awarded to one person, but may be shared equally among recipients who have contributed to the same body of work.

The Prize will be awarded by ICTP through a selection committee of five eminent mathematicians appointed in conjunction with the International Mathematical Union. The first winner will be announced