

General Assembly
of the
International Mathematical Union
Harrison Hot Springs, British Columbia, Canada
August 17 - 19, 1974

INTERNATIONAL MATHEMATICAL UNION

Executive Committee

(1 January 1971 - 31 December 1974)

President: Professor K. Chandrasekharan

Vice-Presidents: Professor Nathan Jacobson

Academician L.S. Pontrjagin

Secretary: Professor Otto Frostman

Members: Professor M.F. Atiyah

Professor Y. Kawada

Professor N.H. Kuiper

Academician M. Nicolescu

Professor E. Vesentini

Past President: Professor H. Cartan

**SEVENTH GENERAL ASSEMBLY
OF THE
INTERNATIONAL MATHEMATICAL UNION
Harrison Hot Springs, British Columbia, Canada
August 17-19, 1974 (opening Session 10.30 a.m.)**

AGENDA

1. Opening of the Assembly
2. Address by the President
3. Appointment of Committees:
(i) Credentials Committee, (ii) Resolutions Committee, (iii) Tellers,
(iv) Committee on Finance and Dues, (v) Nominating Committee.
4. Review of the Activities of the Union :
 - A. (i) Symposia, Conferences, (ii) IMU Lectures, (iii) IMU Fellowship,
(iv) Exchange Commission, (v) ICM I
 - B. (i) IMU Bulletin, (ii) Canberra Circulars, (iii) World Directory of
Mathematicians .
 - C. Support for the Organization of the International Congress of Mathema-
ticians; grants to young mathematicians from developing countries.
5. Items proposed for discussion by Members of the Union:
 - (a) Encouragement of the growth of mathematics in developing countries,
in cooperation with ICSU and Unesco.
 - (b) Problems concerning mathematical publications – the question of
financing journals; the proliferation of journals and the possible lowering
of standards; the copyright of articles and a possible "banking" of items
from which individual journals could select topics of particular interest to
specialist readers.
 - (c) The question of stimulating interest in the Union among countries that
have mathematical activities but are not yet members of the Union;
and the question whether the Union could act as a clearing house for
information, or possibly even initiate action, with regard to reciprocity
agreements between mathematical societies in different countries.

Appointment of Working Groups, as may be necessary, to consider these items.
6. Relations with ICSU and UNESCO

7. Finance and Dues

A. Financial reports for the years 1970-73

B. Proposals for 1975-78:

- (i) Recommendations of the Executive Committee to increase the income from dues in order to offset increased costs and the devaluation of currency: (a) to amend Statute 14 so as to increase the number of unit contributions payable by members in Group III, IV and V, from the present scale of 3, 5, and 8 units to a new scale of 4, 7 and 12 respectively, without changing the number of unit contributions payable by members in Group I and II (which are 1 and 2 respectively); (b) to amend Statute 15 so as to delete the requirement that the unit of dues be "fixed in gold weight"; and (c) to fix the unit at 600 Swiss Francs.
- (ii) Proposal from a Member of the Union to create a new membership group, called Group VI, with 13 unit contributions and 6 votes, and to amend Statutes 6, 8 and 14 accordingly.

C Budget estimates for 1975-78.

Recommendation of the Executive Committee to create an IMU Fellowship Fund, which could serve as a basis for attracting financial support from outside.

8. Terms of office of the President and Vice-Presidents

Proposal from a member of the Union to permit the President and Vice-Presidents to hold office for not more than two terms (or eight years), and to amend Statute 11 accordingly.

9. Elections :

(i) Commissions, (ii) Executive Committee.

10. Approval of the Budget for 1975-78

11. IMU and the International Congress of Mathematicians

12. Adoption of Resolutions

13. Next Meeting of the General Assembly

14. Any other item with the permission of the President

**REPORT OF THE EXECUTIVE COMMITTEE TO THE
SEVENTH GENERAL ASSEMBLY**

OF THE INTERNATIONAL MATHEMATICAL UNION

Harrison Hot Springs (Canada), August 17-19, 1974

(covering the period June 1, 1970 - June 30, 1974)

A. MEMBERSHIP

The Union has now 42 members, the same number as at the time of the General Assembly at Menton in 1970. However, Malaya-Singapore is no longer a member, whereas Nigeria has been admitted by postal ballot into Group I from 1974. The change of the Group of Adherence of the German Democratic Republic from I to III, effective from 1971, was approved by the General Assembly at Menton. Moreover, the following changes of the Groups of Adherence have been approved by postal ballots: Australia and Sweden from II to III, Bulgaria from I to II, all effective from 1973, and Japan from IV to V, effective from 1974. Thus, the members are distributed as follows:

- Group I Argentina, Brazil, China-Taiwan, Cuba, Greece, Iceland, Ireland, Mexico, New Zealand, Nigeria, North Korea, Norway, Portugal, South Africa, Turkey;
- Group II Austria, Bulgaria, Denmark, Finland, Israel, Pakistan, Rumania, Spain, Yugoslavia;
- Group III Australia, Belgium, Canada, Czechoslovakia, German Democratic Republic, Hungary, India, the Netherlands, Sweden, Switzerland;
- Group IV Federal Republic of Germany, France, Italy, Poland;
- Group V Japan, UK, USA, USSR.

This membership corresponds to a total voting strength of 99 and an annual subscription of 115 units. At present the unit is fixed at US \$ 130.40; the total amount of dues is therefore US \$ 14.996.00.

B. SYMPOSIA and CONFERENCES

The following symposia and conferences were held under IMU's co-sponsorship during the period under report. Detailed accounts of these have already been presented in the IMU Bulletin, No. 3, 5, 7.

- 1971 1. International Conference on Number Theory, Moscow, September 14-18.
- 2. Third Prague Symposium on General Topology, August 30-September 3.

- 1972 1. International Symposium on Partial Differential Equations and the Geometry of Normed Linear Spaces, Jerusalem, June 19-28.
2. International Colloquium on Analysis and Differential Topology, Strasbourg, June 19-28.
3. International Conference on Mathematical Problems of Quantum Field Theory and Quantum Statistics, Moscow, December 12-19.
- 1973 1. International Colloquium on Discrete Subgroups of Lie Groups and Applications to Moduli, Bombay, January 8-15.
2. International Conference on Manifolds and Related Topics in Topology, Tokyo, April 10-17.
3. International Colloquium on Infinite and Finite Sets, Keszthely (Hungary), June 25-July 1.
4. International Geometry Symposium, Cambridge (Great Britain), July 4-11.
5. Second International Conference on the Theory of Groups, Canberra, August 13-24.
- 1974 1. International Conference on Mathematical Questions of Optimal Control Theory, Zakopane (Poland), January 7-14.

C. IMU LECTURES

At its meeting in Zürich, May 14-16, 1971 the Executive Committee decided "to invite, from time to time, a distinguished and active mathematician, of international standing, to give a set of four to six lectures, on important new developments in mathematics to which the lecturer himself, directly or indirectly, has made a contribution, and which deserve to be 'surveyed' at some length, for the benefit of younger mathematicians as well as others" (IMU Bulletin, No. 2, p. 5). It was also decided that the lectures should be given at mathematical centres "where an interested and competent audience is easy to presuppose"; further, that the lectures, for the time being, should be published in the *L'Enseignement Mathématique*. Four such lectures have been given:

- 1, by Professor Wolfgang M. Schmidt, "Approximation to Algebraic Numbers", Institute for Advanced Study, Princeton, February 1971;
2. by Professor Lars Hörmander, "On the Existence and Regularity of Solutions of Linear Differential Equations", Institute for Advanced Study, Princeton, March-April 1971;

3. by Professor F. Hirzebruch, "The Hilbert Modular Group", University of Tokyo, February-March 1972;
4. by Professor J.-L. Lions, "Optimization Problems in Partial Differential Equations", Steklov Mathematical Institute, Moscow, November 1972.

D. IMU FELLOWSHIP

At its meeting in Moscow, September 20, 1971 the Executive Committee decided "to create an IMU Fellowship, with a grant of about \$ 2.000 a year, for mathematicians in developing countries, working at the post-graduate level" (IMU Bulletin, No. 3, p. 3). Up to date only one such Fellowship has been awarded: to Dr. César Camacho from Lima, Peru, for studies of "Actions of Non-compact Abelian Groups on Manifolds" at IHES, Bures-sur-Yvette (France), and at the University of Warwick (Great Britain).

E. ACTIVITIES OF COMMISSIONS

I. **International Commission on Mathematical Instruction (ICMI)** **Report on the period 1971-1974, by Professor Sir James Lighthill**

1. During this period ICMI was composed of the members-at-large

J. Lighthill	Y. Mimura
M. Barner	J. Novák
F. Châtelet	H. Pollak
A. Gleason	S.L. Sobolev
L. Lombardo-Radice	J. Surányi

and 38 nominees of National Subcommissions. The Secretary was E.A. Maxwell. Vice Presidents were S. Iyanaga and J. Surányi.

The Executive Committee consisted of

J. Lighthill (President)	H. Freudenthal
S. Iyanaga	J. Pollak
J. Surányi	S.L. Sobolev
E.A. Maxwell	

2. The 2nd International Congress of Mathematical Education was held in Exeter, England from 29 August to 2 September 1972 with an attendance of 1400 full members from 70 different countries. Apart from 7 plenary sessions at which addresses were given to the whole Congress, the work of the Congress took place in 38 Working Groups, in which different topics in mathematical education were actively discussed by those principally interested, and in 17 National Presentations of current developments in mathematical education from many different countries. The Proceedings were published by the Cambridge University Press (1973) under the general title 'Developments in Mathematical Education'.

3. An ICMI Seminar was held at Echternach, Luxembourg from 4 to 9 June 1973 on 'New Aspects of Mathematical Applications at School Level', under the sponsorship of the Luxembourg Government, with participants from 20 countries. Opening addresses were given by the chairman, L. Kieffer, by the President of ICMI, and by the Prime Minister of Luxembourg, and 18 lectures were given.
An ICMI Symposium was held at Eger, Hungary from 18 to 22 June, 1973 on 'Theoretical Problems of Teaching Mathematics in Primary Schools', under the sponsorship of the Hungarian Government, with participants from 18 countries. There were 18 main lectures and 20 sectional lectures.
4. ICMI adopted a new policy of holding Regional Symposia to facilitate wider discussion of mathematical education outside those areas of Europe and America where international meetings on the subject have mainly been held hitherto. The first such Regional Symposium, sponsored jointly between ICMI, UNESCO and CEDO (Centre for Educational Development Overseas), is being held in Nairobi, Kenya from 2 to 11 September, 1974 on 'The Interaction between Linguistics and Education in Mathematics'. The second such Regional Symposium, sponsored jointly between ICMI and JSME (Japan Society of Mathematical Education), is being held in Tokyo, Japan from 5 to 9 November, 1974 on 'Curriculum and Teacher Training for Mathematical Education'.
5. In 1974, ICMI will meet also in Vancouver, Canada during the International Congress of Mathematicians in August. The Executive Committee has specified the general theme of the Mathematical Education discussions at Vancouver as 'Evaluation of Modern Mathematics Curricula'.
6. Plans for 1975 include a third Regional Symposium in India, a second symposium on mathematics in primary schools in Poland, and a symposium on aspects of geometry teaching. ICMI is, in addition, a co-sponsor of the 2nd World Conference on Computer Education to be held in 1975 in Marseille, France by IFIP (International Federation of Information Processing).
7. ICMI initiated in 1972 the regular issue of a series of Bulletins including information on ICMI activities and plans and other relevant material (for example, in ICMI Bulletin no. 2 an extensive list of Journals in Mathematical Education from all countries published with the kind permission of the US National Council of Teachers of Mathematics). At the same time the official journal of ICMI continued to be 'Enseignement Mathématique'.

8. The Executive Committee of ICMI accepted the invitation of the National Sub-Commission of the Federal Republic of Germany to hold the 3rd International Congress of Mathematical Education in Karlsruhe, Germany from 16 to 21 August 1976. A Local Committee for the Congress is being formed under the chairmanship of Professor H. Kunle, together with an international Programme Committee. Careful study aimed at ensuring a Congress Programme of outstanding interest has already begun.

Terms of Reference of the International Commission on Mathematical Instruction (ICMI)

- (a) The Commission shall consist of ten members-at-large elected by the General Assembly of IMU on nomination of the President of IMU, and of one national delegate from each member nation, as specified below.
- (b) The officers of the Commission shall consist of a President, a Secretary, and two Vice-Presidents. The President shall be elected by the General Assembly on the nomination of the President of IMU from the membership-at-large of the Commission.
- (c) The Executive Committee of the Commission shall consist of the officers of the Commission together with three additional members elected by the membership of the Commission.
- (d) In all other respects the Commission shall make its own decisions as to its internal organization and rules of procedure.
- (e) Any National Adhering Organization wishing to support or encourage the work of the Commission may create, or recognize, in agreement with its National Committee, a National Sub-Commission for ICMI to maintain liaison with the Commission in all matters pertinent to its affairs. The National Adhering Organization in question shall designate one member of the said Sub-Commission, if created, to serve as a delegated member of ICMI as mentioned in (a).
- (f) The Commission shall be charged with the conduct of the activities of IMU, bearing on mathematical or scientific education and shall take the initiative in inaugurating appropriate programmes designed to further the sound development of mathematical education at all levels, and to secure public appreciation of its importance. In the pursuit of this objective, the Commission shall co-operate, to the extent it considers desirable with effective regional groups which may be formed spontaneously, within, or outside, its own structure.

- (g) The Commission may, with the approval of the Executive Committee of IMU, coopt, as members of ICMI, suitably chosen representatives of non-IMU countries, on an individual basis.
- (h) The budget of the Commission shall be submitted to the Executive Committee of IMU and the General Assembly, for approval, at such times as may be determined by agreement between the Commission and the Executive Committee of IMU.
- (i) The Commission shall file an annual report of its activities with the Executive Committee of IMU, and shall file a quadrennial report at each regular meeting of the General Assembly.

Paris, April 1960.

II. Commission on Exchange of Mathematicians
Report on the period September 1970 to February 1974
By Professor F. Hirzebruch

- (i) Composition of the Commission:
 - Chairman: Prof. F. Hirzebruch, Mathematisches Institut, University of Bonn, Germany
 - Members: Prof. P.D. Lax, Courant Institute of Mathematical Sciences, New York University, New York, USA
Dr. A. Zhizhchenko, Akademia Nauk, Leninskij prospekt 14, Moscow, USSR.
- (ii) Activity: The Exchange Commission has handled applications for IMU Lectureships and has granted them directly in agreement with a budget determined by the Executive Committee.

The following IMU Lectureships have been granted during the period under report

Name of lecturer	Inviting Country	Place and period of lectures
1. Prof. G. Segal UK	Poland	Warsaw October 2 - 10, 1970

Titles of Lectures: "KO-theory and Clifford algebras"
"Sullivan's proof of the Adams conjecture and some applications in homotopy theory"
"Equivariant homotopy"
"Skew-symmetric operators"
"Symmetric groups and homotopy theory"

Name of lecturer	Inviting Country	Place and period of lectures
2. Prof. A. Weil USA	USSR	Moscow April 15 - 30, 1971

Titles of Lectures: "On the quadratic reciprocity law"
"On the explicit formulas of the theory of prime numbers"
"On non-abelian laws of reciprocity"

3. Prof. P.R. Ahern Italy	Ireland	Cork, Ireland Lectures at the Royal Irish Academy Summer School on Complex Function Theory 1971
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4. Prof. E. Brieskorn Germany	Cuba	University of La Habana, Cuba; seven weeks during February, March and April 1973
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Course: "Qualitative Theory of Dynamical Systems"
Series of four talks for a larger audience to give a
general orientation and survey on the field of
geometry and topology
Discussion on changes in the curriculum with
members of committees working on these.

(iii) The total number of Lectureships was small and even smaller than in the preceding period. Several other applications were received and in most cases Lectureships granted, but the Lectureships did not materialize because the invited mathematicians were unable to accept. One application for 1975 was already received.

The procedure of granting Lectureships was efficient and should be continued in this way. The existence of the Commission was not known widely enough, it is strongly recommended to the Executive Committee to publicize it more.

An application for the support of mathematics in developing countries was forwarded to the special commission of the IMU set up for such purposes.

The Commission should continue to support exchange mainly between those countries where problems of foreign money exchange and similar problems make the exchange of mathematicians difficult and where exchange is not yet existing on a wide basis by other means.

F. MEETINGS OF THE EXECUTIVE COMMITTEE

The Executive Committee met seven times during the period under report:

- (i) 27th Meeting, Menton, August 27, 1970;
- (ii) 28th Meeting, Nice, September 7, 1970;
- (iii) 29th Meeting, Zürich, May 14-16, 1971;
- (iv) 30th Meeting, Moscow, September 20, 1971;
- (v) 31st Meeting, London, June 8-9, 1972;
- (vi) 32nd Meeting, Frankfurt, June 1-2, 1973;
- (vii) 33rd Meeting, Zürich, March 7-8, 1974.

Reports on the first two meetings have been published in the *International Mathematical News* (Vienna), No. 99; all the following meetings have been reported on in the *IMU Bulletin*, No. 2-5 and No. 7.

G. WORLD DIRECTORY OF MATHEMATICIANS

At its meeting in London, June 8-9, 1972 the Executive Committee decided that a fifth edition of the *World Directory of Mathematicians* should be published in 1974, well in advance of the *International Congress of Mathematicians* in Vancouver. It also decided to use the same printers as for the fourth edition, Messrs. Almqvist & Wiksell, Uppsala, Sweden. At its next meeting in Frankfurt, June 1-2, 1973 the Executive Committee decided to re-create a Bureau for the *World Directory of Mathematicians*, with Professor Frostman in charge of it for producing the fifth edition. The new edition is now ready for sale; the price is \$ 10.00 (net), packing and postage included.

H. RELATIONS WITH ICSU—UNESCO

The annual ICSU—UNESCO subvention, which now stands at US \$ 8.750, has been of great help to the Union in its effort to promote international scientific activity. Moreover, for 1973 IMU received an additional grant of \$ 2.000 to finance the IMU Fellowship, and for 1974 an additional grant of \$ 8.000, in the first place intended for travel grants to young mathematicians from developing countries to facilitate their participation in the *International Congress of Mathematicians* in Vancouver. The Union is particularly thankful to ICSU for this generous assistance.

An application for moral and financial support of a mathematical symposium in Mali in 1974 has been passed on to ICSU and COSTED. The Union has also been actively associated with ICSU's Inter-Union Commission on the Teaching of Science (CTS) through Professor A. Lichnerowicz.

With UNESCO the Union has been directly associated through contracts of specific projects undertaken by ICMI. The Union has responded to UNESCO's initiative to get the Union's advice on matters of interest to them.