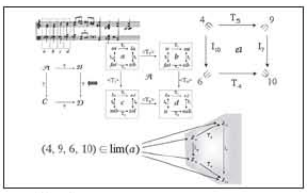
NEWSLETTER

OF THE EUROPEAN MATHEMATICAL SOCIETY



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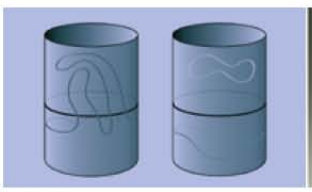

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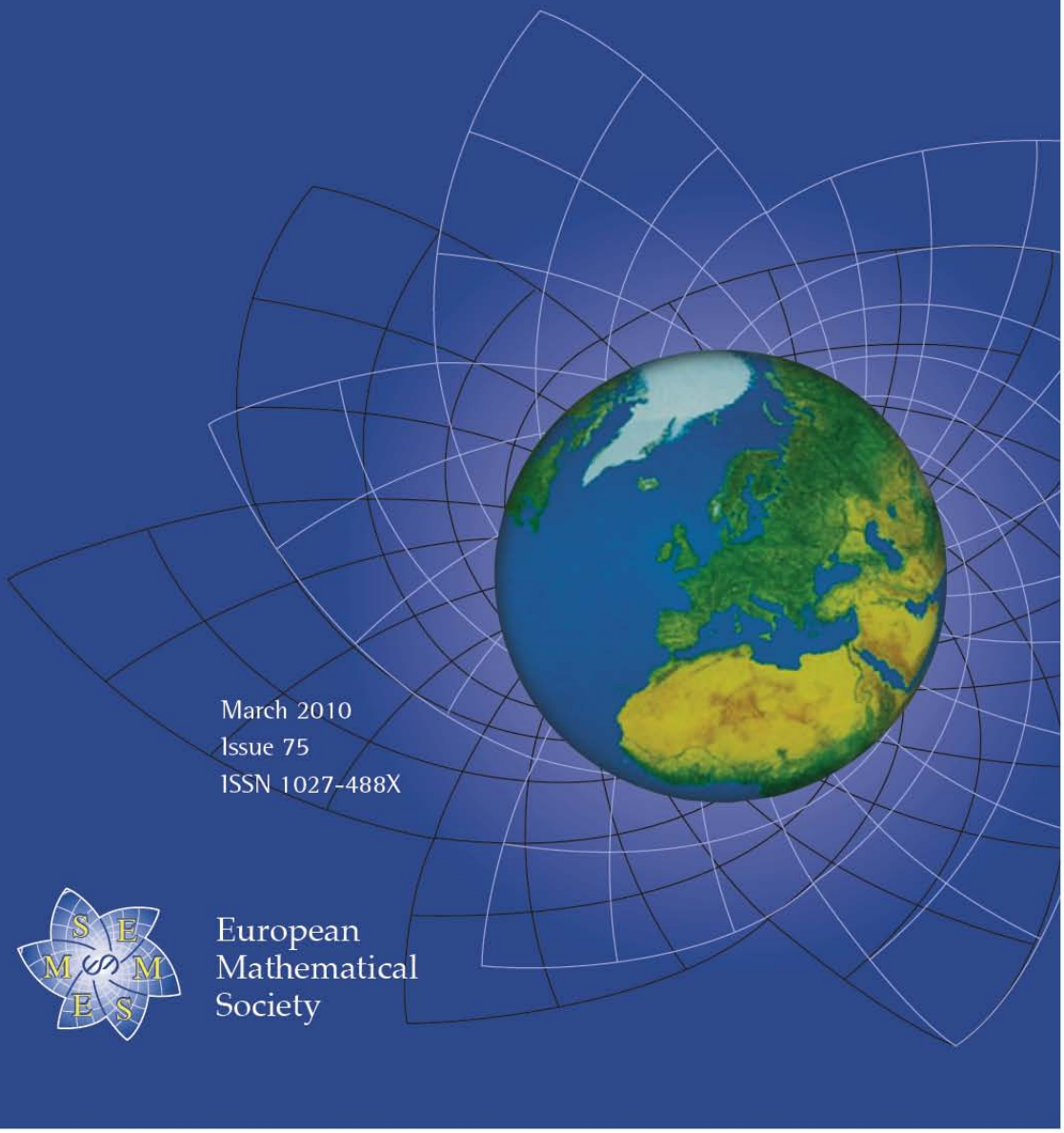

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The Independent University of Moscow

Yu. S. Ilyashenko and A. B. Sossinsky

Walking along Bolshoi Vlasevsky, a small by-street in the historic centre of Moscow, you will probably notice a new four-storey house, partially hidden by the trees of a tiny square that separates it from the street, a house that looks rather like the office building of some successful financial centre. But its appearance is deceptive; it actually houses the Independent University of Moscow (IUM).

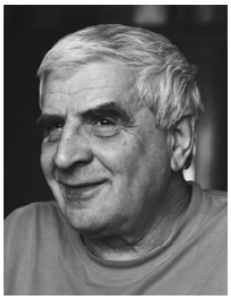
Many Western mathematicians have heard of this university and know that it plays an important role in Russian mathematics and that it has a rather high international reputation. There is lot of talk about the IUM and a great deal has been written about it but very few people can explain what this institution actually is and how it functions. And no wonder; the IUM is extremely unusual, it resembles no other place where mathematics is taught and it has no prototype or clone.

In this article, we shall try to give a brief and balanced account of what the IUM is really like, covering its achievements and its problems.

How it all began

In 1991, perestroika was well underway. For most Russian mathematicians, and many other people, it was a first glimpse of freedom, a time of hopes and hesitation. Should one look for a position abroad? Should one give up mathematics and go into business? Should one try to survive in the new environment, in which salaries of university professors were less than one fifth of the subsistence wage? Or should one passively observe the Russian mathematical school deteriorating as the result of the brain drain?

There was one person, however, who did not hesitate – Nikolay Konstantinov, the influential teacher and organizer of various unofficial mathematics-oriented structures (at one time branded "anti-Soviet" by the communist bureaucracy), e.g. mathematics circles, specialized schools and classes, olympiads and other competitions, and summer institutes[1]. Konstantinov's priority was to revive or create a university capable of teaching mathematics at the level of *mekhmat* (the Mechanics and Mathematics Department of Moscow State University) during the "Golden Years of Soviet Mathematics", described in the book of that title published by the AMS in 2006.



Nikolay Konstantinov – Founder of the IUM

In July 1991, Konstantinov invited the leading Russian mathematicians to Moscow to a classroom in the famous School #57 for a discussion about what should be done about university mathematics education. Practically all of them came: V. I. Arnold, A. A. Beilinson,† R. L. Dobrushin, B. A. Dubrovin, L. D. Faddeev, A. G. Khovansky, A. A. Kirillov, S. P. Novikov, A. N. Rudakov, M. A. Shubin, Ya. G. Sinai and V. M. Tikhomirov.

A. B. Sossinsky was also there, witnessing a heated and fascinating discussion that, unexpectedly, ended in a consensus. It was agreed that *mekhmat* was beyond repair. Indeed, in the 1980s, almost all the best students (most of whom chose either Arnold, Gelfand, Kirillov, Manin, Novikov or Sinai as their research advisor) were not given positions at MSU by the communist administration after obtaining their PhDs. That, together with the brain drain, the disappearance from the research scene of the great mathematicians of the previous generation and the inept and reactionary administration, led to a degradation of the scientific and educational level of the department. On the other hand, a large team of the best alumni of *mekhmat* (who were not involved in the academic world) were full of energy and ready to teach. So, it was further agreed that the only solution was to create a new elite university, a kind of École Normale Supérieure rue d'Ulm in a Russian style, which was not dependent upon the official educational authorities but was a university whose mathematical department would provide a high level research-oriented curriculum for the very best students.

Thus the Independent University of Moscow was born; in September 1991, classes opened in a school near MSU, on the sheer enthusiasm of its founders, without any source of support.

We shall return to our account of the 18 year history of the IUM below.

What the IUM is today

The IUM is not really a university; it is a small elite school training future research mathematicians. Varying in time, there are from 40 to 50 undergraduates[2] and from 10 to 15 graduate students. There are no tuition fees; in fact, the IUM pays all its official students a small stipend. Dur-

[1] To give an idea of the atmosphere of such gatherings, let us quote one of Konstantinov's followers (A. Leman), who taught a class in one of the mathematical schools in Moscow. Answering a question about the mathematical level that his students achieve, he said: "We don't teach people to be mathematicians – we teach them to be free".

[2] Actually, the number of freshman students in the middle of the autumn semester reaches 100 but they are free listeners and only 20–30 of them survive the first examination session and become official students.

ing each academic year, 40–60 different mathematicians[3] give courses at the IUM. Classes take place in the evenings as most students are simultaneously matriculated at other institutions (mostly at *mekhmat* MSU). On average, only 4–5 students finish the 5-year course of study[4] each year at the IUM.

Despite its small size, the IUM is one of the most active mathematical centres of Russia. Here are its main regular activities.

The Globus seminar

This is a general seminar covering all of mathematics and is meant to be accessible not just to experts in the topic under discussion. The talks are like colloquium talks in the US, except that they last two academic hours rather than one. As in the case of the Bourbaki seminar, the proceedings of the Globus seminar are regularly published.

The Math in Moscow program

This is a program mainly aimed at North American students, who come to Moscow to study mathematics "in the Russian way" (but taught in English) for a semester; they can choose several courses from the large range offered and they are credited for completing them at their home institutions.

Contests supporting young mathematicians

The IUM conducts several nationwide contests: two Möbius contests (for undergraduates and graduate students), the Deligne and Dynasty contests for young PhD students and the Dobrushin contest, which is especially aimed at the IUM: it sponsors five stipends for undergraduates and a full professorship for a year at the IUM.

The Moscow Mathematical Journal

This is a relatively new international mathematics journal, published in English and distributed by the American Mathematical Society, which now has the highest (by far) citation index among Russian mathematical journals.

Publication of textbooks and monographs

Many of the courses taught at the IUM then appear as textbooks or monographs published and distributed by MCCME[5] publishers. Fifteen of them have been translated into English. Besides textbooks and monographs, the IUM teachers (and our colleagues from the MCCME) have authored some 50 popular science brochures in mathematics and its applications.

The IUM has also been active in creating other mathematical structures, with which it remains in close contact.

The Mathematics Department of the State University – Higher School of Economics (HSE)

Created only last year, this is a department of fundamental mathematics in the framework of an institution of higher learning that, unlike the IUM, bestows a state approved diploma. Most of the teaching staff come from the IUM. This new faculty has already positioned itself as a viable competitor of *mekhmat* and of the Department of Computational Mathematics of MSU.

The Moscow Center of Continuous Mathematical Education

The MCCME was created (just as the IUM) with the initiative of N. Konstantinov. It is a very active independent organization involved in mathematics education in middle and high schools, olympiads and other contests, specialized mathematics schools and classes, teacher training and other related activities. It is now in charge of the building in which the IUM is housed and actually administers the logistics of the IUM (accounts department, office supplies, computer network, cleaning and repairs, etc.).

The Poncelet Laboratory

This is a French-Russian mathematics lab jointly run by the CNRS and the IUM. Besides six French researchers working in Moscow for a year, it hosts a large number of short-term visitors and organizes up to nine small international conferences every year. The present director is M. A. Tsfasman, the first director being A. B. Sossinsky.

There is a lot more to say about both the MCCME and the Poncelet Lab; more information may be found at http://www.mccme.ru/ and http://www.poncelet.ru. Other activities are described in more detail below.

Some more history

The first classes at the IUM were held in September 1991 in the Lyceum of Information Technologies (a ten minute walk away from Moscow University) on weekday afternoons. The lecturers were E. B. Vinberg (algebra), A. A. Kirillov (calculus) and A. B. Sossinsky (geometry). The IUM had no official status and no financial support at all. In fact, in order to cover the lyceum's increased electricity bill and extra hours for the cleaning women, the teaching staff actually used money out of their own pockets – a unique situation, in which professors were not paid for teaching but instead had to pay to be able to do it!

During the first years of the IUM's existence, the technical part of the administration consisted of friends and followers of Konstantinov: M. Vyalyi (organization of studies), V. Imaikin and V. Prasolov (lecture notes and publications) and S. Komarov (finances). The first Rector (i.e. President) of the IUM was the outstanding mathematical physicist and leading research fellow of the Steklov Institute, the late M. K. Polivanov, also known for his collaboration with Solzhenitsyn. He was one of the authors of the collection of papers (illegal in Soviet times) *Iz Pod Glyb* (From Under the Boulders). Solzhenitsyn writes about him in his autobiography.

[3] Most of them hold permanent positions at other institutions and the IUM pays them symbolic honoraria for their courses on a per hour basis.

[4] The MS-level diploma delivered by the IUM does not have "accreditation", i.e. the official seal of approval of the Ministry of Education. Nevertheless, students with the MS-level diploma have been accepted on PhD-track programs at e.g. Harvard and the Steklov Mathematical Institute.

[5] The Moscow Center of Continuous Mathematical Education (see below).

At first the Independent University had two subdivisions: the College of Mathematics and the College of Mathematical Physics. In the latter, the first Dean was the late O. V. Zavialov; he was followed by A. N. Kirillov. Among the most active professors, let us note A. Pogrebkov and V. Pavlov. In the early years, mathematics courses were taught by S. P. Novikov and D. V. Anosov, the classes taking place in the Steklov Institute. However, the College of Mathematical Physics only survived for about ten years. Since 2005, the Steklov Institute has created its own educational centre (headed by V. Pavlov and D. Treschev), which is, in a sense, a continuation of the College of Mathematical Physics but not formally part of the IUM.

The first Dean of the Mathematics College was A. N. Rudakov; after his departure to Norway, he was replaced by Yu. S. Ilyashenko in 1994. In 2000, Ilyashenko was elected President of the IUM, which by then consisted de facto of the mathematics college only[6]. From 1992 to 1996, the mathematics college classes were hosted by the famous specialized School #2, whose principal was then P. V. Khmelinsky.

In 1995, a minor miracle occurred, a miracle without which the IUM would probably not have been able to survive: the Prefect of the Central District of Moscow A. I. Muzykansky, one of the leading political figures of Moscow in the early days of perestroika, convinced the Moscow Major Yu. M. Luzkov to provide the IUM with a building of its own – the one mentioned at the beginning of this article. More precisely, the building was allocated to the newly created Moscow Center of Continuous Mathematical Education[7].

The newly reconstructed MCCME-IUM building

The building was reconstructed and furnished at the city's expense and opened in an official ceremony in the presence of Muzykansky (representing the Mayor), the President of the Russian Academy of Sciences Yu. S. Osipov, the Rector of MSU V. A. Sadovnichi, Academician V. I. Arnold and other personalities.

In the new building, the IUM continued and extended the teaching process to include a graduate school (created thanks to the efforts of Victor Ginzburg and Alexander Beilinson) and progressively widened the spectrum of its other activities (listed above).

Looking back at the history of the IUM, one should not forget the crucial help extended to us by several foreign colleagues. Among them are Michiel Hazewinkel of the Netherlands and H. Samuelson of the US (both of whom contributed math books to our library), Pierre Cartier (who hosted our students in Paris during the ENS-IUM exchanges), Jean-Michel Kantor (who organized the support of the Société Mathématique de France to the IUM), William Faris, who organized for the IUM "Bill Faris emergency Foundation" to give support in case of disaster, William H. Jaco, John Ewing, Sergei Gelfand and Galina Kovaleva (who organized different kinds of support by the American Mathematical Society), Dan Stroock (who headed a corporation for the support of Russian mathematicians in the early 90s), and Jaco Palis, who supported the IUM in his capacity of the President of the IMU, Mr and Ms Clay, founders of the Clay Mathematics Institute (CMI), Arthur Jaffe and James Carlson, former and present Directors of the CMI, who provided long lasting support to the IUM, Felix Browder and Christiane Rousseau, who initiated the stipends of the AMS and the CMS for the American and Canadian participants of the MIM program, and last but not least, Robert MacPherson and Pierre Deligne, whose practical and moral support during all these years was invaluable and whom we regard, together with the mathematicians who decided to create the IUM, as founding fathers of the Independent University.

Our faculty, teaching and research

In the first years of the IUM's existence, classes were conducted by D. V. Anosov, V. I. Arnold, A. A. Kirillov, S. P. Novikov, A. N. Rudakov, V. M. Tikhomirov, E. B. Vinberg and other outstanding lecturers of that generation. At the present time, our lecturers include Victor Vassiliev (Vice-President of the Moscow Mathematical Society, plenary lecturer at the ICM in 1994 and Member of the Russian Academy of Sciences), Boris Feigin (plenary lecturer at the ICM in 1990), Maxim Kazaryan (whose research work in mathematics was declared to be the best in the Russian Academy of Sciences in 2005), Sergei Natanzon (recipient of the Dobrushin fellowship and a leading expert in complex analysis and Teichmüller

Opening ceremony of the MCCME–IUM building: S. Gusein-Zade, N. Konstantinov, A. Khovanski, Yu. Ilyashenko, A. Sossinsky, P.P. Baskevich, V.Arnold.

[6] The original IUM project was to create a real university with several colleges. At different times of its history, attempts were made to create a college of biochemistry and a college of philology and linguistics but these attempts proved unsuccessful.

[7] To some extent, the MCCME was created specifically for this purpose because, according to the existing rules, the city authorities could only support primary and secondary education, higher education being under the auspices of the federal authorities.

Opening ceremony of the MCCME–IUM building: V. Arnold speaking, A. Gonchar, Yu. Ilyashenko, A. Muzhykantski (seated left to right)

spaces), Alexander Belavin (one of the world leaders in quantum field theory), Alexander Kuznetsov (winner of the Möbius and Deligne contests and awarded the European prize of Best Young Mathematician in 2008 and one of the four Prizes of Best Young Scientist in 2009 by President Medvedev), Sabir Gusein-Zade, Sergei Lando, Stefan Nemirovski, Askold Khovanski and many others.

The IUM has no permanent positions in the sense used in regular universities. The faculty members of the IUM listed on our webpage are those who have given at least a one semester course over the whole history of the IUM. This list includes more than a hundred names. Among them are those who have given courses occasionally, those who have given a series of courses from time to time and then quit for a while and those who have given various courses regularly, forming, as it were, the backbone of the Independent University.

The IUM encourages Russian mathematicians now working in the West to come to the IUM and to give intensive "crash courses". In two or three weeks, the equivalent of a semester course may be taught in this way. Such courses have been given by A. Katok, I. Krichiver, A. Kuksin and M. Shubin among others. This tradition helps to maintain the participation of the Russian mathematical diaspora in the mathematical life of their homeland.

From time to time we invite our young alumni, or even our students, to give basic or higher level courses. This is a bold practice but has proved to be successful. Several of our young alumni have become part of the backbone of the IUM in the 2000s.

The courses are addressed to very strong listeners and are really intensive. Yet the goal is that the material should be grasped on the spot. The lectures are accompanied by a list of problems that are discussed with the students at the exercise classes by the instructors and their assistants. The problems are not mere exercises but rather allow the participants to rediscover parts of the material included in the courses.

There are several research seminars at the IUM, which are sometimes organized as research groups with a flexible meeting schedule. In one of the classrooms, you may often meet Boris Feigin talking to a group of his students about various topics of modern mathematics. Grigory Olshanski has taught his graduate students at the IUM from the beginning of the 1990s and continues today. One of his first students at the IUM was Andrey Okunkov. A seminar headed by Victor Vassiliev took place at the IUM for about ten years. The seminar by M. Kazarian and S. Lando on combinatorics and topology has been taking place at the IUM for many years. M. Tsfasman has trained several young number theorists at the IUM via small informal seminars. The seminar on Riemann surfaces, Lie algebras and mathematical physics headed by S. Natanzon, O. Sheinman and O. Shwartzman has been running for over a decade. These and many other groups and seminars have been the training ground for numerous young researchers. They have become winners of the Pierre Deligne and Dynasty contests, faculty members of the IUM, young researchers at the Steklov Institute and have found teaching and research positions in various other institutions, including the HSE.

Our alumni

In 1996, the first 8 students of the IUM were each awarded its MS-level diploma. In all, 58 students have graduated from the Independent University, an average of only 4–5 graduates per year. Almost all of them have become research mathematicians. Most of them also graduated from *mekhmat* MSU. However, several IUM students did not study in parallel at any other institutions and, although IUM diplomas are not accredited by the Russian authorities, all of them were accepted onto PhD-track programs at prestigious institutions: N. Markaryan to the Steklov Institute in 1995, V. Vologodsky to Harvard in 1996, V. Kirichenko to the University of Toronto in 2002 and R. Travkin to MIT in 2007.

Let us add a few words about the exceptional case of Roman Travkin. He has suffered since early childhood with cerebral palsy. Confined to a wheelchair, his manual coordination is insufficient to use an ordinary computer keyboard, his slurred speech is difficult to understand and he is only able to function with the constant assistance of his father Mikhail Travkin, who devotes all his time, in fact his whole life, to Roman. Roman took first place in the Russian national olympiad but no Russian university would accept him – for medical reasons – except for the IUM, where he got his MS diploma (completing the five-year course in four years) and which organized financial support for him and his father during his studies in Moscow, in particular from the Dynasty Foundation headed by D. B. Zimin and from the Clay Institute. At present, Roman Travkin is a second year graduate student at MIT, working with R. Bezrukavnikov. Recently, he passed his qualifying exam with a well above average score and has two research papers in publication.

The Globus Seminar

The Globus Seminar, headed by M. A. Tsfasman and Yu. S. Ilyashenko, has been running since 1997. At first, it was intended as a seminar for students, with the aim of broadening their mathematical culture. The first lecturer was V. I. Arnold. Progressively, it became one of Moscow's leading mathematics seminars. At different times,

talks have been given by S. P. Novikov (Fields medallist, 1970), Ya. G. Sinai, Yu. I. Manin, P. Deligne (Fields medallist, 1978), Steve Smale (Fields medallist, 1966), M. Kontsevich (Fields medallist, 1998), L. Lafforgue (Fields medallist, 2002), A. Okounkov (Fields medallist, 2006), J.-P. Serre (Fields medallist, 1962) and many other outstanding mathematicians.

The talks are registered, then written out by V. V. Prasolov and, after the authors' corrections, published in the form of seminar proceedings. Six such volumes have appeared to date. The first two have been translated into English by Cambridge University Press.

The Math in Moscow (MiM) program

The program started functioning in 2001. Since then, over 150 North American and European undergraduates have participated in it, including students from Harvard, Princeton, MIT, Berkeley, Cornell, Yale, McGill, Toronto and Montreal. The American students are supported by 10 NSF grants every year (awarded by the American Mathematical Society) and the Canadian students by 3 NSERC (National Science Education Research Center) grants. Though the majority of the students of the MiM program come from the US and Canada, the program encourages the participation of European students too. At present, MiM is a joint program of the IUM, the Higher School of Economics and the MCCME. The IUM carries on the mathematical part of the program; from September 2008, it has shared this job with the new Mathematics Department of the HSE. Moreover, the HSE provides the dormitory rooms and visa support whilst the MCCME resolves other logistical problems.

Here are some reactions of Math in Moscow students.

I think I learned as much or more than I would have had I stayed in the US. Certainly I wouldn't have experienced as much emotional growth. Being in another country really changed me.
Ian Le, Harvard University, Autumn 2002

The department here is the friendliest and closest I've ever found. It's been an absolute joy to be here, and I can't wait to come back.
Tom Church, Cornell University, Autumn 2005

Thank you very much for everything: great mathematics, wonderful experience and lots of fun. Moscow looked more beautiful for me than I expected it to be and your university is much better. I've heard that the IUM is a very interesting place but my stay here was even more pleasant than I thought.
Andrei Negut, Princeton University, Spring 2007

During his stay in Moscow, Negut began to do some serious research with Yu. S. Ilyashenko; this research is still in progress.

It should be understood that the program is not a bed of roses; we have had problems with some (actually very few) of the students and, until this year, finding adequate living quarters for them was quite a headache for the administrators of the program, headed by Irina Paramonova (Shchepochkina). Fortunately, that problem seems to have been resolved by means of the dormitories of the State University-Higher School of Economy. More about the IUM-HSE cooperation will be mentioned below.

A poster of the MiM program.

For more details about the MiM program, see the website www.mccme.ru/mathinmoscow.

The Moscow Mathematical Journal (MMJ)

The Moscow Mathematical Journal was first published in 2001. Its founders are Yu. S. Ilyashenko and M. A. Tsfasman, and together with S. M. Gusein-Zade, they are the Editors-in-Chief. The Editorial Board of the MMJ includes four Fields Medal laureates (L. Lafforgue, G. Margulis, S. Novikov and S. Smale) and several other famous mathematicians. It is published in English (we have been unsuccessful in trying to obtain financial support for a Russian version) and distributed by the American Mathematical Society. To our surprise, the journal has been rather successful: according to data from the AMS, it has the highest citation index among the Russian mathematical journals (0.6 as compared to 0.34 for *Uspekhi* and 0.33 for *Funct. Anal. Appl.*).

Among the authors published in the MMJ, let us note V. I. Arnold, Yu. I. Manin, S. P. Novikov, Ya. G. Sinai, R. A. Minlos, A. G. Khovansky, B. L. Feigin, W. Brieskorn, P. Cartier, J.-P. Serre, L. Lafforgue and M. Kontsevich.

Support for young mathematicians

The Möbius Contest was organized in 1997 by two successful businessmen A. Kokin and V. Balikoev, who were former students of the applied mathematics department of the Moscow Institute of Electronics and Mathematics. At first it was aimed at supporting one undergraduate or graduate student of the IUM. Vadim Kaloshin, now Michael Brin Chair Professor at the University of Maryland, raised additional funds in the US for the contest and thus increased the number of awards. Pierre Deligne contributed some funds from his Balzan Prize as well. At present the Möbius contest awards five biannual stipends aimed at supporting graduates and undergraduates from all over Russia.

The Pierre Deligne Contest. In 2004, Pierre Deligne was awarded the Balzan Prize, worth one million Swiss franks, half of which had to be used according to the rules of the prize to support some mathematical project. Deligne decided to support, as he wrote in a letter to Yu. S. Ilyashenko, "Russian mathematics struggling for survival". Together with Ilyashenko, he created the "Pierre Deligne Contest" for under-35 mathematicians with a PhD degree and convinced the Balzan Foundation to contribute the funds to Russia. The contest has awarded 16 three-year fellowships in the period 2005–08. The funds are now exhausted but Deligne is resolute about continuing to fund the contest from his own sources.

The Dynasty Contest. In May 2006, Arnold and Ilyashenko convinced D. B. Zimin, a prominent businessman and the organizer and head of the charity foundation "Dynasty", to organize an annual "Dynasty Foundation Contest" for three winners. The jury of both contests is the same and the mathematical interests of its members cover almost all the landscape of modern mathematics. The contests support young mathematicians who are well-known to the community but also reveal new brilliant names.

The Dobrushin Stipend. One of the admirers of the talent of the late R. Dobrushin established a stipend for five IUM students. It is awarded every six months for a half year period. In parallel, a one-year Dobrushin fellowship for one IUM professor is awarded.

The mathematics department of the HSE

The State University – Higher School of Economics is a new institution and one of the most popular universities of economics and humanities in Russia (see http://www.hse.ru/lingua/en/about.html). In 2007, the president of the HSE Ya. I. Kuzminov put forward the idea of a broad cooperation between the HSE and the IUM. As a response, the IUM suggested creating a Department of Fundamental Mathematics as part of the HSE.

The new department includes a part of the faculty of the IUM and uses the teaching style and programs of the IUM, slightly modified if needed. The goal is to make the new department as strong as the Mechanics and Mathematics Department of the MSU. The Dean is S. K. Lando. Three chairs, Algebra, Geometry and Discrete Mathematics, are headed by A. N. Rudakov, V. A. Vassiliev and S. K. Lando, respectively.

The new department started teaching about 40 freshman students on 01 September 2008. We strongly hope that the department will become an important new mathematical centre in Russia, having taken much of its expertise and spirit from the IUM.

The legal status of the IUM

From the very beginning, the administration of the Independent University strived to transform the informal educational institution to a *bona fide* university with all the usual legal attributes of an ordinary Russian institution of higher learning, namely:

(i) Registration and licence (which would make the teaching process legal).
(ii) Accreditation (after which the IUM MS-level diploma would be officially recognized).
(iii) Freeing the students from the draft.
(iv) Holding classes in the daytime (rather than in the evening).
(v) Running a graduate school.
(vi) Having a scientific council authorized to deliver PhDs.

Battling the educational bureaucracy to obtain these legal rights, the present IUM administration, as well as the previous ones, have proved to be remarkably ineffective. Only items (i) and (v) have been achieved. Moreover, in 2006, we lost item (i); the right to teach mathematics legally was taken away from us by the Ministry of Education.

At present the IUM has changed its status, becoming, from a legal point of view, a subdivision of the MCCME. As such, its collaborators are allowed to teach but they can only deliver a diploma for "additional education" (which is officially recognized by the state but is not legally equivalent to an ordinary MS degree). But, overall, the program taught at the IUM is still equivalent to a university MS program.

Our budget and our sponsors

The IUM is not supported by the Ministry of Education nor by the city of Moscow; it is privately endowed and functions with a very small budget. We are grateful to our Russian sponsors: A. Vavilov, President of the Human Capital foundation, A. Volozh, President of the Yandex company, D. Zimin, President of the Dmitry Zimin Dynasty foundation, for their past and present support of the IUM. The main sources of income are:

- Support from the Clay Mathematics Institute, continued from 1998.
- The Math in Moscow program.
- Overheads of various research grants.
- Support from the Yandex company (now suspended).
- Support from the Human Capital Foundation (now stopped).

In total, the budget of the IUM is appoximately 30 times smaller than that of a mathematics department of a similar size in an American university.

An indirect, yet very important, support is provided to the IUM by the Steklov Mathematical Institute (director: V. V. Kozlov) and the Institute for Information Transmission Problems (director: A. P. Kuleshov).

Perspectives

Originally, the IUM was meant to be a small, privately endowed, elite university consisting of several colleges, granting MS and PhD degrees officially recognized by the Russian authorities but independent of the Ministry of Education. This ambitious project was never realized. Moreover, its only remaining college, the mathematical one, was not only refused accreditation by the ministerial bureaucracy but had its teaching licence cancelled.

And yet the Independent University still exists and remains one of the leading mathematical centres of Russia. Its parallel *alter ego*, the Mathematics Department of the HSE, brings together the advantages of a college in a state-approved, accredited university with a high-class teaching staff coming from the IUM and carrying on the development of a modern, research-oriented curriculum.

We are optimistic about the near future. We do not agree with those who fear that the creation of the HSE Mathematics Faculty, competing with the IUM, will lead to the latter's degradation. We believe that the IUM is stable and that it has its own ecological niche. It is difficult to imagine the Moscow mathematical scene today without the Independent University, the building it shares with the MCCME, its Globus seminar, its Math in Moscow students, its nationwide support of young mathematicians via the Möbius, Deligne, Dynasty and Dobrushin contests, the Moscow Mathematical Journal, the Poncelet Lab and, above all, its tiny group of talented and highly motivated undergraduates and graduate students, its underpaid, first-class teachers and researchers who work with an enthusiasm and flair that defies, to our mind, any logical explanation.

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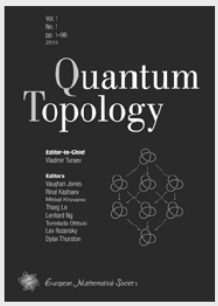

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