

# News about the IMU and ICM-98

At the April 1996 meeting of the AMS Eastern Section, a panel was held to discuss the activities of the International Mathematical Union (IMU) and plans for the upcoming International Congress of Mathematicians (ICM), to be held in August 1998 in Berlin.

The panel was organized and chaired by IMU president David Mumford of Harvard University. IMU secretary Jacob Palis of Instituto de Matemática Pura e Aplicada in Rio de Janeiro spoke about the International Council of Scientific Unions, of which the IMU is a member. ICM Program Committee chair Phillip Griffiths of the Institute for Advanced Study discussed the preparation of the scientific program for the ICM, and ICM Organizing Committee president Martin Grötschel of the Konrad-Zuse-Zentrum in Berlin talked about other aspects of planning for the Congress. Jeremy Kilpatrick of the University of Georgia, vice president of the IMU's International Commission on Mathematical Instruction, discussed that commission's activities. C. Herbert Clemens of the University of Utah, a member of the IMU's Commission on Development and Exchange, was not able to attend the panel, but his written remarks were read by Emma Previato of Boston University.

This article contains edited versions of the remarks of Griffiths, Grötschel, and Clemens. A progress report on ICM-98 appeared in the June 1996 issue of the *Notices*, page 683, and a more general article about the IMU appeared in the November/December 1994 issue of the *Notices*, page 1112. Further information on the IMU and ICM-98 is also available on the Web pages <http://elib.zib-berlin.de/IMU/> and <http://elib.zib-berlin.de/ICM98/>, respectively. There are mirror sites for these servers in Copenhagen, Marseilles, Kyoto, Rio de

Janeiro, and Warsaw. Further mirror sites are under construction.

## **Phillip A. Griffiths, Chair, ICM Program Committee**

The ICM Program Committee is charged to recommend to the IMU Executive Committee the scientific program for the ICM. The committee recommends, first, the list of plenary speakers, and, second, the list of 45-minute speakers, broken into sections in the familiar way. This time there are a couple of experiments that change the process slightly. One is to organize jointly some of the scientific sections with other scientific societies, specifically with applied mathematicians (through the Committee for the International Conferences on Industrial and Applied Mathematics (CICIAM)), control theorists (through the Mathematical Programming Society), statisticians (through the Bernoulli Society), and computer scientists (a cooperating society has not yet been named). A second experiment has to do with making the process more open. So my name as chair of the Program Committee has been made public, and I put a letter on the Internet giving the provisional program that the committee arrived at when they met in December and inviting comments on it. There were in fact a number of comments, and we considered them all.

A number of the comments were organized around two particular aspects of the program. When I went back to the Program Committee and consulted with them, everyone felt that following these comments would lead to a better scientific program. So those changes were made, and now we are in the process of contacting people whom we would like to serve as chairs of the panels for the various sections and as core

panel members. If these individuals accept, then their job is to appoint additional panelists and to develop a recommended list of talks and speakers for that section.

One change which came out of the comments was the following. Traditionally, a section would be listed as, say, algebra, and then connections would be indicated to other related sections. This means that the chair of the panel on algebra should at least consult the chair of these other panels in choosing speakers. We went one step further and stipulated that in some cases two sections should jointly decide on speakers in some general area. There are so many interesting parts about mathematics that do not fall neatly into one section, so we thought we would at least experiment with asking a few sections to jointly sponsor a talk.

There are three changes in the way that applications are dealt with in the ICM program. First, we will do joint planning with CICIAM: we will ask them to recommend a couple of panelists, the Program Committee will select a couple, and together they will propose speakers to the Program Committee. The second idea is to have an integrated session in an area of active research involving mathematics, computation, and experiment. In the session these three aspects of a particular scientific problem would be looked at by three different speakers representing these perspectives, and we would ask them to coordinate what they speak on. The third idea is, rather than having one section with a hodgepodge of talks on applications of different areas, that those talks would be put in a regular section that is closest to them mathematically. For example, many applications obviously involve partial differential equations, so rather than having just a collection of talks on applied PDE, we will put them in the section on PDE. In this way, the applied talks would be integrated with the selection of other speakers and with the structure of the section.

The question has been raised of making public the names of the members of the selection panels; in the past this information has been kept confidential, as have the names of the Program Committee members. I think it is probably better to do these experiments one step at a time. So this time let us try the experiment where my name is public and the initial program is put out for comment. We will take a look afterward to see if this works, and then we can raise the question about making public the names of the Program Committee members, the panel chairs, and/or the panel members. I think it is fine to make one person public and have that person be the conduit for comments from the community, but if you make all the names public, then there could be lobbying. And not only that—

then the chair of the Program Committee will not know what is going on! So that would be my inclination. Eventually it will be up to the General Assembly, which will meet just prior to ICM-98, to evaluate how things went this time and decide what course to follow in the future.

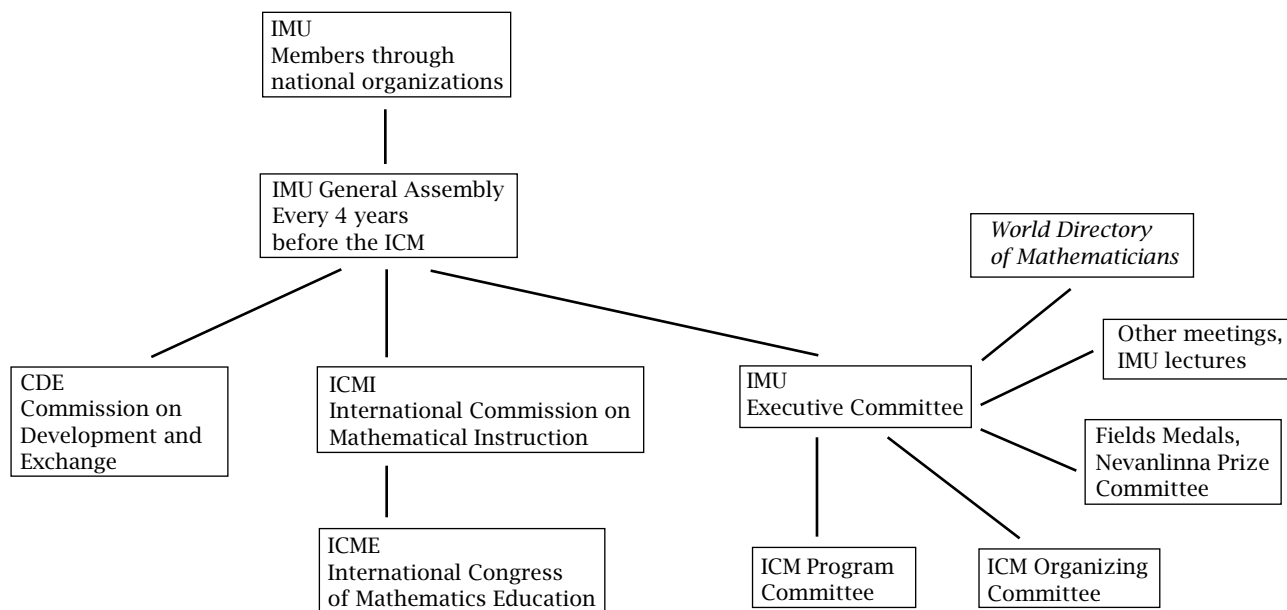
### **Martin Grötschel, President, ICM Organizing Committee**

The scientific program is the most important part of the International Congress. The Organizing Committee is just providing the framework for the program so that the Congress goes smoothly. It is, of course, a lot of work, since it will be a big meeting. We are trying to collect substantial amounts of money to make it an interesting and pleasant Congress for everybody.

Berlin is a big city that has three universities and two research institutes in mathematics: Humboldt University, Technische University, and the Free University; the Weierstrass Institute (WIAS) and the Konrad-Zuse-Zentrum (ZIB), where I am from. There is a new university in Potsdam (the capital of the state of Brandenburg), with which we are also working. Each institution has representatives on the Organizing Committee.

Serving on the Board of Directors of the Organizing Committee as honorary president is Friedrich Hirzebruch, who tried four times to invite the Congress to Germany after World War II and this time was successful. We are very happy about this. The other members of the Board are Secretary General J. Winkler, from the Technische University, who will work on the local arrangements; Vice President Martin Aigner, from the Free University, who is responsible for public relations; and Treasurer J. Sprekels from the Weierstrass Institute.

We are trying to provide a good framework for the scientific program and also to come up with additional activities for the attendees and the general public. The money we have raised so far is sufficient to run the Congress. Now we are trying to get additional money for extra activities. We will rent a special building for evening talks as well as for performances and art exhibitions. We will try to attract high school students and have classes coming in for tours. There will be a video show, probably running every day, which will include 10 to 20 short movies about mathematics. The biggest and most expensive project is on mathematics and music. It is very expensive to hire an orchestra! But there is support from the Academy of Arts and Music in Berlin, and we are discussing with them how to stage an event which would include music performances and talks about mathematics and music. What is going to come out of that I can-



not tell because it is still in the process of development.

In addition to an art exhibition (preliminary title: “Mathematics and the Arts”) featuring well-known painters, we are planning another exhibition of mathematical models. This is a joint project with the Deutsches Museum in Munich, where some of the models will actually be produced. And something exciting happened just a few months ago. The Humboldt University is the oldest university in Berlin. It was in a state of transition because of the unification and subsequent internal restructuring and somehow lost some inventory. An art historian and a mathematician rediscovered a lot of mathematical models somewhere in the corner of a basement. The models had been produced perhaps 100 or 150 years ago. Now they are trying to dig them out and register them. Maybe we can also use this material in our exhibition.

We are aware of the fact that many very good mathematicians come from countries with little financial means. We will try our best to raise money to support them. The Special Development Fund from the IMU will pay for travel for mathematicians from developing countries. We will provide local support and will make a special effort to bring in people from Eastern Europe.

Also, hotel costs are an important factor. Berlin is a big city, and it is not cheap. But there are inexpensive accommodations, and we will make them available.

We have set up a Web server for the Congress, where you can do what we call “preliminary preregister”. We say “preliminary preregister” because we learned that for the ICM you “preregister” prior to the Congress and you “register” at the Congress. “Preliminary preregistration” just means that you get on the mailing list

and receive information. I checked two weeks ago, and we had 1,300 people preliminarily pre-registered, which I thought was quite good. We have written to all national mathematical societies to ask them to publish an announcement about this service in their newsletters.

### C. Herbert Clemens, Member, IMU Commission on Development and Exchange

I once heard a comment by a mathematician from the former Soviet Union when asked some years ago how he became a mathematician. He said that it was for him the only window of reason, logic, and order in an impossibly crazy world. It was the refuge of last resort for the mind, saving it from inevitable insanity. That in a society in which one was relatively safe from physical assault and personal insult and injury. However fundamental was that motivation for him and for many other scholars of those societies in that era, how much more fundamental it must be for the isolated intelligent individual in some far corner of Africa, Asia, or, for that matter, in any of the physically dangerous, economically deprived, and scientifically barren corners of our world! (In fact, not all such places are far away, at least not physically far away, from the room in which this AMS meeting is taking place.)

The professional impediments of most of us pale into nothingness compared to those of, say, bright young university students of mathematics in Mogadishu in the mid-1980s, students whose school mathematical training and culture, according to Italian colleagues who taught there at the time, would stand up well beside their European counterparts. Closer to my own personal experience was the situation of some

young Chilean mathematicians in the mid-1970s, whose experiences mirrored in miniature and from the reverse side of the political spectrum the madness of the cultural revolution in China ten years earlier.

Improbably yet inevitably, even in these environments, young people still do continue to find a book which inspires or a mentor who opens their personal window of sanity. On the scientific side, it is often the subject mathematics which is the intellectual instrument of that opening. The subject of this report, the Commission on Development and Exchange of the IMU, or CDE for short, is one of the few professional mechanisms that we mathematicians have to reach out to our colleagues and their students in many obscure places in which an orderly life, let alone a mathematical life, is still extremely difficult.

The CDE presently runs two programs aimed at supporting mathematics and mathematicians in developing countries. One program applies to individuals and supports research visits, chiefly by offering partial travel support. The other gives partial support to conferences organized by mathematical groups in developing countries.

The individual grants, usually at the level of \$1,000 or less, must be matched by support for local expenses given by the research center which the mathematician is visiting, and the visit must be for a month or more in duration. However, visits of six months or more are rarely funded, since it is assumed in such cases that ongoing local support from the inviting center will suffice to recoup travel costs. Individual mathematicians apply by submitting a curriculum vitae, a proposed program of joint research with a mathematician at the host institution, together with a letter of invitation from that institution. At the end of the research visit, the support recipient submits a final scientific report to the CDE.

The CDE gives supplementary support for research conferences organized in developing countries, on conditions including the stipulation that the conference be regional in nature, not limited to a single country, and open to all working mathematicians regardless of nationality. The level of support is typically on the order of \$2,000 and is meant to encourage other potential funders and to encourage special attention to CDE priorities, priorities such as making possible conference participation by mathematicians in nearby countries without the means to sponsor such activities. Again, the CDE responds to well-documented and mathematically sound applications from conference organizing committees. The CDE does not initiate the support process, but rather responds to requests. Due to the relatively small budget within

which the CDE operates, conference support is limited to research, as opposed to training, conferences.

A variant on CDE support to research conferences is support for “working teams”, that is, small groups of mathematicians in developing countries whose work centers around a single mathematical theme. Typically, these groups have a continuing mathematical contact with a center in a “mathematically developed” country. All grants went to individuals and entities in Asia and Africa, with the exception of a single individual grant to a Latin American mathematician.

In 1995 the CDE supported seven individual mathematicians for a total of \$8,000, six conferences for a total of \$12,000, and two working groups for \$4,000. The CDE received \$30,000 plus an administrative budget of \$4,500 from entities internal to the IMU and another \$10,000 from UNESCO. As can be seen from these budgets, the CDE is very limited in the number of grants it can give, as well as in the size of grants. However, the CDE’s efforts to be geographically balanced and even-handed and to observe rather rigorous mathematical standards have also been factors in limiting the number of grants. Even at present funding levels, the CDE could raise its grant output somewhat if its programs were more widely known, an eventuality that would presumably generate more fundable applications.

Which brings me finally to a couple of questions the CDE would like to put to the mathematical community. First of all, should we seek to expand the kind of mathematical activity we fund? This might take the form of continuing and extending the experimental policy of supporting working groups, perhaps in the direction of supporting groups of advanced students and mathematicians just starting out. Secondly, should the CDE seek to expand the size and number of its grants by seeking outside money from foundations, businesses, and governments through its parent body, the IMU?

So I would like to end with these questions to the mathematical community. Are we doing enough to help our colleagues in developing countries have a productive professional life themselves and to encourage those who come after them? If we should do more, what kinds of activities should we consider? And finally, what about the tension between access and mathematical standards? Should we try to support, for example, young talent starting out, perhaps even at the advanced-student level, even at the risk of making (costly) mistakes with a relatively small budget?