1978 INTERNATIONAL CONGRESS OF MATHEMATICIANS

Once every four years, mathematicians from various parts of the world gather under the auspices of the International Mathematical Union (IMU) to talk about their research work, communicate with each other and witness the presentation of the prestigions Fields medal.

The awarding of the Fields medal was initiated in 1936 at Oslo and, except for a hiatus of fourteen years covering the Second World War, has generated since then much interest and expectations within the mathematical community. The Fields medal is popularly regarded as the equivalent of the Nobel prize in mathematics. A notable difference is that the former is traditionally awarded to mathematicians below the age of forty with the objective that "while it was in recognition of work already done it was at the same time intended to be an encouragement for further achievement on the part of the recipients and a stimulus to renewed effort on the part of others" - in the words of John Charles Fields (1863 - 1932), a mathematician and Chairman of the Committee of the 1924 International Mathematical Congress, who bequeathed part of his estate to the setting up of a trust for the award. On the material side, each recipient of the award receives a gold medal and a sum of 1500 Canadian dollars.

The complete list of Fields medallists is given below. The areas in which the award-winning contributions were made are also indicated.

1936, Oslo

Lars Valerian Ahlfors (b. 1907), Harvard University; Complex analysis

Jesse Douglas (b. 1897), Massachusetts Institute of Technology; Minimal surfaces

1950, Cambridge (Massachusetts)	Laurent Schwartz (b. 1915), University of Nancy, Analysis
	Alte Selberg (b. 1917), Institute for Advanced Study, Princeton; Number theory
1954, Amsterdam	Kunihiko Kodaira (b. 1915), Princeton University; Differential topology
	Jean-Pierre Serre (b. 1926), University of Paris; Number theory, topology
1958, Edinburgh	Klaus Friedrich Roth (b. 1925), University of London; Number theory
	René Thom (b. 1923), University of Strasbourg; Differential topology
1962, Stockholm	Lars V. Hörmander, University of Stockholm; Several complex variables
	John Willard Milnor (b. 1931), Princeton University; Differential topology
1966, Moscow	Michael Francis Atiyah (b. 1929), Oxford University; Topology
	Paul Joseph Cohen (b. 1934), Stanford University; Set theory
	Alexandre Grothendieck, University of Paris; Algebraic geometry
	Stephen Smale (b. 1930), University of California, Berkeley; Global analysis
1970, Nice	Alan Baker, Cambridge University; Number theory
	Heisuke Hironaka, Harvard University; Algebraic geometry
	Sergei P. Novikov (b. 1938), Moscow

	University; Topology
	John G. Thompson, Cambridge University; Group theory
1974, Vancouver	Enrico Bombieri, University of Pisa; Number theory, Minimal surfaces
	David B. Mumford (b. 1937), Harvard University; Algebraic geometry

This year the Congress will be held at Helsinki, Finland, from 15 August to 23 August. In addition to the presentation of the Fields medals at the opening ceremony, the mathematical activities will include seventeen one-hour plenary addresses in the form of broad surveys of recent progress in various fields of mathematics, more than one hundred 45-minute addresses in specified sections and numerous 10-minute oral communications by participants. A new feature of this Congress is the introduction of $1\frac{1}{2}$-hour poster sessions whereby participants may display their work on given bulletin boards. During the Congress, a symposium on the Mathematical Training of Mathematics Teachers will be organized by the International Commission on Mathematical Institution.

The one-hour plenary addresses and the 45-minute addresses are given below.

One-hour plenary addresses

L. V. Ahlfors	Quasiconformal mappings, Teichmüller spaces, and Kleinian groups
A. P. Calderon	Commutators, singular integrals on Lipschitz curves and applications
A. Connes	On the classification of von Neumann algebras
R. Dobrushin	Classical statistical mechanics as a

	branch of probability theory
D. Edwards	The topology of manifolds and cell-like maps
Gorenstein	The classification of finite simple groups
Kashiwara	Micro-local analysis
N. Krasovskii	Control under uncertain information and differential games
Langlands	Automorphic representations and L-functions
Manin	Modular forms and number theory
Novikov	Linear operators and integrable Hamiltonian system
Penrose	The complex geometry of the natural world
Schmid	Representations of semisimple Lie groups
N. Shiryayev	On absolute continuity and singularity of probability measures on functional spaces
P. Thurston	Geometry and topology in dimension three
Weil	History of mathematics : why and how
T. Yau	The role of partial differential equations in differential geometry

45 - minute addresses in sections

1. Mathematical logic and foundations of mathematics

H. Conway	Arithmetical operations on transfinite numbers

L. Harrington	Definability theory
A. Macintyre	Nonstandard number theory
G. S. Makanin	Rešenie problemy razrešimosti uravneniĭ svobodnoĭ polugruppe
D. A. Martin	Infinite games

2. Algebra

M. Aschbacher	A survey of the classification program for finite simple groups of even characteristic
K. S. Brown	Cohomology of groups
B. Fischer	Sporadische endliche einfache Gruppen
M. Hochster	Cohen-Macaulay rings and modules
V. Kac	Lie superalgebras
W. van der Kallen	Generators and relations in algebraic K-theory
V. P. Platonov	Algebraic groups and reduced K-theory
A. V. Roiter	Matrix problems
A. Suslin	The cancellation problem for projective modules and some related topics

3. Number theory

G. Choodnovsky	Algebraic independence of values of exponential and elliptic functions
J. H. Coates	The arithmetic of elliptic curves with complex multiplication
H. Iwaniec	Sieve methods
N. M. Katz	P-adic L-functions
G. Shimura	On some problems of algebraicity
R. Tijdeman	Upper bounds for solutions of

	exponential diophantine equations
R. C. Vaughan	Recent work in additive prime number theory

4. Geometry

D. Bogoyavlensky	On manifolds, satisfying Einstein equations with hydrodynamical stress-energy tensor
R. Connelly	Conjectures and open questions in rigidity
M. do Carmo	Minimal surfaces
M. Gromov	Synthetic geometry
V. M. Harlamov	Real algebraic surfaces
D. G. Larman	Recent advances in convexity
R. Osserman	Isoperimetric inequalities and eigenvalues of the laplacian
K. Shiohama	Convex sets and convex functions on complete manifolds

5. Topology

J. W. Cannon	The recognition problem : what is a topological manifold? A solution to the double suspension problem for homology spheres.
S. E. Cappell	Singularities of immersions and embeddings
A. J. Casson	Knot cobordism
D. Fuks	New results on the characteristic classes of foliations
A. Hatcher	Linearization in 3-dimensional topology

J. Lin	The topology of finite H-spaces
I. Madsen	Spherical space forms
S. Mardešić	Shape theory
D. C. Ravenel	Complex cobordism and its applications to homotopy theory
J. E. West	Hilbert cube manifold - meeting ground of geometric topology and absolute neighborhood retracts

6. Algebraic geometry

S. Bloch	K-theory and zeta functions of elliptic curves
F. A. Bogomolov	Unstable vector bundles and families of curves on surfaces
D. Gieseker	Some applications of geometric invariant theory to moduli problems
E. Looijenga	Homogeneous spaces associated to certain semiuniversal deformations
C. Procesi	Standard monomials, Young diagrams and invariant theory
S. Ramanan	Vector bundles on algebraic curves
K. Ueno	Classification of algebraic manifolds

7. Lie groups, algebraic groups, automorphic functions

I. Bernstein	Induced representations of GL(n) over p-adic field
W. Casselman	Jacquet modules for real groups
V. G. Drinfeld	Langlands' conjecture for GL(2) over functional fields
G. R. Kempf	Algebraic representations of reductive groups

I. Lepowsky	Lie algebras and combinatorics
I. Piatetski-Shapiro	Tate theory for reductive group
T. Shintani	On special values of zeta functions of totally real algebraic number fields

8. Real and functional analysis

W. Beckner	Basic problems in Fourier analysis
S. V. Boskarov	Method of averagings in the theory of orthogonal series
C. Foias	Contractive intertwining dilations and waves in layered media
A. M. Garsia	Some combinatorial methods in real analysis
E. M. Nikishin	The Pade approximants
N. K. Nikol'skiı	What problems the spectral theory and complex analysis can solve one for another?

9. Complex analysis

A. Baernstein	How the *-function solves extremal problems
P. A. Griffiths	Holomorphic mappings in one and several complex variables
B. Korenblum	Analytic functions of unbounded characteristic and Beurling algebra
J. Moser	The holomorphic equivalence problem for real hypersurfaces
Y. T. Siu	Extension problems in several complex variables

H. Skoda	Integral methods and zeros of holomorphic functions
J. Väisälä	Survey on quasiregular maps in R^n

10. Operator algebras and group representations

J. Dixmier	Enveloping algebras
R. G. Douglas	Extensions of C*-algebras and algebraic topology
A. Kirilov	Infinite dimensional groups; their orbits and representations
S. Sakai	Recent developments in the theory of unbounded derivations in C*-algebras
J. R. Wallach	The spectrum of compact quotients of semi-simple Lie groups
G. J. Zuckerman	Coherent translation of characters of semi-simple Lie groups

11. Probability and mathematical statistics

A. Borokov	Rate of convergence and large deviations for invariance principle
C. Dellacherie	A survey of the theory of stochastic integrals
M. Fukushima	Dirichlet spaces and additive functionals of finite energies
P. Revesz	Some properties of the coin-tossing sequence
S. R. S. Varadhan	Some problems of large deviations
A. D. Wentzell	Large deviations for stochastic processes

12. Partial differential equations

F. J. Almgren, Jr.	Minimal surfaces : tangent cones, singularities, and topological types
V. A. Ivriĭ	Propagation of singularities of solutions of symmetric hyperbolic systems
H. McKean	Riemann surfaces of infinite genus arising from nonlinear wave equations
R. B. Melrose	The singularities of solutions to boundary value problems
P. H. Rabinowitz	Critical points of indefinite functionals and periodic solutions of differential equations
J. Sjostrand	Eigenvalues for some hypoelliptic operators and related constructions
A. Weinstein	Eigenvalues of the laplacian plus a potential

13. Ordinary differential equations and dynamical systems

A. D. Bruno	Formal and analytical integral sets
M. R. Herman	Recent results on differentiable conjugacy of diffeomorphisms
Ju. Ilyashenko	Global and local aspects of geometric theory of complex differential equations
J. Mallet-Paret	Generic theory for functional differential equations
R. McGehee	Singularities in classical celestial mechanics
J. Palis, Jr.	Bifurcations and moduli of stability

14. Control theory and optimization problems

P. Brunovsky	On the structure of optimal feedback

	systems
F. H. Clarke	Nonsmooth analysis and optimization
L. Ekeland	Non-convex variational problems
N. V. Krylov	The control of the diffusion type processes
H. J. Sussman	Analytic stratifications and control theory

15. Mathematical physics and mechanics

H. Araki	Some topics in quantum statistical mechanics
M. F. Atiyah	Geometrical aspects of Gauge theories
J. L. Bona	Model equations for waves in nonlinear dispersive systems
L. D. Faddeev	Quantum theory solitons
J. Frohlich	The mathematics of phase transitions and critical phenomena
A. M. Jaffe	Introduction to Gauge theories
Ya. G. Sinai	Scaling in the theory of phase transitions

16. Numerical analysis

C. de Boor	Splines and B-splines
J. Nitsche	Finite element approximations to the one-dimensional Stefan problems
P. A. Raviart	Finite elements and duality
A. A. Samarskii	O cislennom resenii zadac mathematiceskoı fiziki
V. Thomée	Galerkin-finite element methods for parabolic equations

Discrete mathematics and mathematical aspects of computer science

W. Haken	Combinatorial aspects of some mathematical problems
S. V. Jablonskiĭ	On some results in the theory of functional systems
G.-C. Rota	Recent progress in combinatorics
G. Rozenberg	Some recent developments in formal language theory
C. C. Sims	Group theoretic algorithms, a survey
D. Uhlig	On the synthesis of self-correcting circuits

18. Mathematics in the social and biological science

R. J. Aumann	Recent developments in the theory of the Shapley value
S. I. Rubinow	Some contributions to mathematical biology

19. History and education

T. F. Banchoff	Computer animation and the geometry of surfaces in 3- and 4-space
A. I. Markushevich	Nekotorye voprocy razvitija teorii analitičeskih funkciĭ v XIX veke

Note The Secretary of the *Society*, Dr Chong Chi Tat, will attend the General Assembly of the IMU on 11-12 August, held in conjunction with the Congress, as the delegate from Singapore with financial support from the IMU fund for travel grant for young mathematicians. He will also participate in the Congress.