

International Association of Mathematical Physics



News Bulletin

October 2009



International Association of Mathematical Physics News Bulletin, October 2009

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<http://www.iamp.org>

Cover photo: The Prague Castle Cathedral, the site of the ICMP09 organ concert.

A new page in the IAMP-Bulletin life

by PAVEL EXNER (IAMP President)

The IAMP News Bulletin is almost as old as the Association itself. Establishing a means of spreading fresh information about mathematical physics was one of the first things the newborn organization did.

The Bulletin format changed in the course of time. At first it was a few mimeographed A4 pages produced by an IAMP officer and sent to the members by mail – I acknowledge that our younger members may associate this technique with something like the late Middle Ages. Later it morphed into A5 booklets, better readable but still distributed in the time-honoured postillion way. They were sometimes thick enough because they contained a lot of scientific information, in particular, they provided an equivalent of todays preprint-archive-type services.

Change came in the nineties with the advent of the Web. To be honest, the IAMP reaction did not react very fast, and only after the Brisbane congress we switched to the electronic form of the bulletin, and it took several years before its format and periodicity was established. Now our members find every three months a Bulletin issue with a news summary. Its form changes with the Association secretaries who prepare it but the contents are standard: new members, forthcoming conferences, open position announcements, etc.

While electronization made it possible to spread the bulletin faster and cheaper, it also reduced significantly its importance in comparison with the information-hungry seventies. The lists of new preprints which allowed you to send a request card with the hope to find a copy in your mailbox in a few weeks were replaced by electronic preprint archives. Also, conference announcements and job postings are nowadays reduced mostly to a URL of the page where you can find detailed information. All in all, there is much less to read in our News Bulletin today.

The present Executive Committee decided that we should attempt to change the situation and make the Bulletin more interesting again, and this issue is the first step on this way. Such a thing cannot be done in the traditional way, so we decided we need a Bulletin editor and a small team around him or her. The EC has appointed Valentin Zagrebnov to the job and we wish him every success in this undertaking.

Jan Philip Solovej, the IAMP secretary, is an ex officio member of the editorial team, and his role will be to supply all the information mentioned above. In addition to that, we envision that the Bulletin will bring news about our community life and worries, reports of interesting achievements and conferences, interviews, news from our associate members, and more.

The Bulletin overhaul is experimental in nature, of course, and I ask you not to judge its start too harshly. Above all, the News Bulletin is our common mean of communication and it will be your feedback and initiative which will decide whether this project will succeed.

After the Prague meeting

by PAVEL EXNER (IAMP President)



The life of the IAMP has natural cycles with the culminating points being the congresses every three years. One of them ended recently and it is useful to look back at it.

I am not going to say much about the Prague congress generally. First of all, as the one responsible for its organization I am the last person to judge whether it was successful. Secondly, many of the readers attended the meeting and could form their own opinions, and those who did not can find a lot of information at the congress page, <http://www.icmp09.com> - we will take care that the page will remain active for a long time.

In a brief summary, the congress was well attended. Against all the odds resulting from the economic crisis it attracted more than six hundred participants which made it the third largest in history, after Paris and London. In six days, the programme included sixteen plenary lectures, and about 70 invited and 60 contributed talks, practically all well attended. In addition, there were some 180 posters which meant that a majority took active part in the programme.

The ICMP opening gave an opportunity to distinguish extraordinary achievements in mathematical physics. The Henri Poincaré Prize, sponsored by the Daniel Iagolnitzer Foundation, was awarded to Juerg Fröhlich, Robert Seiringer, Yakov Sinai, and Cédric Villani. For the first time the recently established IAMP Early Career Award was presented: it went to Mihalis Dafermos.

The congress was traditionally preceded by the two-day Young Researcher Symposium with another six plenary and more than twenty seminar talks. It was also an occasion at which the IUPAP Young Scientist Prizes in mathematical physics were awarded; they were given to Rupert Frank, Benjamin Schlein and Simone Warzel.

We congratulate all the laureates! It is particularly encouraging to see appreciation of the work of numerous young colleagues - it gives you hope about the future of our field.

The topic I want to address primarily is the IAMP matters related to the congress. The first thing to observe is that it was attended mostly by non-members. The number of those who had paid the IAMP member fee was slightly over one hundred. True, some registered as non-members being in arrears and then brought themselves to good standing but the amount of those was not significant. Also among the invited speakers non-members dominated. We invited all of them to join and some accepted the invitation but by far not everybody. It is a clear message for us that we have to seek ways of how to raise interest for the Association.

The congress is also traditionally the one opportunity in three years to call the General Assembly. In Prague it met on Monday August 3 in the evening and from what I wrote above you have a clear idea how it was attended; it was nevertheless encouraging to see that a lively discussion took place.

A standard point of the agenda were officer reports. In mine I could recapitulate what the Executive Committee was doing concerning conference support and other traditional activities, listed a few other items which could and should be added to our agenda, and called for more member initiative. It is again encouraging that there was a positive response which I hope will help us, for instance, to improve the IAMP presentation on the web.

The treasurer report summarized the message which went out recently to all the Association members. The IAMP is a notoriously cheap organization with very modest membership dues. If we want to do the work our members expect from us, in the first place to support mathematical physics conferences, it is necessary that the dues are indeed paid. Since some of us neglected this obligation for a long time, the Executive Committee decided to declare a partial amnesty: it is enough to pay two years before the end of December 2009 to regain the good standing status. After this deadline the Statutes article will be applied which foresees a membership termination because of non-payment of the dues. Measures will be also taken to reform the reduced dues status and to make the lifetime membership more attractive for younger colleagues.

Another standard point of the General Assembly agenda is the choice of the next congress site. This year the Executive Committee received three bids. One of them, from Singapore, was not very rich in details and nobody came to defend it, so it finally did not attract substantial support. The other two, from Aalborg and Yerevan, were well worked out and presented, and the competition between them was serious. I use this opportunity to thank Arne Jensen and Horia Cornean who presented the Aalborg bid, and to George Pogosyan who did the same for Yerevan. They entered a tough competition and each of them did their best for his cause.

Of course, finally only one could win. After an animated discussion the General Assembly in an informal vote gave priority to Aalborg, roughly in a three to two proportion, and the Executive Committee weighed again all the available information and made the same decision. We all wish Arne and Horia success and we are looking forward to the next congress in August 2012.



From the right to the left: Jürg Fröhlich, Robert Seiringer, Yakov G. Sinai, Cédric Villani (2009 Poincaré prize laureates), Mihalis Dafermos (IAMP Early Carrier Award) and Pavel Exner

An interview with a 2009 Poincaré prize laureate – Ya. G. Sinai

Professor Yakov G. Sinai was awarded at the recently concluded ICMP in Prague the Henri Poincaré prize sponsored by the Daniel Iagolnitzer Foundation. The official citation says he received it for his ground-breaking works on dynamical entropy, ergodic theory, chaotic dynamical systems, microscopic theory of phase transitions, and the time evolution in statistical mechanics.

At this occasion the IAMP News Bulletin asked him for a small interview.

***Bulletin:** You were awarded the Poincaré prize. How do you appreciate it? Noticing that the prize this year became “younger”, is it in your opinion worthwhile to give more room to young people?*

Sinai: I appreciated the Poincaré prize much even before I received it. The Daniel Iagolnitzer foundation is doing a lot for our field by supporting these prizes. The sculpture by Reinhard Fescharek which was given together with the prize was also remarkable; it shows in a very nice way some of Poincaré’s discoveries. Concerning the second half of your question, I think that the procedure of awarding the prize could be possibly more ordered. In my opinion, there should be a rule that the prize is given to at most two people for their life-long achievements and one prize might be given for a brilliant striking result without any restriction on age. I also would not be against it if someone receives the Poincaré prize several times.

***Bulletin:** How do you see the development of relations between mathematics and physics?*

Sinai: I believe that mathematicians working on problems of physics should remain mathematicians as well as physicists should remain physicists. According to my personal taste mathematicians should not prove theorems justifying the results obtained by physicists, but should work on mathematical problems, which could be interesting for physicists. I had a remarkable experience in the Landau Institute, where mathematicians had a lot of possibilities to interact with physicists and this was useful for both sides. Mathematicians there never competed with physicists but enjoyed very fruitful discussions with them. For this reason, I firmly believe that inviting physicists to our congresses is absolutely necessary.

***Bulletin:** How do you evaluate the recently concluded congress, what did you like, and on the other hand, what are the changes which should be made in the next congress?*

Sinai: This congress was superb, its organization was remarkable and we all should be thankful to Pavel Exner for his excellent work. Concerning future-oriented remarks I believe that there should be more advertisements of important results, with the suggestions that some talks can be presented in more details.

***Bulletin:** Do you consider yourself a mathematician or a mathematical physicist?*

Sinai: Certainly, I consider myself a mathematician working on problems of mathematical physics. Some time ago I gave a talk on a seminar for physicists and there I said that for me theoretical physics is the same as for them is experimental physics.

Bulletin: *What do you think about the thorny remark sometimes heard that mathematical physicists are below the level of mathematics, and since they do not understand physics either they pollute it with numerous useless theorems?*

Sinai: In my opinion, the notions of a “mathematical physicist” or a “physical mathematician” does not exist. There is the field of mathematical physics and there are mathematicians and physicists working on problems of this field. This field is mainly the collection of topics covered by our congresses.

Bulletin: *Mathematicians usually do not become physicists; most frequently they get stuck at the level of mathematical physics. On the other hand, physicists often become mathematical physicists and even mathematicians. How do you explain this phenomenon? What is your personal experience?*

Sinai: I am not sure I understand fully your question. In my opinion, both mathematicians and physicists should do what they like to do. However, as soon as the problem is clearly formulated each of them should devote to it hundred percent of effort and time, if not more. The most difficult question is when to stop, if the problem proves to be too difficult. This is an occasion when advice from senior colleagues is needed.

The interview was taken by
Valentin Zagrebnoy (Marseille, France)



Yakov G. Sinai (Princeton/Moscow)

Satellite-Aalborg

by HORIA CORNEAN (Aalborg, Denmark)



The ICMP satellite *Mathematical aspects of quantum transport and applications in nanophysics* took place in Aalborg, Denmark, in the period August 10–13, 2009. Nowadays it is no longer possible to precisely determine the nature of a conference just by reading the words *mathematical physics* in its title. These two words mean very different things to different people.

So it is not useless to say that all the participants in our meeting work in “mathematical quantum mechanics”, which roughly can be defined as a mixture of PDEs and functional analysis with (non)relativistic quantum (statistical) mechanics, to which we add some operator and spectral theory for self-adjoint operators.

Since the other keywords in the title were quantum transport, the meeting was also intended to be a natural continuation of a series of somehow smaller yearly workshops initiated in 2004, which have created strong ties between five European centres: Aalborg, Berlin, Bucharest, Dublin and Marseille.

The main idea behind these meetings has always been the same: to invite theoretical and experimental physicists to talk and interact with an equal number of mathematicians. It is clear that at least the mathematical results can only be better if we achieve a first hand understanding of how “the other side” thinks and works. Of course that this is not at all a new idea in our community, but we tried to go a step further: to intercalate physically oriented talks with more mathematical ones, ideally grouped in themes dealing with the same subject but seen from different perspectives.

The current A-B-B-D-M pentagon started in 2005 as the triangle Aalborg-Bucharest-Marseille. During the very first meetings, topics were rather theoretical and restricted to the understanding of the connection between different ways of constructing non-equilibrium steady states. With the addition of Berlin and Dublin, the applied component gained in importance. We now cover topics ranging from physical aspects of quantum communication, to spectral theory of interacting Fermi particles and applications to optical response in solid state physics, quantum modeling of (light emitting) diodes, and enhanced excitonic effects at nanoscale.

Getting back to the conference in Aalborg, we mention that we had 22 talks, all plenary, which covered five main themes. Let us say a few words about each of them:

1. *Modeling of semiconductor devices.* This topic is by now one of our main interests. Two talks dealt with both classical and quantum models of diodes, also from a numerical point of view. A third talk was about graphene and its peculiar optical properties, and two other talks were concerned with non-equilibrium steady states in the so-called partition free approach.

2. *Spectral analysis with applications in nanophysics.* This topic has not been treated as independent during the previous editions. But it is clear by now that spectral analysis has a decisive role to play in quantum transport, especially in continuous models. Identifying the subspace corresponding to the point spectrum is an important ingredient in any proof of existence of steady states, and all the talks covered this issue.
3. *Quantum transport in disordered systems.* This topic has not been previously addressed in the other meetings. There were presented results on level spacing, Wegner and Minami estimates for continuum Anderson Hamiltonians (among other models).
4. *Transport in open quantum systems.* Another main topic of all previous meetings. One talk was about the connection between Renyi's relative entropy to the Tomita-Takesaki modular theory, while two others covered several aspects of quantization of charge transport, and different models of diffusion. The last talk gave an interpretation of quantum memories as open systems.
5. *Interplay between theory and experiment.* Here we heard two interesting reviews on some actual problems in the statistical approach to quantum information, while a third talk discussed the connection between Painlevé transcendents and quantum transport.

The session organizers were G. Nenciu (Bucharest), V. Zagrebnov, P. Duclos, C.-A. Pillet (Marseille), P. Exner (Prague), F. Germinet (Cergy-Pontoise), J. Dereziński (Warsaw), and Y. Avron (Haifa).

Concerning financial support, we managed to cover the local expenses for all our invited speakers and session organizers, and provided support for a small number of students. Our sponsors were:

1. The Danish Natural Science Research Council (FNU) through the grant *Mathematical Physics* coordinated by A. Jensen (Aalborg),
2. The French Embassy in Denmark,
3. The International Association of Mathematical Physics (IAMP),
4. Center for Teleinfrastruktur (CTIF), Aalborg University,
5. The Department of Mathematical Sciences, Aalborg University.

And finally, the local organizing committee consisted of Horia Cornean and Arne Jensen (Aalborg University). For many more technical details about the meeting and its history, you may access the website

http://people.math.aau.dk/~cornean/ICMP09_satellite/.

Satellite-Göttingen: Algebraic Quantum Field Theory – The First 50 Years

by DETLEV BUCHHOLZ (Göttingen, Germany)



Fifty years ago the seminal paper “Discussion des axiomes et des propriétés asymptotiques d’une théorie des champs locale avec particules composées”, written by Rudolf Haag in Göttingen, triggered the algebraic approach to quantum field theory which is complementary to the Lagrangean approach and one of the pillars of mathematical physics. Within the past five decades, a wealth of deep results has been accumulated in this setting and recent developments have opened new and promising perspectives towards the rigorous theoretical treatment and understanding of relativistic quantum systems.

This 50th anniversary gave reason for providing an overview of past accomplishments and of the many modern facets of the subject during a three day conference in Göttingen held from 29th - 31st July 2009. The event was organized by members of

the Courant Research Center “Higher Order Structures in Mathematics” and the Institute for Theoretical Physics of the Georg-August-Universität Göttingen. It was approved as a satellite meeting of the 16th ICMP in Prague by the executive committee of IAMP. More than 130 participants, including many junior scientists, gave evidence for the great interest in the subject of this conference.

The first day of the conference was devoted to reviews of major accomplishments of algebraic quantum field theory. Rudolf Haag, the father of the subject, shared in his talk with the audience his reminiscences of the beginnings of this approach, its successes, but also of some missed opportunities. He was followed by Klaus Fredenhagen, who featured in his talk the impact of the algebraic approach on perturbative quantum field theory, in particular on the perturbative construction of algebras of observables in a generally covariant setting. Sergio Doplicher then expounded on the fundamental role of the notion of locality in the development of the subject, emphasizing the need for a meaningful substitute of locality in theories on non-commutative spacetimes. The status of the structural analysis of quantum fields within the scope of the Borchers-Uhlmann algebra was reviewed by Jakob Yngvason who also explained recent ideas of deforming this algebra in order to describe interaction. In the last talk of the day, John E. Roberts explained the usage of cohomological methods in quantum field theory which, in the course of the years, have turned into the preferred tool for tackling problems in superselection theory.

The talks of the second day were devoted to the impact of developments in mathematics on the subject, in particular in the theory of operator algebras. Roberto Longo gave in his talk a survey of applications of modular (Tomita-Takesaki) theory to the structural analysis of nets of local algebras and their classification. David Evans then took conformal field theory as an example to present recent progress in the understanding of the

relation between subfactors and K-theory. A new approach to the discussion of the short distance structure in quantum field theory was presented by Daniele Guido, using a quantum version of Gromov–Hausdorff limits. Elements of Rieffel’s deformation procedure for C^* -algebras played a central role in the subsequent talk by Gandalf Lechner on a novel algebraic approach to the construction of nets of operator algebras describing interaction. Finally, Stephen J. Summers emphasized in his talk the significance of modular theory for the identification of the vacuum state in quantum field theory, the reconstruction of spacetime symmetries and of the dynamics.

The last day of the conference was devoted to quantum field theory on curved spacetime, a subject which currently takes center stage. Robert M. Wald presented in his talk an axiomatic setting for these theories, expressly stating the need for an algebraic (state independent) approach. Rainer Verch thereafter gave a comprehensive review of conceptual and constructive developments in this field, featuring the fundamental role of quantum energy inequalities and the concept of local general covariance. A new perturbative approach to quantum field theory based on an axiomatic setting for operator product expansions and vertex algebras was proposed by Stefan Hollands. Chris J. Fewster then presented a thorough discussion of physical implications of the principle of local general covariance, highlighting his recent observation that this principle does not necessarily enforce the same physics in all spacetimes. A fresh look at the off shell dynamics and Poisson structure of interacting classical field theories was taken by Romeo Brunetti within an algebraic setting. The conference concluded with a talk by Valter Moretti who expounded on various aspects of quantum field theories on spacetimes with lightlike boundaries, including a discussion of the longstanding problem of the geometrical significance of the modular groups for double cone algebras in massive free field theory.

Many other leading experts participated in this conference and contributed as chairmen and in discussions to its success. A list of participants, the program and slides of most talks may be found at <http://www.uni-math.gwdg.de/aqft/>.

ICMP 2012, August 6-11, Aalborg, Denmark

by ARNE JENSEN (Aalborg, Denmark)



During the recently concluded International Congress on Mathematical Physics 2009 in Prague, Czech Republic, the executive committee of the IAMP decided that the next congress (ICMP12) will take place in Aalborg, Denmark, August 6–11, 2012. The proposal was submitted by Horia Cornean and Arne Jensen, Aalborg University. Arne Jensen was appointed as the next congress convener.

The Venue

The congress will take place in Aalborg, Denmark. Aalborg is the fourth largest city in Denmark, with 125,000 inhabitants. Aalborg can be reached by frequent flights from Copenhagen. The flying time is 45 minutes. The airport is located close to the city centre, about 15 minutes by taxi to major hotels.

The venue is Aalborg Congress and Culture Centre. This is the second largest congress facility in Denmark. A view of the facilities is shown in Figure 1. The main lecture hall will be the one called the Europe Hall, with a seating capacity of approximately 600 persons (can be increased using two balconies). We plan to have topical sessions in four parallel sessions. One session will take place in the Europe Hall, and the remaining sessions in halls with a seating capacity of 160–240. A number of meeting rooms, facilities for poster sessions, etc. have also been reserved.

Inside the Congress Centre is a restaurant, where a buffet lunch will be available. We will use a prepaid ticket system. There are also restaurants located within 15 minutes walk from the Congress Centre, where one can get lunch.

Accommodation is available at a number of hotels, all within walking distance from the Congress Centre. The organizers will negotiate conference rates with some of the hotels.

The location of the Congress Centre is shown in Figure 2, together with the location of some of the hotels.

Organization

A Local Organizing Committee is being formed. The Scientific Committee will be formed by the IAMP executive committee during the second half of 2010, and then the scientific program will be announced.

The topical sessions will be selected, based on proposals from our community. Calls and deadlines will be announced later.

Further Information

The website of the Congress will be

www.icmp12.com

It will be operational Spring 2010, and will be continuously updated, as the planning progresses.

Information on the city of Aalborg can be found at

www.visitaalborg.dk

Arne Jensen

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General IAMP Assembly, Prague 2009

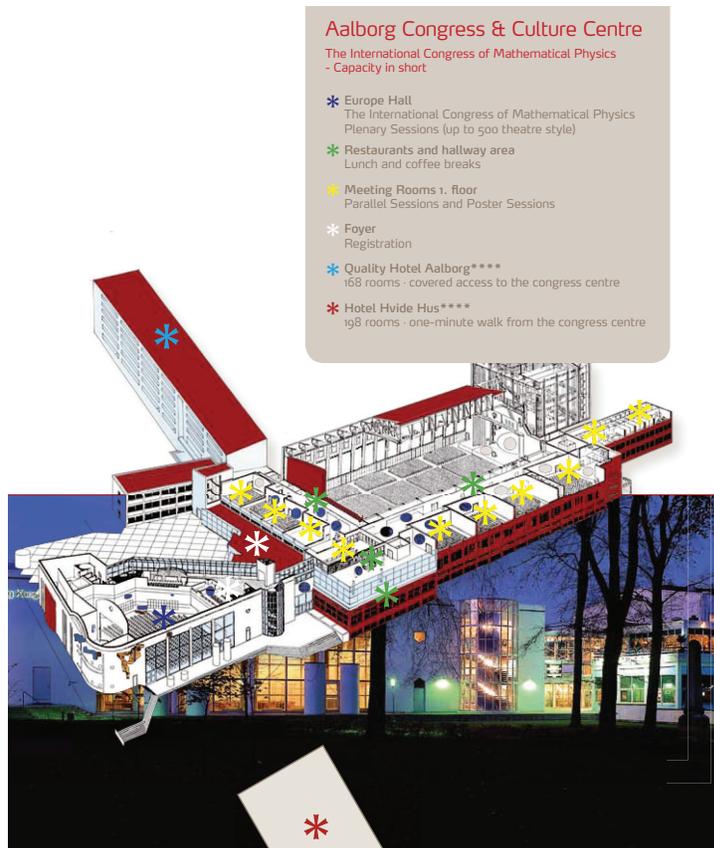


Figure 1: Overview of the Aalborg Congress and Culture Centre.

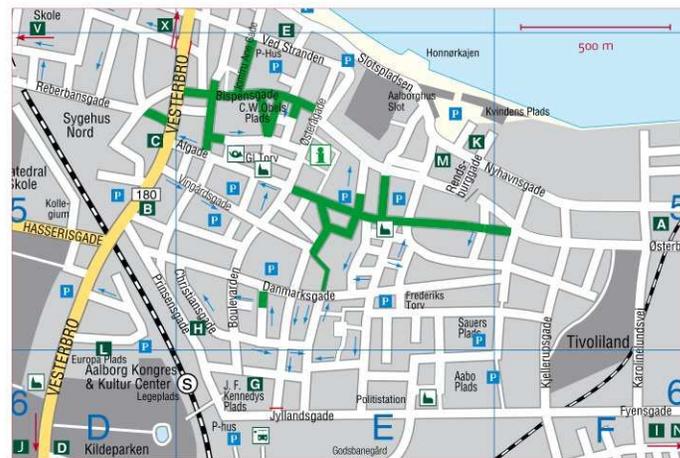


Figure 2: Map showing location of Congress centre (marked L) and some hotels (marked by capital letters A, B, C, etc).

New IAMP members

1. **Walter H. Aschbacher**, Zentrum Mathematik, Technische Universität, München, Germany
2. **Jan Derezinski**, Department of Mathematical Methods in Physics, Faculty of Physics, University of Warsaw, Poland
3. **Florica Ioana Dragomirescu**, Department of Mathematics, University “Politehnica” of Timisoara, Timisoara, Romania
4. **Eman Hamza**, Physics Department, Cairo University, Cairo, Egypt
5. **Agapitos Hatzinikitas**, Mathematics Department, Aegean University, Samos, Greece
6. **Elena Kartashova**, RISC Department, J. Kepler University Linz, Linz, Austria
7. **Maxim Kontsevich**, Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France
8. **George Pogosyan**, Physics Department, Yerevan State University, Yerevan, Armenia
9. **Lea Santos**, Physics Department, Yeshiva University, New York, USA
10. **Stanislav Smirnov**, Section de Mathématiques, Université de Genève, Geneva, Switzerland
11. **Jerzy Jacek Wojtkiewicz**, Department of Mathematical Methods in Physics, Faculty of Physics, University of Warsaw, Poland

Conferences

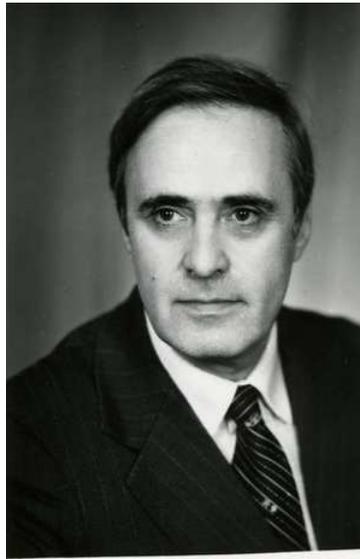
<http://www.iamp.org/conferences.html>

Positions

<http://www.iamp.org/positions.html>

Jan Philip Solovej (IAMP Secretary)

Mikhail Shlyomovich Birman



On July 2, 2009, Professor Mikhail Birman, the renowned specialist in Theory of Operators in Hilbert Spaces and Spectral Theory of Differential Operators, passed away after a long and serious illness.

M. Birman was born in Leningrad on January 17, 1928. He finished high school in 1944 and entered the Leningrad Electrotechnical Institute. However already during the first year of his study, his professor of Mathematics noticed Birman's exceptional talent and recommended him to transfer to the Department of Mathematics and Mechanics of the Leningrad State University. M. Birman followed this advice and successfully graduated from the Leningrad University in 1950. Although he was an exceptionally bright student, he was not admitted to the graduate school because of the anti-Semitic climate in the USSR at that time. Nevertheless this did not prevent him from starting his own independent scientific work. Already as a university student he took a part time job in the research team led by Prof. L.V. Kantorovich. This might explain why his first publications were concerned with some aspects of Numerical Analysis. In the middle of the 50's, M. Birman was influenced by works of M.G. Krein, and began his research on the Theory of Operators in Hilbert Spaces, which eventually became one of his main scientific interests.

Between 1950 and 1956 M. Birman worked as an Assistant Professor at the Leningrad Mining Institute. After 1956 he was employed by the Physics Department of the Leningrad State University, first as an Associate Professor and then as a Full Professor. He retained this position until the end of his life.

The scientific school created by M. Birman received world-wide recognition. Below is a far from complete list of topics to which M. Birman's contributions in Mathematics and Mathematical Physics were especially important and in many cases, decisive for their further development:

- Extension theory of symmetric operators.
- Spectral theory of singular boundary value problems. In this context the famous Birman-Schwinger principle was formulated for the first time.
- Scattering theory, where M. Birman created the stationary approach. Among his results is the statement which is now known as Birman-Kato Invariance Principle.
- Theory of the Spectral Shift function for unitary operators developed jointly with M.G. Krein. (It is worth mentioning that the most important papers related to the last three areas, appeared within the three years 1961-1963.)
- Theory of Double Operator Integrals and its applications to Perturbation Theory.
- Piecewise polynomial approximation of functions from Sobolev spaces, with applications to the epsilon-entropy of Sobolev embeddings, and to spectral estimates and asymptotics for elliptic operators with non-smooth coefficients.
- Theory of the Maxwell operator in non-smooth domains.
- Spectral theory of periodic differential operators, including the problem of absolute continuity, and a new operator approach to the homogenization theory.

Professor M. Birman continued his work until the very last days of his life. His impact on Mathematics and Mathematical Physics has inspired and continues to inspire many scientists who will always keep M. Birman's name in their hearts.

V. Buslaev
A. Laptev
A. Sobolev
M. Solomyak
T. Suslina
D. Yafaev

Israel Moiseevich Gelfand



Israel (Israïl) Moiseevich Gelfand (2 September 1913 – 5 October 2009) was a Soviet-Russian mathematician who made major contributions to many branches of mathematics, including group theory, representation theory, and linear algebra. The recipient of numerous awards and honors, including the Order of Lenin and the Wolf Prize, he was a Fellow of the Royal Society and a lifelong academic, serving decades as a professor at Moscow State University and, in his late seventies, after immigrating to the United States, at the Busch Campus of New Jersey's Rutgers University.

A native of Southern Ukraine, Israïl Moiseevich Gelfand was born into a Jewish family in the small town of Okny (subsequently, Krasniye Okny) in the Kherson Oblast, then a part of Tsarist Russia. His level of academic achievement was of such a high degree that he was able to bypass high school and college and proceed to postgraduate study at Moscow State University, where his advisor was the preeminent mathematician Andrei Kolmogorov.

Gelfand was awarded the Order of Lenin three times for his research. In 1977 he was elected a Foreign Member of the Royal Society. He won the Wolf Prize in 1978, the Kyoto Prize in 1989 and a MacArthur Foundation Fellowship in 1994. He held the presidency of the Moscow Mathematical Society between 1968 and 1970, and was elected a foreign member of the U.S. National Academy of Science, the American Academy of Arts and Sciences, the Royal Irish Academy, the American Mathematical Society and the London Mathematical Society. He also worked as a Chief Science Officer of Scientific Research Institute of System Development (NIISI RAN) founded by the Presidium of the USSR Academy of Sciences in 1986. He held several honorary degrees.

The editors