

INTERNATIONAL ASSOCIATION OF MATHEMATICAL PHYSICS



IAMP NEWS BULLETIN

MARCH 1997

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**President:**

Prof. E.H. Lieb  
Department of Mathematics  
Jadwin Hall, P.O. Box 708  
Princeton University  
Princeton, NJ 08544-0708, USA

**Secretary:**

Prof. C. Radin  
Department of Mathematics  
University of Texas  
Austin, TX 78712, USA

**Vice-President:**

Prof. H. Araki  
Department of Mathematics  
Science University of Tokyo  
Yamazaki 2641  
Noda-shi Chiba-ken 278  
Japan

**Treasurer:**

Professor D. Iagolnitzer  
Department of Theoretical Physics  
P.B. No.2, CEN Saclay  
F-91191 Gif-sur-Yvette  
France

Change of Address: Please inform the Secretary:  
Prof. C. Radin if you  
should change your address.

## Message from the Past President

This is my last "News from the President." I wish Elliott Lieb the best in carrying on for I.A.M.P. My term has been a very interesting one, including the planning of the Paris and Brisbane Congresses, setting up the I.A.M.P. Website and appointing an I.A.M.P. Committee on Electronic Communication, seeing the creation of a mathematical physics prize, and initiating the category of Life Members, of which we have now approximately one hundred. This leads to the major problem for the Association: the fact that one-quarter of our dues-paying members are life members. We must both increase the percentage of people on our rolls whose dues are current, and also broaden the base of our membership by attracting a generation of young mathematical physicists.

Over the past few months, I have been active in two movements in the United States. While these are not I.A.M.P. initiatives, they do affect us. The first concerns the public awareness of mathematics. Never before has there been a technical mathematical lecture especially for members of the United States Congress and their staff. The American Mathematical Society has organized such an event for Wednesday, March 5. It is co-sponsored by half a dozen other scientific and engineering societies, as well as by three Congressmen. The speaker is Raffi Coifman who will talk about wavelets and their application, with Andrew Wiles making general comments.

The second event is also unique. A coalition of 23 leaders of major societies and umbrella organizations representing all branches of science in the United States (embracing the biological sciences, the physical sciences, engineering and mathematics) have signed a statement concerning the federal budget for science. Taking into account the make-up of umbrella organizations, this totals well over 100 scientific and engineering societies in all. Their membership comprises well over 1 million scientists, engineers and mathematicians. These leaders believe that we can chart a new future to reverse the decline of the scientific infrastructure in our country. Our statement will be announced on Tuesday, March 4 at a press conference, where I will act as moderator. I have been an active participant in bringing this group together, and I hope that it will have an important impact.

Closer to home, you will find elsewhere in this Bulletin the names of the new members of the Executive Committee and officers. I want to thank Huzihiro Araki, Juerg Froehlich and Aubrey Truman for serving as officers for the past three years, and I also thank the eight other members of the Executive Committee. I wish the Association luck and will see you 13-19 July in Brisbane.

*Arthur Jaffe*

## Report of the President

This is the second time I have the privilege of greeting the members of IAMP as President, the first being 1982-1984. Since the ballots were being counted just as this issue of the News Bulletin was going to press, I have not yet had time to formulate a real 'news' letter. My main message for now is that I am grateful for this second chance to serve the community; I will try to do better this time. I would also like to thank the previous executive committee and particularly the officers, Huzihiro Araki, Jürg Fröhlich, Arthur Jaffe, and Aubrey Truman, who worked hard and well for the Association. We are all indebted to them for undertaking this task in addition to all the other commitments they had.

There are some general facts about IAMP that I would like to mention, however.

(1). *Brisbane conference*: Everyone is invited and encouraged to attend what will surely be an important and memorable meeting: icmp'97, XIIth International Congress of the IAMP, July 13-19, 1997. During this meeting there will be an IAMP 'General Assembly' at 19:30 on Wednesday, July 16 to which all IAMP members are invited. (Information is on the web site <http://www.maths.uq.oz.au/~icmp97>). In the past there have been some interesting 'free-ranging' discussions during these Assemblies and I trust this one will be lively, too. An agenda appears elsewhere in this News Bulletin.

(2). *The significance of IAMP*: Many times I am asked "why one should pay dues (a relatively modest \$20US/year) to the Association when the main value is this News Bulletin and the triannual meeting" (soon to take place in Brisbane). There are several answers. One is that IAMP could do more with the cooperation of and suggestions from members (Please feel free to write to me, [lieb@math.princeton.edu](mailto:lieb@math.princeton.edu), or anyone else on the executive committee about your ideas for projects). One thing it already does is provide greatly reduced subscription rates to several mathematical physics journals for private use.

But there is much more to IAMP than simple benefits for its members. It is one of the very few international organizations in which the members are people instead of scientific societies or other delegations. I am enough of an old-fashioned internationalist to think that this is important in these times of political fragmentation and increasing chauvinism.

Another important role, and possibly the main motivation at its foundation in the early 70's, is to bring the community together and forge an identity for mathematical physics, which is a subject that is not always clearly identified in either physics or in mathematics departments. Such mundane matters as career options, and advancement (in short, positions) can depend on the international visibility of the field. By supporting several local conferences each year (mostly morally) IAMP adds recognition to these meetings.

Admittedly, more can be done in this direction, and IAMP plays an important role in this endeavour.

(3). *Communication*: The world is turning a corner; eventually, most scientific communication will be done electronically. This has not fully taken place for journals yet, but it is on its way. Many members have complained in the past that they did not always get the News Bulletin or ballots and this is partly due to the fact that ordinary 'snail' mail is not totally reliable, but more importantly that members do not keep their addresses up to date. In cooperation with Charles Radin, the new Secretary, I will try to make at least part of the News Bulletin available electronically, either on the web or by email. This will eventually be the standard practice; it is cheaper, quicker and more reliable than snail mail and it follows people around when they change their physical addresses. The details have to be worked out. Admittedly, some members might find email unreliable, and arrangements will be made to continue with hard copies in those cases. Email also allows the possibility for direct and rapid communication between the officers of the Association and members and I hope it will increase the sense of participation by members.

Unfortunately, only about 1/3 of our members have given us email addresses. *It is essential, if you want to be in touch, that we have your email address.* This can be checked on our web page:

<http://www.ma.utexas.edu/iamp/index.html>

You can also send it to Daniel Iagolnitzer, the new Treasurer, at

[icmp@amoco.saclay.cea.fr](mailto:icmp@amoco.saclay.cea.fr)

(4). *Dues*: This is an invariant problem. Pay your dues (and encourage your colleagues to join). They are modest, as I said, and members from countries in which they present any kind of problem can have them waived by writing to me. If you don't know your current dues status, please write to Daniel Iagolnitzer.

Elliott Lieb  
1 March, 1997

IAMP BALLOT 1996

Total Number of Votes for Eligible Candidates

D. Iagolnitzer	137
H. Araki	127
E. Lieb	109
S. Varadhan	90
H. Narnhofer	86
S. Doplicher	83
M. Aizenman	82
L. Faddeev	80
C. Radin	72
H. Spohn	54
R. Schrader	54
L. Pastur	52
<hr/>	
A. Verbeure	51
K. Yajima	50
D. Brydges	46
A. van Enter	46
W. Nahm	46
R. Longo	42
B. Helffer	33
M.-B. Ruskai	33
R. de la Llave	32
S. Shlosman	31
I. Krichever	28
R. Sénéor	27

H. Doebner	26
M. Winnink	24
A.J. Wassermann	23
R. Benguria	22
D. Yafaev	22
L. Takhtajan	22
J. Challifour	12

The top 12 people are voted onto the Executive Committee

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Result of the Election of Officers

<b>President:</b>	Professor E.H. Lieb
<b>Vice-President:</b>	Professor H. Araki
<b>Secretary:</b>	Professor C. Radin
<b>Treasurer:</b>	Professor D. Iagolnitzer

S. Jones  
March 1997

## DANIEL IAGOLNITZER PRIZE IN MATHEMATICAL PHYSICS

### Call for Nominations

As previously announced, the I.A.M.P. established the Daniel Iagolnitzer Prize in Mathematical Physics, which will be awarded every three years at a ceremony during the Meeting of the General Assembly of IAMP on the occasion of the ICMP.

The prize will be awarded for the first time in 1997 during the Brisbane Congress to one or more recipients.

Nominations are invited; they should be sent to the new President of IAMP, Professor E.H. Lieb (Princeton), before 31st March 1997.

## ELECTRONIC MATHEMATICAL PHYSICS ARCHIVE

Dear Colleague:

We remind you that the archive is completely free to the user, and can be accessed by sending email messages to the internet address [mp\\_arc@math.utexas.edu](mailto:mp_arc@math.utexas.edu). Instructions are automatically returned to the sender of any such request to that address.

To receive the paper from the archive whose number is Y-N, send the message (precisely; in particular be careful of capitals, colon, etc.):

REQUEST: send papers  
NUMBER: Y-N

to the address [mp\\_arc@math.utexas.edu](mailto:mp_arc@math.utexas.edu).

Finally, we note that the archive is also a repository of email addresses and some utilities for use with the archive, and that there are three new features to the archive: a keyword search, optional file compression, and a subscription service for abstracts of archived papers.

*H. Koch, R. de la Llave, C. Radin*

Dept. of Mathematics  
University of Texas at Austin

International Association of Mathematical Physics

## XIIth International Congress of Mathematical Physics The University of Queensland Brisbane, July 13-19, 1997

Planning for the Congress is well advanced. IAMP members should have received the First Circular and Poster before now. If not, and for any other queries, contact the Congress Secretary Dr M D Gould by Email at [icmp97@maths.uq.oz.au](mailto:icmp97@maths.uq.oz.au) or by FAX at +61 7 3365 1477. The Second Circular and Poster will be mailed out in January.

Firm commitments to present Plenary Lectures have been received from

- R Bartnik (UNE, Armidale)
- J Feldman (UBC, Vancouver)
- V Jones (Berkeley)
- M Loss (Georgia Tech.)
- P Sarnak (Princeton)
- L S Young (UCLA)
- R J Baxter (ANU, Canberra)
- G Gallavotti (Univ. Roma)
- V Kac (MIT)
- M Mezard (ENS, Paris)
- H T Yau (Courant Inst., New York)

There will be 9 invitational sessions, each of 2 hours. The session organisers are:

- Integrable Models (P A Pearce & L Takhtajan)
- Statistical Mechanics (V V Bazhanov & J Froehlich)
- General Relativity & String Theory (B R Greene & S T Yau)
- Disordered Systems (C M Newman and G Parisi)
- Quantum Mechanics (V Bach & C A Pillet)
- Quantum Chaos & Semiclassical Limit (B D Simons & S Zelditch)
- Statistical Hydrodynamics (A J Kupiainen)
- General Quantum Field Theory (S Doplicher)
- Operator Algebras (H Araki & C Sutherland)

Short contributed talks will be called for, although we may have to restrict the number of these; all participants will be welcome to present their work through posters and to contribute to a book of Abstracts. Attention is drawn also to the satellite meetings in Kuala Lumpur, Auckland and Canberra before the congress, and in Canberra afterwards, where contributed talks may be presented. For details see the First or Second Circular, or see our HomePage at <http://www.maths.uq.oz.au/~icmp97>

Ample good quality accommodation has been reserved in student dormitories on the campus at AUS\$42 per night, bed + full breakfast. The registration fee has now been set at AUS\$275 (including a copy of the Proceedings), with a surcharge of AUS\$75 for nonmembers or nonfinancial members of the IAMP, which may be offset against membership dues. Registration for students and others for whom a special case can be made will be at half the full rate. (At present, AUS\$1.00≈US\$0.80.)

See you in Brisbane!

A J Bracken, Local Chairman, icmp'97.

## Agenda for the General Assembly in Brisbane

All IAMP members are invited to the General Assembly during the meeting in Brisbane.

Date: Wednesday, 16 July, 1997

Time: 19:30

Place: Campus of The University of Queensland

### Agenda:

1. Progress report (President)
2. Financial report (Treasurer)
3. Other business

Interested members who wish to suggest topics to be discussed under 'other business' at the General Assembly are urged to contact the IAMP secretary, Prof. Charles Radin, at least one month prior to the Assembly.

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## TRAVEL SUPPORT FOR YOUNG RESEARCHERS TO ATTEND THE ICMP IN BRISBANE

As usual there is an application pending at US National Science Foundation to support the travel of young US-researchers to attend the ICMP meeting in Brisbane. This application has not been approved yet. Nevertheless we encourage young researchers to apply. For further information about conditions and procedures please consult the world wide web at

<http://www.math.gatech.edu/~icdemp/icmp/>

or write to

Evans Harrell and Michael Loss  
School of Mathematics  
Georgia Institute of Technology  
Atlanta GA 30332-0160  
USA

## XXVII<sup>th</sup> PROBABILITY SUMMER SCHOOL

SAINT-FLOUR (Cantal)

7th - 23th July, 1997

### INVITED SPEAKERS

- J. BERTOIN, Professeur à l'Université Paris VI  
"Processus de Lévy"
- F. MARTINELLI, Professeur à l'Université dell'Aquila (Italie)  
"Glauber Dynamics for Lattice Spin Models of Statistical Mechanics"
- Y. PERES, Professeur, Hebrew University, Jérusalem  
"Probability on trees"

### INSCRIPTIONS AND INFORMATION

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XXVIIème ECOLE D'ETE DE CALCUL DES PROBABILITES

SAINT-FLOUR (Cantal)

7 - 23 Juillet 1997

CONFERENCIERS INVITES

- J. BERTOIN, Professeur à l'Université Paris VI  
"Processus de Lévy"
- F. MARTINELLI, Professeur à l'Université dell'Aquila (Italie)  
"Glauber Dynamics for Lattice Spin Models of Statistical Mechanics"
- Y. PERES, Professeur, Hebrew University, Jérusalem  
"Probability on trees"

INSCRIPTIONS et RENSEIGNEMENTS COMPLEMENTAIRES

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SECOND ANNOUNCEMENT

FUNCTIONAL DIFFERENTIAL EQUATIONS AND APPLICATIONS

AUGUST 18 - 22, 1997

AKDENIZ UNIVERSITY, ANTALYA, TURKIE

THEMES OF THE CONFERENCE

The conference will be devoted to various aspects of functional-differential and difference equations, including stability theory, asymptotic behaviour, oscillations theory, semigroups, transformations, inequalities, numerical methods, approximation theory, control theory, stochastic processes and applications.

FORMAT OF THE CONFERENCE

Plenary lecture of invited speakers will feature the conference in the morning on August 18 and the parallel three sessions consisting of thirty (30) minute lectures will run between August 18 - 22. Title of the Parallel Sessions:

1. DIFFERENTIAL AND DIFFERENCE EQUATIONS
2. OPERATOR EQUATIONS AND FUNCTIONAL ANALYSIS
3. APPLICATIONS

REGISTRATION:

Everyone is required to pay the registration fee 150 US Dollars at the registration desk. The registration fee covers:-

1. 5 days dinner,
2. 5 days excursions and tour packages,
3. copy of abstracts,
4. banquet, welcome dinner, coffee and tea service,
5. conference registration packet.

All participants, accompanying members and children are required to register. In order to enter and attend the lectures, one is required to wear a Conference Badge at all times.

Accompanying members and children (above 12 years old) will pay 100 US Dollar to cover the excursions and dinners expense.

## ACCOMMODATION

Due to the heavy tourist season in Antalya during the time of the Conference availability of accommodation are expensive and also limited. The Organizing Committee have arranged with the most reasonably priced and maximum comfort the following hotels. All three hotels are on the beach and 5 minutes walk from one another. Scientific activities are going to be held in TUREM HOTEL. All the hotels are airconditioned, with swimming-pool, 100 meters to the Mediterranean Sea and rooms are with bath-room.

Giving price is for seven (7) days and includes; transfer (airport - hotel - airport), breakfast and lunch.

Expected arrival to the hotel: 17 August 1997  
Departure from hotel : 24 August 1997

Hotels	Single	Double	Triple
TUREM(** three stars)	315 USD	210 USD	175 USD
TURKAY(** three stars)	315 USD	210 USD	175 USD
AKCAHAN(** two stars)	245 USD	175 USD	140 USD

Reservations will be filled on a first come, first served basis. In order to ensure that the accommodation are guaranteed one must register with pre-payment 100 US Dollar to the given Bank Account Number as a housing deposit by check, credit card or money order before June 15 1997.

## PROCEEDINGS

Abstracts and manuscripts are to be submitted in camera-ready form by the appropriate deadlines. Organizing Committee will try to publish Conference Proceeding. Due to the limited number of pages provided in the proceedings the page limits should be strictly adhered to 10-15 pages.

## \*\*\*\*\*IMPORTANT NOTE\*\*\*\*\*

1. Camera-ready form of abstract must be sent before June 1, 1997.
2. Pre-payment for housing deposit must be paid before June 15, 1997.
3. Abstract will contain title of the talk, name and address of the author, AMS classification and brief resumé of the paper.
4. English will be the official language of the scientific programmes of the Conference including abstracts and manuscripts. for the proceedings.
5. The registration fee does not include insurance for the participants against accidents, sickness or loss of personal property. All participants are advised to make suitable arrangements in this regard.
6. The average temperature in Antalya in August is between 30 - 35°C and always sunny. Therefore light and casual clothing is appropriate. Do not forget swimsuits.

## FUNDING AND GRANTS

Conference organizers have applied to NATO, ICTP and Turkish Research Council for subsistence funds for participants. A selected number of participants will be exempted from paying registration fee, travelling expenses and lodging.

Haydar Akca  
Secretary of the Conference  
e-mail : akca@ufuk.lab.akdeniz.edu.tr  
fax : 90 242 323 23 63  
Akdeniz University  
Faculty of Arts and Sciences  
Department of Mathematics PK 510  
07200 Antalya, Turkey

## Organizing Committee

I. Gyori            L. Byszewski  
L. Berezansky    E. Braverman  
S. Elaydi         H. Akca



In der Fakultät für Physik der  
Georg-August-Universität Göttingen  
ist am Institut für Theoretische Physik die Stelle eines/einer

**Hochschuldozenten/in (C2) auf Zeit**

zum 1. Oktober 1997 zu besetzen.

Bewerber/innen sollten auf dem Gebiet der Algebraischen Quantenfeldtheorie ausgewiesen sein und ihre Forschungsschwerpunkte in der quantenstatistischen Mechanik, Quantenoptik oder (allgemein-)relativistischen Quantenfeldtheorie haben. Es ist erwünscht, daß die Bewerber/innen diese am Institut vertretenen Arbeitsrichtungen methodisch sinnvoll ergänzen und die Möglichkeiten zur Zusammenarbeit nutzen. Vom/von der zukünftigen Stelleninhaber/in wird erwartet, daß er/sie sich in angemessenem Umfang am Lehrangebot in der Theoretischen Physik beteiligt.

Einstellungsvoraussetzungen sind Habilitation oder gleichwertige wissenschaftliche Leistungen.

Die Stelle ist für die Dauer von sechs Jahren zu besetzen. Das NHG läßt gemäß §61 Abs. 2 die Umwandlung in eine Dauerstelle zu.

Die Universität strebt eine Erhöhung des Anteils von Frauen am wissenschaftlichen Personal an und fordert deshalb qualifizierte Frauen nachdrücklich auf, sich zu bewerben.

Bewerbungen mit den üblichen Unterlagen und Sonderdrucken der drei wichtigsten Publikationen sind bis zum 1. April 1997 an den Dekan der Fakultät für Physik der Universität Göttingen, Bunsenstraße 13, 37073 Göttingen, zu richten.

First Announcement

**The Fields Institute for Research in Mathematical Sciences  
Program in Probability and its Applications**

**August 1998 - June 1999**

**Organizing Committee**

D. Dawson (Fields), N. Madras (York), T. Salisbury (York),  
G. Slade (McMaster)

**Program Committee**

D. Dawson (Fields), G. Grimmett (Cambridge), T. Lyons (Imperial),  
T. Kurtz (Wisconsin), N. Madras (York), E. Perkins (U.B.C.),  
T. Salisbury (York), G. Slade (McMaster), S.R.S. Varadhan (Courant)

**Topics of Concentration**

August - December 1998

Probability and Physics  
Probability and Communications

January - June 1999

Probability and Biology  
Probability and Finance

Approximately 8 workshops are planned. Graduate courses are planned in both terms of the program. The program includes a monthly series of distinguished lectures, to be called the Kolmogorov Lectures. Funding will be available for visitors, postdoctoral fellows, and graduate students.

As it becomes available, information will be posted on the program's website. Consult the home page of the Fields Institute

(<http://www.fields.utoronto.ca/>),

send e-mail to [probability@fields.utoronto.ca](mailto:probability@fields.utoronto.ca),

or write to:

The Fields Institute for Research in Mathematical Sciences  
222 College Street, Second Floor,  
Toronto, Ontario, M5T 3J1, Canada  
Telephone: 416-348-9710  
Fax: 416-348-9385

PREPRINTS (RECEIVED IN GAINESVILLE)

NOTE entries for this listing should be addressed to:

John R. Klauder, IAMP News Bulletin, Department of Mathematics, University of Florida, Gainesville, FL 32611

H. P. W. Gottlieb, School of Science, Griffith University, Nathan, Queensland, Australia 4111

ISODYNAMICAL SYSTEMS

John R. Klauder, Departments of Physics and Mathematics, University of Florida, Gainesville, FL 32611

COHERENT STATE PATH INTEGRALS FOR SYSTEMS WITH CONSTRAINTS

IS QUANTIZATION GEOMETRY

COHERENT STATE QUANTIZATION OF CONSTRAINT SYSTEMS

NEW MEASURES FOR THE QUANTIZATION OF SYSTEMS WITH CONSTRAINTS

Viqar Husain, Center for Gravitational Physics and Geometry, Department of Physics, Pennsylvania State University, University Park, PA 16802-6300

GENERAL COVARIANCE, AND SUPERSYMMETRY WITHOUT SUPERSYMMETRY

Lee Smolin, Center for Gravitational Physics and Geometry, Department of Physics, The Pennsylvania State University, University Park, PA 16802

THREE DIMENSIONAL STRINGS AS COLLECTIVE COORDINATES OF FOUR DIMENSIONAL NON-PERTURBATIVE QUANTUM GRAVITY

THE CLASSICAL LIMIT AND THE FORM OF THE HAMILTONIAN CONSTRAINT IN NON-PERTURBATIVE QUANTUM GENERAL RELATIVITY

William Krivan, Institut für Astronomie und Astrophysik, Universität Tübingen, D-72076 Tübingen, Germany and Department of Astronomy and Astrophysics and Center for Gravitational Physics and Geometry, Penn State University, University Park, PA 16802, Pablo Laguna and Philippos Papadopoulos, Center for Gravitational Physics and Geometry, Penn State University, University Park, PA 16802

DYNAMICS OF SCALAR FIELDS IN THE BACKGROUND OF ROTATING BLACK HOLE

John Baker and Jorge Pullin, Center for Gravitational Physics and Geometry, Department of Physics, The Pennsylvania State University, 104 Davey Lab, University Park, PA 16802, Andrew Abrahams and Peter Anninos, National Center for Supercomputing Applications, 605 E. Springfield Ave., Champaign, IL 61820, Steve Brandt, National Center for Supercomputing Applications, 605 E. Springfield Ave., Champaign, IL 61820, Max-Planck-Institute für Gravitationsphysik, Albert-Einstein-Institute, 14473 Potsdam, Germany and Department of Physics, University of Illinois at Urbana-Champaign, 61801, and Edward Seidel, National Center for Supercomputing Applications, 605 E. Springfield Ave., Champaign, IL 61820, Max-Planck-Institute für Gravitationsphysik, Albert-Einstein-Institute, 14473 Potsdam, Germany, Department of Physics and Astronomy, University of Illinois at Urbana-Champaign, 61801

THE COLLISION OF BOOSTED BLACK HOLES

A. Panaitescu, Department of Astronomy and Astrophysics, Pennsylvania State University, University Park, PA 16802, L. Wen, Physics Department, M.I.T., Bldg. 6-110, Cambridge, MA 02139, P. Laguna and P. Mészáros, Department of Astronomy and Astrophysics and Center for Gravitational Physics and Geometry, Pennsylvania State University, University Park, PA 16802

IMPACT OF RELATIVISTIC FIREBALLS ON EXTERNAL MATTER: NUMERICAL MODELS OF COSMOLOGICAL GAMMA-RAY BURSTS

Reinaldo J. Gleiser, Facultad de Matemática, Astronomía y Física, Universidad Nacional de Córdoba, Ciudad Universitaria, 5000 Córdoba, Argentina, Carlos O. Nicasio, Facultad de Matemática, Astronomía y Física, Universidad Nacional de Córdoba, Ciudad Universitaria, 5000 Córdoba, Argentina and Center for Gravitational Physics and Geometry, Department of Physics, The Pennsylvania State University, 104 Davey Lab, University Park, PA 16802, Richard H. Price, Department of Physics, University of Utah, Salt Lake City, Utah 84112, and Jorge Pullin, Center for Gravitational Physics and Geometry, Department of Physics, The Pennsylvania State University, 104 Davey Lab, University Park, PA 16802

COLLIDING BLACK HOLES: HOW FAR CAN THE CLOSE APPROXIMATION GO?

SECOND ORDER PERTURBATIONS OF A SCHWARZCHILD BLACK HOLE

Kirill V. Krasnov, Center for Gravitational Physics and Geometry, The Pennsylvania State University, University Park, PA 16802 and Erwin Schrödinger Institute for Mathematical Physics, Boltzmannngasse 9, 1090 Vienna, Austria and Bogolyubov Institute for Theoretical Physics, Kiev 143, Ukraine

COUNTING SURFACE STATES IN THE LOOP QUANTUM GRAVITY

Erik A. Martinez, Center for Gravitational Physics and Geometry, Department of Physics, The Pennsylvania State University, University Park, PA 16802-6300

THE POSTULATES OF GRAVITATIONAL THERMODYNAMICS

Abhay Ashtekar, Center for Gravitational Physics and Geometry, Physics Department, The Pennsylvania State University, University Park, PA 16802  
LARGE QUANTUM GRAVITY EFFECTS: UNEXPECTED LIMITATIONS OF THE CLASSICAL THEORY

Michael Aizenman, Departments of Physics and Mathematics, Jadwin Hall, Princeton University, Princeton, NJ 08544-0708  
ON THE NUMBER OF INCIPIENT SPANNING CLUSTERS

Steven Duplij, Department of Physics, University of Kaiserslautern, D-67653 Kaiserslautern, Germany  
NONINVERTIBILITY AND SEMI-ANALOGS OF (SUPER) MANIFOLDS, FIBER BUNDLES AND HOMOTOPIES

SUPERMATRIX REPRESENTATIONS OF SEMIGROUP BANDS

Abhay Ashtekar, Center for Gravitational Physics and Geometry, Physics Department, Penn State, University Park, PA 16802, Jerzy Lewandowski, Institute of Theoretical Physics, University of Warsaw, 00-681 Warsaw, Poland, Donald Marolf, Department of Physics, University of California, Santa Barbara, CA 93106, José Mourão, Sector de Física da U.C.H.E., Universidade do Algarve, Campus de Gambelas, 8000 Faro, Portugal, and Thomas Thiemann, Department of Physics, Harvard University, Cambridge, MA 02138  
 $SU(N)$  QUANTUM YANG-MILLS THEORY IN TWO DIMENSIONS: A COMPLETE SOLUTION

Eli Hawkins, Center for Gravitational Physics and Geometry, The Pennsylvania State University, University Park, PA 16802  
HAMILTONIAN GRAVITY AND NONCOMMUTATIVE GEOMETRY

Paul Federbush, Department of Mathematics, University of Michigan, Ann Arbor, MI 48109-1109  
THE AXIAL ANOMALY REVISITED

Volker Enss and Ricardo Weder, Institut für Reine und Angewandte Mathematik, Rheinisch-Westfälische Technische Hochschule Aachen, D-52056 Aachen, Germany  
- INVERSE TWO CLUSTER SCATTERING

Ricardo Weder, Instituto de Investigaciones en Matemáticas Aplicadas y en Sistemas, Universidad Nacional Autónoma de México, Apartado Postal 20-726. México, D. F. 01000  
INVERSE SCATTERING FOR  $N$ -BODY SYSTEMS WITH TIME-DEPENDENT POTENTIALS

Roberto Gómez and Jeff Winicour, Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA 15260, Pablo Laguna and Philippos Papadopoulos, Department of Astronomy and Astrophysics and Center for Gravitational Physics and Geometry, Penn State University, University Park, PA 16802  
CAUCHY-CHARACTERISTIC EVOLUTION OF EINSTEIN-KLEIN-GORDON SYSTEMS

Hugo Fort, Rodolfo Gambini, Instituto de Física, Facultad de Ciencias, Tristan Narvaja 1674, Montevideo, Uruguay and Jorge Pullin, Center for Gravitational Physics and Geometry, Physics Department, The Pennsylvania State University, 104 Davey Lab, University Park, PA 16802  
LATTICE KNOT THEORY AND QUANTUM GRAVITY IN THE LOOP REPRESENTATION

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DENSITY OF KINKS AFTER A QUENCH: WHEN SYMMETRY BREAKS, HOW BIG ARE THE PIECES?

Abhay Ashtekar, Center for Gravitational Physics and Geometry, Department of Physics, Penn State, University Park, PA 16802 and Erwin Schrödinger International Institute for Mathematical Sciences, Boltzmanngasse 9, A-1090 Vienna, Austria and Alejandro Corichi, Center for Gravitational Physics and Geometry, Penn State, University Park, PA 16802  
PHOTON INNER-PRODUCT AND THE GAUSS LINKING NUMBER

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PROBING QUANTUM GRAVITY THROUGH EXACTLY SOLUBLE MIDSUPERSPACES I

Jorge Pullin, Center for Gravitational Physics and Geometry, Department of Physics, The Pennsylvania State University, 104 Davey Lab, University Park, PA 16802  
CANONICAL QUANTUM GRAVITY WITH NEW VARIABLES AND LOOPS: A REPORT

Carsten Gundlach, LAEFF-INTA (Laboratorio de Astrofísica Espacial y Física Fundamental - Instituto Nacional de Tecnología Aeroespacial), PO Box 50727, 28080 Madrid, Spain and Jorge Pullin, Center for Gravitational Physics and Geometry, Department of Physics, 104 Davey Lab, The Pennsylvania State University, University Park, PA 16802,  
INSTABILITY OF FREE EVOLUTION IN DOUBLE NULL COORDINATES

Rodolfo Gambini, Instituto de Física, Facultad de Ciencias, Tristan Narvaja 1674, Montevideo, Uruguay and Jorge Pullin, Center for Gravitational Physics and Geometry, Department of Physics, 104 Davey Lab, The Pennsylvania State University, University Park, PA 16802

THE GENERAL SOLUTION OF THE QUANTUM EINSTEIN EQUATIONS?

Abhay Ashtekar, Center for Gravitational Physics and Geometry, Department of Physics, Penn State, University Park, PA 16802, Jiří Bičák, Department of Theoretical Physics, Charles University, V Holešovičkách 2, 180 00 Prague 8, Czech Republic, and Bernd G. Schmidt, Max-Planck-Institut Für Gravitationsphysik, Schlaatzweg 1, 14473 Potsdam, Germany

BEHAVIOR OF EINSTEIN-ROSEN WAVES AT NULL INFINITY

ASYMPTOTIC STRUCTURE OF SYMMETRY REDUCED GENERAL RELATIVITY

Abhay Ashtekar, Center for Gravitational Physics and Geometry, Physics Department, Penn State University, University Park, PA 16802-6300, and Jerzy Lewanowski, Institute of Theoretical Physics, University of Warsaw, ul Hoza 69, 00-681 Warsaw, Poland

QUANTUM FIELD THEORY OF GEOMETRY

José A. Zapata, Center for Gravitational Physics and Geometry, Department of Physics, The Pennsylvania State University, 104 Davey Laboratory, University Park, PA 16802

TOPOLOGICAL LATTICE GRAVITY USING SELF-DUAL VARIABLES

PREPRINTS RECEIVED IN SWANSEA

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SFB 237 - Preprint Nr. 325, June 1996.

Wiener and Feynman-Path Integrals; Origins, structure and applications

S. Albeverio<sup>1</sup>, R. Cianci<sup>2</sup> and A. Khrennikov<sup>2</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany. <sup>2</sup>Dipartimento di Matematica, University di Genova, Italy.

SFB237 - Preprint Nr. 332, August 1996.

On the Fourier Transform and the Spectral Properties of the p-adic Momentum and Schrödinger Operators

S. Albeverio<sup>1</sup>, R. Cianci<sup>2</sup> and A. Khrennikov<sup>2</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany. <sup>2</sup>Dipartimento di Matematica, University di Genova, Italy.

SFB237 - Preprint Nr. 333, August 1996.

On the Spectrum of the p-adic Position Operator

S. Albeverio<sup>1</sup> and S-M. Fei<sup>2</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany; SFB 237 Essen-Bochum-Düsseldorf, Germany; BiBoS Research Centre, D 33615 Bielefeld, Germany; CERFIM, Locarno, Switzerland. <sup>2</sup>Alexander von Humboldt-Stiftung fellow. On leave from Institute of Physics, Chinese Academy of Sciences, Beijing.

SFB237 - Preprint Nr. 337, August 1996.

A Remark on Integrable Poisson Algebras and Two Dimensional Manifolds

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SFB237 - Preprint Nr. 336, August 1996.

A Remark on Higher-Spin Ising Models

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SFB237 - Preprint Nr. 335, August 1996.

Current Algebraic Structures over Manifolds: Poisson Algebras, q-Deformations and Quantization

- S. Albeverio<sup>1</sup> and S.-M. Fei<sup>2</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany; SFB 237 Essen-Bochum-Düsseldorf, Germany; BiBoS Research Centre, D 33615 Bielefeld, Germany; CERFIM, Locarno, Switzerland. <sup>2</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany. Alexander von Humboldt-Stiftung fellow. On leave from Institute of Physics, Chinese Academy of Sciences, Beijing. SFB237 - Preprint Nr. 338, September 1996.  
**Symmetry, Integrable Chain Models and Stochastic Processes**
- S. Albeverio<sup>1,2,3</sup>, H. Gottschalk<sup>1</sup> and J.-L. Wu<sup>1,2,4</sup>. <sup>1</sup>Fakultät und Institut für Mathematik, Ruhr-Universität-Bochum, D-44780 Bochum, Germany. <sup>2</sup>SFB 237 Essen-Bochum-Düsseldorf, Germany. <sup>3</sup>BiBoS Research Centre, D 33615 Bielefeld, Germany; and VERFIN, Locarno, Switzerland. <sup>4</sup>Probability Laboratory, Institute of Applied Mathematics, Academia Sinica, Beijing 100080, P R China. SFB 237 - Preprint Nr. 340, October 1996.  
**Partly Divisible Probability Measures on Locally Compact Abelian Groups and Related Topics**
- S. Albeverio<sup>1</sup>, A. Hilbert<sup>2</sup> and V. Kolokoltsov<sup>3</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany; SFB 237; BiBoS; CERFIM, Locarno. <sup>2</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany; SFB 237; <sup>3</sup>Department of Mathematics, Nottingham Trent University. SFB 237 - Preprint Nr. 320, November 1996.  
**Sur Le Comportement Asymptotique du Noyau Associé à Une Diffusion Dégénérée**
- S. Albeverio<sup>1</sup>, W. Karwowski<sup>2</sup> and X. Zhao<sup>3</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany; SFB 237 Essen-Bochum-Düsseldorf, Germany; BiBoS Research Centre, D 33615 Bielefeld, Germany; CERFIM, Locarno, Switzerland. <sup>2</sup>Institute of Theoretical Physics, Wrocław University, Poland. <sup>3</sup>Institute of Mathematics, Shantou University, Shantou 515063, China. SFB237 - Preprint Nr. 344, November 1996.  
**Asymptotics and Spectral Results for Random Walks on p-adics**
- S. Albeverio<sup>1</sup>, V.N. Kolokoltsov<sup>2</sup> and O.G. Smolyanov<sup>3</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität-Bochum, Germany; SFB 237 Essen-Bochum-Düsseldorf, Germany; BiBoS Research Centre, D 33615 Bielefeld, Germany; CERFIM, Locarno, Switzerland. <sup>2</sup>Department of Mathematical Statistics and O.R., Nottingham Trent University, Burton Street, Nottingham, NG1 4BU. <sup>3</sup>Mech.-Math. Dep., Moscow State University, 119899 Moscow, Russia. SFB237 - Preprint Nr.343, November 1996.  
**Continuous Quantum Measurement; Local and Global Approaches**
- S. Albeverio<sup>1,2,3</sup> and P. Kurasov<sup>1,4,5,6</sup>. <sup>1</sup>Dept. of Mathematics, Ruhr-Universität, D 44780 Bochum, Germany. <sup>2</sup>SFB 237 Essen-Bochum-Düsseldorf, Germany. <sup>3</sup>BiBoS Research Centre, D 33615 Bielefeld, Germany; CERFIM, Locarno, Switzerland. <sup>4</sup>Mathematical Inst., Stockholm Univ., 10691 Stockholm, Schweden. <sup>5</sup>Dept. of Physics, St. Petersburg Univ., 198904 St. Petersburg, Russia. <sup>6</sup>Dept. of Math., Lulea Univ., 97817 Lulea, Schweden. SFB 237 - Preprint Nr.334, August 1996.  
**Pseudodifferential Operators with Point Interactions**
- S. Albeverio<sup>1,2,3</sup>, J.-L. Wu<sup>1,2,4</sup> and T.-S. Zhang<sup>5</sup>. <sup>1</sup>Dept. of Mathematics, Ruhr-Universität, D 44780 Bochum, Germany. <sup>2</sup>SFB 237 Essen-Bochum-Düsseldorf, Germany. <sup>3</sup>BiBoS Research Centre, D 33615 Bielefeld, Germany; CERFIM, Locarno, Switzerland. <sup>4</sup>On leave from Probability Laboratory, Institute of Applied Mathematics, Academia Sinica, Beijing 100080, P R China. <sup>5</sup>Faculty of Engineering, HSH, Skaregt 103, 5500 Hausgesund, Norway. SFB 237 - Preprint Nr.330, July 1996.  
**Parabolic SPDEs driven by Poisson White Noise**
- D.B. Applebaum, Department of Mathematics, Statistics and Operational Research, The Nottingham Trent University, Burton Street, Nottingham, NG1 4BU. Research Report No.11/96, November 1996.  
**Quantum Martingale Measures and Stochastic Partial Differential Equations in Fock Space**
- J.A. De Azcárraga<sup>1\*</sup>, R.S. Dunne<sup>2\*</sup>, A.J. Macfarlane<sup>2\*</sup> and J.C. Pérez Bueno<sup>1\*</sup>. <sup>1</sup>Departamento de Física Teórica and IFIC, Centro Mixto Universidad de Valencia-CSIC, E-46100 Burjassot (Valencia) Spain. <sup>2</sup>Department of Applied Mathematics & Theoretical Physics, University of Cambridge, Cambridge, CB3 9EW. \* Emails: azcarrag@evalvx.ific.uv.es; r.s.dunne@damtp.cam.ac.uk; a.j.macfarlane@damtp.cam.ac.uk; and pbueno@lie.ific.uv.es Preprint Nr.hep-th/9609002, 30 August 1996.  
**Braided Structure of Fractional  $Z_3$ -Supersymmetry<sup>†</sup>**  
<sup>†</sup>Presented at 5th Colloquium 'Quantum groups and integrable systems', Prague, 20-22 June 1996.

J.A. De Azcárraga<sup>1</sup>, R.S. Dunne<sup>2</sup>, A.J. Macfarlane<sup>2</sup> and J.C. Pérez Bueno<sup>1\*</sup>

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Preprint Nr.hep-th/9609003, 30 August 1996.

**The  $q$ -Calculus for Generic  $q$  and  $q$  A Root of Unity<sup>†</sup>**

<sup>†</sup>Presented at 5th Colloquium 'Quantum groups and integrable systems', Prague, 20-22 June 1996.

C. Becker<sup>1</sup>, R. Gielerak<sup>2</sup> and P. Lugiewicz<sup>2</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität Bochum, 44780 Bochum, Germany. <sup>2</sup>Institute of Theoretical Physics, University of Wrocław, 50-204 Wrocław, Poland.

SFB-237 - Preprint Nr.331, July 1996.

**Covariant SPDEs and Quantum Field Structures**

C. Becker<sup>1</sup>, H. Gottschalk<sup>1</sup> and J.-L. Wu<sup>1,2,3</sup>. <sup>1</sup>Institut für Mathematik, Ruhr-Universität Bochum, D 44780 Bochum, Germany. <sup>2</sup>SFB237 Essen-Bochum-Düsseldorf, Germany. <sup>3</sup>Probability Laboratory, Institute of Applied Mathematics, Academia Sinica, Beijing 100080, P R China.

SFB-237 - Preprint Nr.342, October 1996.

**Generalized Random Vector Fields and Euclidean Quantum Vector Fields**

R. Flume\*, M. Magro<sup>†</sup>, L. O'Raifeartaigh, I. Sachs and O. Schnetz. Dublin Institute for Advanced Studies, 10 Burlington Road, Dublin 4, Ireland.

\*Volkswagen Foundation Fellow, on leave of absence University of Bonn.

<sup>†</sup>On leave of absence from ENSLAPP, Groupe de Lyon, 46 allée d'Italie, 69364 Lyon Cedex 07, France.

DIAS-STP/96-21, BONN-TH-96-15, ENSLAPP-L-621/96, FAU-TP3-96/20.

**Uniqueness of the Seiberg-Witten Effective Lagrangian**

R. Flume\*, L. O'Raifeartaigh<sup>†</sup>, and I. Sachs<sup>‡</sup>. Dublin Institute for Advanced Studies, 10 Burlington Road, Dublin 4, Ireland. email : physics@stp.dias.ie

\*Volkswagen Foundation Fellow, on leave of absence from University of Bonn.

<sup>†</sup>Talk presented at the Inaugural Conference of the Asia Pacific Center for Theoretical Physics, Seoul, June 1996 and at XXIst Conference on Group Theoretical Methods in Physics, Goslar, Germany, July 1996.

<sup>‡</sup> Partially supported by Swiss Nationalfond for Scientific Research. DIAS-STP/96-22.

**Brief Resume of Seiberg-Witten Theory**

A. Khrennikov\*, Mathematical Institute, Bochum University, D-44780, Bochum, Germany. \* Alexander von Humboldt Fellowship. On leave from Moscow Institute of Electronic Engineering.

SFB237- Preprint Nr. 339, September 1996.

**Non-Kolmogorovean Probabilistic Models with  $p$ -adic Probabilities and Foundations of Quantum Mechanics**

A. Khrennikov\*, Mathematical Institute, Bochum University, D-44780, Bochum, Germany. \* On leave from Moscow Institute of Electronic Engineering, this research was realised on the basis of Alexander von Humboldt Fellowship and visiting professor fellowship at the University of Genova supported by the Italian National Research Council.

SFB237- Preprint Nr. 341, October 1996.

**$p$ -adic Description of the Black Body Radiation**

E.H. Lieb\*, Departments of Physics and Mathematics, Princeton University, P.O. Box 708, Princeton, NJ 08544-0708, USA. \* Work partially supported by U.S. National Science Foundation grant PHY 95-13072.

**Stability of Matter in Magnetic Fields<sup>†</sup>**

<sup>†</sup> Lecture given at the Euroconference on Correlations in Unconventional Quantum Liquids, Evora, Portugal, October 1996.

M. Znojil, Bogoliubov Laboratory of Theoretical Physics, JINR, Dubna, Moscow 141980, Russia.

Preprint Nr.E4-95-340

**The Coupled-Channel T-Matrix; Its Lowest-Order Born+Lanczos Approximants**

M. Znojil, Bogoliubov Laboratory of Theoretical Physics, JINR, Dubna, Moscow 141980, Russia.

Preprint Nr.E5-96-260

**The Hill-Determinant Perturbation Theory with Triangular Propagators**

The German Max-Planck Society decided to found a Max-Planck Institute for Mathematics in the Sciences in Leipzig. The official opening ceremony took place on October 2, 1996. The new Institute is the second Max-Planck Institute devoted to the mathematical sciences, after the one in Bonn whose founding director was Friedrich Hirzebruch.

The purpose of the Institute is to carry out research in pure and applied mathematics, to foster the dialogue between mathematics and the sciences and to integrate modern scientific advances in the sciences into mathematics. Historic experience shows that problems from physics, chemistry, biology and other sciences have inspired new developments in mathematics while mathematics in turn has had a profound impact on these fields. Fourier's analysis of the heat equation, for example, led to the development of harmonic analysis, Gauss' work as a surveyor inspired his theory of surfaces and the development of differential geometry which now forms the basis of general relativity and the Standard Model in particle physics, Heisenberg's formulation of quantum mechanics accelerated the development of functional analysis and operator theory, research in nonlinear dynamics was partly motivated by and had a strong impact on celestial mechanics, the theory of compensated compactness partly grew out of problems of the binding of atoms, and gauge field theories have deep connections with topology and geometry.

To foster the exchange of ideas the Institute will have a few permanent positions and a variety of temporary positions for young scientists, as well as an active programme of long and short term visitors. It is planned to build up some research groups that work together on specific projects.

Among the visiting positions there will be a particularly distinguished 'Sophus-Lie Visiting Professorship' for which eminent senior scientists will be invited for one or two year terms in order to stimulate the exchange between mathematics and the sciences. The name for this position has been chosen in honour of the Norwegian mathematician Sophus Lie (1842-1899) who worked in Leipzig from 1886 to 1898 and whose deep theories of symmetry groups and differential equations have had a profound and decisive influence on the development of 20th century theoretical physics.

The main areas of mathematical research will be analysis, geometry and mathematical physics. A prominent theme will be the theory of nonlinear partial differential equations. Specific topics will include Riemannian and algebraic geometry as well as their interaction with modern theoretical physics (harmonic maps, minimal surfaces, Ricci flow, mean curvature flow, Yang-Mills and Seiberg-Witten equations), mathematical models in materials science (microstructure, homogenization, phase transitions, fracture, interfaces and thin films), continuum mechanics (elasticity, fluid and gas dynamics), nonlinear waves and pattern formation, many-particle systems, phenomena in general relativity, quantum field theory, neural networks and models of cognition.

Interaction with the sciences will include a broad spectrum of topics, ranging from fields that already have a strong interaction with mathematics, such as particle physics or continuum mechanics to areas whose mathematization is just beginning, such as cognition or materials science.

To complement analysis and modelling by numerical simulation, it is also planned to build up a research group in scientific computing.

The Institute has started with a board of three directors consisting of Eberhard Zeidler (acting director), Jürgen Jost, and Stefan Müller, with Jürgen Moser as scientific advisor.

Further information can be found on the home page: [www.mis.mpg.de](http://www.mis.mpg.de)

## INTERNATIONAL ASSOCIATION OF MATHEMATICAL PHYSICS

### IAMP NEWS BULLETIN

December 1997

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## PRESIDENT'S REPORT

It is customary for the IAMP president to report on events of interest to the Association and to mathematical physics generally. This time, the main interest centers on our triannual meeting that was held this summer in Brisbane and it is no exaggeration to say that it was hugely successful. The organization by our hosts was among the smoothest I have seen at any large meeting anywhere, and on behalf of IAMP I would like to say how grateful we are.

The local organizing committee that carried this out consisted of Tony Bracken (chair), Mark Gould (secretary), Barry Jones (treasurer) and many others. The International Scientific Advisory Committee together with the Australian Scientific Committee gave us a scientific program that brought out clearly that mathematical physics, as a field in its own right, is alive and well and is also adaptable to the changing currents in physics and mathematics. That is to say, the traditional subjects that have guided this Association since its founding are vibrant, but we were also treated to some new foci that should continue with us for some time.

Several items concerned with this meeting are to be found in this issue of the News Bulletin. Tony Bracken has kindly contributed a synopsis of the meeting. My brief opening remarks are also included, partly because they mention the people who made it all work and partly because they contain some historical remarks that younger members might not know about.

One of the decisions by the Executive Committee in Brisbane was that the next Congress, to be held in 2000, will be in London. A welcoming message by Boguslaw Zegarinski, the chair of the local organizing committee, will be found in this issue.

Until then, let me hope that we may have many small local and/or topical meetings, and I would encourage everyone to think about organizing such meetings. They can be quite useful in bringing the community together.

The Association is financially healthy and we are trying hard to find ways in which we can be useful to the members. One way is to provide a web page

<http://www.ma.utexas.edu/iamp/index.html>  
maintained by Charles Radin and on which this News Bulletin will be stored. In fact, it is hoped, eventually, to have the News Bulletin exclusively electronic, i.e., to eliminate the hard-copy and its costs and distribution problems. At the Executive Committee meeting in

Brisbane it was determined that this would be the last hard-copy of the bulletin with full distribution.

*The News Bulletin will henceforth be sent by email to all those members for whom we have an email address. If you want to have a hard-copy bulletin, you must request it from the secretary.*

After reviewing these results, further action may be taken restricting hard copy distribution.

As you can see from this, it is very important that we have your email address and that you keep it up-to-date. The person to send it to is the treasurer, Raghu Varadhan, at [varadhan@cims.nyu.edu](mailto:varadhan@cims.nyu.edu)

Another way in which we can make IAMP more useful is to have a section on our web page devoted to *Open Problems*. Michael Aizenman has kindly agreed to edit this section and an announcement, with some more details, is included in this issue.

There is also a message from Eugene Wayne, the chair of our Committee on Electronic Communication. Ideas in this area are most welcome.

One of the really pleasurable events in the General Assembly in Brisbane was the award of three prizes in Mathematical Physics established by Daniel Iagolnitzer. This was also a good year for the recognition of Mathematical Physics in terms of several other prizes, as mentioned later.

The officers of the Association have changed. Daniel Iagolnitzer resigned as treasurer in June. It was not possible to find a replacement during the summer, but in September Raghu Varadhan kindly agreed to assume this responsibility. The other officers remain as before: Huzihiro Araki is Vice-president and Charles Radin is Secretary.

We have three new Associate members, and I should like to welcome them and thank them for their support. They are Kluwer Academic Publishers, Microsoft and the Max Planck Institute for Mathematics in the Sciences, Leipzig.

Elliott Lieb, December, 1997



## SECRETARY'S REPORT

This is the last paper News Bulletin which will be distributed to our full membership; in future, all members will periodically receive by email a snapshot of the information currently on our web site together with appropriate timely announcements. (Those who wish to also receive the next snapshot in paper form should contact me.)

The reasons for the switch to electronic communication are two-fold – the large savings in expense for reproduction and distribution, and, more significantly, the enhanced service available through the web. Examples of the latter already in place include the membership data, the extensive and timely preprint archives, and the current and detailed information about conferences now possible through web links.

In conclusion I urge you to check out our web site:

<http://www.ma.utexas.edu/iamp/index.html>

or the mirror site:

<http://mpej.unige.ch/iamp/index.html>

In particular, please check that the information listed for you on the membership list is accurate and complete, especially the email address. Amendments are easily done through the web; alternatively, please send the information to the treasurer: S.R.S. Varadhan, [varadhan@cims.nyu.edu](mailto:varadhan@cims.nyu.edu). And while you are at it, check your dues status and bring it up to date if necessary. (This can also be checked from the address label on this bulletin.)

Charles Radin, Secretary of IAMP  
[iamp@math.utexas.edu](mailto:iamp@math.utexas.edu)

### REPORT FROM THE IAMP COMMITTEE ON ELECTRONIC COMMUNICATION

The IAMP now has an active site on the World Wide Web, located at "<http://rene.ma.utexas.edu/iamp/>". The site is maintained by the Association Secretary Charles Radin, and contains a host of useful information including the Association's membership list, the Bulletin, and links to other mathematical physics sites.

There is a mirror of this web site in Geneva (<http://mpej.unige.ch/iamp/index.html>) which should provide faster response times for European users. It would also be nice if we could establish a mirror site in Asia or Australia. If anyone is willing to volunteer to establish and maintain such a site, or if you have any other suggestions for ways in which the Association could improve the electronic services it provides to its membership, please contact the IAMP Committee on Electronic Communication, care of Eugene Wayne ([cew@math.bu.edu](mailto:cew@math.bu.edu))

## XIII International Congress of Mathematical Physics

17 - 22 July 2000, Imperial College, London, UK

Dear Colleagues,

Through an interesting and fortunate arrangement made in the history of the IAMP ten years ago, the next International Congress of Mathematical Physics will take place in the millennium year. It will be a special year in many respects: through activity both on the Earth and on the Sun.

We are very pleased that during the millennium year, between 17<sup>th</sup> and 22<sup>nd</sup> July, we will host the XIII<sup>th</sup> International Congress of Mathematical Physics at Imperial College, London. It will again be an opportunity for meeting colleagues, for presenting excellent recent results and for fruitful scientific discussions. But also at this special moment in time it will be a good opportunity to look back and summarize the achievements made in this century in the area of Mathematical Physics. Certainly every speaker will wish to tell us about great open problems. We also plan to have a number of round-table discussions which will help us to create a vision of the most important directions for the future.

It will be important during this particular Congress to underline relevance of the mathematical and physical research for modern society. Therefore we plan to have an extensive public programme consisting of a number of open lectures which we hope will also be intellectually enjoyable to all participants of the Congress.

Travelling to a congress from other countries takes time and costs money. Fortunately London has a superb location in respect of travel costs as well as convenience of travel connections. With a large number of tourist and other attractions it is also a very interesting place to visit.

To make your trip even more worth your while we will have a number of satellite meetings organized by UK enthusiasts: •Bristol: PDEs and Schrödinger Operators •Cambridge: Statistical Mechanics and Related Fields •Edinburgh: Dynamical Systems •Nottingham: Noncommutativity, geometry and probability •King's College London: Disordered Systems •King's College London: Quantum Groups and Integrable Systems •Queen Mary and Westfield College London: Strings and Gravity •Oxford: Bio-Math-Phys •Warwick: Stochastic Analysis on Loop Spaces •Imperial College: Kindergarten - Special Programme for Post Graduate Students.

We will make every effort to keep the conference fee at a very low level and to organize a possibly large support fund for attendees. We are also able to provide a large amount of inexpensive accommodation.

Detailed information will be available under the following Internet address: <http://icmp2000.ma.ic.ac.uk/>. For communication the following e-mail address can also be used: [icmp2000@ic.ac.uk](mailto:icmp2000@ic.ac.uk)

We very much hope that by your active participation you will make this Congress special and memorable. For good planning please make a note in your diary now and come in the year 2000.

On behalf of the Local Organizing Committee I am pleased to send you this very warm invitation.

Yours sincerely, Bogusław Zegarliniski

Chairman of the Local Organizing Committee  
ICMP2000

The XIIth International Congress was held from July 13 to 19 on the campus of the University of Queensland in Brisbane. It was attended by 346 delegates.

There were 13 one-hour plenary lectures, presented by R Bartnik, R Baxter, J Feldman, S Ferrara, G Gallavotti, G 't Hooft, V Jones, V Kac, M Loss, M Mezard, P Sarnak, H-T Yau and L-S Young.

There were 9 two-hour invitational sessions, with the themes

- disordered systems
- general quantum field theory
- general relativity & string theory
- integrable models
- operator algebras
- quantum chaos & semiclassical limit
- quantum mechanics
- statistical hydrodynamics
- statistical mechanics

in which 35 shorter, invited talks were given.

And there were 107 short, contributed talks plus 79 posters presented.

All of this was fitted into 6 mornings and 4 afternoons, and was supplemented by a busy social program in the evenings and on the midweek Wednesday afternoon, when there was a tour to view local fauna and flora. A novel feature of the social program was a concert by the resident University of Queensland chamber ensemble, at which a short composition specially commissioned for the Congress, and sponsored by the Australia Council for the Arts, had its premiere.

The General Assembly, held on the Wednesday evening, had some very lively discussion about directions, new and old, in mathematical physics. IAMP President Elliott Lieb also awarded three prizes during the Assembly. Vaughan Jones gave a very successful public lecture on the Friday evening.

Many delegates also took the opportunity to attend one or more of the several other conferences in the Asia/Pacific region which were loosely associated with the Congress, and which were held in the weeks before or after the Brisbane meeting.

The Congress was blessed with fine weather and good luck. There were no major problems with the program or the accommodation arrangements, and delegates seemed to enjoy the meeting. Most important for the IAMP, the Congress was a financial success, and the organizers have been able to refund all the money advanced by the IAMP, plus the registration surcharges paid by 113 non(financial)members who attended.

Thanks to all those who helped with the organization - far too many to list here, but special thanks to the Local Organizing Committee, and to a great bunch of helpful grad students. Thanks also to our supporters and sponsors, especially IMU and IUPAP, the Australian Mathematical Society, the Universities of Adelaide, Melbourne and Queensland, and the Australian National University.

The contributions of the plenary and invited speakers to the Proceedings have almost all been received, and will go to the publisher shortly. All delegates will receive a copy in due course.

Tony Bracken

## OPENING REMARKS, Brisbane, July 14, 1997

Elliott Lieb

On behalf of the International Association of Mathematical Physics, I welcome you all to this twelfth in the series of International Congresses.

First of all I want to thank, the many people who organized this splendid chance for our community to get together and get to know each other's work.

There is the International Scientific Advisory Committee chaired by H. Araki, with Tony Bracken, Tom Spencer, Arthur Jaffe, Giovanni Jona-Lasinio and S T Yau.

The Australian Scientific Committee chaired by Angas Hurst, Derek Robinson, Paul Pearce, Bob Delbourgo, Alan Carey, Phil Broadbridge, Gerard Milburn, Peter Jarvis and others.

The Local Organizing Committee in Brisbane: Tony Bracken (chair), Mark Gould (secretary), Barry Jones (treasurer), Jon Links, David de Wit, Yao-Zhong Zhang, Katrina Hibberd, Iain Clark, David MacAnally, Mabo Suzuki, Phil Isaac and Jack Ge.

To the audience I would say that if you have never been involved with something of this dimension then you probably have only a faint idea of the tremendous amount of work involved. In particular, Tony Bracken, who wore three hats has certainly earned a place in our hearts for his tireless efforts.

One of the gifts that the older generation can pass on to the younger is the story of how we got where we are. That story is a bit complicated and involves the realization by some young upstarts in the 1950's and 60's that theoretical physics consisted of more than simple back of the envelope calculations. The enormous success of quantum mechanics in the 30's and 40's had led the major figures in physics to the view that mathematical thought, viewed from the perspective of physical reality, was cerebral calcification.

Bit by bit, the idea that one could actually prove useful theorems about the problems of physics—an early example being the existence of the thermodynamic limit—slowly gained ground. But I must note, parenthetically, as pointed out to me by Jean Bricmont, that some of the most elegant and interesting rigorous results were contributed by card carrying physicists instead of people who made a profession of mathematical physics. But I don't want you to think that this was always the case.

In any event, by 1972 it was felt that there were enough specialists in mathematical physics in the world to have an international conference on the subject. This took place in Moscow. Then in 1974 in Warsaw (in those days the conferences were not so large and expensive and having one every two years was not considered excessive). At the Warsaw meeting, the idea of an Association was explored, and again in Kyoto in 1975. The statutes were assembled and Walter Thirring became the first President in 1976. The first meeting in this series under IAMP auspices was in Rome in 1977. This was followed by Lausanne (1979), Berlin (1981), Boulder (1983), Marseille (1986), Swansea (1988), Leipzig (1991) and Paris (1994).

Finally, after much effort on the part of our hosts we are able to cross the equator and take a different view of the world. I hope there will be more such meetings south of the equator, perhaps in South America. In any event, I wish you all, Australian and overseas participants, a delightful and culturally profitable congress.

## AWARDS FOR MATHEMATICAL PHYSICISTS IN 1997

It is a pleasure to announce that several of our colleagues received awards this year for their work in mathematical physics. Such recognition is an encouragement for all of us and we congratulate them on their achievements, so justly recognized.

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Three prizes in mathematical physics established by Daniel Iagolnitzer were awarded in the General Assembly of IAMP in Brisbane. The IAMP committee that chose the recipients consisted of Sergio Doplicher (chair), Jürg Fröhlich, Daniel Iagolnitzer and Aubrey Truman. The prizes were awarded to Rudolf Haag, Maxim Kontsevich and Arthur Wightman, with the following citations:

*Rudolf Haag:* For his fundamental contributions to the quantum theory of systems with infinitely many degrees of freedom, as one of the founders of modern Quantum Field Theory, where he discovered the central role of the principle of locality and of the concept of local observables as roots of all the conceptual and formal structures; and as a leader in the operator algebraic analysis of the foundations of Quantum Statistical Mechanics. Of all these aspects his recent book is a superb condensation.

*Maxim Kontsevich:* For his contributions to topological gravity, establishing a deep link between quantum gravity, string theory and the geometry of the moduli space of Riemann surfaces; to topological sigma-models on compact Kaehler manifolds; to mirror symmetry, and for the notion of quantum deformations of cohomology spaces; for the contributions to Chern-Simons theories and the construction of knot invariants; for the discovery of topological string theoretic aspects in one dimensional dynamical systems.

*Arthur Wightman:* For his central role in the foundations of the general theory of quantized fields, the powerful impetus impressed promoting research on various aspects of Modern Mathematical Physics (on constructive QFT, and on domains ranging from statistical mechanics, dynamical systems and ergodic theory to integrable systems, Schroedinger Operators and renormalization theory), for his expository contributions of a masterly level to mathematical physics.

\*\*\*\*\*

Some other awards:

*Jürg Fröhlich* received the Benoist prize, which is the most prestigious science prize for Swiss citizens or residents. The citation (translated) is

For his work on phase transitions, electron localization, and on the theory of the quantized Hall effect.

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The Wolf prize in mathematics was awarded this year to Joseph Keller and Iakov Sinai. The citations are

*Joseph Keller:* For his profound and innovative contributions, in particular to electromagnetic, optical and acoustic wave propagation, and to fluid, solid, quantum and statistical mechanics.

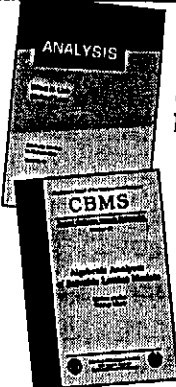
*Iakov Sinai:* For his fundamental contributions to mathematically rigorous methods in statistical mechanics and the ergodic theory of dynamical systems and their applications in physics.

\*\*\*\*\*

*Michael Aizenman* and *Edward Nelson* were elected to the U.S. National Academy of Sciences.

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Please notify the Secretary, Charles Radin, of 1998 awards.



**Algebraic Analysis of Solvable Lattice Models**

Michio Jimbo and Tetsuji Miwa, *Kyoto University, Japan*

The book provides a very clear exposition on the subject, and meanwhile gives an elementary introduction to representation theory ... serves very well as both introduction and reference.

—Mathematical Reviews

Very clearly written ... suitable for those who may not be expert either in quantum groups or in the theory of solvable lattice models.

—Zentralblatt für Mathematik

CBMS Regional Conference Series in Mathematics, Number 85; 1994; 152 pages; Softcover; ISBN 0-8218-0320-4; List \$19; All individuals \$15; Order code CBMS/85IAMP

Recommended Text

**Analysis**

Elliott H. Lieb, *Princeton University, NJ*, and Michael Loss, *Georgia Institute of Technology, Atlanta*

Lieb and Loss offer a practical presentation of real and functional analysis at the beginning graduate level ... could be used as a two-semester introduction to graduate analysis ... not all of the topics covered are typical. The authors introduce the subject with a thorough presentation ... [an] informative exposition.

—CHOICE

Graduate Studies in Mathematics, Volume 14; 1997; 278 pages; Hardcover; ISBN 0-8218-0632-7; List \$35; All AMS members \$28; Order code GSM/14IAMP

**Asymptotic Completeness, Global Existence and the Infrared Problem for the Maxwell-Dirac Equations**

Moshé Flato, Jacques C. H. Simon, and Erik Taflin, *Université de Bourgogne, Dijon, France*

Memoirs of the American Mathematical Society, Volume 127, Number 606; 1997; 311 pages; Softcover; ISBN 0-8218-0683-1; List \$57; Individual member \$34; Order code MEMO/127/606IAMP

Independent Study

**Geometry and Quantum Field Theory**

Daniel S. Freed and Karen K. Uhlenbeck, *University of Texas, Austin*, Editors

Members of the Mathematical Association of America (MAA) and the National Council of Teachers of Mathematics (NCTM) receive a 20% discount from list price.

IAS/Park City Mathematics Series, Volume 1; 1995; 459 pages; Softcover; ISBN 0-8218-0400-6; List \$44; All AMS members \$35; Order code PCMS/1IAMP

**Mathematical Scattering Theory: General Theory**

D. R. Yafaev, *Université Rennes 1, Rennes Cedex, France*

A book one can learn from.

—The Bulletin of Mathematics Books

Fills a gap in the literature ... explanations and descriptions are clear and understandable for readers who are familiar with the framework and fundamentals of the scattering theory ... provides a complete view of the time-independent theory excluding the resonance theory.

—Zentralblatt für Mathematik

The volume is well organized and is a fine guide for a serious reader and a good source of information to research workers in the field.

—Bulletin of the AMS

Translations of Mathematical Monographs, Volume 105; 1992; 341 pages; Hardcover; ISBN 0-8218-4558-6; List \$59; All AMS members \$47; Order code MMONO/105IAMP

**Mirror Symmetry II**

B. Greene, *Cornell University, Ithaca, NY*, and S.-T. Yau, *Harvard University, Cambridge, MA*, Editors

Titles in this series are co-published with International Press, Cambridge, MA.

AMS/IP Studies in Advanced Mathematics, Volume 1; 1996; 844 pages; Hardcover; ISBN 0-8218-0634-3; List \$85; Individual member \$51; Order code AMSIP/1IAMP

Recommended Text

**Representations of Finite and Compact Groups**

Barry Simon, *California Institute of Technology, Pasadena*

Contains a very good explanation of representation theory of finite and compact groups and can be recommended to everyone for learning or teaching representation theory.

—Zentralblatt für Mathematik

This is indeed a nice book ... I would recommend it precisely for the graduate course [that] I am teaching now. "Representation Theory" ... I very much like the hands-on approach and the very explicit formulae that are given ... Professor Simon has done an excellent job on this beautiful material.

—Tudor Ratiu, *University of California, Santa Cruz*

Can be recommended as a base for courses about representations of finite groups and finite-dimensional representations of Lie groups.

—Mathematical Reviews

Graduate Studies in Mathematics, Volume 10; 1996; 266 pages; Hardcover; ISBN 0-8218-0453-7; List \$34; All AMS members \$27; Order code GSM/10IAMP

**Selected Papers of Freeman Dyson with Commentary**

Freeman Dyson, *Institute for Advanced Study, Princeton, NJ*

All papers are carefully reproduced. The value of the book is greatly enhanced by author's commentary on each selected paper.

—Zentralblatt für Mathematik

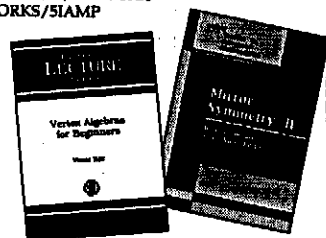
Wide in subject matter, contains many deep, often classic, results, and is written in an impeccable style ... has a wealth of topics ... Dyson's versatility, mathematical strength and depth are well known and his comments and sometimes provocative opinions are thought-inspiring and a pleasure to read. I cannot do better than recommending this volume by repeating the old saying: Study the masters!

—Aernout C. D. van Enter, *Mathematical Reviews*

The writings of Freeman Dyson are among the jewels that crown the subject [of theoretical physics] and today even the earliest among them can be read with profit and much pleasure by beginners and experts.

—from the Foreword by Elliott Lieb

Collected Works, Volume 5; 1996; 601 pages; Hardcover; ISBN 0-8218-0561-4; List \$59; All AMS members \$47; Order code CWORKS/5IAMP



All prices subject to change. Charges for delivery are \$3.00 per order. For optional air delivery outside of the continental U. S., please include \$6.50 per item. Prepayment required. Order from: American Mathematical Society, P. O. Box 5904, Boston, MA 02206-5904, USA. For credit card orders, fax (401) 455-4046 or call toll free 800-321-4AMS (4267) in the U. S. and Canada, (401) 455-4000 worldwide. Or place your order through the AMS bookstore at <http://www.ams.org/bookstore/>. Residents of Canada, please include 7% GST.

**Selected Papers of Walter E. Thirring with Commentaries**

Walter E. Thirring, *University of Vienna, Austria*

With the huge success of the quantum theory, starting especially with the Schrödinger equation in 1926, came a feeling among the leading physicists that mathematics should keep in the background or, as one person put it, "elegance is for tailors". From the other side, mid-twentieth century mathematicians were not much more hospitable about intrusions of physics, as we can see, for instance, in Hardy's well known little essay. Walter was one of the first, in the post-war years, to try to put things back together.

—from the Foreword by Elliott Lieb

Collected Works, Volume 8; 1997; 729 pages; Hardcover; ISBN 0-8218-0812-5; List \$135; Individual member \$81; Order code CWORKS/8IAMP

**Variations on a Theme by Kepler**

Victor Guillemin, *Massachusetts Institute of Technology, Cambridge*, and Shlomo Sternberg, *Harvard University, Cambridge, MA*

The brilliant style and clarity of the exposition makes this book interesting for a large part of the mathematical and physical community.

—Mathematical Reviews

Colloquium Publications, Volume 42; 1990; 88 pages; Hardcover; ISBN 0-8218-1042-1; List \$19; All AMS members \$16; Order code COLL/42IAMP

Independent Study

**Vertex Algebras for Beginners**

Victor Kac, *Massachusetts Institute of Technology, Cambridge*

Very good introductory book on vertex algebras.

—Zentralblatt für Mathematik

University Lecture Series, Volume 10; 1997; 141 pages; Softcover; ISBN 0-8218-0643-2; List \$25; All AMS members \$20; Order code ULECT/10IAMP

