Fields Medals, other prizes, ICM

Martin Andler
Université de Versailles St Quentin
Animath

LMV
Laboratoire de mathématiques
de Versailles - CNRS UMR 8100

UNIVERSITÉ DE
VERSAILLES
ST-QUENTIN-EN-YVELINES

Animath

A Bit of History

Nobel

Alfred Nobel (1833-1896) and mathematics

- A nice story about a lady... but wrong
- The rival : Mittag-Leffler ?
- Nobel's view that science should benefit mankind, did not include mathematics

Consequence : no Nobel in mathematics !

The International Congress of mathematicians (ICM)

- End of the XIXth century : the Franco-Prussian war of 1870, rise of nationalisms
- Professionalisation of mathematical (more generally scientific) research (professorships, journals...)
- development of international exchanges
- Georg Cantor : create an international congress ! Idea supported by Hermite and Poincaré
- First congress in Zürich in 1897 (neutral country)

Zürich 1897

Adolf Hurwitz.

Adolf Hurwitz (professor at ETH)

« Would the instigating force of personal communication guide you during these few days, and be the pretext for numerous scientific discussions. Let us enjoy together the spirit of comradeship, remembering that, while we represent many different countries, we are present here united by the most noble ideals of peace and friendship. »

Four plenary lectures :
Poincaré, Peano, Hurwitz and Klein
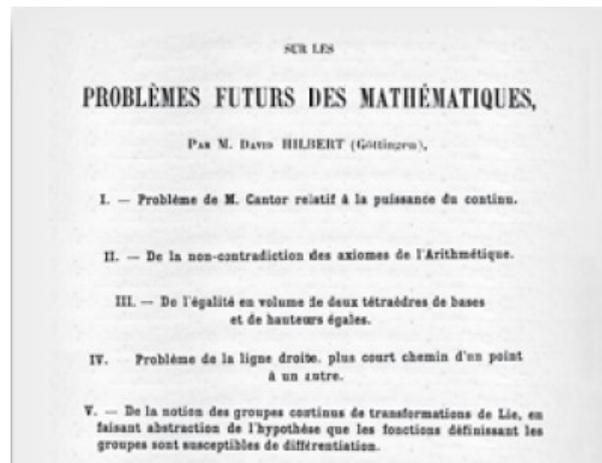
208 participants from 16 countries

David Hilbert.

Henri Poincaré.

Paris ICM 1900

Congress presided by Poincaré ; 250 participants from 26 countries.
Hilbert's lecture : On the Future Problems of Mathematics (23 problems - reduced to 10 in the lecture)

Heidelberg ICM 1904

- 396 participants from 19 countries
- 173 come from all over Germany (in the previous ICM's, the Berlin mathematicians were absent)
- 6 sections for specialised lectures

I. Arithmetics and algebra

II. Analysis and function theory

III. Geometry

IV. Mechanics and mathematical physics → Applied Mathematics

V. History and bibliography

VI. Teaching and Methodology → Pedagogy

1908 : Rome − 1912 : Cambridge (UK)

- At the Rome congress, a much larger place for applied mathematics and mathematics education (creation of the International Commission for Mathematics Education)
- 10 plenary talks (instead of 4) and 127 sectional talks
- 535 participants

- At the Cambridge congress, applications of mathematics have an even larger importance
- The number of participants reaches 574, from 28 countries

World War I

1920 : Strasbourg, 1924 : Toronto

1920 : Mathematicians from defeated nations are excluded

As for the relationships which have been broken by the tragedy of the past years, our successors will see if a sufficiently long period of time and a sincere remorse will allow them to resume some day, and if those who have excluded themselves from the circle of civilised nations are worthy to be readmitted. But for us who are to close to those events, we share Cardinal Mercier's words : « to forgive some crimes is to be their accomplice »

Emile Picard in 1920

1924 : Exclusion continues

Bologna (1928)

Mathematicians from WWI losers are reintegrated, but Berlin mathematicians chose not to come.

« It makes me very happy, that after a long, hard time all mathematicians of the world are represented here. (…) Let us consider that we as mathematicians stand on the highest pinnacle of the cultivation of the exact sciences. We have no other choice than to assume this highest place, because all limits, especially national ones, are contrary to the nature of mathematics. It is a complete misunderstanding of our science to construct differences according to people and races, and the reasons for which this has been done are very shabby ones (…) Mathematics knows no races . . . . For mathematics, the whole cultural world is a single country."
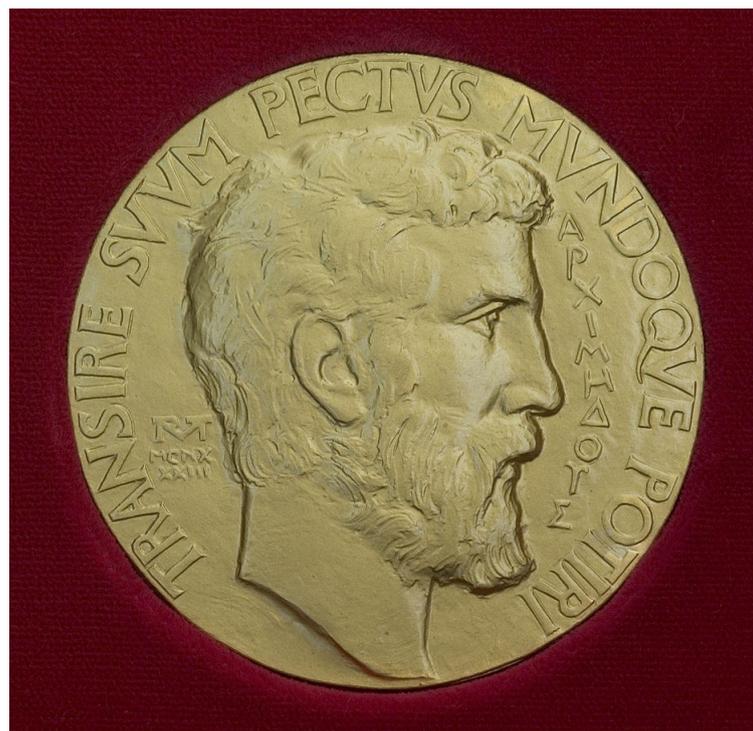
David Hilbert

Zürich 1932

The International Congress of Mathematicians, held in Zürich, is glad to accept the proposal made by professor Fields, who regretfully left us, to award two medals to two mathematicains every four years during the International Congresses.

Fields medals

The rule

- A prize to reward, but also to encourage, therefore given to young mathematicians
- Young ? Young means ≤ 40 (requires interpretation)
- At the beginning, two medals every four years ; starting in 1966, two to four medals ;
- since 1936, 56 medals have been distributed in 1936, 1950, 1954,... 2014).

Country comparisons

Fields medals statistics

Pays	Number of Fields medals	Since 1990
USA	11 + ?	2
France	10 + 2	6
(ex) USSR	9	7
UK	6	2
Japan	3	0
Belgium	2	0
...		

Seoul ICM lecturers

	Country of origin	Country of graduate education	Country of work
USA	26	84.5	73
UK	12	16.5	19.5
ex USSR	27	17	3.5
Germany	12	12	8
Italy	9	7.5	6.5
Japan	6	7	6
Israel	7	7	7
China	9	2	2
Korea	6	0	6
Switzerland	3	0	7
France	30	30.5	35

de Versailles - CNRS UMR 8100