

Information and Announcements



India to Host 1996 International Mathematical Olympiad

India will host the 37th International Mathematical Olympiad (IMO) in July 1996 in New Delhi. The IMO, which is an annual event, is the most celebrated intellectual contest for school children all over the world. The first ever IMO was held in 1959 in Romania with just seven countries taking part. This year it is expected that about 75 countries will participate. Each participating country can send a team of upto six students. To be able to contest in the IMO a student must not have entered the university and should be below 20 years of age.

The National Board for Higher Mathematics (NBHM) is organizing the event which will be sponsored by the Ministry of Human Resources Development. The selection of the Indian team for the 1996 IMO has already begun (*). The aims of the IMO are:

(*) The Indian team for the IMO is selected during the training camp usually conducted in the month of May every year. The students for these camps are selected through the Indian National Mathematical Olympiad (INMO) held in February every year. To qualify for the INMO, students have to come through the Regional Mathematical Olympiads which are generally conducted around October. Further information may be obtained from: The National Board for Higher Mathematics, DAE, Anushakti Bhavan, C S M Marg, Bombay 400 039.

Sample Problems from IMO

- 1 (IMO 92, Problem 2) Let \mathbf{R} denote the set of all real numbers. Find all functions $f: \mathbf{R} \rightarrow \mathbf{R}$ such that for all x, y in \mathbf{R}

$$f(x^2 + f(y)) = y + (f(x))^2$$

- 1 IMO 95, Problem 6) Let p be an odd prime number. Find the number of subsets A of the set $\{1, 2, \dots, 2p\}$ such that i) A has exactly p elements, and ii) the sum of all the elements in A is divisible by p .

- 1 to discover, encourage and challenge mathematically gifted young people in all countries;
- 1 to foster friendly relations between mathematicians of all countries;
- 1 to create an opportunity for the exchange of information on school syllabi and practice throughout the world.

The IMO consists of a written contest held on two consecutive days. Each day the contestants have to solve three problems in four-



and-a-half hours. The problems are all from high school mathematics (no calculus). They are of an elementary nature but rather difficult and their solutions require a certain degree of insight and creativity.

India has been participating in the IMO since 1989 and has so far bagged 1 gold, 15 silver and

20 bronze medals. The NBHM awards scholarships to the Olympiad participants if they wish to pursue mathematics and also conducts Nurture Programmes for them every year at leading institutes in the country.

C R Pranesachar, DAE, Department of Mathematics, Indian Institute of Science, Bangalore.

1994 Fields Medals

The most prestigious award for mathematics is the Fields Medal which is awarded once in four years to three or four young mathematicians for their outstanding contributions. They receive the Medal during the International Congress of Mathematicians held once in four years.

In the last International Congress of Mathematicians held in Zurich, Switzerland in August

1994 the following four mathematicians were awarded the Fields Medal: *Jean Bourgain*, Institute for Advanced Study, Princeton, USA; *Pierre-Louis Lions*, University of Paris-Dauphine, Paris; *Jean-Christopher Yoccoz*, University of Paris-Sud, Paris; *Efim Isaakovich Zelmanov*, University of Wisconsin, USA.

1995 Nobel Prizes

Physics

The 1995 Nobel prize in Physics has been awarded to *Martin L Perl* of Stanford University, USA and *Frederick Reines* of the Department of Physics, University of California at Irvine, USA for pioneering experimental contributions to lepton physics. They discovered two remarkable subatomic particles.

Martin L Perl and his colleagues found, through a series of experiments in the 1970s, a lepton, called the 'tau' (τ). The tau has properties similar to the electron, but is about 3500 times

heavier. Their discovery of the tau was the first sign that a third 'family' of fundamental building blocks existed. (The second family has the muon (μ) which is some 200 times heavier than the electron)

Frederick Reines and the late Clyde L Cowan, Jr., demonstrated experimentally in the 1950s, the existence of the antiparticle of the electron-neutrino $\bar{\nu}_e$. This was a remarkable feat because neutrinos and anti-neutrinos interact very weakly with matter and are thus extremely



difficult to detect experimentally.

Physiology or Medicine

Research on malformation in the fruitfly fetched three developmental biologists: *Edward B Lewis* of the Department of Biology, California Institute of Technology, *Christianan Nusslein-Volhard* of Max Planck Institute for Development Biology, Tubingen and *Eric Wieschaus* of the Department of Molecular Biology, Princeton University the Nobel prize in Physiology or Medicine for the year 1995. Their work on the fruitfly *Drosophila melanogaster* helped uncover many secrets of embryonic development. They created mutations in the genes of the fly which could delete or duplicate entire body segments. This work has significantly

advanced our knowledge of the genetic control of development.

Chemistry

The 1995 Nobel Prize in Chemistry has been awarded to: *Paul Crutzen*, Max-Planck-Institute for Chemistry, Mainz, Germany; *Mario Molina*, Department of Earth, Atmospheric and Planetary Sciences and Department of Chemistry, MIT, Cambridge, MA, USA, and *F Sherwood Rowland*, Department of Chemistry, University of California, Irvine, CA, USA for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone.



100th year of wireless communication ...

Poisson's view ... That the French mathematician Poisson (1781 - 1840) liked teaching can be seen from his own words: "Life is made beautiful by two things — studying mathematics and teaching it".

