

## How the 'International Congress of Mathematicians' came to be

In August 2010, the city of Hyderabad will be witness and host to an event of great significance. The 'International Congress of Mathematicians', which was held for the very first time in 1897 in the city of Zurich, is to happen in India in 2010. The Congress, convened by the International Mathematical Union, is an event that occurs every four years. Since that first assembly in Zurich, except for the period corresponding to the time of the two World Wars, the Congress has been a regular event. This is the first time that the Congress is to be hosted in India and will be one of the few times the Congress has travelled outside of Europe and the United States.

The opening ceremony of the Congress will see some exciting moments. The Fields Medals, the Nevanlinna Prize and the Gauss Prize are traditionally awarded to mathematicians of repute. Of these, the Fields medal is the most prestigious and has often been called the 'Mathematics Nobel'. First awarded in 1936, this prize is awarded every four years to between two and four mathematicians and carries a cash prize of around US\$15,000. The Fields Medal recognizes young mathematicians and is awarded to mathematicians who are less than forty years of age.

Tracing the history of the Congress throws up some unexpected insights. The 1897 Zurich Congress was initiated by the French and the Germans. This was the period in history when Europe was at the forefront of mathematical research and study. The proceedings of that first Congress were recorded in French and German with talks being presented in different European languages. As such, the proceedings are a glimpse of a world in which English was not yet the dominant language of communication. There were in fact many proposals in Europe at that time that a new 'international auxiliary language' be devised to be used for communicating between people with different native languages.

Writing in the September 1897 issue of *Science*, American mathematician George Bruce Halsted has reported that

the Congress was in 'every way a success...' and that the '...the actual program was particularly rich and interesting'. He has noted that 'The greatest mathematician in the world Sophus Lie was not expected; and the greatest French mathematician, Poincare, though down for a speech, did not come'. He also says 'The second section contained a title from Z. de Galdeano, whose heroic efforts gave Spain a Journal of Mathematics, now unfortunately dead in the decadence of that beautiful, priest-ridden land(!)'.

At that first gathering, the purpose behind the regular future meetings was also decided and these were to be '(1) to promote personal relations between mathematicians of different lands; (2) to give, in reports or conferences, an aperçu of the actual state of the diverse branches of mathematics, and to treat questions of recognized importance; (3) to deliberate on the problems and organization of future congresses; (4) to treat questions of bibliography, of terminology, etc., on subjects where an *entente internationale* appears necessary'.

The next Congress happened at Paris in 1900. It was at this assembly that the German mathematician David Hilbert, announced his famous list of 23 problems in mathematics, now known as Hilbert's problems. Hilbert is said to have presented his problems with the following opening lines: 'Who among us would not be happy to lift the veil behind which is hidden the future; to gaze at the coming developments of our science and at the secrets of its development in the centuries to come? What will be the ends toward which the spirit of future generations of mathematicians will tend? What methods, what new facts will the new century reveal in the vast and rich field of mathematical thought?' As it turned out, the problems Hilbert discussed formed a large part of 20th century mathematical study. Of the 23 problems Hilbert presented to the world, some of the problems were solved fairly quickly, some were decided to be irresolvable and some remain unresolved even now.

The World Wars threw their shadows on the mathematical community. After the First World War, an International Research Council was set up by the countries that had won the war but those that had lost the war were not allowed to participate. This council included an International Mathematical Union (IMU). At the 1920 ICM in Strasburg, the statutes of the IMU were decided on but Germany was excluded from participation! This state of affairs continued until the 1928 ICM at Bologna from which point onwards the Congresses were open to all mathematicians irrespective of nationality.

The Fields medal mentioned earlier was instituted and first awarded at the 1936 ICM to Finnish mathematician Lars Ahlfors and American mathematician Jesse Douglas. At the last ICM in Spain (2006), an event that greatly caught the attention of the popular press was the refusal of Russian mathematician Grigori Perelman to accept the medal.

Indian participation in the ICM has been qualitatively significant. The schedule of each Congress includes some 200 invited talks. Since the 1958 Congress, except for the one in 1986, there has been at least one invited talk by an Indian mathematician living and working in India.

The last Congress in Spain (2006) was attended by some 4000 participants from all over the world. In India, the National Board of Mathematics, under the aegis of the Department of Atomic Energy, is responsible for the promotion of Higher Mathematics. Four Indian mathematicians represented India at the Meeting of the IMU General Assembly in Santiago de Compostela, Spain and bid successfully for the ICM 2010. ICM 2010 will take place between 19 and 27 August 2010 at the Hyderabad International Convention Centre.

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