



European Mathematical Society

NEWSLETTER No. 15

March 1995

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NOTICE FOR MATHEMATICAL SOCIETIES

Please note labels are prepared during the second half of the month before the next issue. Would you please send your updated lists before this time.

Many thanks.

Ms T Mäkeläinen

ARTICLES FOR FUTURE EDITIONS of EMS NEWSLETTERS

Files: E-mail to Dr D. Singerman: **ds@maths.soton.ac.uk**
 or Mrs B.J. Betts: **bjb@soton.ac.uk**

Articles camera ready for printing or on disk (Wordperfect)(T_EX)

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EMS Lectures

The European Mathematical Society has decided to invite a distinguished mathematician, in each odd-numbered year, to visit an institution within the area covered by the EMS, to give a series of from three to five lectures of an advanced expository nature on a topic of current research interest.

The first EMS Lecturer is

Hendrik W. LENSTRA, Jr.
(University of California at Berkeley)

who will lecture on

“Topics in algorithmic algebraic number theory”

on June 12–15, 1995

Université de Franche-Comté, Besançon, France

Some additional talks are planned in algebraic number theory and algebra. The details concerning these talks will be announced later.

For information and inscription, please contact

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16 route de Gray
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TRAINING and MOBILITY of RESEARCHERS

PROGRAMME of the EUROPEAN COMMUNITIES

The official journal of the EC has published on January 17, 1995 a first call for proposals in this new programme, which replaces the Human Capital and Mobility Programme.

A preliminary announcement was made a month earlier - note that some of the deadlines have been changed between the two announcements.

Here is a summary of the various activities.

Note that they concern only the member states of the European Union and the associated states, i. e. those who have entered in a full agreement with the EU concerning this programme.

Activity 1: Research networks.

The aim is to help research groups in different countries to unite their efforts around high quality research projects, and also to promote the training and mobility of researchers, in particular at the post-doctoral level.

A network should contain at least five teams representing at least three countries.

The EC support is not for the research activity itself in each country, but for the supplementary cost of interaction and for the support of researchers (mostly at post-doctoral level) moving from one country to another.

The information package (see below how to obtain it) contains guidelines for those networks.

These suggest that 50 to 65 % of the expenses should go to fellowships for young researchers, the rest being used for travel expenses. The EC will encourage candidates to apply for a rather large amount for each group, taking into account the high cost of fellowships.

The applications will be examined by a scientific panel, which normally should not modify the amounts asked. (In the past, the panel often decreased the amounts substantially).

The guidelines are rather detailed, and it is certainly advisable to follow them as closely as possible.

The deadline for submission of proposals is June 15, 1995.

Activity 2: Access to large facilities.

These large facilities should be understood as essentially unique facilities for research in Europe. The EC - support should help researchers to gain access to these.

The deadline for submission of proposals by these facilities is April 18, 1995.

Activity 3: Training by research.

A. Post-doctoral fellowships.

These are for periods between 6 months and 2 or 3 years, and should allow a young researcher (at the doctoral or post-doctoral level) to work in another EC country (i. e. not in his country of origin or of residence).

B. Return allocations.

Researchers from less favoured regions of the EC having benefited from a fellowship of type A (or one in the HCM programme) can apply for a one year support when returning in a less favoured region of their country of origin.

C. Support for established researchers.

These aim at covering the stay of established researchers in less favoured regions, for periods between 3 months and 1 year.

The deadline for these proposals is May 15, 1995.

Activity 4: Euroconferences, summer schools.

A Euroconference is a series of meetings of high level involving established and young researchers on a specific theme. The number of participants should be between 30 and 100.

Summer schools aim at the training of doctoral or post-doctoral researchers.

The deadline for proposals is April 18, 1995.

Information Package.

For the whole programme, one should write or (preferably) send a fax to the address below, mentioning full name and address of the applicant.

Packages will then be sent when available (normally starting in early February).

ADDRESS: T. R. M. Information Package,
Commission Europeenne
DGXII - G3, MO 75 5/34
Rue Montoyer 75
B-1040 BRUXELLES

Fax numbers: (322) 2962136, (322) 2962133, (322) 2956995, (322) 2963270

Tel: (322) 2960254

Luc LEMAIRE

Liaison Officer of the European Mathematical Society with the EC.

IAMP

NOTICE

The International Association of Mathematical Physics (IAMP) invites mathematicians and physicists (including students) interested in research in mathematical physics to become members. The Association sponsors a Congress every three years (in 1994 the meeting was held at UNESCO in Paris) and publishes a news bulletin sent to members three times each year. The bulletin includes advertisements of positions in mathematical physics as well as announcements of preprints available in paper or electronic form, as well as other news of the activities of the Association. One special advantage of membership is steep discounts on personal subscriptions to several journals and on certain books, including *Communications in Mathematical Physics* and *Letters in Mathematical Physics*. Dues are quite modest (now \$20/year, payable in different currencies). New PhD's sponsored by two members will be inscribed for their first year of membership without fee.

Applications for membership can be obtained from the Secretary: Professor Aubrey Truman, Department of Mathematics, University of Swansea, Singleton Park, Swansea SA2 8PP, GB;

E-mail a.truman@swansea.ac.uk

Arthur Jaffe President

EUROPEAN RESEARCH CONFERENCES

The programme of European Research Conferences is run by the European Science Foundation, in association with several learned Societies (including the EMS) and with funding from the Human Capital and Mobility Programme of the European Union. Each conference consists of a series of meetings, held typically every other year. There are neither written contributions nor proceedings. Unconventional ideas and new approaches, not yet fully explored, are encouraged.

Learned Societies participating in the programme of European Research Conferences.

European Mathematical Society.

European Physical Society.

EUCHEM/Federation of European Chemical Societies.

European Union of Societies in Experimental Biology.

European Union of Geosciences.

European Association for Signal Processing.

The number of participants will be limited to about 100.

The emphasis will be on discussion about new developments. There will be a Registration Fee covering full board and lodging. Some grants will be available for younger scientists, in particular from less favoured regions of Europe. Some conferences will also have limited funding for participants from Eastern and Central Europe.

Amongst the conferences in 1995 of interest to Mathematicians are

Mathematical Analysis: Local Singularities of Solutions to Nonlinear and Singular PDEs.

B. Ziemian (*Warsaw*) - San Felin de Guixois, (*Spain*), 19 - 24 September.

Advanced Quantum Field Theory: Integrability, Conformal Invariance, Topological Field theory and Applications.

K. Osterwalder (*Zürich*) - La-Londe-les-Maures, France 2-7 September.

Deadline for applications: 3-4 months before a conference.

For information and application forms, contact the Executive Director of the Programme:

Dr. Josip Hendekovic
European Science Foundation
1 quai Lezay-Marnésia
67080 Strasbourg Cedex
FRANCE

Tel:(33) 88 76 71 35 Fax:(33) 88 36 69 87 E-mail: euresco@esf.c-strasbourg.fr

THE BRITISH COUNCIL

EUROPEAN JOINT RESEARCH PROGRAMMES

The British Council promotes cultural, educational and technical co-operation between Britain and other countries. Its work develops world-wide partnerships and improves international understanding.

The Council is represented in 90 countries, where it runs 162 offices, 127 libraries and 60 English teaching centres. The Council provides an unrivalled network of contacts with government departments, universities, polytechnics, embassies, professional bodies, and business and industry in Britain and overseas.

The Council's annual turnover is over £400 million including government grants and overseas aid programmes.

The British Council is an autonomous, non-political organisation.

JOINT RESEARCH PROGRAMMES

As part of its work in promoting links and contacts between British and other European higher education and research institutions and laboratories, the British Council has developed joint research programmes in several countries. These programmes are set up with partner organisations in each country, which in most cases share the funding.

The purpose of these programmes is to encourage research collaboration in areas of mutual interest. Priority is often given to projects likely to attract future funding from other sources (for example, from the European Community), particularly those which may lead to multilateral links.

FUNDING

The programmes contribute to fares and subsistence, but do not cover research costs, bench fees, consumables, insurance etc. The period of funding for approved projects varies from one to three years. Funds may be available for exploratory visits.

APPLICATION, SELECTION AND MONITORING

Application and selection procedures are agreed with the British Council's partner organisations, and vary widely from country to country, though the key criterion is always the excellence of the research proposal.

A report on the year's activities with a statement of expenditure is usually required at the end of each year.

OTHER BRITISH COUNCIL PROGRAMMES OF INTEREST TO RESEARCHERS

In addition to the joint research programmes, many British Council offices have programmes of travel grants, fellowships and other awards to assist researchers in extending contacts and links. The range of these programmes varies from country to country. Enquiries on the activity in a particular country should be addressed to the British Council office concerned.

The five UK Research Councils and the British Council maintain a joint office in Brussels to provide UK Higher Education Institutions with information and advice about EC activities, and to encourage and support their participation in EC research and education programmes.

For more information, contact:

The UK Research and Higher Education
European Office
Rue de la Loi 83
BP 10
1040 BRUSSELS

Tel: (02) 230 5275
Fax: (02) 230 4803
E-Mail UK EO @ UK.AC.RL.IB

STEFAN BANACH

INTERNATIONAL MATHEMATICAL CENTER

**Founded in 1972 to enhance cooperation between mathematicians from the East and West.
Cooperation with European Mathematical Society since 1993.**

During the 20 years of its existence under the leadership of Professor Czeslaw Olech the Center has gained world wide recognition as a center of collaboration of mathematicians from all over the world. It was founded by the Academies of Sciences of the ex-Socialist Countries.

The year 1993 begins a new stage of serving the mathematical community. The agreement on cooperation with the European Mathematical Society adds new perspectives to its activity. New forms of activity are continually added, including condensed workshops and symposia in addition to the existing form of seminars. Special emphasis is laid on the interaction of different fields of mathematics.

The new Scientific Council of the Banach Center has 3 representatives from the EMS, 3 representatives from the founding countries and 4 mathematicians from Poland.

For the period 1993 - 1997 the Scientific Council consists of:

Eva Bayer-Fluckiger		<i>Besançon</i>
Pavol Brunovsky		<i>Bratislava</i>
Ludvig D Faddeev		<i>St. Petersburg</i>
Andrzej Hulanicki		<i>Wroclaw</i>
Friedrich Hirzebruch	- <i>Chairman</i>	<i>Bonn</i>
Bronislaw Jakubczyk		<i>Warsaw</i>
Stanislaw Janeczko		<i>Warsaw</i>
Gyula O.H. Katona		<i>Budapest</i>
Aatos Lahtinen		<i>Helsinki</i>
Bogdan Ziemian	- <i>Secretary</i>	<i>Warsaw</i>

We hope that the Center will continue to serve as a natural meeting place and collaboration center for mathematicians from the East and the West.

Professor Bogdan Bojarski, Director

MAIN FORMS OF ACTIVITY

The main forms of activity are international semesters, minisemesters and workshops.

A workshop usually takes 2–3 weeks and has an informal character with a limited number of participants (at most 40, due to size of the main auditorium hall).

A minisemester takes 3–6 weeks, and has a specified subject matter and a group of organizers. Different forms of organization are possible.

Several minisemesters and/or workshops may be coordinated to constitute a semester with a more general subject matter. It is desirable that a semester had an organizing council with a chairman responsible for general coordination. Organizers of minisemesters and workshops need not be members of the council. As well as stimulating research and the exchange of information, a semester should also play an instructional role, e.g. minicourses or series of survey lectures attracting younger mathematicians are desirable.

It is a general policy of the Center that young people attend its activities and the organizers make their best to encourage them to come.

The Center also serves Polish mathematicians by

- offering lecture rooms and accommodation facilities for conferences and workshops
- organizing seminars with participants from all over the country

BANACH CENTER FACILITIES

The Center is located in a 19-th century neo-rococo style palace, in the center of Warsaw.

The facilities of the Center include:

- An auditorium hall for about 50 listeners.
- A seminar room and a meeting room.
- Offices for 15 participants.
- Excellent mathematical library.
- The Center has its own accommodation for 15 participants and uses other hotels and rented rooms.

The Center provides:

- Organizational staff (2 secretaries).
- Free accommodation for 15 lecturers.
- Support for living expences of invited lecturers.

The Center does not cover the travelling costs. The number of supported speakers depends on the financial possibilities of the Center. The organizers of minisemesters or workshops are expected to apply to other sources.

CALL FOR PROPOSALS

The Center encourages proposals of the future activities.

The project of an intended semester, minisemester or workshop should include:

- Title of symposium, names of organizers, proposed period.
- Provisional scientific program, including the basic aims of the symposium.
- Suggested list of lecturers.
- The list of members of the scientific council for a semester.

The proposals will be considered and approved at an annual meeting of the Scientific Council of the Center.

Address Mokotowska 25, P.O. Box 137,000-950 Warsaw, Poland
E-Mail banach@impan.impan.gov.pl, office@stefan.banach.impan.gov.pl
Tel: (48-2) 628 01 92 Fax: (48-22) 29 39 97

Stefan Banach International Mathematical Center

25 Mokotowska Str., 00-950 Warsaw, Poland

Program for 1995

Aproximation and complexity

Workshop, February 6–24, 1995

Coordinators: Z. Ciesielski, H. Woźniakowski

Stochastic control

Workshop, March 13–24, 1995

Coordinators: Ł. Stettner, J. Zabczyk

Differential geometry and mathematical physics

Minisemester, April–May, 1995

Coordinators: S. Janeczko, J. Kijowski

Foliations: Geometry and Dynamics

Conference, May 29–June 2, 1995

Coordinator: P. Walczak

Ergodic theory and dynamical systems

Minisemester, June 5–July 7, 1995

Organizer: F. Przytycki

Shape optimization and scientific computing

Workshop, July 10–14, 1995

Organizers: J. Sokołowski, M. Masmoudi

Knot theory

Minisemester, July 17–August 25, 1995

Organizers: V. F. R. Jones, J. Kania-Bartoszyńska, J. H. Przytycki, V. Turaev, P. Traczyk

Singularities in Differential equations and Pfaff systems

Minisemester, September–October, 1995

Tentative organizers: B. Jakubczyk, S. Łojasiewicz, T. Mostowski, H. Żołądek

Topological algebras

Workshop, October 23–27, 1995

Organizer: W. Żelazko

Quantum groups and quantum spaces

Minisemester, November 6–December 1, 1995

Organizers: S. L. Woronowicz, R. Budzyński, W. Kondracki, P. Podleś, W. Pusz, S. Zakrzewski

**Institute of Mathematics, Polish Academy of Sciences
Stefan Banach International Mathematical Center
Mokotowska 25, Warsaw, Poland**

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Phone: (48-2) 628-01-92; Fax: (48-22) 29-39-97

**SYMPOSIUM ON DIFFERENTIAL GEOMETRY
AND MATHEMATICAL PHYSICS**

April–May 1995

The workshops:

- 1. Singularities and PDE's; 18–28 April '95:**
(Organizers: S. Lojasiewicz, J. Tsuji, B. Ziemian)

- 2. Symplectic singularities; 24 April – 5 May '95:**
(Organizers: S. Janeczko, F. Kuenzle, T. Mostowski)

- 3. Hamiltonian and Lagrangian mechanics; 8 – 12 May '95:**
(Organizers: J. Grabowski, G. Marmo)

- 4. Quantum and classical gauge theory; 15 – 23 May '95:**
(Organizers: J. Kijowski, W. Kondracki, G. Rudolph)

- 5. Canonical and quantum gravity; 24 – 31 May '95:**
(Organizers: P. Hajicek, J. Kijowski, J. Lewandowski)

Information

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Stefan Banach International Mathematical Center
25 Mokotowska Str., Warsaw, Poland

Foliations: Geometry and Dynamics

29 May - 2 June, 1995

Organizers: Remi Langevin (France), Takashi Tsuboi (Japan), Paweł Walczak (Poland).

Main Topics:

1. Coarse foliation geometry
2. Foliations of links complements on 3 manifolds
3. Compact foliations of non compact manifolds
4. Stability of leafs
5. Entropy and other dynamical invariants measuring the complexity of foliations
6. Geometric invariants of foliations of Riemannian manifolds
7. Differential operators related with foliations

Information: Paweł Walczak, Instytut Matematyki, Uniwersytet Łódzki,
Banacha 22, 90-238 Łódź, Poland.
E-mail: pawelwal@krycia.uni.lodz.pl

Ergodic Theory and Dynamical Systems

5 June - 7 July 1995

Organizing Committee: K.Krzyżewski (University of Warsaw), M.Lemańczyk (University of Toruń), M.Misiurewicz (University of Indiana, Indianapolis), T.Nowicki (University of Warsaw), F.Pirzytycki (Polish Academy of Sciences), W.Szlenk (University of Warsaw), M.Urbański (University of North Texas, Denton), M.Wojtkowski (University of Arizona), Z.Zdunik (University of Warsaw).

The Symposium will be organized in a series of workshops on more specific topics:

- Ergodic theory of smooth dynamical systems. (June 12-17)
- Dynamical systems and differential geometry and foliations. (June 5-10, organizer: A.Katok).
- Iterations of maps of interval. (June 19-24, organizers: J.Graczyk, G.Świątek)
- Iterations of holomorphic maps, relations with potential theory, relations with Kleinian groups. (June 26 - July 2).
- Abstract ergodic theory.
- Hamiltonian systems. (July 2-7, organizer: M.Wojtkowski).
- Bifurcations to chaos, low-dimensional dynamics.
- Applications (organizers: A.Lachowicz, W.Szlenk).

In the next announcement more details on these workshops together with more precise dates and the names of all the organizers will be provided. Talks on current research, survey lectures and introductory courses for students are planned.

Information: Feliks Przytycki
Institute of Mathematics
Polish Academy of Sciences
ul. Śniadeckich 8, 00-950 Warsaw, Poland
E-mail: dynsys@impan.impan.gov.pl

Stefan Banach International Mathematical Center
25 Mokotowska Str., Warsaw, Poland

Banach Center Minisemester on KNOT THEORY

July 17 -- August 25, 1995

Program: The Semester is addressed to all mathematicians who are interested in knot theory. We particularly encourage Ph.D. students interested in starting research related to knot theory.. All are welcome to participate in any part o the semester.

Organizing Committee:

1. V.F.R. Jones (U.C. Berkeley)
2. J. Kania-Bartoszyńska (Boise State Univ., Idaho)
3. J.H. Przytycki (U.C. Berkeley & Odense Univ.)
4. P. Traczyk (Warsaw University)
5. V. Turaev (Louis Pasteur Univ., Strasbourg)

Topics includes:

1. Algebraic topology based on links (e.g. skein modules)
2. Invariants of 3-dimensional manifolds
3. Surgery on knots
4. Symmetries of links
5. Link invariants and partition functions of statistical mechanics
6. Applications of the knot theory

Information:

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Warsaw University
ul. Banacha 2
02-097 Warszawa, POLAND
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fax: (48-2)-658-34-48

EUROPEAN NEWS: Country by Country

BELGIUM

PRIX DE LA FONDATION DU 150^{ème} ANNIVERSAIRE DE LA SOCIETE ROYALE DES SCIENCES DE LIEGE

La Société des Sciences a le plaisir de vous informer que cette année quatre prix internationaux (troisième période quinquennale 1990-1995) seront décernés à de jeunes chercheurs âgés de moins de 35 ans au 31 décembre 1995.

Ces prix d'un montant de 75.000 francs belges chacun ont pour but de récompenser un ensemble de travaux publiés par un auteur seul ou en collaboration dans les domaines suivants :

Biologie : Prix Edouard VAN BENEDEN,
Chimie : Prix Louis D'OR,
Mathématique : Prix Lucien GODEAUX,
Physique : Prix Pol SWINGS.

Toute demande d'information doit être adressée le plus tôt possible au Professeur G. HAMOIR, c/o Secrétariat de la Société Royale des Sciences de Liège, Institut de Mathématique, Université de Liège, 15, avenue des Tilleuls, B-4000 LIEGE (Belgique).
FAX : --32 (41) 66 95 47.

Dès réception de cette demande, la documentation permettant d'introduire un dossier complet sera transmise à l'intéressé.

La date limite de dépôt des dossiers est fixée au 1er octobre 1995.

PRIZES OF THE 150th ANNIVERSARY FOUNDATION OF THE ROYAL SOCIETY OF SCIENCES OF LIEGE

The Society of Sciences is pleased to inform you that this year it will award four international prizes (3rd quinquennial period 1990-1995) to young researchers, of less than 35 on December 31st 1995.

These prizes, amounting to 75.000 Belgian francs each, will reward a whole of published work either by a single author or in collaboration with others in the fields :

Biology : Edouard VAN BENEDEN Prize,
Chemistry : Louis D'OR Prize,
Mathematics : Lucien GODEAUX Prize,
Physics : Pol SWINGS Prize.

Any request for more information can be addressed as soon as possible to Professor G. HAMOIR, c/o Secretariat of the Royal Society of Sciences of Liège, Institute of Mathematics, 15, Avenue des Tilleuls, B - 4000 LIEGE (Belgium). FAX : --32 (41) 66 95 47.

On receipt of that request, instructions for completing the application form will be sent to the nominee.

The deadline for application is October 1st 1995.

CATALONIA

CENTRE DE RECERCA MATEMÀTICA (BARCELONA)

ADVANCED COURSE ON ELLIPTIC COHOMOLOGY

Date: 4 - 14 July 1995**Location:** Centre de Recerca Matemàtica (Barcelona)**Speakers:** Haynes R. Miller (M.I.T.)**Local and global aspects of elliptic spectra**

Deformations of formal group laws. Construction of homotopy fixed point spectra. Elliptic spectra. Construction of equivariant rational elliptic cohomology. New proofs of rigidity. (15 hours)

Charles B. Thomas (University of Cambridge)**Elliptic cohomology and moonshine**

Summary: Cohomology theories admitting characteristic classes. Cohomology of classifying spaces of finite groups. Moonshine for simple groups with special reference to the Mathieu groups. Variants and generalisations of elliptic cohomology. (15 hours)

Coordinator: Carles Casacuberta

Deadline for registration: April 15, 1995.

For further information: www http: crm.es
 ftp crm.es
 e-mail crm@crm.es

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

Tel: (34-3) 581 1081

Fax: (34-3) 581 2202

This is the first of a series of courses, at a level suitable for advanced graduate students or recent Ph.D.'s, which the CRM plans to offer every year, either at the beginning or the end of the summer.

ADVANCED COURSE ON COMPLEX DYNAMICS

Date: 22 - 30 September 1994**Location:** Centre de Recerca Matemàtica (Barcelona)**Speakers:** J. C. YOCCOZ (Université Paris-Sud)**Small divisors**

Summary: Small divisor problems occurring in dynamics will be considered, with particular concern for holomorphic germs in one complex variable near a fixed point and cycle diffeomorphisms. Several approaches, functional-theoretical as well as geometric, will be developed. (12 hours)

R. PÉREZ MARCO (Université Paris-Sud)**Rational iteration**

Summary: The main purpose is to give an introduction to the classical and modern theories of rational iteration. Contents: classical theory of Fatou and Julia; modern results related to quasi-conformal tools: Sullivan's non-wandering theorem, hyperbolicity and stability, polynomial-like maps; study of the quadratic family. (12 hours)

Coordinator: Joaquim Bruna

Deadline for registration: June 30, 1995.

For further information: www http: crm.es ftp crm.es e-mail crm@crm.es

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

Tel: (34-3) 581 1081, Fax (34-3) 581 2202.

CRETE

EURO CONFERENCES IN MATHEMATICS ON CRETE

The Department of Mathematics of the University of Crete announces the second phase of the series Euroconferences in Mathematics on Crete, sponsored by the Human Capital and Mobility Programme of the Commission of the European Union.

30 July - 5 August 1995 HYPERBOLIC CONSERVATION LAWS AND NUMERICAL ANALYSIS

Organizers: P.- A. Raviart (Ecole Polytechnique, France), A. Tzavaras (University of Wisconsin, USA)

Main speakers: C. Dafermos (Brown University, USA), D. Levermore (University of Arizona, USA), B. Perthame (Paris VI, France), P.- A. Raviart (Ecole Polytechnique, France).

20-26 August 1995 ALGEBRAIC TRANSFORMATION GROUPS AND INVARIANT THEORY

Organizers and invited speakers: M. Brion (Grenoble, France), H. Kraft (Basel, Switzerland), P. Littelmann (Strasbourg, France), D. Luna (Grenoble, France), C. Procesi (Rome, Italy), P. Slodowy (Hamburg, Germany), E. Vinberg (Moscow, Russia).

The conferences will take place at the Academic Village of Anogeia, a conference center located at the traditional Cretan village of Anogeia on the slopes of the mountain Ida. Anogeia is located at an elevation of 750 m, about 45 minutes by car from Heraklion, the largest city of Crete, and about half an hour from the closest coast. The living expenses (accommodation plus meals) per day for a person are estimated at about 30 ECU in a double room or 40 ECU in a single room.

The Human Capital and Mobility Programme financially supports young researchers from the countries of the European Economic Area to enable them to attend the conferences. For information please contact the local co-ordinator of the conference series indicated below. It is expected that financial support will be extended to young researchers from some countries of Central and Eastern Europe.

The conference series will continue in summer 1996 with the following two conferences:

Different approaches to population dynamics (P. Jagers, Göteborg, Sweden), **Geometric Group Theory** (D. Epstein, Warwick, United Kingdom).

The topics of the conferences, which will follow in the next years, will be decided by the international scientific committee consisting of: H. Abels (Bielefeld, Germany), H. Bauer (Erlangen, Germany), C. Dafermos (Brown University, USA), O. Kegel (Freiburg, Germany), S. Papadopoulou (Crete, Greece), V. Thomée (Göteborg, Sweden), A. Wilkie (Oxford, United Kingdom). The next meeting of the committee will be in Spring 1996. Suggestions for topics for future conferences should be sent to the local co-ordinator of the series.

For additional information please contact the local co-ordinator:

Susanna Papadopoulou
 Department of Mathematics
 University of Crete
 Heraklion, Crete, GREECE
 Fax-Nr.: 81-234516
 e-mail: souzana@talos.cc.uh.gr

or, for the conferences of 1995:

A. Tzavaras
 Department of Mathematics
 University of Wisconsin
 Madison, Wisconsin 53706, USA
 e-mail: tzavaras@math.wisc.edu

H. Kraft
 Mathematisches Institut
 Universität Basel
 Rheinsprung 21
 4051 Basel, SWITZERLAND
 e-mail: kraft@math.unibas.ch

CZECH REPUBLIC**PRAGUE MATHEMATICAL CONFERENCE 1996**

In honor of the 70th birthdays of

Ivo Babuska, Miroslav Fiedler, Jaroslav Kurzweil, and Vlastimil Ptak.

Date: 8 - 12 July 1996

Location: Prague, Czech Republic.

PRELIMINARY ANNOUNCEMENT

The Mathematical Institute of the Academy of Sciences, the Faculty of Mathematics and Physics of the Charles University, the Institute of Computer Science of the Academy of Sciences and the Union of Czech Mathematicians and Physicists, in cooperation with the Patriae Foundation, will organize a Prague Mathematical Conference in July 1996.

The aim of the conference is to bring together people from different disciplines who work in the fields of ordinary and partial differential equations, linear algebra, and functional analysis and people who are interested in the numerical treatment of problems from these fields and their applications.

Invited lectures will be given in honor of Professor Ivo Babuska, Professor Miroslav Fiedler, Professor Jaroslav Kurzweil, and Professor Vlastimil Ptak, who laid the foundations of several branches of modern mathematics, on the occasion of their 70th birthdays.

The five-day program will consist of invited lectures, short communications in parallel sessions, and poster sessions. The Organizing Committee headed by K. Segeth will distribute further information in the spring of 1995.

Contact: Prague Mathematical Conference 1996, Mathematical Institute of the Academy of Sciences, Žitná 25, CZ-115 67 Praha 1, Czech Republic.

Tel: +422 24213973 Fax: +422 24227633 E-mail: pmc96@earn.cvut.cz

NON-COMMUTATIVE GEOMETRY AND ITS APPLICATIONS

Date: 7 - 13 May 1995

Location: The Castle Třešť, Czech Republic

Organizers: Czech Union of Mathematicians and Physicists; Institutes of Mathematics and Physics, Academy of Sciences of Czech Republic; Institute of Mathematics, Charles University; E. Schrödinger Institute (Vienna)

Int. advisory committee:

A. Connes (Paris), J. Fröhlich (Zürich), C. Klimčik (CERN), P. Michor (Vienna)

Organizing Committee:

J. Bureš (Praha), M. Čadek (Brno), C. Klimčik (CERN), J. Niederle (Praha), J. Slovák (Brno), V. Souček (chairman, Praha), J. Vanžura (Brno)

Principal speakers: A. Connes (*IHES, Paris*), M. Dubois-Violette (*Université de Paris XI*), A. Chamseddine (*Universität Zürich*) R. Coquereaux (*CNRS, Marseille*), S. Doplicher (*Università di Roma, "La Sapienza"*), K. Gawedzki (*IHES, Paris*), D. Kastler (*CNRS, Marseille*), R. Kerner (*Université de Paris VII*), C. Klimčik (*CERN*), J. Lott (*Univ. of Michigan, Ann Arbor*), J. Madore (*Orsay, Paris*), P. Michor (*ESI, Wien*), M. Rieffel (*Univ. of California, Berkeley*), J. Roberts (*Università di Roma, "Tor Vergata"*).

Contact: Vladimír SOUČEK, Institute of Mathematics, Charles University, Sokolovská 83, 186 00 Praha, Czech Republic,

E-mail: soucek@karlin.mff.cuni.cz,

Fax: 42-2-2310464

FRANCE

XXVème ECOLE D'ETE DE CALCUL DES PROBABILITES

SAINT-FLOUR (Cantal)

10 - 26 Juillet 1995

CONFERENCIERS INVITES

- M. BARLOW, Professeur à l'Université de Cambridge (Grande-Bretagne)
"Diffusion on Fractals"
- G. BEN AROUS, Professeur à l'Ecole Normale Supérieure (France)
"Sharp Asymptotics and Large Deviations"
- D. NUALART, Professeur à l'Université de Barcelone (Espagne)
"Analysis on Wiener Space and Anticipative Stochastic Calculus"

INSCRIPTIONS et RENSEIGNEMENTS COMPLEMENTAIRES

P. BERNARD
Université Blaise Pascal Tel: 73.40.70.52 ou 73.40.70.50
Mathématiques Appliquées Telefax: 73.40.70.64
F63177 AUBIERE CEDEX E-mail: bernard@ucfma.univ-bpclermont.fr

GERMANY

**Colloquium Carolus Magnus on Arithmetic and Geometry - 1200 Years
of Science in Central Europe**

19 - 22 March, 1995

RWTH Aachen

We are celebrating the 1200th anniversary of the scientific school of Charlemagne's court at Aachen, led by the mathematician Alcuin of York.

The major part of the colloquium includes invited talks given by: V.I. Arnol'd (Moscow/Paris), W. Benz (Hamburg), B. Berndt Univ. of Illinois, Champaign), F. Buekenhout (Brussels), H. Cohen (Bordeaux), J. Dhombres (Paris), I. Ekelund (Paris), D. Foata (Strasbourg), M. Grötschel (Berlin), H. Harborth (Braunschweig), A. V. Kuz'minykh (Novosibirsk), H. W. Lenstra (Berkeley), M. Shub (Yorktown Heights), D. Singmaster (London), G. Tallini (Roma), J. F. Traub (Columbia Univ. New York).

There will also be smaller sections on reviewed contributed papers. These papers will be published together with the invited papers in a special proceedings volume.

Social activities are:

- Get-together on Sunday evening,
- Concert in Charlemagne's cathedral on Monday,
- Excursion to Maastricht on Tuesday,
- Joint conference dinner on Wednesday in the historical Krönungssaal.

After the mathematical conference there follows on March 22 - 25 a conference on Carolingian history and culture with invited talks given by leading experts.

A guided tour to the cathedral takes place on Friday and an excursion to Liège, Stavelot and Prüm on Saturday.

The Conference fee is DM 80 (Additional charges for the dinner and the excursions).

For registration and hotel information write to:

Prof. Walter Oberschelp, Department of Mathematics, RWTH, D-52056 Aachen, Germany.

Tel: +49/241-80-21051; Fax: +49/241-8888-215; E-mail: carolus@rwth-aachen.de

GERMANY continued

INA KERSTEN PRESIDENT OF THE GERMAN MATHEMATICAL SOCIETY

Ina Kersten of the University of Bielefeld is working in Algebra, Number Theory and Algebraic Groups. She has published many research papers and a book, and is currently editing the Collected Works of Ernst Witt. Since 1991 she has been on the Executive Committee of the German Mathematical Society (DMV). She is in charge of organising networks of mathematicians in various mathematical subjects. She has been interested in the work of EMS for several years, and she has been a member of the EMS-committee on Women and Mathematics since 1991. She was also one of the delegates of DMV to the Zürich Council meeting of EMS in August 1994.

After being the first woman member of the Executive Committed of the DMV, Ina Kersten also became the first woman to be elected as President of this Society. This is a very important step in the improvement of the situation of women mathematicians in Germany. I would like to congratulate Ina, and also the DMV for their excellent choice!

Eva Bayer

Max-Planck-Institut für Mathematik Gottfried-Claren-Straße 26, 53225 Bonn

Permanent Members

Scientific Members: F. Hirzebruch (Director), G. Faltings, G. Harder, Yu. Manin, D. Zagier

Head, Topology Group: H. Baues

Visiting Research Mathematicians in 1995

Akbulut, S., MSU	5/95	Activity "Gauge Theory and 4-Mfds"
Albert, M.K., Colorado State	10/95-9/96	Quantum groups
Alekseevsky, D., Moscow	3/95-2/96	Quaternionale Mff
Anosov, D.V., Moscow	1/95-5/95	Differential geometry
Askitas, A., Cambridge	10/94-9/96	Low-dimensional Topology
Bauer, S., Bielefeld	3/95	Activity "Gauge Theory and 4-Mfds"
Baum, P., Penn.State	5/95	Algebraic Topology
Behrend, K., M.I.T.	10/94-9/95	Algebraic Geometry
Bilu, Yu., Ben Gurion U.	4/95-3/96	Number theory, Alg.Geometry
Boden, H., U. of Michigan	9/93-8/95	Geometry, Gauge theory
Buium, A., I.A.S.	9/94-8/95	Algebraic Geometry
Chai, Ching-Li, U. of Penna.	2 months	Alg.Geometry, Number theory
Chmutov, S.G., Pereslavl	5/95-9/95	Knot theory, Singularities
Cohen, H., Bordeaux	6/95	Number theory
Conolly, F., U. of Notre Dame	10/94-6/95	Geometric Topology
Degtyarev, A., POMI	4/95-6/95	Topology, Alg.Geometry
Edmonds, A., Bloomington	1 month	Activity "Gauge Theory and 4-Mfds"
Eichhorn, J., Greifswald	9/95-3/96	Differential geometry
Fastré, J., Louvain	4/95-3/96	Integral operators, Math. Physics
Fintuscel, R., MSU	5/95	Activity "Gauge Theory and 4-Mfds"
Fock, V., Moscow	10/95-9/96	Mathematical Physics
Frøyslov, K., Oxford	3/95-5/95	Activity "Gauge Theory and 4-Mfds"
Galicki, K., U. of New Mexico	15.5.-15.7.95	Differential geometry, Math. Physics
Göttsche, L., Trento	8/93-7/95	Algebraic Geometry
Goncharov, A., M.I.T.	10/95-9/96	Arith. Algebraic Geometry
Goto, Y., Toronto	9/95-8/96	Arith. Algebraic Geometry
Grossberg, M.D., Columbia	10/95-9/96 ?	Geometry, Math. Physics
Ha Huy, Khoai, Hanoi	10/94-2/95	p-adic Nevanlinna-Theory
Hambleton, I., McMaster U.	7/94-6/97	Algebraic Topology
Herald, Ch., UC Irvine	1/95-6/95	Activity "Gauge Theory and 4-Mfds"
Huebschmann, J., Lille	9/94-8.95	Sympl. Geometry
Husemoller, D., Haverford	9/95-7/96	Algebraic Geometry
Kapranov, M., Northwestern	9/95-8/96	Alg. Geometry, Homolog. Algebra
Kim, Jongsu, Seoul	2,6,7/95	Differential geometry

GERMANY continued

Kimura, Shun-ichi, Utah	9/95-8/96	Algebraic Geometry
Kontsevich, M., UC Berkeley	6/95-8/95	Geometry, Combinatorics, Math. Physics
Küchle, O., Bayreuth	9/94-8/95	Algebraic Geometry
Kuleshov, S.A., Moscow	1/95-2/95	Algebraic Geometry
Lang, S., Yale U.	6/95	Alg.Geometry, Number theory
Le, Hong Van, Hanoi	seit 1992	Minimal surfaces, Sympl. Geometry
Leary, I., Barcelona	1/95-12/95	Algebraic Topology
Leprévost, F., Paris VII	11/94-10/95	Number theory
Liu, Xiaobo, U. of Penna.	10/95-3/96 ?	Differential geometry
Lott, J., U. of Michigan	10/95-8/96 ?	Math. Physics, Differential geometry
Manolache, N., Bucharest	in 95/96	Alg.Geometry, Vector bundles
Matic, G., U. of Georgia	4/95-6/95	Activity "Gauge Theory and 4-Mfds"
Maslen, D.K., Harvard	10/93-9/95	Harmonic Analysis
Matthes, R., Göttingen	10/94-3/95	Automorphic forms, Number theory
Mikhalkin, G., Michigan St.U.	6/94-5/95	Alg.Geometry a. Topology
Moree, P., Sydney	ab 9/95	Number theory
Namikawa, Yoshinori, Sophia U.	10/94-9/95	Calabi-Yau-Manifolds
Namikawa, Yukihiko, Nagoya	10/95-3/96	Algebraic Geometry
Nayatani, S., Tohoku	3/94-2/95	Differential geometry
Nenashev, A., POMI	7/95-3/96	Algebraic K-Theory
Oertel, U., Rutgers	10/95-9/96	Low-dimensional Topology
Orlov, D., Moscow	1/95-2/95	Alg.Geometry, Homolog. Algebra
Ozsvath, P., Princeton	4/95-5/95	Activity "Gauge Theory and 4-Mfds"
Pedersen, E., SUNY	7/94-6/95	Algebraic Topology
Pirashvili, T., Tiflis	11/94-6/95	Homolog. Algebra, K-Theory, Homotopy th.
Platonov, V.P., Minsk	5/95-11/95	Algebraic Groups
Polyak, M., UC Berkeley	9/94-8/95	Low-dimensional Topology
Popov, V., Sydney	5/95-7/95	Invariant theory
Pragacz, P., Torun	9/93-8/95	Algebraic Geometry
Prokhorov, Yu., Moscow	2/95-4/95	Birat. Geometry, Alg. Varieties
Raina, A., Tata Inst.	1 month	Mathematical Physics
Ramero, L., M.I.T.	9/95-8/96	Arith. Algebraic Geometry
Roberts, B., U. of Chicago	10/94-9/95	Number theory, Modular forms
Rodriguez Villegas, F., Princeton	9/94-8/95	Number theory
Schmutz, P., Lausanne	10/94-9/95	Differential geometry
Schulze-Pillot, R., Köln	4/95-7/95	Number theory, Modular forms
Schwachhöfer, L., U. of Pennsylvania	9/94-8/95	Differential geometry
Shimada, I., Hokkaido	4/95-3/96	Algebraic Geometry
Sibner, L., New York	1/95-5/95	Gauge field theory
Sibner, R., CUNY	1/95-5/95	Gauge field theory
Sofer, A., Princeton	9/94-8/95	Number theory
Stipsicz, A., Rutgers	4/95-5/95	Activity "Gauge Theory and 4-Mfds"
Sun, Xiaotao, Acad.Sinica	10/94-9/95	Algebr.a. Arithmet.Surfaces
Tabachnikov, S., Cambridge	7/95-6/96	Glob. Analysis, Sympl. Geometry, Knot theory
Teichner, P., UC San Diego	3/95	Low-dimensional Topology
Terao, H., U. of Wisconsin	6/95-7/95	Geometry
Tokunaga, H., Kochi	10/95-9/96	Algebraic Geometry
Tonks, A., Bangor	9/94-9/96	Alg.Topology, Homotopy th.
Tregub, S., Uzbek Ac.Sci.	9/95-12/95	Birat. Geometry
Tsafiriri, L., Jerusalem	17.7.-17.8.95	Harmon. Analysis, Operator theory
Tumanov, A., U. of Illinois	15.5.-15.8.95	Complex Analysis
Turner, P.R., Oxford	1/95-12/95	Algebraic Topology
Umehara, M., Osaka	10/95-9/96	Differential geometry
Vasiu, A., Princeton	9/94-8/95	Alg.Geometry, Number theory
Voisin, C., Pari-Sud	7/95	Algebraic Geometry
Wajnryb, B., Haifa	8/94-7/95	Algebraic Geometry
Wambst, M., Strasbourg	10/95-9/96	Quantum groups
Wang, R., IHES	1/95-12/95	Differential geometry, Gauge theory
Wentworth, R., Harvard	1 month	Gauge theory, Alg.Geometry
Wüstholtz, G., ETH	9/95-12/95	Transcendence

ITALY

Program of C.I.R.M. (Trento) for the year 1995

The Centro Internazionale per la Ricerca Matematica (C.I.R.M.) of Trento will organize during the year 1995 the following Conferences and Schools:

1. "Giornate di lavoro sul Calcolo delle Variazioni: Teoria Geometrica della Misura, Rilassamento e Γ -Convergenza", from February 20 to February 24 at the Hotel Villa Madruzzo (TN).

The Department of Mathematics of the University of Trento co-sponsors this meeting.

Scientific Organizers: G. Anzellotti (Trento) and I. Tamanini (Trento).

2. School "Enumerative Theory on Moduli Spaces of Curves and Related Topics", from May 14 to May 20, at the Grand Hotel Bellavista in Levico (TN).

Scientific Organizers: M. Andreatta (Trento), G. Bolondi (Sassari) and E. Sernesi (Roma III).

This school is also sponsored by Department of Mathematics of the University of Trento and by Europroj.

Main lecturers of the school will be E. Arbarello (Roma I) and C. Faber (Amsterdam).

Lectures on related topics will be held by B. Dubrovin (ICTP Trieste), A. Vistoli (Bologna) and others.

Deadline for applications: April 15, 1995.

3. " p -adic Methods in Arithmetic Algebraic Geometry", from May 21 to June 3, at the Grand Hotel Bellavista in Levico (TN).

Scientific Organizers: F. Baldassarri (Padova), P. Berthelot (Rennes), N. Schappacher (Strasbourg), A. Scholl (Durham).

Provisional list of Lecturers: P. Berthelot (Rennes), S. Bosch (Münster), J.-F. Boutot (Strasbourg), C. Deninger (Münster), B. Edixhoven (Rennes), B. Dwork (Padova), L. Moret-Bailly (Rennes), E. Nart (Barcelona), A. Scholl (Durham), N. Schappacher (Strasbourg), J.-P. Wintenberger (Strasbourg).

Deadline for applications: March 15, 1995.

4. "Complex Analysis and Geometry - XII", from June 5 to June 9, at the Grand Hotel Bellavista in Levico (TN).

Scientific Organizers: V. Ancona (Firenze) and A. Silva (Roma I).

Deadline for applications: April 30, 1995.

5. "Nonlinear Parabolic Problems", from June 11 to June 16 at the Grand Hotel Bellavista in Levico (TN).

Scientific Organizers: A. Lunardi (Parma) and L. Tubaro (Trento).

Provisional list of Lecturers: P. Acquistapace (Pisa), N.D. Alikakos (Knoxville), H. Amann (Zürich), C. Bandle (Basel), P.W. Bates (Provo), L. Boccardo (Roma I), C.-M. Brauner (Bordeaux I), P. Brunovsky (Bratislava), S.-N. Chow (Atlanta), G. Da Prato (Pisa), A.

ITALY continued

Debussche (Orsay), E. Di Benedetto (Evanston), J. Escher (Basel), A. Fasano (Firenze), A. Favini (Bologna), M. Fila (Bratislava), M. Fuhrmann (Milano), G. Fusco (Roma II), J.A. Goldstein (Baton Rouge), D. Guidetti (Bologna), P. Guidotti (Zürich), A. Haraux (Paris VI), H. Koch (Heidelberg), N. Krylov (Minneapolis), G.M. Lieberman (Ames), K. Lu (Provo), E. Mitidieri (Trieste), E. Obrecht (Bologna), M. Pierre (Nancy I), P. Polacik (Bratislava), J.-M. Roquejoffre (Palaiseau), G. Ruiz Goldstein (Baton Rouge), C. Schmidt-Lainé (Lyon), B. Schmitt (Bayreuth), G. Simonett (Los Angeles), A. Tesei (IAC Roma), V. Vespri (Pavia), W. von Wahl (Bayreuth), L. Wang (Iowa City), J. Wiedmann (Zürich), M. Wiegner (Bayreuth).

Deadline for applications: April 30, 1995.

6. "Summer Conference on K-Theory", from June 18 to June 23, at the Grand Hotel Bellavista in Levico (TN).

Scientific Organizers: C. Deninger (Münster), M. Karoubi (Paris VII), H.J. Muncholm (Odense), C. Pedrini (Genova).

There will be two main lecture series on the following topics: "*Motivic Cohomology*" (A. Suslin-V. Voevodsky) and "*K-Theory of Local Fields*" (I. Madsen). Furthermore, there will be several talks on current research in K-theory and related topics by participants.

Deadline for applications: May 15, 1995.

7. "Poincaré Conjecture", from July 3 to July 14, at the Grand Hotel Bellavista in Levico (TN).

Scientific Organizers: M. Boileau (Toulouse), D. Gabai (Pasadena), A. Tognoli (Trento).

This meeting will concern with the papers by V. Poenaru (Orsay) and the main interest will focus on Chapter V (of Poenaru preprint). *Deadline for applications: May 31, 1995.*

8. "Linear Groups", from September 4 to September 8, at the Grand Hotel Bellavista in Levico (TN).

Scientific Organizers: L. Di Martino (Milano), N. Vavilov (Bielefeld), G. Zacher (Padova).

Deadline for applications: July 31, 1995.

9. "Vector Bundles on Fano 3-Folds - II", to be held in a week of November or December.

Scientific Organizers: M. Andreatta (Trento), E. Ballico (Trento), R. Mirò Roig (Barcelona), J. Wisniewski (Warsaw).

For further information and applications please contact:

Mr. A. Micheletti - Secretary of CIRM

Centro Internazionale per la Ricerca Matematica

Istituto Trentino di Cultura

38050 Povo (Trento)

Italy

Tel. and Telefax: +39-461-810629 - e-mail: micheletti@itnvax.science.unitn.it.

RUMANIA**Representation Theory of Groups, Orders and Algebras**

Date: 2-7 October 95 Meeting
25-29 September 95 Workshop

Location: Ovidius University, Constanța, Rumania

Confirmed speakers for the meeting:

Jon Carlson, U.S.A. Vlastimil Dlab, Canada; Karl Gruenberg, Great Britain;
Idun Reiten, Norway; Claus Ringel, Germany

Workshop Computer algebra and representation theory, Wolfgang Kimmerle.

Program: Auslander-Reiten sequences and derived categories, Steffen König.
Structure of blocks with cyclic defect and Green correspondence, Alexander
Zimmermann.

Stable and derived equivalences of blocks, Markus Linckelmann.

Clifford theory and the Zassenhaus conjectures, Klaus Roggenkamp.

Demonstrations of computer algebra systems like GAP and Maple, Martin Wursthorn.

Organizing Prof. Dr. N. Popescu *Bucharest* nipopesc@roimar.imar.ro

Committee: Prof. Dr. K.W. Roggenkamp *Stuttgart* ovid@machnix.mathematik.uni-stuttgart.de

Prof. Dr. M. Stefanescu *Constanța* mirela@roimar.imar.ro

Contact: One of the organizers

SPAIN**EWM 95 Seventh Congress of European Women in Mathematics**

Date: 4-9 September 1995

Location: Madrid, Spain.

The programme will include:

1. Explanatory mathematical talks on the following topics:
 - (i) Dynamical systems in the complex plane.
 - (ii) Classification in algebraic geometry.
 - (iii) Mathematical topics in quantum field theory and statistical physics.

Talks will be complemented by working sessions for participants.

Speakers: Bodil Branner (Copenhagen), Nuria Fagella (Boston/Berkeley), Tan Lei (Lyon); Mireille Martin-Deschamps (Paris), Margarida Mendes Lopes (Lisboa), Emilia Mezzetti (Trieste); Flora Koukiou (Paris), Alice Rogers (London), Claire Voisin (Paris).

2. Family versus career for women mathematicians. Report and discussion introduced by science historian Eulalia Perez Sedeno (Berkeley).

3. General assembly of EWM: For further details contact the organisers:

Dr. Capi Corrales, Departamento de Algebra, Facultad de Matemáticas, Universidad Complutense de Madrid, 28040 Madrid, Spain.

capi@emducml1.sim.ucm.es Tel.34-1-3944657 Fax 34-1-3944607

and

Dr Rosa Maria Miro Roig, Facultad de Matematicas, Departamento d'algebra i geometria, Universidad de Barcelona, Gran Via de les Corts Catalanes 585, 08007 Barcelona, Spain.

miro@cerber.ub.es Tel. 34-3-4021101 Fax 34-3-4021601

Closing date for applications: May 1st, 1995.

For more information about other EWM activities and membership please contact EWM Office, Riitta Ulmanen, Secretary, Department of Mathematics, PO Box 4 (Hallituskatu 15), SF-00014 University of Helsinki, Finland. ulmanen@Sophie.helsinki.fi fax 358 0 191 3213

To join the EWM email network, contact sarah.rees@newcastle.ac.uk

UNITED KINGDOM



UNIVERSITY OF CAMBRIDGE
**ISAAC NEWTON INSTITUTE
 FOR MATHEMATICAL SCIENCES**

Director: Sir Michael Atiyah, OM, PRS

20 CLARKSON ROAD, CAMBRIDGE, CB3 0EH, U.K.
 Tel. (01223) 335999 Fax. (01223) 330508
 e-mail: i.newton@newton.cam.ac.uk

NATO Advanced Study Institute

FROM FINITE TO INFINITE DIMENSIONAL DYNAMICAL SYSTEMS

21 August - 1 September 1995, Newton Institute, Cambridge, UK

The meeting will discuss and explore the recent advances in the theory of attractors of partial differential equations and dynamics of patterns

Organising Committee

P Glendinning (Cambridge), P Coulet (Nice)
 P Cvitanovic (Copenhagen), J Hale (Georgia Tech)

Lecturers

- | | |
|--|--|
| J Ball (Heriot-Watt University, Edinburgh): | <i>Dynamics and variational principles</i> |
| L Bunimovich (Georgia Institute of Technology): | <i>Lattice dynamical systems</i> |
| J Carr (Heriot-Watt University, Edinburgh): | <i>Infinite dimensional systems and metastability</i> |
| P Collet (Ecole Polytechnique, Paris): | <i>Unbounded domains, spectral problems and nonlinear dynamics</i> |
| P Constantin (Chicago): | <i>Mathematical fluid dynamics</i> |
| P Coulet (Nice): | <i>Qualitative theory of symmetry breaking in extended systems: patterns and topological singularities</i> |
| P Cvitanovic (Niels Bohr Institute, Copenhagen): | <i>Transfer operator methods in dynamical systems</i> |
| P Glendinning (University of Cambridge): | <i>Finite dimensional chaos</i> |
| J Hale (Georgia Institute of Technology): | <i>Global attractors and partial differential equations</i> |
| P Holmes (Princeton): | <i>Low dimensional dynamics of coherent structures</i> |
| I Procaccia (Weizmann Institute, Israel): | <i>Scaling phenomena in systems far from equilibrium</i> |
| D Rand (Warwick): | <i>Spatial dynamics in ecology, evolution and epidemiology</i> |

Participation is limited to successful applicants. Financial support will be available for some participants from appropriate countries. The workshop will take place in the Newton Institute's building. Accommodation for participants will be available in a nearby college. A daily cost of £45 will include accommodation, breakfast and evening meal, and lunch, coffee and tea on weekdays at the Institute. For further information contact: *Florence Leroy* at the Institute (email f.leroy@newton.cam.ac.uk) from whom application forms can be obtained. Application forms are also available by gopher from gopher.newton.cam.ac.uk, or by ftp from ftp.newton.cam.ac.uk as `pub/programmes/fidasi.txt`.

Closing date for applications: **31 March 1995.**

UNITED KINGDOM continued

**A Newton Institute Euroconference
FINITE AND INFINITE DIMENSIONAL DYNAMICAL SYSTEMS
4-15 September 1995**

Organising Committee:

C Sparrow (Cambridge), P Constantin (Chicago),
J Gibbon (Imperial College), J Hale (Georgia Tech)

First Call for Registration and Contributed Talks

A research conference supported by EU Human Capital and Mobility Programme associated with the six-month programme from From Finite to Infinite Dimensional Dynamical Systems at the Newton Institute. Topics to be covered: spatio-temporal chaos, pattern formation, attractors in infinite dimensional systems and related areas including experimental results and numerical techniques.

Speakers (subject to confirmation) will include:

P Bates	D Broomhead	L Bunimovich	P Collet	P Constantin	P Coullet
P Cvitanovic	CR Doering	J Elgin	C Elliott	P Fife	G Fusco
J Gibbon	P Glendinning	J Hale	D Holm	P Holmes	RM Kerr
R Mackay	J McGlade	DA Rand	A Sharkowski	C Sparrow	E Spiegel
J Stark	ES Titi				

Contributed talks:

The organisers invite offers of contributed talks. These will be selected by the programme committee on the basis of submitted abstracts. Abstracts in English (up to 2 pages) should be sent to the programme committee chairman:

Colin Sparrow
at the Newton Institute
Email: c.sparrow@newton.cam.ac.uk

to arrive not later than 15 April 1995. In addition to an indication of the results to be presented in the talk, the abstract should give the talk title and the speakers' name, address, phone number, fax number and email address (when available). Notification of selection of contributed talks will be made by 15 May 1995.

Conference location, costs and registration:

Due to space restrictions, the participation is limited to successful applicants. The workshop will take place in the Newton Institute's purpose-designed building, in a pleasant area in the west of Cambridge, about one mile from the centre of the City. Accommodation for participants will be available in a nearby college. A daily cost of £30 will include accommodation, breakfast and evening meal and coffee and tea on weekdays at the Institute. There will be a registration fee of £100 which will include the cost of weekday lunches. For further information and registration forms please contact:

Florence Leroy, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH
Tel: +44 1223 335984, Fax: +44 1223 330508
Email: f.leroy@newton.cam.ac.uk

Grants:

The conference is partially sponsored by the European Union Human Capital and Mobility Programme which will provide grants towards registration, travel and subsistence costs of selected young (under 35 years for men and 40 years for women) participants at postgraduate or postdoctorate level. To be eligible for such a grant you must be a citizen of a European Union Member State, or a person residing and working for at least one year in such a country. The grant application form is available by gopher from gopher.newton.cam.ac.uk, by ftp from [ftp.newton.cam.ac.uk](ftp://ftp.newton.cam.ac.uk) as `pub/programmes/fideuro.txt`, or by post from Florence Leroy at the above address. In order to apply for a grant please fill in and return the form by 1 June 1995.

Important dates:

Abstracts for contributed talks	15 April 1995
Notification of selection of contributed talk	15 May 1995
Deadline for grant applications	1 June 1995
Deadline for registration	1 July 1995
Workshop dates	4-15 September 1995

OTHER CONFERENCES**Gauge Theory and Symplectic Geometry****Date:** 3 - 4 July 1995**Location:** Université de Montreal

Contact: Ghislaine David, secrétaire Séminaire de Mathématiques Supérieures, Université de Montréal, Case postale 6128, succ. "Centre-ville" Montréal, Québec, Canada, H3C 3J7
Tel: (514) 343 6710 Fax: (514) 343 5700

VI Activities for mathematics students - teachers in the future

There are some courses included in the maths bachelor program concerning the matters discussed: "Elements of combinatorics", "Number theory", "General methods of elementary mathematics", etc. A special masters program in mathematics devoted to the preparation of high-level mathematics instructors in high school and middle school is provided by the University of Latvia.

VII Publications within this system

There is a mathematical newspaper "Daudzskaldnis" ("The polyhedron"), being published once a month.

A course in geometry is available for grades 7-12. Books for 7th and 8th Grade are published and used as textbooks already.

A course in informatics is available; a textbook consisting of three parts and a problem book are published.

A number of books and booklets on problem solving (in total, 2500 pages) are published.

References

[1] A.Andžāns. Mathematical problems for junior students. Riga, University of Latvia, 1993.

Rainis boul. 19, Riga, Latvia, LV-1586, Fax: 7-013-2225039

35th INTERNATIONAL MATHEMATICAL OLYMPIAD 1994

ITALIAN PARTICIPATION

Lucia Grugnetti

The activity has been developed in three stages:

1. **Local selections**
 - 24th February 1994
 - ~ 52000 students from ~ 1000 secondary high schools.
2. **National selection**
 - 6th May 1994 in Cesenatico (Emilia Romagna)
 - 300 students selected by the local selections.
3. **International Mathematical Olympiad**
 - 20th July 1994 in Hong Kong
 - 385 students coming from 69 countries; 6 Italian students (2 of them received a bronze medal).

FOR THE FUTURE

Concerning the 36th International Mathematical Olympiad, we will follow a new programme:

1. **A "promoting" competition**
 - November 1994
 - All the secondary high school students are invited to participate (not only the best students); the exercises will be quite near to school experiences.
2. **Local selections**
 - February 1995
 - ~ 8000 students chosen (in each province) by their teachers, with the coordination of local responsables.
3. **National Competition**
 - May 1995

continued.....

Problems posed at the National Selection

1. Si dimostri che esiste un intero N tale che per ogni $n \geq N$ è possibile suddividere un quadrato in n quadratini a due a due disgiunti. (Due quadratini siano considerati disgiunti se non hanno punti interni in comune).

2. Determinare tutte le soluzioni intere dell'equazione

$$y^2 = x^3 + 16$$

3. Un giornalista deve fare un articolo su una classica isola di furfanti e cavalieri in cui tutti gli abitanti o mentono sempre (e sono furfanti) o dicono sempre la verità (e sono cavalieri) e tutti si conoscono reciprocamente.

Supponiamo che il giornalista intervisti una e una sola volta tutti gli abitanti ed ottenga nell'ordine le seguenti risposte.

- A_1 : "sull'isola c'è almeno 1 furfante"
- A_2 : "sull'isola ci sono almeno 2 furfanti"
- ...
- A_{n-1} : "sull'isola ci sono almeno $n-1$ furfanti"
- A_n : "sull'isola sono tutti furfanti"

Può il giornalista stabilire se sull'isola ci sono più furfanti o più cavalieri?

4. Si consideri una retta r e un triangolo ABC che giace in uno dei semipiani individuati da r .

Detti A', B', C' i punti simmetrici di A, B, C rispetto a r , si conduca da A' la parallela a BC , da B' la parallela ad AC , da C' la parallela ad AB .

Si dimostri che queste tre rette passano per uno stesso punto.

5. Si consideri un cubo di spigolo unitario e sia OP una sua diagonale. Si determini il valore minimo e il valore massimo dell'area della figura che risulta dall'intersezione fra il cubo e un piano passante per OP .

6. Si consideri una scacchiera 10×10 e in ogni sua casella siano indicati ordinatamente i numeri da 1 a 100 incominciando dalla prima casella in alto a sinistra, andando verso destra fino a terminare la prima riga e poi proseguendo con la seconda riga sempre da sinistra a destra, fino ad arrivare alla centesima casella in basso a destra. Supponiamo ora di cambiare i segni a 50 di questi numeri con la condizione che in ogni riga e in ogni colonna ci siano tanti numeri positivi quanti negativi. Si dimostri che dopo tale cambiamento la somma di tutti i numeri è zero.

(durata della prova: 4 ore e mezzo)

Mathematics Education Conferences

FIRST ANNOUNCEMENT

MATHEMATICS EDUCATION AND COMMON SENSE: THE CHALLENGE OF SOCIAL CHANGE AND TECHNOLOGICAL DEVELOPMENT.

Date: 23 - 29 July 1995

Location: Faculty of Mathematics, Technical University, Berlin.
Building MA, Straße des 17 Juni 136, Berlin - Charlottenberg

International Programme Committee:

Christine Keitel, Berlin (Chair)

Rijkje Dekker, Amsterdam

Lucia Grugnetti, Parma

Paulo Abrantes, Lisbon

Sixto Romero Sanchez, Huelva

Local Organising Committee:

Christine Keitel (Chair)

Jürgen Zimmer, Uwe Gellert, Mirjam Müller,

Udo Simon, Roland Stowasser, Eva Jablonka,

Thomas Jahnke, Peter Damerow,

Wolfgang Schulz, Ingmar Lehmann.

CIEAEM 47Berlin - 45 years CIEAEM

Commission Internationale pour l'Etude et l'Amélioration de l'Enseignement des Mathématiques

International Commission for the Study and Improvement of Mathematics Education

European Research Conference on the Psychology of Mathematics Education

Date: 29 September - 2 October 1995

Location: Haus Ohrbeck near Osnabrück, Germany

Contact: Prof.Dr. Elmar Cohors-Fresenborg
Fachbereich 6 - Mathematik/Informatik
D-49069 Osnabrück, Germany
Fax: 0541-969-2770
E-mail: ERCME@dosuni.informatik.uni-osnabrueck.DE

or Prof.Dr. Hartwig Meissner
WWU-Mathematik,
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D-48149 Muenster, Germany
Fax: 0251-838350
E-mail:meissne@uni-muenster.de

THE SEARCH FOR THE GERMAN IMO-TEAM

Hans-Dietrich Gronau

Universität, Fachbereich Mathematik, D-18051 Rostock
email: nfa002@nfa.uni-rostock.d400.de

1. Aims and History

There is a long tradition of German teams taking part in the International Mathematical Olympiads (IMO). The former GDR team took part from the very beginning of the IMOs in 1959 with two exceptions (1978, 1981), whereas the former FRG team took part from 1977. While in 1991 we started for the first time with just one common team of the unified Federal Republic of Germany, since 1992 the procedures for selecting the team members have also been unified. The aim of these selection and preparation procedures is to form a team of the 6 strongest students and to support them in learning the topics and types of problems and their level of difficulty. Finally, we want to give them opportunities for comparing themselves with the other contestants. In general, the best IMO problems are simple to understand, but for a solution, they require great creativity. Therefore, school knowledge alone - without additional training - is not sufficient to attack the problems successfully.

continued.....

In order to get an impression of the type of problems, we present one proposed for the IMO by a German author (1988): Let a and b be positive integers such that $ab+1$ divides a^2+b^2 . Prove that $(a^2+b^2)/(ab+1)$ is a square of an integer.

2. Organisation

The selection and preparation of the team is carried out by the association *Verein Bildung und Begabung e.V.*, which is also responsible for the Bundeswettbewerb Mathematik. For this task the association founded the *Deutsche IMO-Organisationsbür (Wissenschaftszentrum, PF 201448, D-53144 Bonn)* which is identical with the office of the Bundeswettbewerb Mathematik. It should be contacted to get material of the Bundeswettbewerb Mathematik as well as of the Mathematik-Olympiaden. The funding of all the related activities will be taken over by the Federal Minister of Education and Sciences.

The mathematical preparation of the team is done by a group of about 15 mathematicians and graduate students with long experience in this task. It is directed by Professor Arthur Engel (Frankfurt), Dr. Horst Sewerin (Hofheim), and the author. Most of the members of this group were prize winners of former IMOs.

3. Selection

There are 3 ways to become included in the selection procedure:

- winner of the second round of the Bundeswettbewerb Mathematik
- winner of the federal-wide round of the Mathematik-Olympiaden
- winner of the mathematical part of the competition "Jugend forscht".

Frequently, students qualify in more than one way. Altogether, about 130 students will be invited to take part in two selection papers to be taken locally at their schools under supervision around December 1. The top 16 form the group of candidates. These candidates are invited to 5 meetings.

- 4 days (Saturday through Tuesday) in Rostock in February
- 3 weekends (Saturday-Sunday) in Frankfurt in March, April and May and
- 1 week in Oberwolfach at the end of May.

In the seminars, lectures on special mathematical topics and problem solving strategies as well as many exercises are involved. Here students can test their own knowledge and ability. Besides these seminars the self-preparation at home is of great importance. For this purpose, a special IMO-library has been established.

Using the results of 6 test papers taken during the seminars, we select the top 6 who form the IMO team.

4. Concluding remarks

The duration of the training camps is relatively short (also compared with the former East German preparation system). On the one hand we feel that it is suitable to give the students the chance to solve IMO problems and to stimulate their own interest in doing so. On the other hand, the students are able to do their usual school work without too essential and long interruptions. In the past, several students qualified before their last school year, so they got more chances to participate. For example, in 1993 five of the six students have had IMO experience. This resulted in a strong team with the best success for several years: the students of the German team won 4 gold and 2 silver medals and scored second behind China among 73 participating countries. But more important are the contributions the IMO and other mathematical competitions make towards students' motivation and inspiration for mathematics. Many former IMO participants went on to successful careers (mostly in mathematics). Among the about 120 German participants of IMOs (which are older than 28 now) at least 75 got their PhD and at least 15 became professors. A few also successfully started other careers, e.g. one former IMO prize winner became the Vice-president of the first and (last) free elected parliament of the GDR in 1990.

Problem Corner

Le Kangourou des Mathématiques

One can say without exaggeration that one of the shooting stars in the mathematical contest scene is Australia. The Fifth Continent has appeared almost from nowhere to get as far as the ranks of the traditionally competing countries. The land of the kangaroos has participated in the International Mathematical Olympiads (IMO) each year since 1981, and it has certainly never been disgraced by the teams they have sent to this annual olympic mathematical meeting. Quite the reverse! The smallest continent has achieved commendable success and has steadily worked its way from the 23rd place up to the top twelve. This is particularly so of the team who competed in Hong Kong last summer. The mathematical six-pack achieved the best ever results for Australia, with two silver and three bronze medals. Australia ranked twelfth overall in the competition.

The Olympic Movement has the motto *Faster, Higher, Stronger*. It is appropriate to consider this motto in the light of the work of the Australian Mathematical Olympiad Committee (AMOC) and the Australian Mathematical Olympiad. For many years a number of Australian mathematicians and educationalists have been concerned not only about the lack of direction, stimulus and encouragement of excellence for gifted school students but also about the adverse effect that the so-called *New Mathematics* has had on certain aspects of Australian school syllabi. For example, the decline of emphasis on Euclidean Geometry in 2 and 3 dimensions as well as the use of problem solving and its related use of logical reasoning.

To be precise, the AMOC actually is the life's work of the unforgettable *Peter J O'Halloran*, who died too early in life last September. He was the founder of the Australian Mathematics Competition and it was he who established the AMOC, too. The activities of this committee have grown to a complex web of competition and enrichment activities, at the highest level culminating each year in Australia's participation in the IMO. Peter J O'Halloran organised, and developed, and assembled, and inspired others to do the same. There are now thousands and thousands of people who are involved in the competition and in the other activities of the Australian Mathematical Trust, the umbrella organisation he helped to set up. The University is full of talent and that talent covers an amazing range of human knowledge and experience. But there are few who have his combination of vision and persistence. That mixture, plus the support of a handful of colleagues, produced the Australian Mathematics Competition (AMC), the largest of its kind in the world until then, with more than half a million entrants (!) from more than 80% of Australian secondary schools with a further 32,000 competitors from 12 other countries, mainly in the South Pacific region. Large print and Braille versions are also produced for visually handicapped students and a separate adaptation for French-speaking entrants in the territory. So, it's hardly surprising that the AMC has become a model for similar competitions around the world. For example, France has reproduced its major competition from the AMC and named it *Le Kangourou des Mathématiques* in honour of the AMC.

Le Kangourou des Mathématiques has been slightly adapted to European requirements. The Kangaroo contest aims to stimulate and motivate a multitude of students following the normal program of their classes. It rounds off other activities, competitions, olympiads, rallies... and it fits in with a general strategy to guarantee quality and effectiveness while studying mathematics. The Kangaroo offers a large popular basis to these actions. The game was conceived to attract a maximum of students without aiming at a national selection or comparison between countries. In a word, the main objective of the competition is to contribute to the popularisation and promotion of maths among children and teenagers.

Meanwhile *Le Kangourou des Mathématiques* has become a contest that is very easy to organise. It takes place once, the same day at the same time in all the registered educational institutions, and there is only one test to pass, no preliminary rounds or (semi)finals are provided. The Kangaroo is open to all entrants from primary school to first year tertiary students. The competitors are classified into four categories: the youngsters (called *less petits débrouillards*), the minors, the juniors and the students. The Kangaroo competition is a multiple choice exam consisting of 30 questions and ascending levels of difficulty. Each question is followed by answers marked A,B,C,D,E. Only one of these is correct. Correct answers will be scored 3, 4 or 5 points according to difficulty. On the other hand there is a penalty for wrong answers:

all incorrect answers will cause a deduction of points by a quarter of the total score for that question. The students have to undergo their examination without help of a calculator. The answer sheets will be evaluated centrally by computer-assisted optical scanning. Legibility is therefore part of the competition. We conclude that the organiser of the *Kangaroo* has to make provisions only for three periods

- up to April 1st: He registers enrolments for the contest;
- up to May 10th : He has to see to it that the test will go off without a hitch;
- and finally, he has to accept the results and prizes and hold an award ceremony between June 13th and 18th.

And even now, three years later, the apprentice has put his master, the Australian model, in the shade. Admittedly, during the 90's, assuming about ten millions of inhabitants, more than five hundred thousands of students have been taking part in the Australian Kangaroo Contest, that is to say 97% of the youth at school have attended these events. But *Le Kangourou des Mathématiques* is in no way inferior to this establishment. In 1991, it brought together 120,000 participants, in 1992 300,000 entrants, in 1993 half a million contestants. As from 1994 the French contest was opened to Europe; it will be organized simultaneously in twelve European countries (in the language of the country concerned, at least for the 13-14 year-olds), under the auspices of the European Council. Thus, *Le Kangourou des Mathématiques* has blossomed into the greatest mathematical event in the world. The French press applauded devotedly: *La fête des maths pour tous les élèves, Jouer aux maths!* or *Les maths, c'est dans la poche!* That much is certain, the kangaroos have embarked for Europe! In the wake of *Le Kangourou* numerous schools offer extra helpful activities around mathematics: Maths Days, exhibitions, mathematical rallies, debates with parents about maths, a mathematics open day.

The huge success of that kind of contest in both Australia and France and the difficulties students meet with learning mathematics have now induced the organizers of *Le Kangourou*, first and foremost *Professor André Deledicq*, from Université Denis Diderot, Paris 7, to extend their creation towards Europe. Thereupon the Kangaroo joined further initiatives recently established for the purpose of internalisation of mathematics promotion and for arousing students' interest in mathematics as one of the most important sources of technical advances. Thus the organizers are stealing a little glance at the aims of the IMO. The International Mathematics Olympiad is the pinnacle of excellence and achievement for school students of mathematics throughout the world. The concept of national mathematics competitions started with the *Eötvös Competition* in Hungary during 1894. This idea was later extended to an international mathematics competition in 1959, when the first IMO was held in Romania.

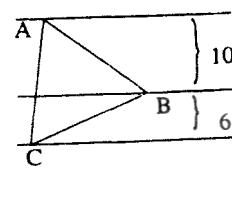
The aims of the IMO include:

- (1) the discovering, encouraging, and challenging of mathematically gifted school students;
- (2) the fostering of friendly international relations between students and their teachers; and
- (3) the sharing of information on educational syllabi and practice throughout the world.

In a complementary way, the Kangaroo contest depends on a similar mass-participation of students. The future of mankind greatly depends on the scientific development of our students — that's why it was natural for the French organizers to let the Kangaroo go into Europe — from now on under the patronage of the French Academy of Sciences!

In the last issue we gave some of the problems posed at the 1994 British Mathematical Olympiad, round I. This number we'll jump the Channel and give five problems selected for the highest age-group *Étudiants* of the Kangaroo test 1994. My thanks go to *André Deledicq*, the president of the association *Kangourou des Mathématiques — Collèges* for forwarding them to me. Each question is worth 5 points.

Q17. In the diagram, what is the area of the equilateral triangle ABC?



- A) $196\frac{\sqrt{3}}{3}$ B) $56\sqrt{3}$ C) $\frac{221\sqrt{3}}{3}$ D) 84 E) $\frac{189}{\sqrt{3}}$

Q18. You are given a rectangle with length 8 and width 2, and you have rectangular tiles, 2 units long and 1 unit wide. The large rectangle is to be tiled with the smaller ones.

In how many ways can this be done, assuming that the tiles are indistinguishable?

- A) 8! B) 2^4 C) 34 D) 35 E) 36

Q19. Let $a^{(1)} = a$, $a^{(2)} = a^a$, $a^{(3)} = a^{(a^a)}$, and generally $a^{(n+1)} = a^{(a^{(n)})}$.

What is the smallest integer n satisfying the inequality $3^{(n)} > 9^{(1993)}$?

- A) 1994 B) 1995 C) 3987 D) 3988 E) None of these

Q20. Consider all (ordered) triples (a,b,c) of positive integers a,b,c chosen from the set $\{1,2,\dots,10\}$. For each triple find $\min\{a,b,c\}$, and form the arithmetic mean m of the 1000 minimum elements formed in this way.

What is that value, correct to one decimal place?

- A) 1.5 B) 2 C) 3 D) 3.5 E) 4

Q21. Let n be written in decimal notation ($n = abcde$) and let $f(n) = bcdea + 1$.

So we have, for example: $f(4) = 5$; $f(24) = 43$; $f(809) = 99$.

If we define a sequence u_n such that $u_0 = p$ and $u_{n+1} = f(u_n)$, which statement is true?

- A) the sequence (u_n) is convergent
B) the sequence (u_n) is bounded
C) the sequence (u_n) is repeating
D) the sequence (u_n) equals 1 everywhere
E) the sub-sequence (u_{u_n}) is constant

This issue will exceptionally show no solutions to previous problems, in order to prolong the period between posing problems and printing their solutions. This lengthy interval facilitates the consideration of your solutions and of course adds ample time for treating the problems. For it happens repeatedly that I receive solutions after the time of going to press. This recently happened to the **CON AMORE PROBLEM GROUP, The Royal Danish School of Educational Studies, Copenhagen**, when their correct solutions to Problem Q9 arrived late.

Finally, propose problems for which readers will send in solutions. Proposals should, whenever possible, be accompanied by a solution, references, and other insights which are likely to be of help to the editor. They can be anything from elementary to advanced, from easy to difficult. Original problems are particularly sought. So, please submit any interesting problems you come across, especially those from (problem) books and contests that are not easily accessible. Original problems are particularly sought. But other interesting problems may also be acceptable provided they are not too well known and references are given as to their provenance. I hereby invite my readers to share them with their colleagues and students.

That's all the space we have this quarter. Send me your nice solutions, Olympiads, and pre-Olympiad contest materials.

Paul Jainta, Werkvolkstr. 10, D-91126 Schwabach, Germany.

ANNOUNCEMENT AND CALL FOR PAPERS

This is to announce a new refereed electronic journal

THEORY AND APPLICATIONS OF CATEGORIES

The Editors, who are listed below, invite submission of articles for publication in the first volume (1995) of the journal. The Editorial Policy of the journal, basic information about subscribing and some information for authors follows.

More details are available from the journal's WWW server at URL [http: www.tac.mta.ca](http://www.tac.mta.ca) `tac` or by anonymous ftp from [ftp.tac.mta.ca](ftp://ftp.tac.mta.ca) in the directory `pub tac`.

EDITORIAL POLICY

The Journal Theory and Applications of Categories will disseminate articles that significantly advance the study of categorical algebra or methods, or that make significant new contributions to mathematical science using categorical methods. The scope of the journal includes: all areas of pure category theory, including higher dimensional categories; applications of category theory to algebra, geometry and topology and other areas of mathematics; applications of category theory to computer science, physics and other mathematical sciences; contributions to scientific knowledge that make use of categorical methods.

Articles appearing in the journal have been carefully and critically refereed under the responsibility of members of the Editorial Board. Only papers judged to be both significant and excellent are accepted for publication.

The method of distribution of the journal is via the Internet tools WWW gopher ftp. The journal is archived electronically and in printed paper format.

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INFORMATION FOR AUTHORS

The typesetting language of the journal is TeX, and LaTeX is the preferred flavour. TeX source of articles for publication should be submitted by e-mail directly to an appropriate Editor. Please obtain detailed information on submission format and style files by WWW or anonymous ftp from the sites listed above. You may also write to tac@mta.ca to receive details by e-mail.

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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, 186 00 Praha 8, Czech Republic.

M.Chipot (Ed.): Progress in Partial Differential Equations: the Metz Surveys 2, Pitman Research Notes in Mathematics Series, vol.296, Longman Scientific & Technical, Harlow, 1993, 230 pp., GBP 24.00, ISBN 0-582-22769-0

These proceedings contain nineteen papers which were presented at the Metz conference in 1992. The main topics of this collection are: phase transition, asymptotic behaviour of evolution equations and existence for elliptic and parabolic problems. Some of the articles relate to physical problems (thermomechanical behaviour in pseudo- or super-elasticity, heat transfer in an emulsion, non-isothermal phase separation, models for semiconductors). There are also papers dealing with special methods (compensated compactness, homogenization, Young measures). Much attention is paid to various aspects of asymptotic behaviour (attractors, nonlinear semigroup, Navier-Stokes equations) and the existence problems for nonlinear elliptic equations with various growth conditions for parabolic equations with dynamical boundary conditions. The richness of problems in PDE's is demonstrated by papers devoted to the spectral properties of linear feedback control and to regularity of antiderivatives of distributions. (jm)

B.Booss-Bavnbek, K.P.Wojciechowski: Elliptic Boundary Problems for Dirac Operators, Mathematics: Theory and Applications, Birkhäuser, Boston, 1993, xviii+307 pp., sFr 98.00, ISBN 3-7643-3681-1, ISBN 0-8176-3681-1

While boundary value problems for second order elliptic PDE's are a classical topic, boundary value problems for elliptic systems of the first order are much less standard. The present book is a valuable addition to the literature on this topic. The authors took a very useful decision - not to treat the most general case but to develop the theory for a special subclass of the so called compatible Dirac operators on Riemannian manifolds (with boundary). It makes the theory less technical, more understandable and more interesting for potential readers. In the first part of the book, the main ideas are introduced - Clifford algebras, Dirac operators acting on sections of bundles of Clifford modules (not necessarily irreducible), a unique continuation property of solutions is proved and an invertible extension of a Dirac operator from a manifold with boundary to its closed double is constructed. The second part considers Sobolev spaces, Cauchy data, the Calderon projection, the Grassmanian of pseudo-differential projections and a study of the topology of the space of self-adjoint Fredholm operators. The last part uses the tools developed for study of

elliptic boundary value problems. The main topic here is a description of the index formulae for Dirac operators with elliptic boundary value conditions of different types, including a description of the Atiyah-Patodi-Singer index theorem on closed manifolds from this point of view. The last chapters contains index formulae for Dirac operators on closed manifolds cut into two pieces by a submanifold of codimension 1 and the corresponding linear conjugation problem. A knowledge of basic facts from the theory of pseudo-differential operators and (in the second part) of the index theory of elliptic operators is assumed. The book would be useful both for beginners and advanced readers interested in the topic. (vs)

L.Carleson, T.W.Gamelin: Complex Dynamics, Universitext: Tracts in Mathematics, Springer-Verlag, New York, 1993, ix+174 pp., 28 fig., DM 50.00, ISBN 0-387-97942-5, ISBN 3-540-97942-5

Complex dynamics concerns the behaviour of analytic functions under iteration. The first bloom of this branch covers roughly the period 1870 - 1925 beginning with the pioneering work of E. Schröder and culminating in the work of Fatou and Julia. After a pause of almost sixty years the study was renewed due to new conformal mapping techniques and to the progress in computer technology, making it possible to visualize the complicated geometrical objects under study. The book is a masterpiece. One must wonder how so much hard material has been condensed into a few pages yet at the same time remain precisely and clearly explained. Every chapter contains at least one hard theorem and the reader is led towards current research. Let us briefly describe the contents of the book. The first chapter contains some nonstandard material from complex analysis, largely on conformal and quasiconformal mappings, the second one the description of the local behaviour near fixed points. Chapters III - VII are concerned with rational iteration, focussed on the geometry of Fatou and Julia sets, whose deep topological and metrical properties are studied by analytical methods in great detail. Among others the theorem of Sullivan asserting that the Fatou set has, in contrast to iteration of entire functions, no wandering components is proved and the classification of periodic components of the Fatou set is given. The book concludes with the study how the complex dynamics of quadratic polynomials $z^2 + c$ depends on the parameter c . This leads naturally to the definition of the celebrated Mandelbrot set in parameter space which reflects the shapes of the Julia sets for certain values of c . (jf)

R.-H.Schulz: Codierungstheorie Eine Einführung, Aus dem Programm Mathematik, Friedrich Vieweg & Sohn, Braunschweig, 1991, viii+227 pp., DM 42.00, ISBN 3-528-06419-6

This book is a nice elementary introduction to algebraic coding theory, requiring almost no prerequisites. The text begins with topics like digitalization of pictures and tones, prefix codes, data compression and Shannon's theorem. Chapter 3, devoted to error-correcting codes (sphere packings, perfect codes, Hamming codes, linear codes, cyclic codes, BCH-codes) begins with the description of ISBN, EAN (line code) and banknote numbers. The last chapter presents some basic facts about cryptography (e.g., Viginere code, one-time pad system, public key systems). The material covered in the text is standard, but the characteristic feature of the book is the special attention paid to examples from everyday life. The book is well written, easy to read and can serve as a good first introduction to coding theory. (pn)

W.Koepf: Höhere Analysis mit Derive. Mit zahlreichen Abbildungen, Beispielen und Übungsaufgaben sowie Mustersitzungen mit DERIVE, Friedrich Vieweg & Sohn, Braunschweig, 1994, xii+206 pp., DM 38.00, ISBN 2-528-06594-X

This is the second part of a calculus textbook, making extensive use of the Computer Algebraic System DERIVE. While the first book (W.Koepf, A.Ben-Israel, B.Gilbert: Mathematik mit DERIVE) is devoted to topics in the analysis of functions of one variable, this book covers standard topics for functions of several variables: metric spaces and continuous functions, multiple derivatives, implicitly defined functions, curves in \mathbf{R}^n , multiple integration. As in the first book, DERIVE is employed in the explanation of topics whenever it is reasonable to use such a computer system. The author points out in the preface that the book contains references to definitions, theorems, examples etc. from the first book. For example, the index of DERIVE forms includes many entries from the first book. From this point of view (and not only this one), it is useful to read both of these books. This textbook is nicely written and recommended to everybody. (ml)

A.Yukie: Shintani Zeta Functions, London Mathematical Society, Lecture Note Series 183, Cambridge University Press, Cambridge, 1993, xii+339 pp., GBP 25.00, ISBN 0-521-44804-2

The book studies analytic properties of Shintani's zeta functions associated to prehomogeneous vector spaces. The knowledge of singularities of these zeta functions yields an asymptotic distribution of various arithmetic objects associated to a given prehomogeneous vector space. The author uses tools from geometric invariant theory and estimates of Eisenstein series to obtain information about the principal part of Shintani's zeta functions (in some cases he is able to determine the

principal part completely). The book will be of interest to mathematicians working in analytic number theory. (jn)

D.S.Alexander: A History of Complex Dynamics. From Schröder to Fatou and Julia, Aspects of Mathematics, vol.E24, Friedrich Vieweg & Sohn, Braunschweig, 1994, viii+165 pp., DM 58.00, ISBN 3-528-06520-6

The book under review concerns iteration in the complex domain, or, as one says nowadays, complex dynamics. Although its starting point is the (somewhat narrow) question of why the French Academy of Sciences awarded its 1918 Grand Prix des Sciences mathématiques for the study of iteration (of rational functions) in the complex domain, the author does not confine himself to French mathematics and describes in detail the development of this branch in the years 1870 - 1925 from the initial local theory to the global theory and culminating in the admirable work of Fatou and Julia. In fact, he emphasizes the pioneering work by the well known German logician E. Schröder, whose investigation of iterations of Newton's method in 1870-71 was not fully appreciated by his contemporaries and seems not to be fully recognized until now. Also the contribution of A.Cayley and the Russian mathematician A. Korkin (Korkine) and the Hungarian J. Farkas in early the 1880s are rightly considered. Then comes the bloom of the local theory in 1880 - 1890 in France initiated by the studies of G. Koenigs, which stimulated not only the work of his students L. Leau and A. Grévy, but also the papers by P. Appell, E. Leméray and others. The question of the global behaviour of iterations can be found, in special cases, already in the papers by Schröder and Cayley. Later on, Koenigs recognized the importance of the division of the plane into regions according to the limit points of iterates. These problems cannot be solved without rigorous set theoretical and topological notions and one must realize that their usefulness was not at that time shared by all mathematicians. In 1906 Fatou, who was influenced by the work of Lebesgue, Borel and Baire, applied these techniques to the global question of iterations for the special class of rational functions having a unique attracting fixed point. The author's discussion of the work of S.Lattès and the American J. F. Ritt (around 1918) shows that their contribution to the global theory in one variable was rather a continuation of the nineteenth century tradition of studying iterations by seeking the right functional equation. After a chapter on the contest for the 1918 Grand Prix, very interesting from the personal point of view, the book culminates in the remarkable description of the work of Fatou and Julia, illuminating once more the importance and depth of Montel's theory of normal families, on which their work is based. (jf)

H.Begehr, R.P.Gilbert: Transformations, Transmutations, and Kernel Functions. Volume 2, Pitman Monographs and Surveys in Pure and Applied Mathematics, vol.59, Longman Scientific & Technical, Harlow, 1993, 268 pp., GBP 45.00, ISBN 0-582-09109-8

This book is a continuation of the previous volume covering the same topic, namely certain applications of complex analytic methods to other nonlinear or higher-dimensional (systems of) PDE's. The main methods used in the first chapter are kernel functions and singular integral equations (including numerical treatment). The second chapter contains a study of singularities of elliptic equations using the envelope method which is related to a study of singularities of infinite series of special functions. Certain applications in mathematical physics are described. The next chapter contains a discussion of meta- and pseudoparabolic equations by similar techniques coming from elliptic equations. In the last part, a few special topics from Clifford analysis (i.e. a function theory for the Dirac operator) related to boundary value problems are discussed. The number of topics discussed in the book makes it impossible to include most of the proofs of theorems. Instead a guide through the field is offered with a description and statements of results, including comments and further references to results not discussed in the book. A valuable book for research workers specializing in the subject. (vs)

O.Manz, T.Wolf: Representations of Solvable Groups, London Mathematical Society Lecture Notes Series 185, Cambridge University Press, Cambridge, 1993, xi+302 pp., GBP 25.00, ISBN 0-521-39739-1

The book is concerned with that part of representation theory which is related to solvable groups. The authors naturally start with a careful study of modules over finite fields arising as chief factors. Then the usual character theory follows and the material covered includes (among others) proofs of Brauer's height zero conjecture and the Alperin-McKay conjecture for solvable groups. A new interesting proof of Huppert's classification of doubly transitive solvable permutation groups is also given. (tk)

A.Kostrikin, I.R.Shafarevich (Eds.): Algebra IV. Infinite Groups. Linear Groups, Encyclopaedia of Mathematical Sciences, vol.37, Springer-Verlag, Berlin, 1993, 203 pp., 9 fig., DM 144.00, ISBN 3-540-53372-9, ISBN 0-387-53372-9

These are in fact two books in one volume, each of them having about 95 pages. The first book entitled 'Infinite Groups' is written by A.Yu.Ol'shanskij and A.L.Shmel'kin. It divides into two chapters and the content of the first chapter (Combinatorial Group Theory) is roughly equivalent to the classical monograph of Lyndon and Schupp - excluding the geometrical facets and including a few more modern themes (groups acting on trees and growth functions). The second book contains a chapter on group extensions and chapters

on Abelian, nilpotent, soluble and periodic (Burnside problem) groups. The second book is a compendium on linear groups from A.E.Zaleskij. He first describes basic notions and constructions (sesquilinear forms, Zariski topology, Chevalley groups etc.) and then gives a brief survey of various techniques used in the field. This is followed by 'A Sketch of the Contemporary State of the Theory of Linear Groups'. The volume is suitable for anyone who seeks information on both infinite or linear groups and is not a specialist. The exposition is clear and concise. Proofs appear only when they are easy and illustrative. (ad)

R.J.Lopez: Maple via Calculus: A Tutorial Approach, Birkhäuser, Boston, 1994, 166 pp., DM 59.50, ISBN 0-817-63771-0, ISBN 3-764-33771-0

The aim of this book is to give a standard calculus curriculum with the help of the Computer Algebra System - Maple. The author has used materials presented in this book in his own course and demonstrated them in workshops and presentations in North America and Europe. These are some of the topics covered in the book: parametric equations, interpolation, implicit function, inverse functions, derivatives, Taylor polynomials, integration, separable differential equations, lines and planes. It is interesting that all these topics need fewer than 100 Maple commands which readers can find in the index. It is possible to use this book to learn calculus or to learn the basics of Maple. This book is very nicely written and recommended to everyone interested in using Computer Algebra Systems in the calculus classroom. (ml)

D.J.Benson: Polynomial Invariants of Finite Groups, London Mathematical Society Lecture Notes Series 190, Cambridge University Press, Cambridge, 1993, ix+118 pp., GBP 19.95, ISBN 0-521-45886-2

This book is a detailed exposition on the action of a finite group on the ring of polynomial functions on a linear representation, both of zero and non-zero characteristic. The necessary techniques are based on commutative algebra and homological algebra and this substantially contributes to the readability of the book. One of the main topics covered is the role of pseudoreflections which corresponds to certain divisors in the polynomial ring. The book will be of interest to algebraists working in representation theory and/or in commutative and homological algebra. (tk)

A.Buium: Differential Algebra and Diophantine Geometry, Actualités Mathématiques, Hermann, Éditeurs des Sciences et des Arts, Paris, 1994, 192 pp., Frf 130.00, ISBN 2-705-66226-X

The book develops "differential algebraic geometry", a geometry in which local theory is provided by classical differential algebra (in the same spirit as commutative algebra provides a local model for algebraic geometry). This theory has intriguing applications to diophantine

geometry: the author gives new proofs of the conjectures of Lang and Mordell over function fields of characteristic zero. The book is accessible to readers with a relatively modest background in algebraic geometry (the exposition of the necessary facts from differential algebra is largely self-contained). (jn)

D.Salomon (Ed.): Symplectic Geometry, London Mathematical Society Lecture Note Series 192, Cambridge University Press, Cambridge, 1993, 236 pp., GBP 25.00, ISBN 0-521-44699-6

A workshop and conference on symplectic geometry was organized at the University of Warwick in Autumn 1990. The present book contains 13 papers based on lectures given there and covers many topics. To mention a few of them - J.Robbin and D.Salomon construct the metaplectic representation using the Feynman path integral; S.K.Donaldson relates ideas of G.Segal on the complexified diffeomorphism group and the Ashtekar formulation of the self-dual Einstein equation in 4 dimensions; the moduli space of flat connections on a Riemann surface is a symplectic manifold and the mapping class group acts on it by symplectic maps, the corresponding Floer homology groups are discussed in the paper by S.Dostoglou and D.Salomon. Many other interesting facts can be found in the book which will be useful for anybody interested in the field. (vs)

J.A.Hillman: The Algebraic Characterization of Geometric 4-Manifolds, London Mathematical Society Lecture Note Series 198, Cambridge University Press, Cambridge, 1994, ix+170 pp., GBP 19.95, ISBN 0-521-46778-0

Topology of low-dimensional manifolds is an interesting topic which has become very popular in recent years. In the book, certain special classes of 4-manifolds are studied using methods coming from homological group theory and topological surgery. One class consists of infrasolvmanifolds (a subclass of homogeneous spaces of solvable Lie groups, special cases of 4-dimensional geometries in the sense of Thurston), they are characterized up to homeomorphism in terms of standard invariants (Euler characteristic, fundamental group and Stiefel-Whitney classes). Similar invariants are used for the characterization of surface bundles up to simple homotopic equivalence. The book ends by discussing applications to 2-dimensional knots and complex surfaces. The book is well organized, pleasant to read and can be recommended to anybody interested in the topic. (vs)

L.Gerritzen: Grundbegriffe der Algebra. Eine Einführung unter Berücksichtigung funktorieller Aspekte, Friedrich Vieweg & Sohn, Braunschweig, 1994, viii+141 pp., DM 34.00, ISBN 3-528-06519-2

The self-professed motivation of the author is to provide an introduction to algebra that contains all the concepts needed for a study of contemporary algebra, with an

explicit mention of quantum groups. To meet this goal 10-15 pages are devoted to each of the following subjects: rings, modules, fields, groups, topological and Lie groups, tensor algebras, differential modules, sheaves and homologies. He uses categorical language, and the basic algebraic concepts are evolved by means of 'magmas' (Bourbaki's unfortunate terminology for a set with a single binary operation). However, the textbook does not refer in any way to universal algebra. The exposition is exact, concise and somewhat dry. Some of the constructions (e.g. free magmas) prefer brevity to clarity. This book seems to require a motivated and concentrated student; for such it could be very useful. (ad)

A.Grigis, J.Sjöstrand: Microlocal Analysis for Differential Operators. An Introduction, London Mathematical Society Lecture Note Series 196, Cambridge University Press, Cambridge, 1994, 151 pp., GBP 19.95, ISBN 0-521-44986-3

This short but pleasing monograph presents an introduction to microlocal analysis in the classical framework of PDE's. This theory has a growing number of applications in such areas as harmonic complex analysis or quantum mechanics. The authors emphasize two basic principles: integration by parts and the method of stationary phase; and they discuss in twelve chapters topics such as oscillatory integrals, the method of stationary phase, pseudodifferential operators, local symplectic geometry, the WKB method, wavefront sets, the global theory of Fourier integral operators and spectral theory of elliptic operators. More than seventy exercises are distributed at the end of each chapter, some of them complete the main text with important results such as the sharp Garding inequality, the one-dimensional WKB method and the Bohr-Sommerfeld quantization condition. The book is addressed to a mathematician "who wants to get quickly into the subject and to understand its basic mechanisms". (jom)

G.M.Khenkin, A.G.Vitushkin (Eds.): Several Complex Variables II. Function Theory in Classical Domains. Complex Potential Theory, Encyclopaedia of Mathematical Sciences, vol.8, Springer-Verlag, Berlin, 1994, 260 pp., 19 fig., DM 141 ISBN 3-540-18175-X, ISBN 0-387-18175-X

The second volume of the Encyclopaedia of Mathematical Sciences devoted to the theory of several complex variables contains a description of four different topics. The first part describes residue theory - the computation of multidimensional residues of a differential form with a multidimensional singularity on a complex manifold (A.P.Yuzhakov), integral representations for the sum of the values of a holomorphic function at zeros of a holomorphic mapping and applications to systems of algebraic equations (L.A.Aizenberg), and the Grothendieck residue which is a useful and effective tool in algebraic geometry (A.K.Tsikh). The second part (written by

A.Sadullaev) introduces basic properties of plurisubharmonic functions and the complex Monge-Ampère operator, describes the corresponding analogue in classical potential theory (extremal functions and capacities) and its applications in several complex variables. The third part (A.B.Aleksandrov) contains function theory in the ball and contains an updated discussion of solved problems from Rudin's book on the topic. A study of the future tube (and its higher-dimensional generalizations) is important both for mathematics (bounded symmetric domains, boundary values of holomorphic functions) and physicists (edge-of-the-wedge theorem, Jost-Lehmann-Dyson representation, Penrose's twistor theory). The last part (A.G.Sergeev, V.S.Vladimirov) discusses these topics from both points of view. As in all volumes of the Encyclopaedia, the book brings together a nice and very useful survey of the corresponding topics and an extended bibliography, and is valuable both for advanced students and researchers in mathematics and mathematical physics. (vs)

M.Aschbacher: Sporadic Groups, Cambridge Tracts in Mathematics, vol.104, Cambridge University Press, Cambridge, 1994, xii+314 pp., GBP 35.00, ISBN 0-521-42049-0

This very nice book is the first part of a uniform, rigorous treatment of the theory of sporadic groups. It concentrates on the most accessible and least technical aspects of the problem, thus providing (even for a nonspecialist) a good picture of the structure of the sporadic groups and the methods for studying these groups. The book is divided into three parts. Part I contains some introductory material with the main emphasis on large extraspecial 2-groups which are one of the unifying features of the book. Part II is devoted to the existence of sporadic groups. The largest sporadic group (the Monster) is constructed as the automorphism group of the Griess algebra and the existence of twenty of the twenty six sporadic groups is proved via embedding them into the Monster. Part III provides the conceptual base for the proofs of uniqueness of each sporadic group and presents actual uniqueness proofs for five of the sporadic groups. This book is of interest for anybody wishing to obtain a deeper insight into the classification of finite simple groups, one of the greatest achievements of modern mathematics. (pn)

Ch.A.Weibel: An Introduction to Homological Algebra, Cambridge Studies in Advanced Mathematics, vol.38, Cambridge University Press, Cambridge, 1994, xiv+450 pp., GBP 55.00, ISBN 0-521-43500-5

Homological algebra is a very effective tool in many areas of mathematics. Here is a new book on the subject which covers not only topics contained in the classical monographs of MacLane or Hilton-Stammbach but also some more recent developments. The contents is the following: the first five chapters introduce standard concepts and constructions of the "old-fashioned"

homological algebra (chain complexes, derived functors, Tor and Ext functors, homological dimension of rings and modules, spectral sequences). The theory is made explicit in two chapters on group and Lie algebra (co)homology, respectively. The last three chapters are devoted to relatively "modern" topics: simplicial techniques (including the Dold-Kan correspondence and André-Quillen (co)homology), Hochschild and cyclic homology, derived categories. The author draws on many examples from algebra and topology to illustrate the general theory. This makes the book quite attractive to a wide spectrum of potential users of homological algebra as well as to graduate students. (jn)

M.Jarnicki, P.Pflug: Invariant Distances and Metrics in Complex Analysis, de Gruyter Expositions in Mathematics, vol.9, Walter de Gruyter, Berlin, 1993, xi+408 pp., DM 178.00, ISBN 3-11-013251-6

The subject treated in the book is a study of classes of domains $G \subset \mathbb{C}^n$ up to biholomorphisms. The tools used for the study are pseudodistances and the corresponding pseudometrics (infinitesimal versions) invariant with respect to biholomorphic mappings. They are generalizations of Poincaré hyperbolic distance (and the hyperbolic metric) on the unit disc $E \subset \mathbb{C}$. The main examples are Carathéodory pseudodistance based on the space of holomorphic maps from G to E , the Kobayashi pseudodistance arising from the space of holomorphic maps from E to G and the Bergman pseudometric constructed using the space of the square integrable holomorphic functions on G . The limited scope of the book (similar problems for complex manifolds or complex spaces are not treated) makes possible a systematic treatment of the subject. The book is very carefully organized, well written; many explicit examples and notes at the end of chapters make the book less dry. Each chapter ends with exercises and an explicit graphical notation makes it easy to find the many open problems scattered through the book. A necessary knowledge from the theory of several complex variables is nicely summarized in the Appendix. A very useful book for readers interested in several complex variables. (vs)

V.P.Havin, N.K.Nikolski (Eds.): Linear and Complex Analysis Problem Book 3. Part I, II, Lecture Notes in Mathematics, vol. 1573, 1574, Springer-Verlag, Berlin, 1994, xxii+489 pp., xii+507 pp., DM 240.00, ISBN 3-540-57871-4, ISBN 3-540-57870-6

This is the third publication in a series of problem books in linear and complex analysis edited by V.P.Havin and N.K.Nikolski. The first appeared in 1978 as volume 81 of "Zapiski naučnyh seminarov LOMI" and contained 99 short problem articles submitted by mathematicians from many countries; it was followed in 1984 by a volume in Lecture Notes in Mathematics (No. 1043) comprising 199 research problems. The present third version reproduces parts of the previous editions with the

addition of new problems and comments bringing up-to-date information concerning the old ones. The total number of problems is now 341; the book consists of two parts containing together twenty chapters under the following headings: "Banach spaces", "Banach algebras", "Probabilistic problems", "Holomorphic operator functions", "General operator theory", "Perturbation theory", "Scattering theory", "Hankel and Toeplitz operators", "Operators close to normal", "Functional model", "Singular integrals, BMO, H^p ", "Spectral analysis and synthesis", "Approximation and capacities", "Orthogonal polynomials", "Uniqueness, moments, normality", "Interpolation, bases, multipliers", "Entire and subharmonic functions", " C^n ", "Geometric function theory", "Holomorphic dynamics", "Miscellaneous problems". The contributions of 284 participants touch on a variety of topics in linear and complex analysis which will be of interest to a wide circle of mathematicians. (jokr)

N.Bourbaki: Elements of the History of Mathematics, Springer-Verlag, Berlin, 1994, viii+301 pp., DM 78.00, ISBN 3-540-19376-6, ISBN 0-387-19376-6

This is a translation of French book "Eléments d'histoire de mathématique" (1984); it consists of historical comments on those parts of mathematics already considered in the well known "Eléments de mathématique" by the same author(s). Of course, topics not covered in "Eléments" are not included. The aim of the book is to present a view of the history of important concepts and thoughts; information on their authors

is rather limited. Comparing the book with its older version, a few additional chapters appear at the end of the text, the references are enlarged and the text has been made more accessible to readers who are not familiar with the whole "Eléments" but have a good classical mathematical background. (jive)

S.K.Berberian: A First Course in Real Analysis, Undergraduate Texts in Mathematics, Springer-Verlag, New York, 1994, xi+237 pp., 19 fig., DM 76.00, ISBN 3-540-94217-3, ISBN 0-387-94217-3

The book contains carefully written "deeper basics" of real analysis. While the author recommends it for the first course in real analysis following a one year calculus course, it could still be used at many European universities in the first course in mathematical analysis (e.g., for students of mathematics, physics or for future teachers). The book contains many exercises slightly enlarging the apparent scope of the book in the direction of metric spaces, divergent series, etc. Footnotes contain references to mostly classical books. The Appendix (11 pages) explains the logical shorthand, what a proof is and things about sets, integers and functions that one should know beforehand. A rough description of the other material covered in the book is: \mathbf{R} and its properties (32+24 pp.), convergence of sequences in \mathbf{R} (23 pp.), local and global continuity of functions (41 pp.), derivatives, antiderivatives and Riemann integration (58 pp.), infinite series (13 pp.) and few steps from Riemann's to Lebesgue's integrability (26 pp.). The book would be useful mainly for students and novice lecturers. (jive)



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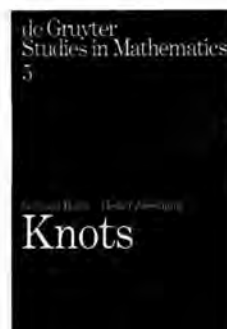
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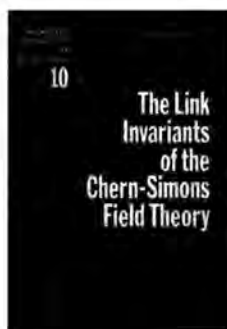
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