European Mathematical Society

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Financial support for young researchers

The Human Capital and Mobility (HCM) programme of the European Community can provide financial support to selected young researchers and post-graduate students to enable them to attend Euroconferences. Euroconferences are high-level scientific meetings which have been selected by the Programme for their scientific quality and format. The grants are restricted to these conferences; **application must be made to the conference organisers. The Commission of the European Communities is not to be contacted** for support for individual participation in these or other conferences. Selection of persons for support is made by a Mixed Committee of conference organisers and Commission representatives. The support may contribute towards registration fees, subsistence expenses during the conference, travel. The decision is at the discretion of the Mixed Committee.

The selected researchers may not benefit, for any given expense in connection with participation, from funding from HCM at the same time as from any other source, but it is allowable for different expenses to be funded from different sources (e.g. registration fees from one source and travel from HCM).

Application forms may be obtained from the above address.

European Mathematical Society

OFFER FROM SPRINGER-VERLAG

The EMS is pleased to announce a benefit in the form of a discount offer for "Zentralblatt für Mathematik und ihre Grenzgebiete (Zbl)" to its corporate members: Springer-Verlag has offered a 15% discount on the regular subscription price. Member societies of the EMS may make this offer available to all their individual members (whether or not they are individual members of the EMS) as well as to all their institutional members.

The operational details of the discount scheme will be as follows: Springer-Verlag will inform each participating society about the price of the discounted Zbl subscription for the following year annually at the end of June. The society will ascertain which of its (individual or institutional) members wish to take advantage of the discounted price for the following year, and will inform Springer-Verlag by the end of November of the number of subscriptions required and supply Springer with a list of the addresses of all subscribers in a format agreed with Springer-Verlag. Springer-Verlag will then send an invoice for the total amount due for the discounted subscriptions to the member society, which will pay this amount by the end of December. (Participating societies will notice that it will be in their interest to collect payment from subscribers before December in order to meet the deadline.) Springer-Verlag will mail the Zbl issues directly to its subscribers within fourteen days after the date of publication.

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The EMS is grateful to Springer-Verlag for making this offer available, and hopes that its member societies will find this an attractive benefit of being a member of the EMS, helping them to recruit institutional members. Please note that the EMS cannot directly negotiate discounted Zbl subscriptions. These must be arranged through an EMS corporate member as described above.

For your information: the regular subscription price of Zbl for 1994 is DM 9,340 plus carriage charges. Please note that we have very attractive offers for those subscribing additionally to the Cd-ROM CompactMATH and/or the online-database MATH. Please be informed that within the European Union the local VAT (of your member's country of residence) is effective.

PROFESSOR HENRIK H. MARTENS, 1927 – 1993

Professor Henrik H. Martens died suddenly on October 12 1993. A highly respected scientist and a nestor of Norwegian mathematics has left us. He was a Council delegate of the European Mathematical Society.

Henrik Martens was born in Haugesund March 16 1927. He did not complete gymnasium (the Norwegian equivalent of American High School), but instead went to sea and worked for some years as a radio-telegraphist in the Norwegian Merchant Marine. In 1949 he settled in New York where he was first employed as a technical assistant at Consolidated Edison and later at Bell Telephone Laboratories. He took evening classes at Cooper Union School of Engineering and received a degree in Electrical Engineering in 1956. While still employed at Bell Telephone Laboratories he began studying mathematics. In 1962 he received his doctoral degree from the Courant Institute, New York University. After this he held temporary positions at Columbia University and at the University of Oslo. In 1965 he was employed as an Associate Professor of Mathematics at the University of Maryland. He held this position until 1968 when he was appointed Professor of Mathematics at the Norwegian Institute of Technology (NTH). He was Visiting Professor at the University of Illinois 1974–75 and has had several sabbaticals in the United States and in Europe. He remained in the position at NTH until, in 1991, he was awarded a special professorship by the Norwegian Research Council for Science and the Humanities.

Henrik Martens was elected a member of the Norwegian Academy of Science and Letters, the Norwegian Academy of Technological Sciences, the Royal Norwegian Society of Science and Letters and the Finnish Academy of Science and Letters as well as a number of other international mathematical associations. From 1986 he was the Norwegian representative on the board of the Mittag–Leffler Institute.

Henrik Martens' scientific contributions include research in the theory of closed Riemann surfaces and their Jacobians. In his first paper he presented an astonishing new proof of Torelli's theorem. His work has in an essential way deepened our understanding of this field of mathematics. Henrik Martens was scientifically active right up until the end. In September this year he gave a talk on some of his latest results and some open problems in the theory of mappings between Riemann surfaces. The occasion was the 75th anniversary of the Norwegian Mathematical Association.

Already from the start of his engagement as a Professor at NTH he felt that one of his prime tasks was to develop an environment more suitable to applications. Martens was the first in Norway to see the need to give the engineering students a thorough background in mathematics which would be well suited to our high technological industry. For this reason he initiated a new direction of technological studies which we now call Industrial Mathematics. This line of studies was established in 1982 and over the years it has become increasingly more popular.

Martens was also active internationally in the development of industrial mathematics. In 1985 he helped to establish the European Consortium for Mathematics in Industry (ECMI), which has the task of spreading in Europe research and education within Industrial Mathematics. Since its establishment Martens has been a member of the board, and was this year elected as President of ECMI.

Martens is survived by his wife, Kirsten, a daughter, Inge, and a son, Chris.

Kari Hag **Helge Holden** **Kristian Seip**

Norwegian Institute of Technology

Centre de Recerca Matemàtica (Barcelona)

10th Anniversary

New Location

This year the Centre de Recerca Matemàtica (CRM) celebrates the 10th anniversary of its foundation. This event coincides with the opening of its new premises in the Faculty of Sciences of the Universitat Autònoma de Barcelona (UAB), not far from its former location. The new offices, which have been inaugurated in February, will provide a pleasant working environment for up to fifteen visitors.

Researchers at the CRM can use the facilities of the UAB, including a science library with more than 8,000 books and 230 mathematical journals, as well as the computer network. Since 1992, the CRM has permanent leases on several furnished apartments at the disposal of its guests on the campus of the UAB.

Founded by the IEC

The CRM was created in 1984 by the Institut d'Estudis Catalans (IEC). The IEC is an academic, scientific and cultural body, founded in 1907, whose sphere of activities includes all territories within the Catalan language and culture. There are 23 affiliated societies in the charge of the IEC, one of which is the Catalan Mathematical Society. Since 1993, the IEC awards every year the international prize Ferran Sunyer i Balaguer to an outstanding mathematical monograph (see Newsletter No. 8, p.12).

Activities in 1993

During 1993 the CRM invited 60 researchers from many different countries. The average duration of the stays were three and a half months. 180 talks were given in this period, and 57 papers were published in the CRM preprint series.

Three postdoctoral grants were awarded to young researchers for the academic year 1993-94. One Leibniz postdoctoral fellowship was awarded in the framework of the Human Capital and Mobility Program of the European Community, in which the CRM participates together with other European institutions (see Newsletter No.9 , p.3). In addition, the Government of Catalonia offered two posts of visiting professors, and the Spanish Ministry for Education and Science gave four grants to invite professors on sabbatical leave.

Visitor programmes

Since 1989, the CRM organizes every year one or two specialized semesters, in connection with the Mathematics Department of the UAB. The list of themes includes: Algebra (Fall 1989), Algebraic Topology (Spring 1990 and Spring 1994), Dynamical Systems (Fall 1990 and Fall 1994) Stochastic Analysis (Fall 1991), Geometric Methods in Group Theory (Fall 1992), Analysis (Spring 1993), Continuous Computability and Complexity (Fall 1993), Differential Geometry (Spring 1995).

In addition, the CRM has recognized several conferences and workshops. One of the most successful meetings was the *Symposium on the Current State and Prospects of Mathematics* (June 1991), where seven Fields medallists discussed the present and future of mathematics. The proceedings of this meeting appeared as vol. 1525 of the Springer series Lecture Notes in Mathematics

Contact address

For more information about the CRM, please contact the Director Professor Manuel Castellet or the Secretary Mrs Consol Roca at the following address:

CRM, Centre de Recerca Matemática, Institut d'Estudis Catalans, Apartat 50, E-08193 Bellaterra, Spain.

Tel: (34-3) 581 1081 Fax:(34-3) 581 2202 Telex:52040 EDUCIE e-mail:icrm0@cc.uab.es

Funding of Academic Mathematical Research in the Netherlands - a Survey

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The funding system in the Netherlands is complex, because many different funding agencies and subagencies are involved. In this paper, an outline is given of the several ways academic research in mathematics is currently being funded. The following aspects are being highlighted:

- Survey of the funding system;
- The role of the Foundations NWO and KNAW, two main sources of secondary funding of academic research.

1. Introduction

Funding is usually institutional or project-oriented. The institutional funding covers 70-90 % of the funding of the academic research centres and the universities and comes from one or two sources. The project-oriented funding consists of several pieces of funding from various sources. In practice, the difference is not always clear, because institutional funding sometimes includes an earmarked part (dedicated to projects), while on the other hand project-oriented funding is sometimes used for exploiting a specialist research institute for a limited period.

2. Funding sources

In the Netherlands there are three main sources of funding academic research (see Figures):

- Primary funding: Funding of research at Universities by Government. The Government distributes the money over the universities. On the level of the University Boards the money is divided over faculties. On faculty level, the faculty committees decide about the budget for Mathematical research. An estimated 58 MHfl (MHfl = 1 million of Dutch Florins) is spent annually.

- Secondary funding: Funding of research at scientific research centres and universities by Government-funded agencies like

  - NWO : The Netherlands Organization for Scientific Research.
  - KNAW : The Royal Netherlands Academy of Arts and Sciences.

  An estimated 14.0 MHfl is spent annually.

- Tertiary funding: All other sources of funding. These include:

  – Funding of contract research for industry and government research institutes.
  – Paying of researchers by industry (Shell, Philips), (semi-)government agencies (PTT Research, Rijkswaterstaat, KNAW), etc. Examples are Shell fellows at research centres, professors paid by KNAW.

  An estimated 5 MHfl is involved annually.

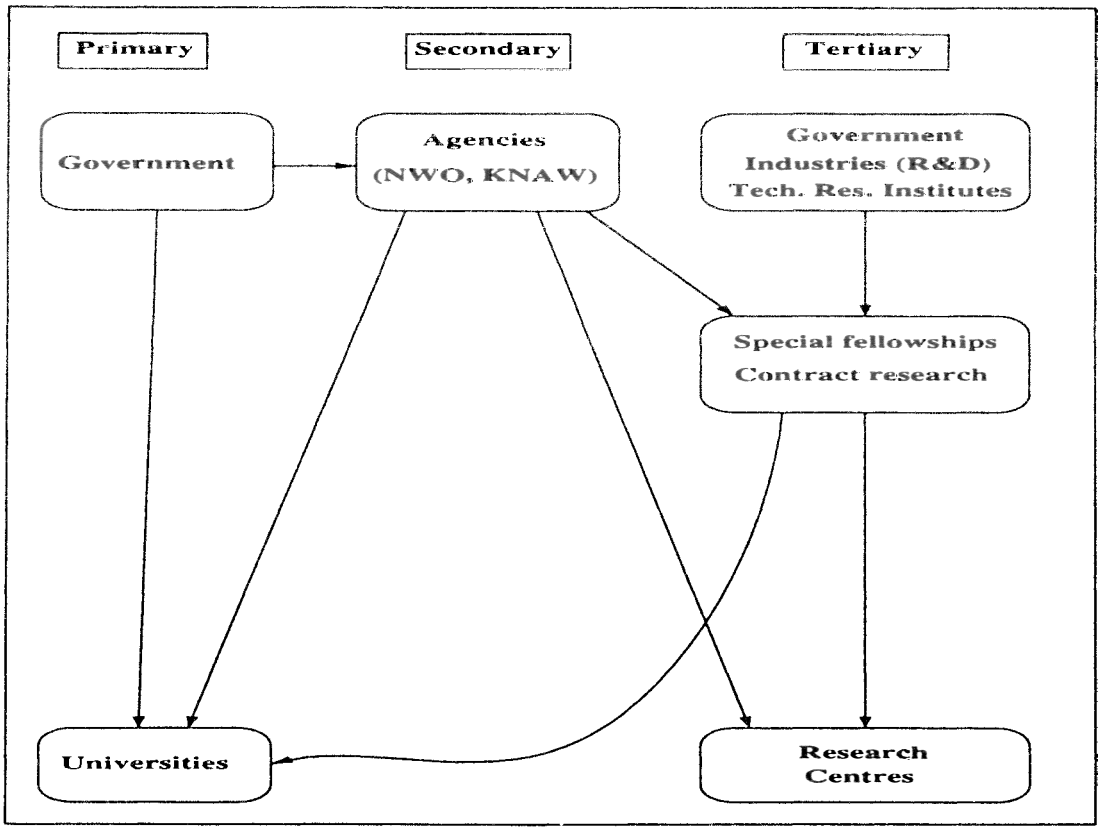

FIGURE 1. *Survey of funding sources in the Netherlands*

3. THE ROLE OF NWO AND KNAW

3.1. NWO

This foundation is the main source of income for many research organizations, amongst them SMC for Mathematics, FOM for Physics.

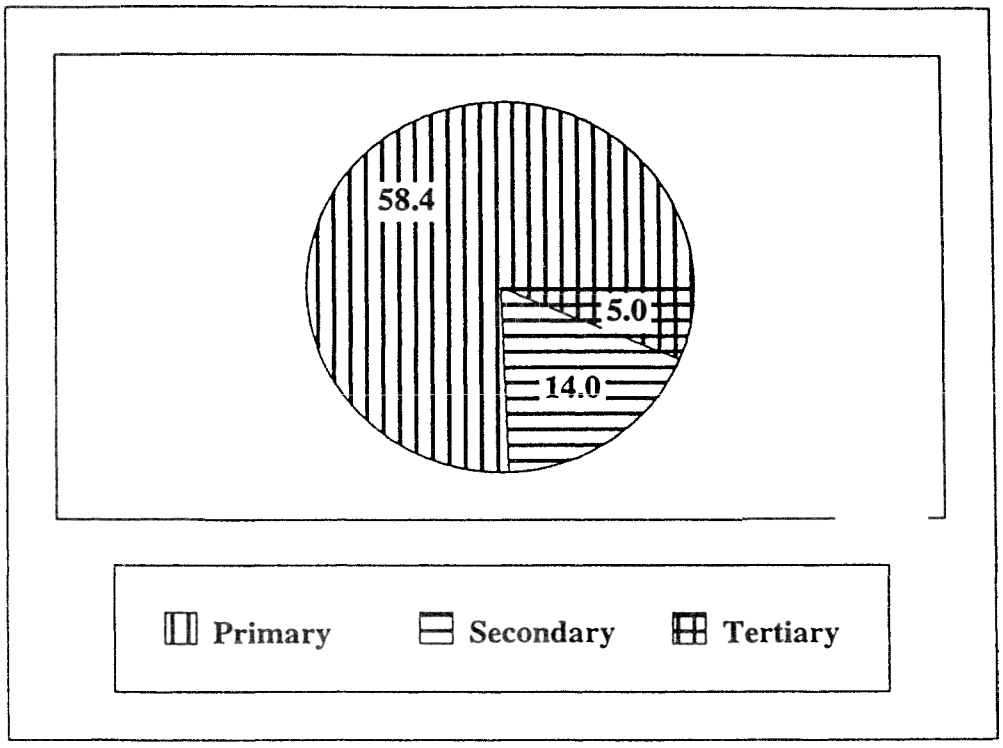

FIGURE 2. *Subdivision of funding sources in the Netherlands in millions of Dutch Guilders*

Most of the SMC money is spent for CWI, the research centre for Mathematics and Computer Science. Besides this institutional funding, NWO also does project-oriented funding. This project-oriented funding is done on institutional level (SMC, FOM, etc.) or administrative level, e.g. on GB-E level (GB-E is the department of NWO in charge of sciences like physics, chemistry, mathematics. etc) . It is realized in several ways:

1) By seconding researchers at Universities and other Research institutes. The researchers are directly paid by NWO, but NWO has established some specialist foundations which coordinate and monitor the seconding of the researchers.

2) By (partial) funding of special activities of Research Foundations or Universities. Examples of such special programmes are

   - The HPCN (High Performance Computing and Networking) programme
   - The Non-Linear Dynamic Systems programme
   - The PIONIER programme. This enables highly qualified researchers to conduct specialist research within their area for a period of some years.

   - The STIMULANS programme. This provides some additional funding to University Research Schools (see the appendix for more information on the Research Schools). This funding covers the costs of incidental events like workshops.

3.2. KNAW

This organization is doing inter alia the following activities:

1) Establishing fellowships for young and promising mathematicians. These are paid by KNAW or some special-purpose foundation funded by KNAW.

2) Exploiting some research institutes, e.g. the National Institute for Brain Research.

3) Exploiting a vast library.

APPENDIX. RESEARCH SCHOOLS

Since about 1992 some universities are jointly operating advanced schools for research, education and training in specialized chapters of disciplines like mathematics. Only highly qualified students are admitted to these schools. The purpose of these schools is two-fold:

1) Creating a platform for educating Ph.D. students to their doctoral thesis

2) Combining researchers from several institutes into research groups.

Newsletter

World Mathematical Year 2000

Institut Henri Poincaré (IHP) • 11, rue Pierre & Marie Curie • 75231 PARIS Cedex FRANCE

Editorial

by

J.L. Lions, President of IMU

The declaration of Rio de Janeiro on Mathematics, the text of wich is to be found in the next columns of this Newsletter, has declared year 2000 to be World Mathematical Year - in short WMY 2000.

I am glad to present here the first issue of this Newsletter, the purpose of wich is being intented to give the largest possible audience all informations related to this intiative.

Dissemination of this Newsletter is made possible thanks to the very kind help of the I.H.P. (Institut Henri Poincaré) and of the Ecole polytechnique. All suggestions, remarks and correspondence, must be sent to the adress given at the end of this Newsletter. Documentation and preparation for the first issue have been realized by Mrs. H. Gispert and by Mrs A. Theis, who is assisting me in my responsability of President of the International Mathematical Union.

Mrs H. Gispert will gather all further information and will be in charge of preparing the next issues.

This Newsletter is sent to all the National Committees and National Commissions - ICMI, CDE, ICHM, and to the CTP, the Third World Academy of Sciences, ICPAM Adhering Organizations of IMU, as well as to the IMU and to other Mathematical Societies.

We thank in advance all these Committees and Institutions to help spreading this Newsletter as widely as possible, among their members and surroundings. We very much hope the tool we are thus setting will greatly help encouraging this intiative.

Declaration of Rio de Janeiro on Mathematics

On May 6th, 1992, in Rio de Janeiro, during the celebration of the 40th anniversary of the world-wide reputed Institute of Pure and Applied Mathematics (IMPA), Professor Jacques -Louis Lions, President ot the International Mathematical Union (IMU) declared in the name of this Union, that the year 2,000 will be the World mathematical Year.

WMY 2,000 is set under the sponsorship of UNESCO (Professor Frederico Mayor), of the Third World Academy of Sciences (Professor Abdus Salam and Professor Carlos Chagas, who took part in the declaration of Rio de Janeiro), of the French Minister of Research and Space (Professor H. Curien), of the Brazilian Academy of Sciences (Professor Israel Vargas) and of the Swiss Federal Counsellor, Dr. Flavio Cotti, the next International Congress of Mathematicians being organized in Zürich in August 1994.

The Declaration of Rio de Janeiro sets three aims.

1. First aim : the great challenges of the 21st century.

During his conference in Paris in 1900, David Hilbert listed a series of the main problems that the now ending century had to challenge.

The American Mathematical Society suggested in 1990, at the last General Assembly of IMU in Kobe (Japan), that first class mathematicians, to be represented within the Turn of the Century Comittee, organize the efforts to envision what the great challenges of the year 2,000 would be. This Committee is chaired by Professor Jacob Palis Jr, IMPA (Brasil) Secretary of IMU.

2. Second aim : Mathematics, keys for Development.

Pure and Applied Mathematics are one of the main keys of the understanding of the world and of its development.

That is why it is essential that countries which are members of UNESCO are gradually able to reach a level enabling their admission to IMU, the members of which are 50 nations for the time being. Therefore, the second aim of the Declaration of Rio de Janeiro is that most countries which are members of UNESCO reach such a level for the turn of the century.

That implies great additional efforts in the fields of Education, of Training, and - a very sensitive point for countries that face difficulties in having currency resources - of access to Scientific Information.

Such efforts which have already been widely undertaken, will be confirmed and raised by the two mains commissions of IMU : ICMI (Internationl Commission on Mathematical Instruction), which is chaired by Professor M. de Guzman from Madrid and whose Secretary is Professor M. Niss from Denmark,

Declaration of Rio de Janeiro on Mathematics

and the CDE (Commission on Development and Exchange), which is presided by Professor M. S. Narasimhan from Bombay and whose Secretary is Professor P. Berard from Grenoble, France. Both commissions are linked with UNESCO, which was represented in Rio de Janeiro by Professor A. Marzollo, responsible for mathematics.

3. Third aim : the image of Mathematics.

The Declaration of Rio de Janeiro sets as third goal, which also has the greatest importance, a systematic presence of mathematics in the "Information Society" thanks to examples and applications which will be scientifically exact and open to the largest number.
That will be developed in connection with such efforts which have already been undertaken by many countries that are members of IMU.
The Declaration of Rio de Janeiro on Mathematics announcing the World Mathematical Year 2,000 was warmly supported not only by all the mathematicians present in Rio and who had come from all continents, and by of course many of the Brazilian most eminent mathematicians, but also by professors in others subjects too, and especially Professor Carlos Chagas, former President of the Pontifical Academy of Sciences.

Call for initiatives

We hope many scientific centers and organizations will relay the Declaration of Rio de Janeiro.
We shall mention all the initiatives all over the word in the next Newsletters.

Follow up of the Declaration

Among these three aims, if considering the great challenges for the 21st century proceeds with a more specific approach of IMU, no doubt the realisation of the two others aims has to be as broad and open as possible. So, UNESCO's sponsorship is specially significant.

UNESCO' sponsorship

UNESCO plans to reinforce in 1994-95 its cooperation with the International Mathematical Union (IMU), in the framework of its sponsoring the World Mathematical Year 2000 launched in Rio de Janeiro in May 1992.
This cooperation, established since 1986 with the Commission for Development and Exchange (CDE), with the International Commission for Mathematical Instruction (ICMI) of IMU, has mainly consisted in :

1 . joint publications of a selected Mathematical Bibliography for the Third World, and of a Directory of Mathematicians from Developing Countries.

2 . the IMU/CDE - UNESCO programme of Visiting Professors and Researchers.

3 . UNESCO support to participation of representatives of mathematical communities from developing countries in international mathematical events
In line with the long term objectives of the IMU WMY 2000, and in particular with the one of creating the prerequisites for broadening national representations in IMU, UNESCO will endeavour in 1994-95 to strenghten its support concerning 1 and 2 above.
Moreover, UNESCO efforts will be devoted to the gradual establishment of regional mathematical information and documentation centres, trying to meet in this way a crucial problem for mathematicians from the Third World.
(A.Marzollo, UNESCO Director)

Turn of the Century

Turn of the Century Committee

On August 1990, in Kobe, during the last International Mathematical Congress, the following resolution was voted :
"Whereas the IMU wishes to mark the turn of the century in a manner appropriate to the standard set by David Hilbert in 1900, the General Assembly directs the Executive Committee to set up a committee to report to the adhering bodies by September 1991 how to accomplish that in 1994 the Assembly can discuss it and decide how to proceed".
The composition of the committee which will address a first report in Zürich in 1994 is the following :
Chairman : J. Palis Jr. (Brazil), Members : V. I. Arnold (Russia), F. Hirzebruch (Germany), L. Lovasz (Hungary), B. Mazur (USA), S. Mizohata (Japan), G. D. Mostow (USA), J. Tits (France), W. Thurston (USA), S. Varadhan (USA)

ICHM

The International Commission on History of Mathematics, believing that it would be appropriate, in the year 2 000, to assess the significance and fate of Hilbert's famous lecture of 1900 on seminal, as-of-then unsolved problems in mathematics (just at the Turn of the Century Committee will project its own vision to devise a new set of seminal problems for the 21st century), is organizing an historical Symposium for the Zürich Congress in 1994. This will be devoted to a rigorous examination of the history of congresses from Zürich to Zürich, including the Paris Congress of 1900.

Mathematical Keys for Development

ICMI

ICME -7 (Quebec, 1992)
and WMY 2000
The announcement of IMU's initiative which was done at the opening address of ICME-7 was very well received.
The Executive Committee and General Assembly of ICMI have discussed of ICME-9 which will take place in year 2000, a global congress on mathematical education - a central congress with regional satellite congresses held at the same time being linked to the central one by means of communication technology.
The Executive Committee agreed to stimulate the publication of a survey book on "what happened in mathematics education in the last 40 years ?"
In the meantime ICME-8 will take place in 1996 in Sevilla. In the very mind of the declaration of Rio, it has been decided to raise registration fees thus enabling to exempt people from some countries.

Sevilla 1996 global communication

Projects are developing to make Sevilla 1996 a test-bench, at a small scale, for the world meeting ICME-9. Among them, a agreement in principle is acquired on the use of the new Spanish satellite Hispasat launched in September 1992 which covers in particular Spain, Portugal and America (USA, Mexico, Central and South America).

CDE

The activity of the CDE which tries to promote the place and the role of mathematics in collaboration with developing countries, is fully in keeping with the second aim of the Declaration of Rio.
More precisely, with the support of ICSU, UNESCO, IMU and some scientific societies, the CDE grants travel fellowships in research advanced centers and partially subsidizes congresses according to scientific level on a somewhat reciprocial commitment. Future activity of CDE will certainly find some profit in the dynamic WMY 2 000 is going to create.

CDE-UNESCO dissemination centres

One of CDE projects, the programm on dissemination of mathematical information and documentation in Developing Countries elaborated with UNESCO in december 1990, is of particular importance. This programm consists in setting up 3 libraries-documentation centres in Asia, Latin America, Africa, in institutions where fairly well developed libraries already exist as well as a group of active mathematicians. The programme intends to provide additional inputs for completing the collections of core mathematics books and important mathematical journals, as well as reprints. Moreover, the new imput should facilitate the acquisition of essential electronic data bases and communication systems. The centres shall provide their services to mathematicians in the region to facilitate access to both latest and classical mathematics literature.

Image of mathematics

ICMI

Among numerous propositions about WMY 2 000, some deal with the image of mathematics with the general public. MM. de Gunzman and Niss (President and Secretary of ICMI) have suggested to emphasize on three ideas : the role of mathematics in culture and society, an overview of the impacts of mathematics on technology (old, modern and future technology), a general effort to counteract wrong images of mathematics with the general public.

ICHM

One of the best ways to establish a "systematic presence" of mathematics in the "Information Age" is through the history of mathematics, which can effectively demonstrate the significance of mathematics in cross-cultural ways in the widest possible variety of different contexts.
Local meetings, international symposia, special exhibitions and long-range publications can all help to achieve the goal of creating a higher public awareness of mathematics and the crucial role it has played in world history.
Two efforts in which the ICHM is already engaged have a direct relation to the aims of WMY 2 000. One is the maintenance of an archive of slides and photographs of mathematicians and historians of mathematics ; one goal of the Commission in light of WMY 2 000 might be publication of a catalogue of all known portraits or photographs and where they may be found.
The second project is the production of a "Historiography of the History of Mathematics". to which more than forty historians from all over the world are collaborating to describe the history of history of mathematics from the first historical writings about mathematics by the ancient Greeks and Chinese, to the present. Publication of this work in anticipation of WMY 2 000 would be a realistic goal of the Commission, and one that would be very much in keeping with aims 2 and 3 as stated in the Rio Declaration.

(J. Dauben, ICHM Chairman)

WMY 2000, First Echoes

Some associations and societies have already shown their interest and their support for WMY 2 000 :

ICSU

The International Council of Scientific Unions has published in the fall issue of Science International an article from Pr. Lions presenting the Declaration of Rio de Janeiro.

AMU

The African Mathematical Union is already involved in WMY 2 000, several of its own projects being in keeping with the second aim of the declaration of Rio. It is in particular the proposal for Mathematical Sciences Network for Africa. Its aims are, first, to encourage South-South cooperation in the area of research and the training of graduate students, second, to have the universities/centers included in the network used as regional mathematical documentation centers.
An other important project of AMU which could be pushed under WMY 2 000 is a Mathematics Communication Network within Africa and between Africa and the rest of the world.
The journal, **Journal Afrika Mathematika** created in 1978 which publishes regularly since several years first rate papers of African mathematicians, is a first essential data to avoid isolation of mathematicians in Africa.

SMF & SMAI

The Société mathématique de France and Société de mathématiques appliquées et industrielles organized, last year in May in Paris the initiative **"Les mathématiques au futur"** which intended to echoe to the Rio declaration about "World Mathematical Year 2000". This initiative, welcomed by the French Ministery of Research and space who patronizes the launching of WMY 2 000, was addressed to the scientific press and the mathematical community. After an interview of J. L. Lions in which were described the three major aims of W.M.Y. 2 000, several talks were given on the topic "Mathematics as an historical adventure". The first one, referring to the work of the"Turn of the Century Committee", dealt with the actuality of the Hilbert program listing the great mathematical challenges of the twentieth century. Then, mathematicians and physicians of the generation of the thirties-forties exposed their vision of mathematics of their time telling what they thought important for the next years to come. The mathematical fields mentionned were Number Theory and Topology, Geometry and Physics, Statistical Mechanics, Applied Mathematics, Dynamical Systems and Analysis. At last, P. Bérard, Secretary of the Commission on Development and Exchange spoke of the second focus of W.M.Y. 2000, the great challenge of mathematical alphabetisation, explaining the formation and teaching problems in mathematics, in particular among Developing Countries, and the support that could be brought to them.

ISRAEL ACADEMY of Sciences and Humanities

informed IMU that they strongly endorse the aims of the Rio Declaration considering a priviledge to be of assistance in promoting this cause.

EMS

During its first congress in Paris in July 1992, the European Mathematical Society (EMS) organized a round table Collaboration with Developing Countries to which participated several members of the CDE including its President. Recommendations, akin to the aims and activities of the CDE, have been drawn for future actions : 1. make governments aware towards the importance of mathematics, 2. training at graduate level and PhD or postdoctoral research, 3. develop local research, 4. multiply local initiatives to develop communications, librairies and scientific documemtation.
EMS is now thinking how to take care of these recommendations in the future.

How to use

This Newsletter, sent to all the national Committees and National Adhering Organizations of IMU, can be reproduced and we hope it will bewidely spread.
Avaibility of an electronic version of this N.L. is understudy.

For publication in the Newsletter, for any information about WMY 2000

Please contact :

Helène Gispert,
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FRANCE

EUROPEAN NEWS: Country by Country

CATALONIA

EUROPROJ 94 - ANNUAL CONFERENCE

23 - 26 September 1994 Sant Feliu de Guíxols

Location: Sant Feliu de Guíxols (90 km north from Barcelona)

Topic: Algebraic Geometry

Coordinator of Europroj: A. Hirschowitz **Chairman of Europroj 94:** W. Decker

Program committee: D.Eisenbud, L.Gruson, J.Harris, J.Kollár.

Local organizers: J.Elias, R.M.Miró-Roig, F.Serrano, S.Xambó.

Contact: Professor Dr.R.M.Miró-Roig (Europroj), Departament d'Algebra i Geometria, Universitat de Barcelona, Gran Via 585. E-08007 Barcelona.
e-mail: europroj@cerber.ub.es

CZECH REPUBLIC

Conference: "Numerical Modelling in Continuum Mechanics"

22-25 August 1994 Prague - Czech Republic

Organizers: M. Feistauer, Charles University Prague
K. Kozel, Czech Technical University Prague
R. Rannacher, Ruprecht-Karls-Univerität Heidelberg.

Program: Fluid Dynamics - Porous Media Flows -
Reactive Flow Problems - Structural Mechanics

Principal Speakers: I. Babuška (USA), E. Dick (Belgium), R. Ewing (USA), R. Hoppe (FRG), G.C. Hsiao (USA), W. Jäger (FRG), C. Johnson (Sweden), R. Jeltsch (Switzerland), U. Maas (FRG), M. Marion (France), J. Pitkäranta (Finland), V. Rivkind (Russia), E. Süli (Great Britain), G. Warnecke (FRG), M. Wheeler (USA), G. Wittum (FRG).

Contact: M. Feistauer, Charles University, Faculty of Mathematics and Physics, Sokolovská 83, 186 00 Praha 8, Czech Republic.

E-mail: nmicm@karlin.mff.cuni.cz
Phone: +42 2 24 81 08 51, +42 2 23 10 464
Fax: +42 2 23 10 464

ENGLAND

London Mathematical Society

RING THEORY AND REPRESENTATION THEORY

13-14 May 1994 Leeds, UK

2-day London Mathematical Society Meeting

Speakers: M.Artin, W.W.Crawley-Boevey, M.Holland, L.W.Small, C.Ringel, T.Stafford

Organizing Committee: J.C.McConnell and C.Robson

Location: School of Mathematics, University of Leeds, Leeds LS2 9TJ

FRANCE

GUILLEMETS FRANCAIS LOGIC COLLOQIUM '94

21 - 30 July 1994 — l'Universite d'Auvergne, France

Laboratoire de Logique, Algorithmique et Informatique de Clermont 1 - LLAIC1

Second Announcement

The European Summer Meeting of the Association for Symbolic Logic (ASL) will be held at l'Universite d'Auvergne, France, from July 21 (morning) to Saturday 30 (noon), 1994.

Tourism : Regional Park of Volcanos, Puy de Dome, Vallee de la Sioule and Lac Pavin are nearby. In July, there is a Summer Concert and Opera Programme at VICHY (Spa-town). The medieval city of RIOM is well worth a visit.

Scope: History of Logic - Recursivity and Algorithms - Model Theory - Arithmetics - Set Theory - Lambda-Calculus and Proof Theory - Finite Models.

The Conference:
1) About 20 main conferences of 50 minutes
2) 6 tutorials of 3 times 45 minutes (2 concurrent lectures)
3) Contributed papers.

Programme Committee: A.Arnold (Bordeaux 1), P.Cegielski (Paris XII), R.David (Chambery), J.L.Krivine (Paris VII), D.Lascar (Paris VII), A.Louveau (Paris VI), M.Magidor (Jerusalem), Y.Matiiassevitch (St Petersbourg), L.Pacholski (Wroclaw), M.Parigot (Paris VII), D.richard (Chairman, Clermont 1), H.Sinaceur (Paris-Sorbonne), A.Wilkie (Oxford), B.Zil'ber (Kemerovo).

Invited speakers: M.Baaz (Wien), P.Dehornoy (Caen), S.Feferman (Stanford), J.Y.Girard (Marseille), M.Gitik (Tel Aviv), E.Graedel (Aachen), S.Grigorieff (Paris VII), D.Harel (Rehovot), E.Hrushovski (Jerusalem), R.Kaye (Oxford), A.S.Kechris (Caltech), P.Koepke (Bonn), D.Leivant (Bloomington), H.D.Macpherson (London), L.Maksimova (Novosibirsk), B.Poizat (Lyon), J.P.Ressayre (Paris VII), S.Ronchi Della Rocca (Torino), J.Tiuryn (Varsovie), J.Van Benthem (Amsterdam), M.Vardi (Rice), B.Velickovic (North York), V.Vianu (San Diego), F.Wagner (Freiburg).

Contributed papers: are invited from all areas of logic. Abstracts should be double spaced and not more than one page long (about 300 words). Deadline for receipt of papers is March 30, 1994 to:

Denis RICHARD, Professeur, LOGIC COLLOQUIUM '94
LLAIC1/IUT - Dept. Info. - BP 86 63172 AUBIERE Cedex FRANCE.
FAX : (33) 73 40 77 33, e-mail : richard@llaic.univ-bpclermont.fr

Organizing Committee: J.P. BLANC, P. CEGIELSKI (Vice-President), M.A. DEVEAU (President), H.A. ESBELIN, F. GAILLARD, P.F. JURIE, P. LAMBEY, R. MALGOUYRES, M. MORE, J. PLYER, J. TOMASIK.

Accommodation and food: single rooms (possibility of an additional bed) are available for about 100 FF a night. Lunch and dinner from 50 to 60 FF. Breakfast about 25 FF. *Vegetarian meals available.*

LES JOURNÉES MATHÉMATIQUES DE CERGY-POINTOISE

20 - 24 June — Université de Cergy-Pontoise, France

Location: Université de Cergy-Pontoise, Avenue du Parc - 8, le campus, 95033 Cergy-Pontoise cedex, FRANCE

Organiser: Emmanuel Hebey

Invited participants: A.Ancona, T.Aubin, R.Azencott, J.Bellissard, G.Ben Arous, H.Beretycki, F.Bethuel, H.Brezis, J.M. Coron, M.Duflo, K.Gawedzki, J.M.Ghidaglia, J.Ginibre, Y.Guivarc'h, J.P.Kahane, G.Lebeau, B.Maurey, P.Pansu, L.Pastur, G.Pisier, R.Temam, J.C.Yoccoz.

Contact address: Emmanuel Hebey, University of Cergy-Pontoise, FRANCE.
Tel: 34 25 49 17 Fax: 34 25 49 04

CONFERENCE ON ALGEBRAIC K-THEORY

Site: Université Paris VII in central Paris
2 place Jussieu (5th arrondissement) metro: Jussieu

Dates: TUESDAY 26 July 1994 - SATURDAY 30 July 1994

Organizers: Max Karoubi, Bruno Kahn, Robert Thomason

Program: Among those who have already agreed to speak are: Gunnar Carlsson, Henri Gillet, Uwe Janssen, Kazuya Kato, Marc Levine, Ivan Panin, John Rognes, Markus Rost, Christophe Soule, Andrei Suslin.

Themes: Algebraic K-theory and its applications, cyclic homology, algebraic K-theory of spaces, "motivic" cohomologies.

FOR INFORMATION AND REGISTRATION (deadline for registration April 5):
send e-mail message to: Kthconf@frmap711.mathp7.jussieu.fr
or FAX to: (33)-(1)-44-27-63-66

or write: Algebraic K-Theory Conference, Madame Liliane Barenghi, UFR de Mathématiques, Université Paris VII, Case 7012, 75251 Paris CEDEX, 05, FRANCE

PLEASE NOTE: If you wish to stay with most of the participants in the official three-star hotel and at a preferential rate of 350Fsingle, 450Fdouble, YOU MUST REGISTER WITH US BY APRIL 5.

CONGRÉS INTERNATIONAL HENRI POINCARÉ 1994

14-18 MAY 1994 NANCY (F)

Organisers: J.L. GREFFE and G. HEINZMANN

Short list of invited participants: Browder (Chicago), Chihara (Berkeley), Detlefsen(Notre Dame), Folina (St.Paul), Friedman (Chicago), Granger (College de France), Grunbaum (Pittsburg), Hilpinen(Turku), Lichnerowicz (College de France), Miller (London), Paty (CNRS), Stillwell (Monash U.Australia), Sullivan (IHES, Bures-sur-Yvette), Thiel (Erlangen), Tieszen (San Jose), Vuillemin (College de France), Vuillermot (Nancy), Yanase (Tokyo), ZAHAR (London).

Contact: J.L. GREFFE, INPL-ENSIC, rue Grandville BP 451 F54001 NANCY CEDEX
Tel : 33/83.17.52.30. FAX : 33/83.35.08.11.
E.mail : greffe@ensic.u-nancy.fr

or G. HEINZMANN, ACERPH, Universite Nancy II, 23, Bd Albert 1er, F54015 NANCY CEDEX
Tel : 33/83.96.16.14 FAX : 33/83.96.23.47 or 33/83.35.08.11.
E.mail : heinzmann@plg.u-nancy.fr

XXIVéme ECOLE D'ÉTÉ DE CALCUL DES PROBABILITÉS

7 - 23 July 1994 Saint-Flour (Cantal)

Speakers: M.Dobrushin, Professeur à l'Université de Moscou (Russiee)
"Perturbation Methods in the Theory of Gibbs Fields"
M. Groeneboom, Professeur à l'Université de Technologie de Delft (Pays-Bas)
"Inverse problems in Statistics"
M. Ledoux, Professeur à l'Université Paul Sabatier, Toulousse III
"Isopérimétrie et analyse gaussienne"

Contact: P. Bernard, Université Blaise Pascal,
Mathématiques Appliquées, F63177 AUBIERE CEDEX, FRANCE.
Tel: 73 40 70 52 ou 73 40 70 50 Fax: 73 40 70 64
Email: bernard@ucfma.univ-bpclermont.fr

CIRM

Centre International de Recontres Mathématiques, Luminy Case 916, 13288 Marseille Cedex 9, FRANCE. Tel: 91 83 30 00 Fax: 91 41 27 86 Email azm@cirm.univ-mrs.fr

7-11 mars	**Géométrie algébrique en liberté** L. Koelblen (U. Paris 6)
21-25 mars	**Symplectic geometry of moduli spaces** J. Huebschmann (U. de Lille I)
25-29 avril	**Points paraboliques et leur déploiement en dynamique Réelle, Complexe et en groupes Kleiniens** A. Douady , P. Sentenac (U. Paris-Sud)
9-13 mai	**Algorithme et programmation** D. Monasse (UPS, Paris), R. Rolland (U. d'Aix-Marseille II)
16-19 mai	**Théorie de l'élimination** M. Chardin (Ecole Polytechnique)
23-27 mai	**Géométrie arithmétique** L. Szpiro , R. Elkik (U. de Paris-Sud), A.N. Pershin (Moscou)
30/5-3 juin	**Equations aux dérivées partielles stochastiques** G. Da Prato (Pise), D. Nualart (Barcelone), E.Pardoux (U. d'Aix-Marseille I)
6-10 juin	**Formes quadratiques et groupes algébriques linéaires** E. Bayer (CNRS Besançon), J.-L. Colliot-Thélène (CNRS Orsay), B. Kahn (CNRS Paris 7), J.-P. Tignol (Louvain-la-Neuve)
13-17 juin	**Advanced topics in applied mathematics and theoretical physics** D. Testard (CPT, CNRS Marseille)
20-24 juin	**Probabilités quantiques** J.-L. Sauvageot (CNRS Paris 6)
27/6-1er juillet	**Logique et informatique** M.-R. Donadieu (U. Aix-Marseille II)
4-8 juillet	**Arrangements d'hyperplans** M. Jambu (U. de Nantes)
11-15 juillet	**Analyse-non standard** M. Diener (U. Nice)
18-22 juillet	**Noeuds et variétés de dimension 3** Y. Mathieu (U. de Provence, Marseille)
25-29 juillet	**Représentation des groupes réductifs p-adiques** G. Henniart (U. de Paris-Sud), Ph. Kutzko (U. d'Iowa)
29/8-2 septembre	**L'arithmétique des courbes de genre deux.** J. Boxall (U. de Caen)
5-10 septembre	**Analyse numérique des polynômes orthogonaux.** C. Brezinski (U. de Lille)
12-16 septembre	**Géométrie algébrique et analyse réelle** F.P. Françoise (U. de Paris 6), D. Trotman (U. de Provence)
19-23 septembre	**3ème Atelier International de Théorie des Ensembles** P. Dehornoy (U. de Caen)
26-30 septembre	**Journées de Probabilités** J. Azéma, M. Yor (U. de Paris 6)
3-7 octobre	**Autour des groupes réductifs finis, représentations** M. Cabanes (DMI, ENS, Paris)
10-14 octobre	**Journées d'Etude en Statistique** J.-J. Droesbeke (U. Libre de Bruxelles), J. Fine (U. de Toulouse III)
17-21 octobre	**Algèbre différentielle** F. Ollivier (CNRS E. Polytechnique, Palaiseau)
2-4 novembre	**Mathématique Informatique** MM. Champarnaud, Neraud (U. de Rouen)
14-18 novembre	**Nouvelles tendances et approximation.** J.C. Fiorot (U. de Lille)

COLLOQUE PIERRE EYMARD & COLLOQUE TOURNANT D'ANALYSE HARMONIQUE

2 - 5 June 1994 — Nancy

The Department of Mathematics of the University Nancy I is organizing a conference in honour of our colleague Pierre Eymard (on the occasion of his retirement). This conference is jointly organized with the *Colloque tournant d'Analyse Harmonique,* a traditional meeting of the French harmonic analysts.

Speakers: Jacques Faraut *Paris VI*, Pierre de la Harpe *Genève*, Sigurdur Helgason *M.I.T.*, Andrzej Hulanicki *Wroclaw*, Adam Korányi *C.U.N.Y.*, Ray Kunze *Univ. Georgia*, Horst Leptin *Bielefeld*, Noël Lohoué *Orsay*, Gérard Schiffmann *Strasbourg*, John Taylor *McGill*, Nicholas Varopoulos *Paris VI.*

Organizers/ contact: Jean-Philippe Anker, Jean-Louis Clerc, Université de Nancy I, Département de Mathématiques, B.P. 239, F-54506 Vandoeuvre-lès-Nancy Cedex, FRANCE.

Email: anker or clerc@iecn.u-nancy.fr
Fax: (33) 83 28 09 89 Tel: (33) 83 91 21 42 or 49

IRELAND

NASECODE X

The Tenth International Conference on the Numerical Analysis of Semiconductor Devices and Integrated Circuits

21 - 24 June 1994 — Dublin, Ireland

With Cooperation Support from the IEEE Electron Devices Society and under the auspices of Applied Informatics Centre, Dublin, Ireland.

Topics: These include circuit analysis, code validation against real devices and processes, computational techniques, device modelling, electrothermal effects, energy transport models, manufacturing equipment modelling, mathematical analysis, Monte Carlo simulations, physical aspects, process models, process simulation, quantum dot, quantum well and quantum effects, quantum tunnelling, simulation of integrated circuits and VLSI interconnections, TCAD frameworks, TCAD industrial applications, transcircuit and interconnection analysis & simulation.

Contact: NASECODE X conference, 26 Temple Lane, Dublin 2, Ireland.
Fax: +353-1 679 2469 Tel: +353-1 679 7655 EMail: CompuServe 73173, 1245

ISRAEL

SEVENTH INTERNATIONAL CONFERENCE ON GEOMETRY

2 - 9 April 1994 — Nahsholim, Israel

Topics: The conference will deal with the Foundations of Geometry, Incidence Geometry, Geometric Algebra, Discrete and Combinatorial Geometry, and Convexity. There will be a special section "Geometry and School".

Organizers: Professors R.Artzy and J.Zaks, Department of Mathematics, University of Haifa, 31905 Haifa, ISRAEL.

Email: RSMA787@HAIFAUVM.BITNET Fax: (972) 4-246814

POLAND

THIRD SCHOOL ON SYMMETRY AND STRUCTURAL PROPERTIES OF CONDENSED MATTER

1 - 7 September 1994 Zajaczkowo, Poland

Location: Zajaczkowo near Poznań

Topics
- Phase problems (Berry and geometric phases, magnetic translation groups)
- Magnetic properties of matter (ground and excited states)
- Algebraic and combinatorial methods (braid groups, group action on set, fractional symmetries)

Sponsors: Polish State Committee for Scientific Research, the European Physical Society (The School is endorsed by the EMS)

Speakers: W.J. Caspers *Enschede*, R.Dirl *Wien*, T.Einarsson *Göteborg*, J.P.Gazeau *Paris*, A.G.M.Janner *Nijmegen*, K.Karwowski *Toruń*, A.Kerber *Bayreuth*, M.Kibler *Lyon*, R.C.King *Southampton*, J.Kociński *Warszawa*, H.Laue *Bayreuth*, J.C.S.Levy *Paris*, B.Lebech *Risø*, J.Louck *Los Alamos*, J.Mozrzymas *Wroclaw*, Y.Ohnuki *Nagoya*, C.E.Wulfman *Stockton*, B.G.Wybourne *Toruń*, V.Yukalov *Dubna*, A.Zabrodin *Moscow*, J.Zak *Haifa*.

Contact: Dr Stanislaw Walcerz, A.Mickiewicz University, Institute of Physics, ul. Matejki 48/49, 60-769 Poznań, Poland. e-mail: sspcm@plpuam11.amu.edu.pl.

PORTUGAL

COLÓQUIO INTERNACIONAL DE MATEMÁTICA NAO-STANDARD
INTERNATIONAL COLLOQUIUM ON NON-STANDARD MATHEMATICS

18 - 22 July 1994 Aveiro / Covilhã, Portugal

In Memory of Abraham Robinson

The CIMNS, International Colloquium on Nonstandard Mathematics, aims to bring together researchers and other people interested in Nonstandard Mathematics in a program that includes:

1. "Invitation" to nonstandard courses on:
   • Foundations • Functional Analysis and Differential Equations • Analysis and Measure Theory
2. Research Symposia: • Invited talks • Contributed talks
3. Debates and Social Events

The Conference will be held in two different places: the University of Aveiro and the University of Beira Interior (Covihã).

Invited speakers: Prof. N.J.Cutland (*Hull, England)*; Prof. R.F.Hoskins (*Cranfield, England*); Prof. H.J.Keisler (*Wisconsin, U.S.A.*); Prof.T.Lindstrom (*Oslo, Norway*) Prof.W.A.J.Luxemburg (*Pasadena, California, USA*); Prof.M.Oberguggenberger (*Innsbrück*, Austria); Prof.A.Roberg (*Neuchâtel, Switzerland*); Prof.K.D.Stroyan (*Iowa, USA*).

Contact: Professor J Sousa Pinto, CIMNS, Departamento de Mathematica,
Universidade de Aveiro, 3800 AVEIRO, PORTUGAL.
Fax 351 34 382014 Email jspinto@ua.pt

ROMANIA

THE 15TH INTERNATIONAL CONFERENCE ON OPERATOR THEORY

6 - 10 June 1994 Timisoara, Romania

Organizers: The Institute of Mathematics of the Romanian Academy and the Department of Mathematics of the University of Timisoara. The Organizing Committee is:
F-H.Vasilescu, *Bucharest;* D.Gaspar, *Timisoara;* S.Stratila, *Bucharest.*

Contact: OT15, Institute of Mathematics of the Romanian Academy
P.O. Box 1-764, 70700 Bucharest, ROMANIA.
Email: otl5@imar.ro Fax: +40 1 312 98 29

RUSSIA

JUBILEE SOUSLIN CONFERENCE

3rd Souslin Conference, dedicated to the memory of M.Ya.Souslin (1894-1919)

20-27 July 1994. Saratov, Russia

Michail Yakovlevich Suslin, famous as the founder of Descriptive Set Theory and the author of many outstanding theories, was born in 1894 in Krasavka which is not far from the ancient Russian city of Saratov, located on the great Russian river Volga. Today Saratov is a city of one million inhabitants,a center of commerce, industry, education and tourism, which keeps old Russial traditions and is apart of noisy political events.

The mathematicians at Saratov have formed The Souslin Foundation, a public society aimed at supporting fundamental mathematical research and organising regular meetings on Souslin's work. The Souslin conferences aim to provide a platform for the presentation of recent results in the areas of Analysis and Foundations in the broad sense, where these are somehow related to, or issued from, M.Souslin's works.

The Foundation have organized two Souslin Conferences in 1989 and 1991 (which were written about in the journals "Uspehy Matem. Nauk", 1990. V.45, N 2, p.231; 1992. V. 47, N 3, p.197-198 and "Izvestiya vysshikh uchebnykh zavedenii, seriya matematica", 1990. N 3,p.88-89, 1992, N 7, p.87-88).

The ASL sponsored Third Souslin Conference, dedicated to the 100th anniversary of Michail Souslin, 1894 - 1919, will be held during July 20-30, 1994, in Saratov, Russia. Papers presenting original contributions in the following topics are being sought: Analysis, Logic and Foundations, Nonstandard Analysis, Computer Scince, General Topology, Set Theory. The scientific program will consist of invited lectures and short contributions, which will be selected from the submitted papers.

Program Co-Chairs are Yu.L.Ershov (Institute of Math., Novosibirsk, Russia) and A.Kechris (Caltech, Pasadena, USA). Program Committee: L.Aksent'ev, S.Artemov (expected), T.Bartoszynski, Yu.Ershov, V.Kanovei (Coordinator), A.Kechris, S.Konyagin, V.Malykhin, V.Matrosov, V.Ponomarev, A.Razborov, D.Ross (expected), V.Tikhomirov. The conference will be organized by the Souslin Foundation; Vladimir Molchanov will be in charge of local arrangements.

Application deadline is January 1, 1994. Further information can be obtained from the Program coordinator, V.Kanovei, e-mail pounce@compnet.msu.su, or from the local organizer: V.Molchanov, Souslin Foundation, Michurina 92, Saratov 410071 Russia; FAX +845 2240446, e-mail (addressed to V.Molchanov) postmaster@scnit.saratov.su.

Please address to vapr@scnit.saratov.su

Postmaster.

SWITZERLAND

European Colloquium of Category Theory (ECCT)

25 - 29 July 1994 ZÜRICH

Sponsoring: Universities *François Rabelais (Tours)* and *Denis Diderot (Paris 7)* plan to hold a European Colloquium on Category Theory (ECCT) in Tours (France) from July 25th to July 29th, the week before the International Congress of Mathematics in Zürich, under the honorary presidency of Professor Saunders MacLane. Mathematicians foreseeing to be present in Europe at that time who wish to attend or participate are most welcome to pre-register now.

Scientific Committee: Saunders MacLane *Chicago*; J.Adamek *Prague*; J.Bénabou *Paris*; F.Borceux *Louvain*; A.Carboni *Milano*; P.Damphousse *Tours*; Y.Diers *Valenciennes*; R.Guitart *Paris*; J.Gray *Urbana*; H.Herrlich *Bremen*; P.Johnstone *Cambridge*; M.Kelly *Sidney*; I.Moerdijk *Utrecht*; G.Reyes *Montreal*.

Pre-Registration: Send a one-line e-mail to **ECCT-request@univ-tours.fr** with the one line **SUBSCRIBE**, without subject in the preamble.

Information: When pre-registering, you will automatically be sent information as the organization progresses. This information will be sent to your e-mail address. For further information, contact DAMHOUS@UNIV-TOURS.FR.or GUITART@UNIV-TOURS.FR,or write to *ECCT, c/o Pierre Damphousse, Département de Mathématiques, Faculté des Sciences, Parc de Grandmont, Tours 37200, France.* A second announcement, with financial conditions. instructions for registering and submitting papers will be sent to universities and pre-registered mathematicians. The deadline for submitting papers will be April 1 1994.

INTERNATIONAL ATOMIC ENERGY AGENCY
AND
UNITED NATIONS EDUCATIONAL SCIENTIFIC
AND CULTURAL ORGANIZATION

INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

Getting Information on ICTP Activities via Computers

Information on the various ICTP Activities throughout the year can be retrieved via electronic mail or using the Internet Gopher. The procedure is as follows.

Using Electronic mail

(1) Calendar of the ICTP Activities

The complete Calendar can be obtained by sending an e-mail to

`smr@ictp.trieste.it`

using as `Subject: get calendar`

Note: This Calendar is constantly updated. So, please check the issue date.

To each activity listed in the Calendar there is an associated `smr-`*number* assigned from which you can obtain more detailed information.

(2) Information on a specific ICTP activity

To receive a list with the names of the available documents for a particular activity, you should first identify the `smr###` code as indicated above. Then send an e-mail to

`smr###@ictp.trieste.it`

using as `Subject: get index`

If you send another mail to

`smr###@ictp.trieste.it`

using as `Subject: get` *`document_name`* (*e.g.*, `announcement`, *etc*)

you will receive detailed information on the topic *`document_name`*.

Note: If you wish more than one document of an activity then use

`Subject: get` *`doc1 doc2 ... etc`*

Using Internet Gopher

The ICTP Gopher server (*hostname:* gopher.ictp.trieste.it) allows you to explore, search and retrieve general information regarding the many scientific activities carried out at ICTP. It is also possible to obtain information on the in-house scientific publications, diploma courses, scientists present at ICTP and the alternative services offered by the

- ICS-International Centre for Science and High Technology and
- TWAS-Third World Academy of Sciences.

When issuing the `gopher` command, you will be connected automatically to your default local Gopher server. Then, it is possible to access the Gopher space by exploring the branch "*Other Gopher servers in the world*" pointing to the geographical region: `Europe→Italy→ICTP`.

To access directly to the ICTP server, you can issue the command

`gopher gopher.ictp.trieste.it`

For further information please write to

SCS-Scientific Computing Section, International Centre for Theoretical Physics
Miramare - PO Box 586 - 34100 trieste, ITALY

or send e-mail to: `admin@ictp.trieste.it`

POST-DOCTORAL FELLOWSHIPS IN MATHEMATICS

1995

The International Centre for Theoretical Physics has a small number of post-doctoral fellowships for outstanding young mathematicians from **developing** countries. It is intended for those who have obtained a Ph.D. in mathematics within the last four years. In 1995 the emphasis will be on Partial Differential Equations, including applications to Geometry, and it is expected that distinguished specialists in the field will be present during the year. Priority will be given to candidates working in this area.

Candidates should submit the completed application form (available from the address below), an abstract of their Ph.D. thesis, and any publications to:

Post-Doctoral Fellowships in Mathematics
International Centre for Theoretical Physics
P.O. Box 586
34100 Trieste
Italy

Three letters of recommendation should be sent directly to us.

Successful candidates will have the possibility of participating in the Mathematics activities of the ICTP, the International School of Advanced Studies (ISAS/SISSA) and the University of Trieste, as well as the opportunity to have contact with visiting professors.

Candidates should submit their applications no later than 30 June 1994.

In addition to the Post-Doctoral Fellowships, a few visiting fellowships are available for mathematicians from and/or working in developing countries to spend up to 9 months at the Centre.

Telephone: (040) 22401 **Cable: CENTRATOM** **Telex: 460392 ICTP I**

ICTP CONFERENCES IN MATHEMATICS 1994
Grants for young researchers in EEC countries

A generous contribution from the **Commission of the European Community, within the framework of its "Human Capital and Mobility" Programme (Euroconferences)**, will make it possible to provide financial support for young researchers (orientatively, who are not older than 35 years) who are **citizens of a European Community Member State *or* who have been residing and working in research for at least one year in a European Community Member State** to participate in the following conferences, to be held at the International Centre for Theoretical Physics during 1994. Those interested in applying for such support should complete and return - **as soon as possible** - the accompanying application form to the following address:

Mathematics Section
International Centre for Theoretical Physics
P.O. Box 586
I-34100 Trieste
Italy

Further details about the contents of the conferences may be obtained from the same address.

* * * * *

7 - 25 March 1994 **WORKSHOP ON FLUID MECHANICS**

Directors: P.G. Drazin (University of Bristol, U.K.)
F.H. Busse (Universität Bayreuth, Germany)
I.A. Eltayeb (Sultan Qaboos University, Oman)
W.R. Young (University of California, U.S.A.)

Contents:
Geophysical fluid dynamics, environmental fluid dynamics and computational fluid dynamics.

16 - 27 May 1994 **WORKSHOP ON COMMUTATIVE ALGEBRA AND ITS RELATION TO COMBINATORICS AND COMPUTER ALGEBRA**

Directors: A. Simis (Universidade Federal da Bahia, Salvador, & I.M.P.A., Rio de Janeiro, Brazil)
G. Valla (Università di Genova, Italy)
N. Mohan Kumar (T.I.F.R., Bombay, India)

Contents:
Blowup algebras, ideal transforms and symbolic powers; Hyperplane sections and Hilbert functions;
Theoretical applications of Groebner bases; Syzygetic sequences; Combinatorial methods;
Cohen-Macaulay and Gorenstein singularities;
Related geometric objects (tangent cones, conormal bundles, dualizing sheaves, set-theoretic complete intersections).

15 - 26 August 1994 **ADVANCED WORKSHOP ON ALGEBRAIC GEOMETRY**

Directors: M.S. Narasimhan (I.C.T.P., Trieste, Italy)
C. Procesi (Università di Roma, [La Sapienza], Italy)
C.S. Seshadri (SPIC Science Foundation, Madras, India)

Contents:
Moduli Problems in Algebraic Geometry; Geometric Invariant Theory.

10 - 28 October 1994 **SCHOOL/WORKSHOP ON VARIATIONAL AND LOCAL METHODS IN THE STUDY OF HAMILTONIAN SYSTEMS**

Directors: A. Ambrosetti (Scuola Normale Superiore, Pisa, Italy)
A. Bahri (University of Tunis, Tunisia/Rutgers University, U.S.A.)
G.F. Dell'Antonio (Università di Roma, [La Sapienza], Italy)

Contents:
School:
Bifurcation theory, stability, K.A.M. theory; Basic problems of celestial mechanics, including singularity structure of orbits; Variational methods and critical point theory, including Morse theory, mountain pass techniques, lagrangian problems with singular potentials, homoclinic orbits; Symplectic techniques for hamiltonian systems.

Workshop:
Periodic solutions on surfaces of fixed energy and the related progress in symplectic methods;
Developments in the study of homoclinic orbits;
Methods of global analysis for the study of geodesics on pseudo-riemannian manifolds;
Improved methods for the study of Arnold's diffusion.

Telephone: (040) 22401 **Cable: CENTRATOM** **Telex: 460392 ICTP I** **Telefax: (040) 224163**

SCHOOL AND WORKSHOP ON VARIATIONAL AND LOCAL METHODS IN THE STUDY OF HAMILTONIAN SYSTEMS

Miramare - Trieste, Italy
10 - 28 October 1994

The International Centre for Theoretical Physics will organize a School and Workshop on Variational and Local Methods in the Study of Hamiltonian Systems from 10 to 28 October 1994. It will be directed by Professors A. Ambrosetti (Scuola Normale Superiore, Pisa, Italy), A. Bahri (University of Tunis, Tunisia/Rutgers University, U.S.A.) and G.F. Dell'Antonio (Università di Roma "La Sapienza", Rome, Italy).

The **School** will be organized in three 10-hour courses and two 6-hour courses. Each course will provide basic material and will also introduce topics of current research. Among the topics to be dealt with during the School are:

- ***bifurcation theory, stability, K.A.M. theory;***
- ***basic problems of celestial mechanics, including singularity structure of orbits;***
- ***variational methods and critical point theory, including Morse theory, mountain pass techniques, lagrangian problems with singular potentials, homoclinic orbits;***
- ***symplectic techniques for hamiltonian systems.***

The **Workshop** will focus on some of the main progress which has been made in the past five years in the study of the theory of hamiltonian systems, both from the local point of view (e.g. stability, bifurcation theory, K.A.M. theory) and from the point of view of variational calculus. Particular emphasis will be given to those results and new techniques which are related to the classic N-body problem, but other topics will also be covered, such as:

- ***periodic solutions on surfaces of fixed energy and the related progress in symplectic methods;***
- ***developments which have taken place in the study of homoclinic orbits;***
- ***methods of global analysis for the study of geodesics on pseudoriemannian manifolds;***
- ***improved methods for the study of Arnold's diffusion.***

The School and Workshop are open to research workers from all countries of the world which are members of the United Nations, IAEA or UNESCO. Participants should preferably have completed several years of study and research after a first degree, and have a good working knowledge of the English language.

As a rule, all expenses of the participants should be borne by the home institution. However, a limited number of financial grants are available for research workers from developing countries. As scarcity of funds allows travel to be granted only in few exceptional cases, every effort should be made by candidates to secure support for their fares (or at least half of their fares) from their home country.

The closing date for submitting requests for participation is **31 March 1994**. The decision of the organizers will be communicated to all candidates as soon as possible thereafter.

The completed "Request for Participation" form, to be found at the back of Bulletin No. 1, should be sent to:

International Centre for Theoretical Physics
School and Workshop on Variational and Local Methods in the Study of Hamiltonian Systems
P.O. Box 586
I - 34100 Trieste
Italy

Telephone: (040) 22401 Cable: CENTRATOM Telex: 460392 ICTP I Telefax: (040) 224163

Trieste, September 1993

11 - 22 April

SPRING SCHOOL AND WORKSHOP ON STRING THEORY, GAUGE THEORY AND QUANTUM GRAVITY
Organizing Committee: R. Dijkgraff, R. Iengo, I.Klebanov, K.S. Narain, S. Randjbar-Daemi
E-mail address: smr756@ictp.trieste.it

11 April - 13 May

WORKSHOP ON NUCLEAR REACTORS - PHYSICS, DESIGN AND SAFETY
In cooperation with ENEA and IAEA Directors: D.E. Cullen, A. Gandini, S. Ganesan, J.J. Schmidt
E-mail address: smr757@ictp.trieste.it

3 May - 10 June

SPRING COLLEGE IN CONDENSED MATTER ON "QUANTUM PHASES"
Organizers: Solid State Advisory Committee
E-mail address: smr758@ictp.trieste.it

9 - 13 May

INTERNATIONAL MONSOON CONFERENCE
Co-sponsored by: WMO and ICS-IIEM Co-organized by: TWAS Directors: R. Newson, T. Palmer, J. Shukla
E-mail address: smr759@ictp.trieste.it

16 - 27 May

WORKSHOP ON COMMUTATIVE ALGEBRA AND ITS RELATION TO COMBINATORICS AND COMPUTER ALGEBRA
Directors: N. Mohan Kumar, A. Simis, G. Valla
E-mail address: smr761@ictp.trieste.it

16 May - 3 June

COLLEGE ON ATMOSPHERIC BOUNDARY LAYER AND AIR POLLUTION MODELLING
Co-sponsored by: ICS and KFAS Directors: C. Ratto, T. Tirabassi
E-mail address: smr760@ictp.trieste.it

13 June - 1 July

WORKSHOP ON SUBMICRON QUANTUM DYNAMICS
Directors: H. Cerdeira, B. Kramer, G. Schön
E-mail address: smr766@ictp.trieste.it

13 June - 29 July

SUMMER SCHOOL IN HIGH ENERGY PHYSICS AND COSMOLOGY
Organizing Committee: E. Gava, A. Masiero, K.S. Narain, S. Randjbar-Daemi, Q. Shafi

7-8 July — WORKSHOP ON PERSPECTIVES IN THEORETICAL AND EXPERIMENTAL PARTICLE PHYSICS
Co-organized by: G. Barbiellini and G. Furlan

28-29 July — WORKSHOP ON STRINGS, GRAVITY AND RELATED TOPICS
E-mail address: smr762@ictp.trieste.it

13 June - 19 August

RESEARCH WORKSHOP ON CONDENSED MATTER PHYSICS
Organizers: G. Baskaran, P.N. Butcher, H. Cerdeira, F. Garcia-Moliner, S. Lundqvist, C.W. Lung, A. Mookerjee, F. Persico, E. Tosatti, M. Tosi, Yu Lu

8-12 August — MINIWORKSHOP ON "NONLINEAR TIME SERIES ANALYSIS"
Directors: Hao Bai-lin and N. Gershenfeld

8-19 August — WORKING GROUP ON DISORDERED ALLOYS
Director: A. Mookerjee
E-mail address: smr764@ictp.trieste.it

20 - 24 June

QUANTUM TRANSPORT IN NANOSTRUCTURES *(Adriatico Research Conference)*
Directors: H. Cerdeira, B. Kramer, G. Schön
E-mail address: smr765@ictp.trieste.it

4 - 22 July

MINIWORKSHOP ON STRONG CORRELATIONS AND QUANTUM CRITICAL PHENOMENA
Directors: G. Baskaran, P. Coleman
E-mail address: smr767@ictp.trieste.it

12 - 15 July

ELECTRONIC AND GEOMETRIC STRUCTURE OF SOLIDS AND SURFACES *(Adriatico Research Conference)*
Directors: P. Perfetti, K. Prince, R. Rosei
E-mail address: smr814@ictp.trieste.it

Please note that information on a specific ICTP activity can be obtained via E-mail and Internet Gopher (gopher.ictp.trieste.it).

* * * *THROUGHOUT THE YEAR* * * *

RESEARCH IN
- PARTICLE PHYSICS
- CONDENSED MATTER PHYSICS
- MATHEMATICS
- PLASMA PHYSICS
-THE STRUCTURE AND NON-LINEAR DYNAMICS OF THE EARTH

RESEARCH PROGRAMME AT
- MICROPROCESSOR LABORATORY
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- LASERS AND FIBRE OPTICS LABORATORY
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DIPLOMA COURSES IN
- PARTICLE PHYSICS
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- MATHEMATICS

International Centre for Theoretical Physics, P.O. Box 586, 34100 TRIESTE, ITALY Telephone: 39 (040) 22401 Telefax: 39 (040) 224163 Telex: 460392
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Competitions in the Promotion of Mathematics

Paul Jainta

Telling is not teaching and listening is not learning. This terse truism summarizes the difficulties in communication so often encountered in mathematical education. Nevertheless, properly directed telling and intelligently oriented listening are essential components of successful communication. The most effective way to measure the degree of such success is by appropriate testing of the student's problem solving ability. Volumes can be and have been written on the importance of problem solving in the learning process and in the growth and development of mathematics.

What applies to a high-developed country but lacking in mineral resources or raw materials like the Federal Republic of Germany, will be correct, too, for all members who are going to play an active role in the world economy: we need to develop our intellectual capital. As we begin this exciting new decade and approach the year 2000, Europe's need to be competitive internationally grows. So does the need for today's youth to be skilled in mathematics, and equipped to develop competence in engineering, manufacturing, science, research and education: all crucial to the success of Europe's economic development. We want to be an organic society that continually extends skills and knowledge rather than one that tolerates mediocrity and stagnation.

Bringing a mathematical business up to scratch

Mathematical ability is one key aspect of that knowledge base. Through the mathematics olympiads, Europe's finest mathematical minds are able to pit themselves against their peers around the world and to extend and refine their individual capacities. But mathematics is not just for the most talented. Understanding of mathematical concepts and the discipline encouraged through the study of mathematics are also important in everyday life and help to ensure that young Europeans have every opportunity to develop their potential. Strangely enough there's a wide gulf between those demands and reality: the higher a country has developed the more miserable is its provision of exciting challenges to interested and talented students as far as Western Europe is concerned.

The former communist countries under the overall control of the now dissolved USSR have set an example to us Western Europeans and still do so in the following respect: in nearly every Russian (large) town pupils were fortunate to grow up in a bright problem solving atmosphere with its mathematical clubs, schools and olympiads. There were for instance about one thousand mathematical olympiads held in the former Soviet Union every year. In smaller Bulgaria they're proud to say that year-by-year *"n pupils from N- town have taken part in the International Mathematics Olympiad"*. Possible values of n are here from 0 - 8 , but the most prestigious number is 3, and when n is 1,2 or 3 practically every time, then N- town is highly respected both by the other towns and its own inhabitants too. In ex- Czecho-Slovakia in 1990 they had 15 mathematical classes in secondary schools, with 1 - 2 in each administrative district. The instruction in these classes differed from those in ordinary ones in mathematics and related subjects:

- The total number of lessons is about 32 per week;
- More emphasis is laid on solving difficult problems, performing detailed proofs, observing the logical structure of reasoning and on encouraging pupil's ability above all;
- Most of the students take part in mathematical clubs and mathematical competitions (the majority of the Czecho-Slovakian representatives in IMO is made up from this source).

Even in sparsely populated Australia in 1990 over 400,000 students competed in the Australian Mathematical Competition. In Western Europe however things are going badly. Promotion of mathematically gifted students in remaining parts of Europe is not as good as in the countries of Eastern Europe. Where's the secret now that makes up such a broad and excellent mathematical education? Or to put it another way: What kind of inadequacies prevent older democracies from executing a comparable promotion of their gifted students at schools?

Just for the fun of it?

First of all, promotion has to start at an early stage. To my mind there are few competitions for junior secondary schools in the (Western) world, to give 11-14 year old children a chance to compete against each other. For example, in the Czech Republic for pupils from 4th to 6th form (aged 10-12) there exists a special problem solving competition - the so called PYTHAGORIAD. Prerequisites and obstacles for successful progressing in working with children showing interest and talent at mathematics are as follows:

- Highly motivated teachers.

Training the top pupils is tremendously time-consuming. The lecturers working in this field are considered to be inferior mathematicians and pedagogues in comparison with those who are teaching at universities and institutes.

- The work on the training programme is, in practice, an obstacle to advancement in science and promotion in one's job.
- Training of participants in such specialized groups is not given much attention by the public and state bodies. There are few awards and honorary titles for extra-curricular work. Teachers are rarely allowed to charge for their work in coaching top pupils.
- A lack of suitable literature.

  What is available is hard to get hold of. Buying books and subscribing to magazines from all over the world is running away with the money. Copying of materials has been an unsatisfactory solution.

There one has to look for new sponsors with substantially changed conditions. In my opinion the greatest obstacle to guaranteeing continuity and creating conditions for the growth of all talents is missing co-ordination between teachers of elementary and secondary schools, lecturers from universities and others coming from outside. The problem of continuity in achieving an advancing growth is not yet developed in its generality - from 4th form up to 11th form.

I'll pick up this last observation and would like to recommend an about-face to (Western) Europe's promotion of mathematically gifted students. Instead of many groups pottering about individual forms of promotion alongside one another it would be more effective if these internal competitions would be fitted together into a new standardized system on a European level.

Let me explain:

1) Competitions have to be divided into 'school' and 'free programme' competitions: the first is to test knowledge of and abilities in elementary school mathematics (up to a higher level). The 'free programme' shall be a collecting point for all additional parts of extra-curricular material (in elementary mathematics) as well as contest problems that were posed in most of popular foreign mathematical magazines.
2) The aim is to create a general orderly system for finding and advancing young talents (from 4th grade up to the 11th).
3) There have to be individual leaders for pupils, working on individual programmes.
4) A teacher of mathematics bears a great responsibility. If students spend their time at routine drills and operations their interest will be stifled and their intellectual development will be retarded. On the other hand, if the teacher challenges the students with problems commensurate with their knowledge and ability and uses stimulating questions to encourage problem solving, they may perhaps develop a taste for independent thinking.

Therefore, qualifications for the leaders of circles is inevitable. They need mature scientific and methodological training and to be very skilled at solving problems .

'La Kangourou des Mathematiques'

In an exemplary fashion *The Mathematics Challenge* for young Australians demonstrates what a national programme can achieve in helping teachers to develop the potential of top math students in years 8 to 10. It provides teachers with interesting, accessible problems *and* their solution, as well as detailed,

motivating teaching and discussion materials. Ideas in the teaching materials supplied can be used in class work and help increase interest and achievement in maths by all students in the school. The Australian way especially appeals to me as a model for similar activities around the world. For example France has modelled its major competition on the Australian pattern and has named it *"Le Kangourou des Mathematiques"* in honour of the Australian Mathematics Competition. There are many factors in its success - enthusiastic support from high profile sponsors, challenging and motivating question papers, efficient administration and innovative school reports. However, underlying all these factors is the commitment, enthusiasm and quality of the teachers and mathematicians who in a voluntary capacity, give their time and talents to making this competition so successful.

Because of that, it's hardly surprising that it is Canberra, the capital of Australia, where the *World Federation of National Mathematics Competitions* (=WFNMC) is residing. This umbrella organization is the major communications link for mathematicians and teachers who use competitions for the enrichment of mathematics learning. As the co-operation between government departments of the twelve members of the European Community is increasing even in the fields of education and culture above organisational structure of the WFNMC could be a model for Europe also.

Interlocking Committees

I suggest such an interlocking committee to be established in Europe to cover the great variety in mathematics competitions and associated activities administered from the University's campus. This Federation to be arranged in Europe should aim to provide a nationwide focal point for those interested in, and concerned with, conducting regional or national mathematics competitions for the purpose of stimulating and enriching the learning of mathematics. Its objectives should include

- serving as a resource for the exchange of information and ideas on mathematics competitions through publications;
- assisting with the development and improvement of mathematics competitions and other activities in promotion of talented students at school;
- increasing public awareness of the role of mathematics competitions in the education of all students and ensuring that the importance of that role is properly recognised in academic circles and in the community and;
- creating and enhancing professional links between mathematicians involved in competitions in whole of Europe.

The European Mathematical Society is interested in receiving articles to appear in its NEWSLETTER, talking about how competitions are related to more traditional educational activities and how to find activities for younger students or those of lower achievement or ability in order to popularize mathematics. In addition articles shall be dedicated to all those mathematicians and teachers who are involved with mathematics competitions not only at national and international level, but also at regional and primary school level. Therefore we'll invite our colleagues to submit their favourite methods used in their work with students of high ability. Many mathematicians have extensive experience in this field and could share their achievements with other fellow teachers.

A meeting of minds

There is a great chasm in the mathematical profession, between those who teach and those who do research. As a result, the teachers are denied access to new results and ideas, while the researchers are denied methods to communicate their ideas. Competition problems offer one of the few areas in which we can combine these two aspects of our profession. Problems posed on a very simple level often can be scaled up to match the wits of our very brightest students and sometimes even of professional mathematicians. What is the link between them? I presume it will be all those journals and magazines dealing with popular mathematics that bring them together. I am myself collaborating on the German journal ***alpha***. This magazine is published in one volume of six issues per year and carries reports, articles, notes, problems (and their solutions) in school mathematics. *alpha* is mainly addressed to students and those who are interested in mathematics clubs, olympiads and competitions, but is also devoted to and received by a larger audience (research scientists at one extreme and people entirely "out of profession" at the other), who read it for mere recreation.

The section that I'm conducting (*The Olympiad Corner*) aims at focusing the different styles of problems, different traditions in their presentation and solution and this reflects an underlying set of differences in what kind of mathematics is done in various countries throughout the world. It's quite a delightful task and is in demand to highlight how different countries produce styles of mathematics, and some of these styles mirror the culture in which these arose. We are different as individuals and different as national groups as well. These differences lead to different contributions to mathematics and thus enrich us all. Just as a healthy biosphere includes a diversity of species, a robust mathematical life must contain divergent national traditions. It is likewise important to exploit national differences by making them public, so that each tradition can borrow from and also stimulate the others.

What is more, there are countries in the world and even in Europe where local traditions are **not well developed** or widely publicized. It is more important to discover and offer such hidden treasures to an inquisitive public.

Brainteasers

In another column *(Problem Corner)* recently established in *alpha* I welcome students from grade 5 up to pre-university level to regularly submit solutions to any given problems. Actually each issue of *alpha* will feature 6 problems paired off into *Junior, Medium and Open* for those students who love mathematics and enjoy the pleasures of solving challenging problems. While in most of the competitions one is usually expected to solve too many problems in too short a time at a fixed location, the *Problem Corner* tries to emulate more realistic conditions for serious problem solving. The heading mentioned above is only a device to encourage participation. Instead of awarding prizes, best solutions to each problem will be published by name.

Girls to the mathematical front

To come to an end I'll draw your attention to another item that arose from my involvement in the organisation of a mathematical contest between all grammar schools in the city and in the district of *Fürth/Bavaria,* Our primary concern is to increase girls' enthusiasm for mathematics. Much yet remains to be done because we're observing a striking difference in the number of contestants in every western competition: in Eastern Europe there are many more schoolgirls taking part in mathematical contests than in Western Europe. They give up competing in mathematics with their male colleagues without a fight. Therefore it was unanimously felt a sensation on the occasion of the award ceremony of the 1992 German *Bundeswettbewerb Mathematik* that there were two female students amongst the finalists, for instance.

We are please to register a 40 percent of girls attending our local mathematical events. Because of this fact we'll continue encouraging young girls to come to terms with mathematics. The official position of the US National Science Teachers Association is similar, that science teachers must consciously strive to overcome the barriers created by society which discourage women from pursuing science for its career opportunities and for the enjoyment it brings to involved students. Women science majors attending a conference on women in science, math, and engineering in Washington, in November 1992, were surveyed to find out what they thought the Government should do to improve math science education. The predominant responses were: *"Make math and science more fun, exciting, and interactive. Let girls know that it's okay to like sciences and math".*

So, let's work to bring students of diverse cultural backgrounds into the scientific fold and appreciate the strength and beauty of cultural pluralism. I believe that all children can learn and be successful in science. The road to a more open and diverse scientific community of the future is paved with this view and hereafter I'll follow the support of the British mathematician G.H.Hardy wrote.... '*No mathematician should ever allow himself to forget that mathematics, more than any other art or science, is a young man's game.*'

Paul Jainta, StR
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* A Mathematician's Apology, Cambridge, 1940, §4. For 'himself' and 'young man' please read 'himself or herself' and 'young person'! Ed.

MATHEMATICAL EDUCATION CONFERENCES

Fifth International Conference on Systematic Cooperation between Theory and Practice in Mathematics Education

Location: Grado (GO) Italy

Date: 2 - 6 May 1994

Organizers: Luciana Bazzini *Italy,* Thomas J.Cooney *USA*, Nicolas Rouche *Belgium*, Heinz Steinbring *Germany*.

Contact: Dr.Luciana Bazzini, Dipartimento di Matematica, Università degli Studi, Via Abbiategrasso, 209, 27100 PAVIA, ITALY.

Second Iberoamerican Congress on Mathematics Education — II CIBEM

Location: Santa Catarina, Blumenau, Brazil

Date: 18 - 22 July 1994

Organizers: Universidad Regional de Blumenau and Sociedade Brasileira de Educacão Matematica

Contact: Maria Salett Biembengut or José Valdir Floriani, Fundacã Universidade Regional de Blumenau, Rua Antonio de Veiga, 140, Caixa Postal 1507, CEP 89012900, Blumenau SC. BRAZIL. Tel: +55 473 23 0422 Fax: +55 473 22818

The Second World Federation of National Mathematics Competitions Congress

Location: Sofia, Bulgaria

Dates: 23 - 28 July 1994

Contact: Borislav Lazarov, Union of bulgarian Mathematicians, G.Bonchev str. bl.8, 113 Sofia, BULGARIA.

The Eighteenth Annual Conference of the International Group for the Psychology of Mathematics Education, (PMEA 18)

Location: College of Science, University of Lisbon, Portugal

Dates: 29 July - 3 August 1994

Contact: Joao Filipe Matos, PME 18, Departamento de Educão Faculdade Ci'ncias, Campo Grande - Cl - Piso 2, 1700 Lisbon, PORTUGAL.
Tel: +351 1 7573141 Ex.1029 Fax:+351 1 7573624 Email: <efim@scosysv.fc.ul.pt>

ICMI-China Regional Conference on Mathematics Education

Location: Shanghai

Dates: 16 - 20 August 1994

Theme: Teacher Preparation in Mathematics, (for details see ICMI-bullentin 34, page 21)

Contact: Professor Zhang Dian-zhou or Professor Ahang Zhen-ya,
Department of Mathematics, East China Normal University, Shanghai 200062,
The People's Republic of CHINA.
Tel: +86 21 257 1095 Fax: +86 21 257 8367

7th International Symposium on World Trends in Science and Technology

Location: Veldhoven (Koningshof), The Netherlands

Dates: 24 - 31 August 1994

Theme: Science and Technology Education in a Demanding Society, (for details see ICMI Bulletin 34, page 22)

Contact: Jacques van Trommel, SLO, P.O.Box 2041, NL-7500 CA Enschede, The Netherlands.
Tel: +31 53 840 840 or +31 53 840 631 Fax: +31 53 307 692
Email: vantrommel@utwente.nl (bitnet)

NORMA 1994
Nordic Conference on Teaching Mathematics
2 - 6 September 1994 Lahti, Finland

The conference theme will be the influence of the latest learning theories on the practice of teaching Mathematics.

It is aimed for teacher trainers researchers and teachers of mathematics mainly in the Nordic and Baltic countries.

For further information please contact:
Dr.Erkki Pehkonen, Department Teacher Education, University of Helsinki, PL 38, SF-00014 Helsinki, FINLAND. Telefax: +358 0 1918073.
or
Mr.Reijo Jouttimäki, University of Helsinki, Lahti Research and Training Centre.
Tel: +358 18 892 265 Email: Reijo.Jouttimaki@Latkk.Helsinki.FI

Teaching Mathematics for Industry

Location: Czech Technical University, Prague

Dates: 18 - 20 September 1994

Contact: Lennart Råde, Mathematics Department, Chalmers University of Technology, S-41296 Gothenburg, SWEDEN. Fax: + 46 31 1619073

or

Marie Demlova, Department of Mathematics, Faculty of Electrical Engineering Cezch Technical University, Prague, THE CZECH REPUBLIC.
Fax: +42 2 311999238 Email: <deml@csearn.bitnet>

BRIEF REVIEWS

Edited by Ivan Netuka and Vladimír Souček. Books submitted for review should be sent to the following address: Ivan Netuka, MÚUK, Sokolovská 83, 18600 Praha 8, Czech Republic.

J.Stillwell: Classical Topology and Combinatorial Group Theory. Second Edition, Graduate Texts in Mathematics, vol.72, Springer-Verlag, New York, 1993, xii+334 pp., 312 fig., DM 88.00, ISBN 0-387-97970-0, ISBN 3-540-97970-0

The book is a nice introduction to topology based on an interaction between topology and combinatorial group theory. The essential object to study is the fundamental group of the space. Special attention is paid to low-dimensional cases. The classification theory of oriented and nonoriented surfaces as well as methods for constructing three-dimensional manifolds are given here. Several algorithms for solutions of topological problems, e.g. the Dehn algorithm, are presented. Part of the book is devoted to the study of knots and braid groups. A chapter about open problems in three-dimensional topology and a very interesting chapter on unsolvability of some topological and group theoretical problems (e.g. the homeomorphism problem) can also be found here. The presentation of material is attractive and well organized. The book can be recommended to everybody interested in topology and geometry. (jbu)

Yu.A.Shashkin: Fixed Points, Mathematical World, vol.2, Amer. Math. Society, The Mathematical Association of America, Washington, D.C., 1991, xviii+75 pp., £ 20.00, ISBN 0-82189-000-X

The goal of this booklet is to explain in an elementary way the nature of fixed point theory and its role in analysis. The author describes in detail Brouwer's fixed point theorem for dimensions one and two and gives a combinatorial proof. There are 57 exercises many of which are solved with comments. The book may be considered as an introduction to analytical topology and may be used by undergraduate students. (joda)

W. Zimmermann, S. Cunningham (Eds.): Visualization in Teaching and Learning Mathematics, MAA Notes and Reports Series Number 19, The Mathematical Association of America, Washington, D.C., 1991, v+224 pp., £ 17.00, ISBN 0-88385-071-0

This book is a collection of 20 papers devoted to the visualization of mathematics. Both the origin and the goal of the book are best described by the editors: "This volume grew out of the editors' conviction that visual thinking and the development of visual tools through computer graphics could make major contributions to mathematics education." The book is an important step in a computer aided approach to mathematics education. (joda)

S.Stahl: The Poincaré Half-Plane. A Gateway to Modern Geometry, Jones and Bartlett Books in Mathematics, Jones and Bartlett Publishers, Boston, 1993, xii+298 pp., ISBN 0-86720-298-X

This is a very good first course in non-Euclidean geometry for undergraduate students. Though it follows the axiomatic development of non-Euclidean geometry, it concentrates on the Poincaré half-plane model of hyperbolic geometry. The book fits its purpose very well. At the beginning we find a review of Euclidean geometry, and then hyperbolic geometry in the form of Poincaré half-plane is constructed and studied. Here the exposition is very concrete and explicit. This is not a slightly strange world of axioms, definitions and theorems, but a fascinating construction, where students must feel as at ease as in familiar Euclidean geometry. The presentation goes into details in order to insure that students will acquire the necessary skills. For example we find many results from the trigonometry of the hyperbolic triangle. But on the other hand many areas are not covered and promote students' own investigations. Here it suffices to solve the exercices at the end of each chapter. They are numerous and they are good. Some of them even call for the use of computers with Mathematica or Maple. It is necessary to add that the Poincaré half-plane does not play an isolated role in the book. Other models of hyperbolic geometry are also described and connections with other non-Euclidean geometries are established. A lot of space is devoted to the introduction to Riemannian geometry, and hyperbolic geometry is also presented as a special example of a Riemannian manifold. The relation to surfaces of constant negative curvature can be found here. At the end of the book the hyperbolic half-space is introduced and the horospheres are investigated. The book can be strongly recommended. (jiva)

G.Karpilovsky: Group Representations. Volume 2, North-Holland Mathematics Studies, vol.177, North-Holland, Amsterdam, 1993, xvi+902 pp., $ 185.75, ISBN 0-444-88726-1

The second volume of this large treatment includes two parts of unequal length. The first 200 pages contain basic material on the second cohomology group, twisted group algebras, covering group and projective representations, while the rest is devoted to Schur multipliers and their applications. Results calculating these

multipliers in all kinds of groups take most of the text. The author almost never hesitates to provide detailed proofs for everything he needs, and hence there are many excursions into abstract group theory. A patient reader can benefit from the book quite a lot, and a non-specialist obtains a valuable information source. (tk)

N.Bouleau, F.Hirsch: Dirichlet Forms and Analysis on Wiener Space, de Gruyter Studies in Mathematics, vol.14, Walter de Gruyter, Berlin, 1991, x+325 pp., FF 514.00, ISBN 3-110-12919-1

This is a fairly abstract and general treatment of the subject. The following keywords give an idea of the contents of various chapters: general Dirichlet forms, Dirichlet forms on vector spaces, analysis on Wiener space and the calculus of stochastic integrals, existence of solutions and regularity properties of trajectories of stochastic differential equations,"categorical" properties of the notion of Dirichlet form (images, tensor products, projective limits, conditioning), Girsanov's theorem (without absolute continuity), quasieverywhere convergence. Exercises are included. (It could be perhaps be useful to complement this book by reading some introductory text on Malliavin calculus and stochastic integrals.) The notion of Dirichlet forms has been studied very intensively in recent years and there is another new book by Röckner and Ma on a closely related subject. (mz)

Zhi-Ming Ma, M.Röckner: Introduction to the Theory of (Non-Symmetric) Dirichlet Forms, Springer-Verlag, Berlin, 1992, viii+209 pp., DM 61.00, ISBN 0-387-55848-9, ISBN 3-540-55848-9

Classical results of Beurling and Deny were the origin for the analytic part of the modern theory of Dirichlet forms while the probabilistic component goes back to work of Fukushima. The aim of this book which appeared in the "Universitext" series of Springer-Verlag is to give an introduction to the theory of Dirichlet forms both from the analytic and probabilistic point of view and to show their interplay. Notice that the authors do not necessarily study symmetric forms on general state spaces but allow non-symmetric forms (to include the non-locally compact setting of infinite dimensional state spaces). The construction of an associated Markov process plays the key role. Each chapter ends with updated notes and references for further study. This excellent monograph can serve not only graduate students but specialists in the field who will surely find in the well organized material many new results. (jl)

U.Dudley: Mathematical Cranks, MAA Spectrum Series, The Mathematical Association of America, Washington, D.C., 1992, x+372 pp., £ 21.00, ISBN 0-88385-507-0

This book on fascinating mathematical nuts, cranks and eccentrics is written in an unexpressed appreciation of them and of their enthusiasm for solving various mathematical statements which sound challenging to them. Miscellaneous solved and unsolved problems (like the trisection of the angle, duplication of the cube or Fermat's last theorem) produced by the history of investigation of the secrets of mathematics are packed together here with quite original "inventions" (like "the role of 57 in the American revolution") in, what the author calls, "opinions of mine". The book will be read with interest by professionals, who, at one time or another, have come across a crank of the type described, as well as many others who will value an extremely entertaining style and transparent simplicity with which even complicated mathematical problems are presented. Both categories of readers will surely enjoy the author's comments inspired by the nature of the topics. (jtro)

A.Visintin (Ed.): Models of hysteresis, Pitman Research Notes in Mathematics Series, vol.286, Logman Scientific & Technical, Harlow, 1993, 221 pp., £ 25.00, ISBN 0-582-20900-5

This Proceedings of the workshop "Models of Hysteresis", Trento 1991, consist of a collection of 18 contributions presenting different points of view on mathematical modelling of hysteresis phenomena. The editors have found a reasonable balance between physical expositions on ferromagnetism (G.Bertotti, D.Pescetti, G.Rieder, F.Vajda & E.Della Torre), applied papers on hysteresis modelling in mechanics and thermodynamics (P.A.Bliman & M.Sorine, Y.Huo & I.Müller, K.Wilmanski), methods of solving ordinary differential equations with hysteretic nonlinearities (G.Gripenberg, A.M.Krasnosel'skii, V.Lovicar & al., A.V.Pokrovskii, T.Seidman, L.Tavernini) and the qualitative theory of partial differential equations with hysteresis (U.Hornung & R.E.Showalter, N.Kenmochi & A.Visintin, P.Krejak, D.Montreanu & P.D.Panagiotopoulos, A.Visintin). This volume does not cover all the existing directions of research in the mathematical theory of hysteresis, but it offers representative information about various activities in this field. (pk)

M.Renardy, R.C.Rogers: An Introduction to Partial Differential Equations, Texts in Applied Mathematics, vol.13, Springer-Verlag, New York, 1993, xiii+428 pp., 21 fig., DM 74.00, ISBN 0-387-97952-2, ISBN 3-540-97952-2

There are not many courses on PDE's giving the student a sense of the proportions of the theory of partial differential equations as a whole. Almost all textbooks are based on some particular unifying aspect (method,

type of the problem etc.) and only after long experience of active work in the field, can the user achieve, step by step, some feeling for the whole immenseness of what is called the theory of PDE's. The authors of the book, which is based on a four-semester course, have tried to pass on part of their experience to the reader. In my opinion they are successful in this nontrivial job, saving students (and teachers), much energy which can be used elsewhere. In the first part of the introduction, the authors collect the basic notions used in PDE-theory explaining them carefully in terms of "non-PDE" material known to students from previous courses. So, for example, Gronwall's inequality and the maximum principle of analytic functions are used to explain the concept of apriori and aposteriori estimates, respectively. The second part of the introduction is a brief excursion into the realm of Laplace, heat, and wave equations. The following is a list of Chapters: Characteristics. Conservation Laws and Shock Waves. Maximum Principles. Distributions. Functions Spaces. Operator Theory. Linear Elliptic Equations. Nonlinear E.E.Energy Methods and Evolution Problems. Semigroup Methods. The text is not overloaded by technicalities. The whole text is permeated by the authors attempt to be as close as possible to contemporary material. (oj)

N.Ghoussoub: Duality and Perturbation Methods in Critical Point Theory, Cambridge Tracts in Mathematics, vol.107, Cambridge University Press, Cambridge, 1993, xviii+258 pp., £ 35.00, ISBN 0-521-44025-4

The aim of the book is to present a self–contained presentation of the min–max approach to critical point theory while emphasizing the role of duality and perturbation methods. The problem of finding critical points of a (nonlinear) functional is the main goal of many branches of mathematics. The present book gives a general theory which can be used for a great variety of situations. Morse theory and min–max methods are known tools for locating critical points. Results of this kind are refined in the monograph of N. Ghoussoub. There is no doubt that this carefully written book will be used as a fundamental reference on critical point theory by mathematicians working in nonlinear functional analysis, optimization and differential equations. (ss)

D.Bainov, P.Simeonov: Impulsive Differential Equations: Periodic Solutions and Applications, Pitman Monographs and Surveys in Pure and Applied Mathematics, vol.66, Longman Scientific & Technical, Harlow, 1993, x+228 pp., £ 38.00, ISBN 0-582-09639-1

The concept of impulsive differential equations is explained intuitively in this book. There are prescribed – mostly nice – sets at which the impulses act on an evolutionary process given by a classical differential equation and the impulses cause instantaneous jumps (discontinuities) in the evolution. Impulsive systems of this sort have similar properties to systems described by ordinary differential equations. If the impulsive differential equation exhibits some periodicity properties in its setting, an interesting question is to see if there are also periodic solutions. Answering this problem is the main goal of the present book. Linear systems are the starting point. In this case a full theory similar to the non–impulsive case can be constructed (Floquet theory). The main part of the book is concerned with the case of weakly perturbed linear impulsive systems. In one chapter attention is paid to fully nonlinear systems; e.g. the method of upper and lower solution is described for the impulsive case. The final chapter gives some iterative techniques for finding approximate periodic solutions of impulsive systems. A detailed description of some interesting examples is given in the book. (ss)

V. Kiryakova: Generalized fractional calculus and applications, Pitman Research notes in Mathematics 301, Longman Scientific and Technical, UK, 1994, 388pp., £39.00, ISBN 0-582-21977-9

This book contains the details of the development of a new generalized fractional calculus, using a system based around generalized fractional integrals and derivatives. It is a work of immense detail, and each of the 388 pages is crammed with results that will excite any reader who possesses the slightest interest in special functions. Fractional calculus is a subject that has been in existence for many years, but somehow never really seems to have attracted the attention that it deserves. Historically, fractional calculus was developed as a means of generalizing the definition of an nth derivative to cases where n is rational, irrational or even complex. The text demonstrates how this generalization may be achieved by means of kernel functions in the form of Meijer G-functions, showing that a complete system of operational rules and many other properties may be developed. Such results have many practical uses, and allow complicated multiple integrals and integro-differential expressions to be expressed as single integrals. One of the great strengths of the text is the number of practical examples that it contains. These include the explicit solution of generalized arbitrary order Bessel-type equations and new results for Abel and dual integral equations. The book contains a huge bibliography of over 500 items, and a useful list of open problems in the theory. It can be warmly recommended to applied mathematicians in general, but must be regarded as indispensable for all those with an interest in special functions or fractional calculus. (adf)

R. Deville, G. Godefroy and V. Zizler: Smoothness and renormings in Banach spaces, Pitman Monographs and Surveys in Pure and Applied Mathematics 64, Longman Scientific & Technical, 1993, ISBN 0-582-07250-6

Renorming theories seeking norms with new ("better") properties form a part of functional analysis called the geometry of Banach spaces. In this book the authors collect together new results and methods appearing in the past decade and provide simplified proofs of many older results. They illustrate basic techniques for constructing equivalent norms on Banach spaces which enjoy special properties of convexity and smoothness and give applications in different areas of modern analysis. The main topics covered in the book include duality mappings containing general variational principles, first and higher order smoothness, roughness of norms, martingal techniques, decompositions and renorming of nonseparable spaces with Haydon's examples and applications to viscosity solutions of Hamilton–Jacobi equations in infinite-dimensional spaces. Each chapter ends with a list of open problems and carefully chosen up-to-date references. This excellent book can be warmly recommended to everybody interested in functional analysis and in Banach spaces theory in particular. Graduate students and researchers will surely find in it not only plenty of relevant material but also a source of inspiration and pleasure as well. (jl)

G.Grützer: Math into TEX. A Simplified Introduction to AMS-LATEX, Birkhäuser, Boston, 1993, xxix+294 pp., sFr 58.00, ISBN 0-8176-3637-4, ISBN 3-7643-3637-4

Nowadays most mathematics around the world is typeset with the help of TEX. Donald Knuth's contribution to typography is sometimes compared with that of Gutenberg. TEX itself is a program language of (digitalized) typography on which some more powerful macros are based. LATEX (Leslie Lamport) was intended to provide people with facilities like automatic generation of contents and indexes enabling people writing books to concentrate on their content, whilst A_MS-TEX (Michael Spivak) is an excellent tool for writing papers on almost all kind of mathematics and has become an unofficial world-wide standard. This book is a self-contained course for beginners and also experienced users on A_MS-LATEX (Frank Mittelbach et al.), the macro package combining the best features of both above mentioned popular macros. More books on TEX are available now so it is nice that experienced readers are provided with a graphical key to parts which will be worth their while reading. Appendices are very useful: suggestions how to make conversions from TEX, LATEX and A_MS-TEX are presented, subjects not covered are listed and useful suggestions for further reading are given. As well as this, the reader is supplied with information on PostScript Fonts and on sources of updates available via Internet (including description of necessary UNIX commands). A combination of the macro package and the book gives the reader immediate access to some features which will be hopefully included in LATEX3. The book is accompanied by a 3.5" disk containing the directory MAINZ with some programs written by Frank Mittelbach and Rainer Schöpf and three other directories containing copyrighted software relating to the parts of the book (© Birkhäuser Boston). Two final remarks: while TEX runs even on an obsolete hardware, A_MS-TEX needs 80386 CPU or higher for efficient use. The book contains practical advice on concrete installations, on PC's and Mac's, of both PCTEX (Personal TEX, Inc.) and Textures (Blue Sky Research). (jive)

R.Long: Martingale Spaces and Inequalities, Friedrich Vieweg & Sohn (Peking University Press), Wiesbaden, 1993, viii+246 pp., DM 89.00, ISBN 7-301-02069-4, ISBN 3-528-08397-2

The monograph is a neatly written survey of the present state of "Martingale spaces - inequalities - transformations theory" developed in probability and analysis since the early 70's as a very natural and useful martingale generalization and counterpart to Hardy and bounded mean oscillation spaces theory on R^n. It covers practically all the developments in the field since A. Garsia's 1973 pioneering "Martingale inequalities" including, perhaps more importantly, D. Burkholder's comparatively recent results on martingale transforms in connection with stochastic integrals and harmonic functions. Martingale inequalities and transformations and, more generally, martingale theory as a whole have a long history and a distinguished role in probability theory as a dependence model and show more and more an intimate relation to some parts of analysis (potential theory, geometry of Banach spaces, Choquet theory) and combinatorics. It is the latter face of martingale theory that is presented by the author which perhaps makes the monography more attractive for "non-probabilistic mathematicians" though it is an excellent reference for everybody in need of advanced martingale techniques. On the other hand little space in the book is allowed for applications and examples which would provide a motivation and a probabilistic insight both of which are important when trying to understand a stochastic dynamic system in all its complexity with stopping times, history π algebras, etc. While this fact may send a beginner back to some classical texts (J.Neveu, P.A.Meyer, e.g.), a specialist will appreciate the straightforward, precise and selfcontained presentation of the rich and up to date material. Key words for the content of the monograph

might read as follows: convergence, a decompositions of martingales, H_p-martingales, convex inequalities, BMO-martingales, martingales transformations, weight theory, regular martingales. (jos)

J.L.Schiff: Normal Families, Universitext, Springer-Verlag, New York, 1993, xii+236 pp., DM 58.00, ISBN 0-387-97967-0, ISBN 3-540-97967-0

The first systematic treatise on the subject of normal families was given in 1927 by P. Montel in his fundamental "Leçons sur les familles normales de fonctions analytiques et leurs applications". The book under review tries, in addition to the presentation of classical theory, to record the progress made in this field in subsequent years. The subject matter is restricted to analytic and meromorhpic functions of one complex variable. Other topics, such as normal families of quasi-conformal mappings, quasi-regular mappings, functions of several complex variables, etc., are omitted. Considering the material collected in the book, a rather surprising observation appears: the classical techniqnes were highly refined but not many new ideas were added to the classical theory. The most significant of them are the Bloch heuristic principle formulated in 1973 by the well known logician A. Robinson and made rigorous by L. Zalcman in 1975, and the work of D. Drasin (1969), based on deep results from Nevanlinna theory. These topics are very succesfully treated in Chapter 4. The classical theory is presented in great detail and with many refinements in Chapters 2 (analytic functions) and 3 (meromorphic functions). Chapter 5 is devoted to applications concerning extremal problems, normal functions theory (Lehto and Virtanen), discontinuous groups (among other results a necessary and sufficient condition for a group of linear transformations to be discontinuous in terms of normality (Fatou 1930) is proved) and, finally, the theory of iterations by rational functions created by G. Julia and P. Fatou in 1918-1920. The renewed interest to this beautiful theory in the eighties is connected with the theory of discrete dynamical systems. From the theory of iterations by entire functions, initiated also by Fatou in 1926, only the famous theorem of J. N. Baker from 1968 asserting that the set of repelling fixed points is dense in the Julia set (known for rational functions already to Julia and Fatou) is proved. Chapter 1 contains necessary prerequisities and an appendix is devoted to quasi-normal families. The material is very well organized, the presentation is clear and essentially selfcontained. (jf)

O.Nevanlinna: Convergence of Iterations for Linear Equations, Lectures in Mathematics ETH Zürich, Birkhäuser, Basel, 1993, 188 pp., sFr 36.00, ISBN 0-8176-2865-7, ISBN 3-7643-2865-7

This book discusses the convergence of Krylov subspace methods for solving fixed point problems of the form x=Lx+g, where L is a bounded linear operator in a Banach space and g is a given vector in X such that the equation has at least one solution. The author focusses on the dynamical aspects of the iteration precesses. The goal is to know how to precondition effectively, both in the case of numerical linear algebra and in function spaces. The book is based on a series of lectures of the author which were given at Helsinki University of Technology and at ETH in Zürich. It can be strongly recommended to specialists as well as to amateurs. (kn)

H.S.Shapiro: The Schwarz Function and Its Generalization to Higher Dimensions, University of Arkansas Lecture Notes in the Mathematical Sciences, vol.9, J.Wiley & Sons, Inc., New York, 1992, xi+108 pp., £ 59.00, ISBN 0-471-57127-X

Let J be a nonsingular analytic Jordan arc in the complex plane. It can be proved that there exists a neighbourhood N of J and an analytic function S on N such that $S(z) = \bar{z}$ for all z belonging to J. The function S (called the Schwarz function) can be used to define a "reflection" with respect to J. The closely related notion of the so called Schwarz potential of J has the advantage that its definition extends naturally to higher dimensions and can be used in various problems of analysis, e.g., analytic continuation of potentials, inverse mean value property of harmonic functions, quadrature indentities, quadrature domains. Classical results are recovered and more recent ones are included in order to show how powerful a tool the Schwarz potential offers. The Schwarz function is also used for the investigation of the Hilbert operator of a plane domain. Relations to the Neumann-Poincaré problem, properties of the Szegö projector and of the Friedrichs operator are also studied. The book is an expanded version of a series of lectures delivered by the author at a conference of Fayetteville in 1988. It provides a nice approach to several problems of mathematical analysis where classical as well as modern methods are succesfully combined. (in)

J.Mawhin: Analyse. Fondements, techniques, évolution, Acces Sciences, De Boeck - Wesmael, Bruxelles, 1992, iv+808 pp., BEF 1650.00, ISBN 2-804-11670-0

This unusual textbook represents the theoretical part of the course in mathematical analysis offered to students of mathematics and physics at the Catholic University of Louvain. The contents of the first nine chapters could be characterized as standard: a short introduction including logic, set theory, real and complex numbers,

mappings, a bit of topology of Euclidean spaces, limits, continuity and differentiation of mappings from one Euclidean space to another, implicit functions, linear differential equations, primitive functions, Taylor expansion, elementary functions. Completely untraditional is the approach to integration. The Henstock-Kurzweil integral is studied systematically (thus no measure theory is required). Results usually covered by a standard "absolutely convergent integral treatment" are included and, of course, specific ones are added. Applications to series of functions are given. Stokes theorems (based on differential forms) are presented and brief chapters on analytic functions on functional analysis and on calculus of variations are included. While each chapter is accompanied by only a few exercises, there is however, an interesting appendix containing important quotations by famous mathematicians. A 60 page long historical index is of a great value: it contains biographical information and important historical notes and comments. This remarkable book will surely be inspiring for analysis teachers. (in)

R.Redheffer: Introduction to Differential Equations, Jones and Bartlett Publishers, Boston, 1992, xii+468 pp., ISBN 0-86720-289-0

This text is an introductory version of the author's book "Differential Equations: Theory and Applications", Jones and Bartlett Publ., 1991 (DETA). The book is intended for students who have had one year of calculus and therefore it is written in a very elementary way. Linear approximations at stationary points of autonomous systems in the plane, the Fourier method for the heat equation, power series solutions to Bessels equation, the Laplace transform and convolution belong to the most advanced topics. The more complicated proofs are omitted but precise references to DETA are given. Instead, thirty examples of various applications are presented. In the reviewer's opinion, the book can be succesfully used in a one year course on differential equations for students who are not mathematicians. (jm)

I.R.Ionescu, M.Sofonea: Functional and Numerical Methods in Viscoplasticity, Oxford University Press, Oxford, 1993, xvii+265 pp., £ 55.00, ISBN 0-19-853590-2

The book offers a nice and modern presentation of some mathematical and numerical methods applied in viscoplasticity. The content of the book starts with a brief overview of basic relations and equations describing viscoplastic models. Then it continues with functional methods used in the study of the associated mathematical formulation. Let us mention, for example, elliptic variational inequalities, ordinary differential equations in Banach spaces, linear semigroups of continuous operators, monotone operators and fixed point methods. With the use of these tools the following types of results are obtained: existence and uniqueness of solutions, continuous dependence of solutions with respect to the data and parameters, evolution of perturbations, stability and blow up of the solutions. The numerical part gives the treatment of the following techniques: penalization and regularization, finite element discretization, Euler's method for unsteady problems and Newton's method for nonlinear equations. Special attention is paid to the convergence of the numerical solutions and error estimates. The purpose of the book is a detailed and complete treatment of the problems studied from the theoretical as well as the numerical point of view together with some engineering applications. The book can be recommended to researchers and students interested in mathematical and numerical problems of nonlinear mechanics and their applications. (mf)

J.R.Retherford: Hilbert Space: Compact Operators and the Trace Theorem, London Mathematical Society Students Texts 27, Cambridge University Press, Cambridge, 1993, xii+131 pp., £ 27.95, ISBN 0-521-41884-4, ISBN 0-521-42933-1

The material covered in the book was the subject of an eight weeks summer course given by the author in the U.S. and Austria. In the book Hilbert space theory and technique is presented in a very user-friendly way with the aim of giving an elementary proof of Lidskij trace theorem. Students are supposed to have a good knowledge of advanced calculus (but not Lebesgue integration) and finite dimensional linear algebra; the presentation is rather self-contained. Thus the book can be used as a good introductory text on Hilbert space and operators (it contains a lot of exercises provided with numerous hints and historical comments). It consists of eleven chapters (Preliminaries, Orthogonality, Isomorphisms and Isometries, Bounded Linear Operators, Elementary Spectral Theory, Self-Adjoint Operators, Compact Operators, Square Roots, The Weak Weyl Inequality, Hilbert-Schmidt and Trace Class Operators, The Lidskij Trace Theorem), three Appendices scattered among chapters (Compact Integral Operators, The Weyl Inequality, Localization of Eigenvalues) and Indexes of notation and terms (and three ways of writing John von Neumann's name). (jive)

A.R.Rajwade: Squares, London Mathematical Society Lecture Notes Series 171, Cambridge University Press, Cambridge, 1993, xii+286 pp., GBP 27.50, ISBN 0-521-42668-5

This is a very interesting book about sums of squares. It has two central themes: 1) Existence of multiplicative formulas of the type $(X_1^2 + \ldots X_r^2)(Y_1^2 + \ldots Y_s^2) = (Z_1^2 + \ldots + Z_n^2)$; 2) Description of sums of squares in various fileds or rings. The topics covered by the author include: properties of the level ("Stufe") of various fields (the smallest s for which -1 is a sum of s squares); Hilbert's 17th problem (representation of positive semi-definite forms as sums of squares); Hurwitz-Radon theorem; multiplicative properties of Pfister forms. The exposition is quite elementary and requires from the reader only familiarity with basic algebra. (jnek)

J.Sebestik: Logique et Mathématique chez Bernard Bolzano, L'histoire des Sciences. Textes et Etudes, Librairie Philosophique J. Vrin, Paris, 1992, 522 pp., ISBN 2-7116-1067-5

This book is devoted to a complex view of the whole published mathematical and logical achievements of Bernard Bolzano based on contemporary analysis. The division of the book into four parts follows the development of Bolzano's scientific interests. Pages 33-112 are devoted to the foundations of mathematics (foundations of geometry, theory of parallels, point set concept of geometrical objects, Bolzano's dimension concept, continuity and connectedness, arithmetization of mathematical analysis). The second part (pp. 115-293) concentrates on Bolzano's logic and theory of science. The next part (pp. 297-431) follows Bolzano's conception of mathematics as "Grässenlehre" (theory of quantities), his introduction into set theory, the theory of real numbers and theory of real functions up to "Bolzano's function". The fourth part (pp. 435-474) contains the development of the notion of infinity and Bolzano's reasonings about infinite sets in connection with analysis of his Paradoxien des Unendlichen. Ten pages of cummulated bibliography of editions of Bolzano's works and 14 pages of references on Bolzanian literature is included. A short vocabulary provides French translations of some German terminology used by Bolzano. Also an index of symbols as well as a condensed curriculum vitae are given. Sebestik's book documents the present state of research in Bolzano's mathematics and logic. (jaf)

E.Beltrami: Mathematical Models in the Social and Biological Sciences, Jones and Bartlett Books in Mathematics, Jones and Bartlett Publishers, Boston, 1993, xiii+197 pp., $ 38.75, ISBN 0-86720-292-0

This book can be used as an upper-level undergraduate text on social and biological applications of matrix algebra, elementary probability and differential equations. It contains several very nice examples such as cyclic recurrence of measles outbreaks, the interplay between economics and exploiting natural resources, growth of algae in coastal waters. These examples are supported by concrete empirical data. The mathematical explanation is very readable, perhaps rather sketchy in some places but referencs to more advanced books are given. (jm)

A.K.Dewdney: 200% of Nothing: An Eye-Opening Tour through the Twists and Turns of Math Abuse and Innumeracy, J.Wiley & Sons, Inc., New York, 1993, ix+182 pp., $ 21.95, ISBN 0-471-57776-6

This is a very exciting book arising the interest of the reader in the mathematics of everyday life. Without making the reader tired by lengthy theoretical explanations, the author awakens ones curiosity to learn more about the mathematics behind various forms of math abuse discussed in the book. The reader will get encouraged to discover possible scams and distortions (deliberate or not) of data, committed by mass media, advertizing companies and others who try to impress him, to mislead him or even to lure him into unwanted activities. Some features of innumeracy (like "number numbness", "dimensional dementia" or "compound blindness") are discussed and more frequent occurrences of math abuse ("nums", "dramadigits", "casting out nines", graphic distortions etc.) are displayed. Motivated by a sudden awareness of his own innumeracy, the reader may be willing to do something for his defence by learning a bit of "street math" - at least to the extent of the content of the book's last chapter. Many of the topics discussed in the book should be woven into the compulsory school curriculum. (jtro)