

## Closing Session

### The Young Danish String Quartet

Carl Nielsen: String Quartet no. 4, F major, 1<sup>st</sup> movement



I C M E  
1 0  
2 0 0 4

Closing Session

### Ole Björkqvist, Master of ceremonies

We have listened to The Young Danish String Quartet which consists of students of the Royal Danish Conservatory of Music in Copenhagen. They have already played together for several years and won several competitions – at home and elsewhere in Europe. This year they have also made their debut in New York. We have heard them play the 1<sup>st</sup> movement of Carl Nielsen’s String Quartet no. 4 in F, opus 44.

My name is Ole Björkqvist and I have the honour and pleasure to serve as the master of ceremonies at this closing session. I am a member of the International Programme Committee for ICME-10 and I represent Finland. On the podium we have some of the persons who were present during the opening session. They seem rather more relaxed now. I guess we all have the impression that the congress has been successful.

The closing session will now follow a format that is fairly similar to the ones used at previous International Congresses on Mathematical Education. I invite Bernard Hodgson, Secretary General of ICMI, to give the Secretary’s Closing Remarks.

### Bernard Hodgson, Secretary General of ICMI

#### *Introduction*

Mr. Ambassador, distinguished guests, ladies and gentlemen, dear colleagues and friends, participants in this 10<sup>th</sup> International Congress on Mathematical Education.

We are now on the final day of an international event which, for all those who gathered during the past week on the campus of the Technical University of Denmark, proved to be in turn intense, hectic, exhausting, hot – in spite of the refreshing Nordic climate –, stimulating, exhilarating, rewarding, friendly, and much more. An enthusiastic assembly of 2394 participants from 94 different countries – mathematicians, researchers in mathematics education, teacher educators and school practitioners from all regions of the world – met in Copenhagen/Lyngby-Taarbæk during the last week to bring to life this tenth congress of a series which was initiated 35 years ago in Lyon. The quadrennial ICME congresses are held on behalf of and under the auspices of ICMI, the International Commission on Mathematical Instruction. And it is in my capacity as the Secretary-General of the Commission that I have the duty and the honour of addressing you today in this closing session of the congress.

As I have just mentioned, ICME-10 was organised on behalf of ICMI – but *not by* ICMI, the direct role of the ICMI Executive Committee being the selection of a site and the appointment of an International Programme Committee (which includes representatives of the Commission). It was the responsibility of an *ad hoc* committee to bring this project to fruition and my first words are directed to all the colleagues who have made this extraordinary event possible and who have welcomed all of us here with their warm



I C M E  
1 0  
2 0 0 4

## Closing Session

and friendly hospitality. As you all know, the organisation of ICME-10 was the responsibility of a consortium of the Nordic countries – Denmark, Finland, Iceland, Norway and Sweden – who jointly formed the so-called Nordic Contact Committee to support the preparation of the congress by fostering co-operation between the five countries. Such a collaborative effort between neighbouring countries is a first in the life of ICMI and I wish to stress both the originality and the fruitfulness of such a model.

The indubitable success of the present Congress rests on the sustained efforts of a very large number of people involved in the various committees and sub-committees of the organisational structure of ICME-10, many of whom have worked invisibly and unknown to the participants. While it would have been well deserved to thank personally every one of those who have devoted time and energy towards the success of this quadrennial gathering, their number makes this clearly impossible. But these hard-working and good-humoured hosts and organisers should all be assured that their dedication and efficiency have not remained unnoticed. Please join me in expressing our warmest thanks to the entire team of ICME-10.

Very special thanks should however be addressed to some of the organisers. On behalf of the Executive Committee of ICMI – and, I am convinced, of all of the participants – it is my great pleasure to express our deepest gratitude and appreciation to four great Nordic colleagues and friends who played key leadership roles towards the success of the congress:

- The Chair of the Nordic Contact Committee, Professor Gerd Brandell of Lund University; Sweden.
- The Administrative Secretary of the Local Organising Committee and to the International Programme Committee, Ms. Elin Emborg, from Roskilde University.
- The Chair of the Local Organising Committee, Professor Morten Blomhøj, Roskilde University.
- And finally, but maybe firstly if I may dare say, a long-time friend of ICMI, the Chair of the International Programme Committee and in many ways the heart of the ICME-10 adventure, Professor Mogens Niss, also from Roskilde University.

The General Assembly of ICMI, which constitutes the formal body of the Commission, met two days ago on this campus and a resolution was then moved, and unanimously approved by a round of applause, to request the President of ICMI to officially convey to the organising committee of ICME-10, and especially to the chairs of the three main committees I just mentioned, the gratitude of the General Assembly for the exceptional quality and the greatly innovative character of the congress, especially as regards its scientific programme, and for the gracious and exceptional hospitality offered to the participants.

Our Nordic hosts should also be thanked for the remarkable support provided to some of the congress participants. It has been indicated in the Second Announcement of ICME-10 that, following the tradition started at ICME-8 in 1996, the organisers have adhered to the general policy of ICMI of forming a solidarity fund established by setting



I C M E  
1 0  
2 0 0 4

Closing Session

aside 10% of the registration fees for grants. These grants aim at facilitating a balanced representation from all over the world, among presenters as well as among general participants, by assisting delegates from non-affluent countries to attend the congress. I have been informed by the Local Organising Committee that the amount actually spent through the ICME-10 Grant Fund even exceeds this engagement, as more than 11% of the total registration fee income has been devoted to the Grant Fund, allowing to support a total of 175 participants from 55 different countries.

The Chair of the International Programme Committee, in his comments on the opening day, compared the congress to a kind of supermarket intended for every member of the mathematics education community, rather than a specialised conference concentrating on a specific theme. This was reflected in the extraordinary diversity and richness of the scientific programme offered to us during the past days, with its eight plenary activities, the more than eighty regular lectures, twenty-nine Topic Study Groups, twenty-four Discussion Groups, five National Presentations, Sharing Experiences Groups, Workshops, etc., as well as the Thematic Afternoon, where five mini-conferences were offered in parallel.

A few ingredients on the scientific programme of ICME-10 were of a highly innovative nature. Such is the case for instance of the Plenary Interview Session moderated by Michèle Artigue and starring four capital figures of the mathematical education historical landscape, an activity which was a truly magnificent moment and a very cordial way of looking at the past, the present and the future of our field.

Another innovative feature of this congress was the creation of five so-called Survey Teams, each having as a mandate to survey the state-of-the-art with respect to a certain theme or issue, paying particular attention to the identification and characterisation of new knowledge, recent developments, new perspectives and emergent issues. The reports from these Survey Teams were presented in two plenary and three regular lectures and, according to the informal comments I have gathered, were extremely well received by the Congress participants. This overview of selected aspects of the field turned out to be a most appropriate and efficient way of gaining a better appreciation and understanding of some central issues in today's work in mathematics education. Having witnessed from a distance the long-term preparation and the extremely wide coverage implied by these surveys, including some intensive fine-tuning sessions held at rather unduly late hours over the last few days in hotel lobbies or elsewhere, I wish to express my gratitude, and I am sure that of all ICME-10 participants, to the members of the five Surveys Teams for their efforts and for the quality of the outcome of their deliberations.

I would also like to mention, among the new initiatives set in place for ICME-10, the organisation on the opening day of the congress of a Newcomers Welcome Programme offered by the Nordic Contact Committee. More than 450 first-time participants registered to this activity, a strong indication of its usefulness. While its logistics may need to be partly revised, the Newcomers Welcome allowed those attending their very first ICME congress to better understand the philosophy and the content of the programme, while facilitating establishing links with other ICME participants. Hopefully this was instrumental in helping all newcomers quickly feel part of the "ICMI family".



I C M E  
1 0  
2 0 0 4

Closing Session

### *A personal testament*

It is today for me, almost certainly, the last time that I have the privilege of addressing the closing plenary session of an ICME congress in my capacity as Secretary General of ICMI, as this is my second term in that position – at ICME-11, in 2008, my successor will be presenting the closing remarks on the analogous occasion. I would thus like to take advantage of this opportunity to raise a deep personal concern about our field that, I know, I share with many colleagues. I would like to introduce this concern by offering a basic question: *why are we all here at this moment?* More precisely, I mean: why did each of us spend the last week on the DTU campus amongst the couple of thousands other participants? I agree there may be something a bit silly in asking such a question. But still allow me to consider some possible, if not plausible, answers.

Fundamentally, I am tempted to say, very many, if not all, of us, would say they are here because of their love for mathematics. A love for solving problems, for proving theorems, a love for doing mathematics, for talking mathematics, a love for teaching mathematics.

Others may say that their presence at an ICME congress is connected to a large extent to the size and the scope of the congress which, in spite of some tendency to gigantism, allows for an exceptionally wide possibility of choices. And here one can either try to explore, if I may use an analogy from Nordic gastronomy, the full diversity of “det store kolde bord” – of the “smörgösbord”, if you prefer to think in Swedish rather than Danish gastronomical terms – or one can aim at building some personal strands on which to concentrate inside a very diverse programme.

What may be other reasons? Well, many of us possibly came to ICME-10 to talk to people, to enjoy meeting with old friends and with the hope of making new ones. The human forum offered by the congress proposes an exceptional concentration of members of the mathematics education community, thus facilitating direct informal contacts... provided the density of the schedule or the innumerable time constraints allow some open windows. Possibly the wonderful surroundings of the Nordic nature was as well a source of motivation for others.

While some may express their attraction to a scientific congress such as an ICME through the objective of knowing about “what’s new in the field”, a common interest to all participants attending the International Congress on Mathematical Education is clearly the desire to gain a better understanding of our field and of its evolution, so as to be in a better position to contribute to its improvement. These quadrennial gatherings may serve as kinds of milestones allowing to better integrate mathematics education as a practical and academic domain of growing complexity, where the main outcomes of our endeavours are usually not stated as theorems or even well-defined results based on conclusive evidence, but rather as stages in an ongoing process in which it is not at all unusual that a question apparently answered needs to be revisited some years later, because of some new understandings or insights.

Whatever the merit of the possible reasons for attending ICME-10 that I have just mentioned, there is still, I strongly believe, one much more fundamental and deeper motiva-



I C M E  
1 0  
2 0 0 4

## Closing Session

tion, which can be formulated as follows: deep in our hearts, we know that we came to this congress because we are convinced that mathematics education is essential to everyone in all segments of any society, because we know that mathematics education can play a fundamental and unique role in addressing the many equity issues still facing our modern world.

To use the allegory proposed by a plenary panelist earlier this week, mathematics education has much to do in order to have the “dorsal spine of modern civilisation” – namely mathematics – develop in such a way as to build a better body, to build a better civilisation, to build a better society. Far from me the pretension of daring to attempt matching the eloquence or emotion conveyed by Ubiratan D’Ambrosio in his closing remarks, during the exceptional Plenary Interview Session we have enjoyed a few days ago. Nonetheless allow me to add my voice not only to those who express concerns about issues of equity within mathematics education, but more to the point to all those, like our dear Ubi, who see mathematics as playing a crucial role in the improvement of social justice and the betterment of societies as well as, ultimately, of mankind.

It is generally recognised that mathematics plays an essential role in the development of the active citizenship required for a truly democratic society. But what needs to be acknowledged is that the challenge goes far beyond this basic but essential level. Let me borrow again from Ubiratan D’Ambrosio, in a paper he presented at the Symposium organised in 2000 to celebrate the centennial of the journal *L’Enseignement mathématique*, the official organ of ICMI.<sup>1</sup> He was asking the question: what can we offer to the future generations, in order that they live in a better world than the one which our and the previous generations before us have constructed? His answer has to do with the capacity of developing a critical view of our current model and of the knowledge system in which it was built. And this is where mathematics comes into play, as it is recognised as central to this knowledge system.

Gila Hanna remarked, during the Plenary Interview Session, that a lot of progress has been made about gender issues in mathematics education. To a certain extent the content of the scientific programme of this congress, or even the composition of the current ICMI Executive Committee, may be seen as some reflection of this progress. But still more progress has to be made on that account, as indicated by Gila Hanna, and also in relation to new challenges such as the exclusion of men in some contexts. However gender inequities, in spite of their importance, are not the only inequities, and probably not the main ones. It was striking to see that many of the contributors to this congress explicitly referred to the crucial role of mathematics and mathematics education in issues of social justice and equity. This was the case in the plenary presentation of the outcomes of some of the Survey Teams, for instance the one on “The professional development of mathematics teachers”, where comments were made about the dominance of research from English-speaking countries and the danger of a blurring of the distinction between local and global issues, when thinking of the main problems facing our community.

<sup>1</sup> See D. Coray, F. Furinghetti, H. Gispert, B.R. Hodgson and G. Schubring, eds., *One Hundred Years of L’Enseignement Mathématique: Moments of Mathematics Education in the Twentieth Century*. 2003, L’Enseignement Mathématique, Monograph no. 39. ISBN 2-940264-06-6.



I C M I  
1 0  
2 0 0 4

Closing Session

Concerns of social justice were also reflected in other components of the programme, including Regular Lectures and Discussion Group or Topic Study Group activities.

That mathematics education as a research field has reached a level where it is capable of a critical reflection on its practice and achievements as regards issues of justice and equity is definitely an important sign of maturity. As a matter of fact, it does take some maturity to be able to look at oneself, at one's past, and to admit that there are some matters that are still going wrong, or at least not as well as they ought to be. Issues of inclusion remain at the heart of our work. We may be accustomed to drawing strength from collaborative work, but such collaborations will often exist in rather "comfortable" environments, if I may say so. We also need to draw from collaborations that deeply and truly involve our differences: different gender, different cultures, different values, different viewpoints, different backgrounds, more or less connected to mathematics or to didactics, even different languages. Neither our field, nor our world for that matter, should aim at uniformity. But this clearly does not prevent some form of unity among us.

So, going back to the question I raised a few minutes ago: "*why are we here now?*", I see as the fundamental answer that we are here so as to try to be better mathematicians, better researchers in mathematics education, better teacher educators, better teachers, in order to try contributing to the rising of a better society, of a better civilisation. We are here because we believe in mankind, in its betterment and in the role that mathematics and mathematics education play in this connection.

But what about the International Commission on Mathematical Instruction in this grand project? While the means of ICMI are somewhat limited, in particular as regards financial matters, there is nonetheless a wonderfully great richness and potential inside the ICMI community. As a matter of fact the strength of ICMI is essentially based on people. People like you, active contributors to activities of the Commission such as the ICME congresses, the ICMI Studies or the ICMI Regional Conferences. People like the members of the various committees organising these activities, who accept to contribute their time freely and considerably to help the Commission set these activities. People who collaborate with ICMI in participating and contributing to the improvement of the field. People who believe in the role and impact of mathematics education in the betterment of our societies.

### *What is ICMI?*

I would now like to review with you briefly what ICMI is and what its main activities are. In many of these activities you may identify some components related to the equity issues I have just been discussing. I will be rather brief in most of my next remarks, and those wishing to get more information are invited to consult the many reports appearing in the June 2004 issue of the *ICMI Bulletin* or to contact me directly.

As was mentioned during the Award ceremony on the opening day of this congress, ICMI has a long history, as it was established in 1908 during the International Congress of Mathematicians held in Rome, with Felix Klein as its first President. As a matter of fact the celebration of the centennial of the Commission, in 2008, is now under prepa-



I C M E  
1 0  
2 0 0 4

Closing Session

ration and the Executive Committee is grateful to the Italian mathematicians and mathematics education communities for having accepted the task of hosting a symposium to be organised on this occasion. The International Programme Committee in charge of this symposium will be appointed shortly.

After an interruption of activity between the two World Wars, ICMI was reconstituted in 1952, as an official commission of the newly formed International Mathematical Union, IMU. This has as an effect that IMU is responsible for formal aspects of ICMI such as the Terms of Reference of ICMI or the election of the Executive Committee of the Commission. Under pressure from its own General Assembly, IMU is currently planning major changes in the election procedure of its Executive Committee, with consequential changes as regards the election of the ICMI Executive Committee. It is in such a context that the current ICMI Executive Committee has recently been involved in intensive discussions with the Executive Committee of IMU about the procedure for the future elections of the ICMI EC. A report was presented earlier this week at the ICMI General Assembly about the ongoing discussion between the ICMI and the IMU ECs, especially as regards the proposal that the election of the ICMI Executive Committee would in the future be made by the General Assembly of ICMI. Such a development, still unexpected up until recently, can be seen as a very positive sign as regards the future of ICMI and the implication of the mathematics education community in all aspects of its organisation. The current agreement between the ICMI and IMU Executive Committees still needs to be approved by the General Assembly of IMU, to be held in August 2006 in Santiago de Compostela, Spain.

The new role eventually to be played by the General Assembly of ICMI entails a need to improve the infrastructure of the Assembly and the links with each ICMI member country Adhering Organisation or with the ICMI Representative in each country. Contacts are currently being established on that account, each member of the ICMI Executive Committee having taken responsibility for re-establishing or reinforcing the links with eight to ten member countries of ICMI.

#### *a) ICMEs*

The most extensive among the activities of ICMI is, undoubtedly, the International Congresses on Mathematical Education. You have just been taking part in the 10<sup>th</sup> such ICME and it is now time to reflect on it, on the way it was organised, on the ingredients of its scientific programme or on any other aspect of the congress. A new team of collaborators has already started the preparation of the next ICME and it would be important to provide them with your observations, concerns and proposals on both the structure and the content of the ICME congresses. You are thus cordially invited to convey your comments and suggestions to me at your earliest convenience, by letter, fax or e-mail:

Prof. Bernard R. Hodgson, ICMI Secretary-General  
Département de mathématiques et de statistique  
Université Laval  
Québec G1K 7P4 Canada  
fax: +1 418 656 2817  
e-mail: bhodgson@mat.ulaval.ca



I C M E  
1 0  
2 0 0 4

Closing Session

A major decision recently made by the Executive Committee of ICMI was to accept the invitation received from Mexico to hold the ICME-11 congress. A little later during this closing session you will be receiving from Mexican delegates an official invitation to the whole mathematics education community to gather in Monterrey on July 6 to 13, 2008, to celebrate the 11<sup>th</sup> ICME. At this moment I would just wish to stress how important this first Latin-American ICME congress is as regards aspects I have discussed earlier, such as equity issues or culture differences. It is the sincere hope of the ICMI EC that, with the support of all interested parties within Mexico and elsewhere in the region, this congress may serve as a catalyst for the promotion of mathematics education in Mexico and Latin America, as well as internationally, and have a long-term impact in the region.

With ICME-11 already on its way, it is now time to start thinking of the following congress, ICME-12, to be held in 2012. The ICMI Executive Committee is thus launching to all its member states an official call for bids to host the twelfth ICME. The task of organising an international congress of the size of an ICME becoming increasingly immense, complicated and demanding, it is hoped that a formal decision about the site of ICME-12 could be made not too late in 2007. We would thus like to propose the following schedule:

- a declaration of intention of presenting a bid should reach the Secretary General by November 1, 2005;
- formal bids should be presented to the Secretary General by November 1, 2006.

A written call for bids will be presented in the December 2004 issue of the *ICMI Bulletin*, which will also include indications about the kinds of issues a bid should address. Those wishing to be informed of those guidelines sooner should contact me.

#### **b) The ICMI Studies**

For close to 20 years, the Commission has conducted a series of so-called ICMI Studies devoted to crucial current themes or issues in mathematics education. It is not appropriate here to describe in detail the general functioning of a Study or the state of ongoing activities in this regard. I refer those interested to a survey of the first eleven Studies that appeared five years ago in the *ICMI Bulletin* (No. 46, June 1999), and also to the June 2004, No. 54, issue for information on the latest ones. Here let me just mention briefly that:

- a new ICMI Study volume is due to appear very soon, as a result of the 12<sup>th</sup> ICMI Study on *The future of the teaching and learning of algebra*;
- editorial work on the Study volumes for Study 13, the so-called ICMI comparative Study (*Mathematics education in different cultural traditions: A comparative study of East Asia and the West*) and Study 14 (*Applications and modelling in mathematics education*), is now ongoing;
- three Studies are now at the stage of getting close to a Study conference, namely Study 15 (*The professional education and development of teachers of mathematics*), whose conference will take place in Águas de Lindóia, Brazil, in May 2005;



I C M E  
1 0  
2 0 0 4

- Study 16 (*Challenging mathematics in and beyond the classroom*), whose conference will take place in Trondheim, Norway, in June 2006;
- Study 17 (*Digital technologies and mathematics teaching and learning: Rethinking the terrain*), whose conference will be held around December 2006.

#### Closing Session

The ICMI Executive Committee is contemplating the launching of a new Study soon. Final decisions on this are yet to come but among the topics currently considered are *The role of proofs and proving in mathematics education* and *Statistics education in school mathematics*.

Among the other topics also envisaged by the EC for a future ICMI Study are for instance:

- Mathematics and physics education
- Integration of mathematics education and science education at the primary school
- Primary school mathematics education
- Connection of mathematics and other discipline (from primary to university)
- Innovative teaching in constrained conditions
- History of mathematics education
- Relation of mathematics education to general education
- Mathematics for and from the workplace
- Diversity in the teaching/learning of mathematics
- Values in mathematics education.

The ICMI Study volumes currently appear in the so-called New ICMI Studies Series published under ICMI patronage by Kluwer Academic Publishers, now Springer. I wish to remind you that individuals buying a Study volume for personal use are entitled to a 60% discount on the hardbound edition. Information on how to obtain such a discount appears regularly in the *ICMI Bulletin*. The Executive Committee of ICMI is fully aware that such a discount, although substantial, does not solve all the difficulties related to the cost of the Study volumes, especially when considered from an equity point of view, and is working on identifying ways to improve the situation.

#### c) *Affiliated Study Groups*

Over the years, five international study groups have joined the Commission as so-called Affiliated Study Groups of ICMI. These groups are neither appointed by ICMI nor operating on behalf or under the control of ICMI. They stage activities of their own and they are also offered slots inside the programs of the ICMEs. The ICMI Affiliated Study Groups produce quadrennial reports presented to the General Assemblies of ICMI. The ICMI Executive is particularly pleased that a new Affiliated Study Group has joined the Commission as of 2003, namely ICTMA, the International Study Group for Mathematical Modelling and Applications. Thus, the five current ICMI Affiliated Study Groups, with their year of affiliation to ICMI, are:

- HPM:** The International Study Group on the Relations between the History and Pedagogy of Mathematics (1976)
- PME:** The International Group for the Psychology of Mathematics Education (1976)



I C M E  
1 0  
2 0 0 4

- IOWME:** The International Organization of Women and Mathematics Education (1987)
- WFNMC:** The World Federation of National Mathematics Competitions (1994)
- ICTMA:** The International Study Group for Mathematical Modelling and Applications (2003)

## Closing Session

The spirit and functioning of these groups are surely familiar to many of you. But allow me to take this opportunity to comment briefly on the activities of one of them, WFNMC. The importance of mathematics competitions for mathematics education should not be judged solely from the point of view of the direct improvement of every day's classroom work. More important is the general impact on many factors that indirectly influence education, including public awareness and appreciation of mathematics. Some of you may have the perception of competitions having to do strictly with math olympiads. While such an activity is definitely within the scope of the Federation, it is clearly not the only nor the main framework of action for WFNMC. Large-scale competitions such as the *Kangourou mathématique* in France are probably a better reflection of the spirit of the Group. Such competitions aim at enlarging the horizons and removing limitations in education. Let me quote here from the comments made by André Deledicq earlier this week, when receiving the Erdős Award of WFNMC from the hands of ICMI President Hyman Bass: "One of the most beautiful things to experience is a child thinking hard, looking for solutions and the moment when his or her face suddenly shines and when his or her mind shouts out."

In some circles competitions may be seen as a way to attract some bright young people to become professional mathematicians. While such an objective is not to be neglected, it should not be considered as the leading philosophy within this field, at least not from ICMI's perspective. This is basically what stands behind the 16<sup>th</sup> ICMI Study I mentioned earlier, where the idea of competition has been enlarged to challenging mathematics, in and beyond the classroom, including math clubs, math camps, exhibits, museums, etc.

### *d) ICMI Regional Conferences*

The Commission's "raison d'être" as an organisation is to offer a forum promoting reflection, collaboration, exchange and dissemination of ideas and information on all aspects of the theory and practice of contemporary mathematical education, as seen from an international perspective. Despite this international nature of its position and role, ICMI from time to time lends its name to a variety of regional conferences on mathematics education, primarily in less affluent parts of the world. These so-called ICMI Regional Conferences are supported morally by ICMI, and sometimes financially as well.

Since ICME-9, six ICMI Regional conferences were held, while four others are currently in the planning stage. More information about these activities can be found in the *ICMI Bulletin*.



I C M E  
1 0  
2 0 0 4

Closing Session

**EM 2000** – Espace mathématique 2000; Grenoble, France, July 2000  
**All-Russian Conference** on Mathematical Education; Dubna, Russia, September 2000  
**ICMI-EARCOME-2** – Second ICMI East Asia Regional Conference on Mathematics Education; Singapore, May 2002  
**LASHEM** – Latin-American School on History and Epistemology of Mathematics; Cali, Colombia, November 2002  
**XI-IACME** – 11<sup>th</sup> Inter-American Conference on Mathematics Education; Blumenau, Brazil, July 2003  
**EMF 2003** – Espace mathématique francophone 2003; Tozeur, Tunisia, December 2003  
**First Africa Regional Conference of ICMI**; Johannesburg, South Africa, June 2005  
**ICMI-EARCOME-3** – Third ICMI East Asia Regional Conference on Mathematics Education; Shanghai, China, August 2005  
**EMF 2006** – Espace mathématique francophone 2006; Sherbrooke, Canada, June 2006  
**ICMI-EARCOME-4** – Fourth ICMI East Asia Regional Conference on Mathematics Education; Penang, Malaysia, 2007

*e) The Solidarity Program and Fund*

In 1992 ICMI, under the impulsion of its President Miguel de Guzmán, established a Solidarity Program in Mathematics Education. The overall objective of the Solidarity Program is to increase, in a variety of ways, the commitment and involvement of mathematics educators around the world in order to improve the situation of mathematics education, in particular in those parts of the world where the economic and socio-political contexts do not permit adequate and autonomous development.

An ad hoc committee was set up in 1999 by the Executive Committee of ICMI to review the functioning and impact of the Solidarity Fund, after its first years of existence, and to bring recommendations to the EC concerning its orientation and development. Unfortunately this ad hoc committee was not able to complete its task, but a new committee has recently been appointed, which is chaired by Professor Alan Bishop, of Australia. A preliminary report has been received by the ICMI Executive Committee and presented at the General Assembly two days ago. Issues of equity and social justice are clearly at the heart of the action of the ICMI Solidarity Fund and it is the objective of the ICMI EC to reinforce the presence and impact of the Fund among its set of activities. Comments and suggestions about possible actions or orientations of the ICMI Solidarity Fund should be sent to a member of the Executive Committee, or to the chair of this ad hoc committee, Alan Bishop.

*f) Miscellanea: ICMI Awards; logo; website*

This brings me to the final part of my closing remarks, in which I would simply like to review briefly three additional bits of information

First a word about the ICMI Awards. The official establishment of the ICMI Felix Klein and Hans Freudenthal Awards was definitely a peak item in ICMI life of the last four



I C M E  
1 0  
2 0 0 4

#### Closing Session

years. The first recipients, Professors Guy Brousseau and Celia Hoyles, were presented with their medals during the opening session of this congress.

The design of the medals accompanying the Klein and Freudenthal Awards has brought forward the need for ICMI to finally adopt a logo, which was also officially presented at the opening session.

Finally I would like to mention that the ICMI website is currently undergoing a substantial rethinking and redesigning. It is the aim of the ICMI Executive to make a much wider and up-to-date use of the website. We hope to be able to present in a not-too-distant future a much better tool for communication and dissemination of information.

#### 4. Conclusion

This brings us, dear friends and colleagues, to the conclusion of this session. The ICME-10 congress has provided us with an overwhelming richness of presentations and activities of all kinds. We have spent at the DTU a most intensive week, during which we have clearly worked a lot, probably discussed a lot, hopefully learned a lot, possibly laughed a lot – and presumably not slept a lot. Well, this is probably what congresses such as the ICMEs are about, after all.

With its many innovative ingredients and the high quality of the programme, this congress has brought the standard of excellence of our quadrennial gatherings to new levels and is yet another memorable milestone in the life of the mathematics education community. Our Mexican colleagues are now eager to welcome us in 2008 for the pursuit of our never-ending journey.

It is now my duty to declare the 10<sup>th</sup> International Congress on Mathematical Education, held from July 4 to 11, 2004, officially closed.

I wish all of you a pleasant journey back home and I look forward to seeing you all again in Monterrey, Mexico, in July 2008, for the 11<sup>th</sup> ICME. Thank you. Goodbye! Au revoir! ¡Hasta luego!

#### Musical interlude by The Young Danish String Quartet

Hans Abrahamsen: Preludes 1-5 (out of 10)

#### Ole Björkqvist

After these preludes by Hans Abrahamsen, I call upon Gerd Brandell, Chair of the Nordic Contact Committee to speak on behalf of the Nordic Contact Committee.



I C M E  
1 0  
2 0 0 4

Closing Session

## Gerd Brandell, Chair of the Nordic Contact Committee

Dear colleagues and friends,

After seven intense congress days ICME-10 is now approaching its end and it is time to say goodbye.

The preparation for the congress brought about a lot of collaboration among people involved in mathematics education in the Nordic countries, not only researchers but also teachers and policy makers. Obviously many contacts and much cooperation on various levels existed at the time when we made the bid to host an ICME congress. However - the network has been enlarged and reinforced during the process. The collaboration during these five years even went beyond preparation for the congress.

One example of a new project is the KappAbel competition. The competition started in Norway and was spread to the other Nordic countries through the Nordic Contact Committee for ICME-10. Some of you saw the final on Tuesday and Wednesday and could witness the joy and feel the spirit of this competition that involves several tens of thousands of pupils and a large number of teachers all over the Nordic countries.

We had set ambitious goals for the Nordic participation. We are happy that so many teachers and researchers from our countries have contributed to the program, and wish to thank you all, especially teachers and young researchers who shared their experiences with a large international audience for the first time at ICME-10.

We are pleased to have seen so many participants from our countries at the congress. We had hoped for even more participants from the Nordic countries. We have reasons to believe that the time of the year – teachers have their summer vacation right now – may have been one reason for choosing not to go to ICME-10. Anyway, we hope that all those who have been here will share your experiences from the congress with your colleagues as much as possible. There will be plenty of opportunities to spread material, and even show videos from the excellent plenary sessions – Morten will explain this further – and I hope you will use these opportunities.

The Nordic Contact Committee and the Local Organising Committee as well as the programme committee have made efforts to create gender balance at ICME-10. We are happy that these efforts have yielded results, and that gender balance has been apparent at all levels in the programme.

To those of you who are going to PME in Bergen or to the HPM conference in Uppsala or perhaps on a tour to visit our countries I wish a happy tour and good luck. To those who are returning home I wish a safe journey and a happy return.

Thank you for coming and thanks to all of you for making the congress such a wonderful experience!

Finally – we are about to leave our Danish hosts. I would like to share with you a stanza from the Hávamál, words of wisdom from the Viking age. This stanza is about visiting friends and about leaving them.



I C M E  
1 0  
2 0 0 4

Closing Session

How to preserve friendship:

Go you must.  
No guest shall stay  
In one place forever.  
Love will be lost  
If you sit too long  
At a friend's fire.

Thank you!

### **Ole Björkqvist**

Our next speaker is Morten Blomhøj, Chair of the Local Organising Committee.

### **Morten Blomhøj, Chair of the Local Organising Committee**

Dear friends and colleagues.

ICMI-10 has now come to an end and it is time for us to reflect on what we have accomplished. This I shall do against the visions for ICME-10 set up four years ago by the Local Organising Committee and the Nordic Contact Committee.

In my judgement ICME-10 has proven to be a well organised congress. However, we are very well aware of the occasional problems with the technical facilities, which in a few cases were so serious that they destroyed some sessions. Please accept my sincere apologies for these incidents. We have, I must admit, underestimated the difficulties of operating a system for uploading and downloading presentations with which many presenters are not familiar. Also on the first day we experienced some problems with the logistics of lunch and happy hour. However, it is our hope, in the LOC, that all the good experiences and the many exciting programme sessions will wipe out these incidents of mis-organisation from your memory of ICME-10.

With regard to attendance, the number of participants from outside the Nordic countries, has actually met our expectations and our budget. Moreover, it is our judgement that ICME-10 has in fact attracted a varied attendance of mathematics teachers and mathematics education researchers from all over the world. The statistics show that ICME-10 has been a truly international congress.

As far as equal access is concerned it does appear that at least the composition of the IPC and the group of invitees display a gender balance which has been considerably improved compared to the previous ICMEs.

As I mentioned at the opening session our budget was originally planned for about 3000 participants so we had to cut down on all variable expenses in the last phase of the planning process. This is the reason why, we could not in all cases, maintain the standards we would have liked to offer.



I C M E  
1 0  
2 0 0 4

Closing Session

We have received quite a few requests for a DVD of the plenary sessions. Therefore, we have decided to produce and sell such a DVD. We expect the price to be approx. 250 DKK which more or less equals 40 USD. However, this scheme will only be realised if we receive more than 200 orders before September 1, 2004. So if you are interested, please sign up.

On behalf of the Local Organising Committee, I will express my deeply felt gratitude to all contributors to the ICME-10 programme, and to all ICME-10 participants. Personally, I would like to thank all members of the Local Organising Committee and of the Nordic Contact Committee for their extensive and effective work in the planning process of ICME-10. And once more, maybe twice more, I would like to warmly thank all parties who have sponsored and supported the congress financially.

On behalf of the Local Organising Committee I wish you all a safe journey home and a successful future in your professional life as mathematics teachers, teacher educators or researchers in mathematics education.

Thank you very much and goodbye!

### **Ole Björkqvist**

Mogens Niss, Chair of the International Programme Committee will speak on behalf of the committee.

### **Mogens Niss, Chair of the International Programme Committee**

Dear distinguished guests, dear colleagues, dear friends, dear participants.

Thank you for flying ICMI-10! It is my pleasant duty to express my sincerest and warmest thanks to all those who have been involved in the organisation of the scientific programme and its surroundings, committee members, organising teams, contributors, speakers, and participants in the different sessions. The possible success of this congress is all yours.

As has already been demonstrated we are not very strong on technical matters. I hope that the incidents that you have experienced will appear to you as mainly minor. There is, however, one major thing that we have not been able to deal with properly. That is the weather. Claudio Alsina, my dear friend from Spain, who was in my shoes for ICME-8 in Sevilla, said that we strongly need a new curriculum in Denmark, according to the following motto "Teaching in the rain". I hope that despite the possible drawbacks of different sizes you have enjoyed the scientific programme and have found ways to benefit from it in a multitude of different fashions. As I already said at the opening, and as Bernard was saying on behalf of the ICMI Executive Committee, we would very much like to have your feed-back on the scientific programme. Please fill in the questionnaire, return it to us or contact us in other ways. We would very much want to provide a heritage of inspiration and deliberations to our Mexican successors.



I C M E  
1 0  
2 0 0 4

Closing Session

There will be a proceedings after this congress. That is part of the registration package that participants have signed up for. The proceedings, I very much hope, will be out in a couple of years; that is our ambition at least. All invited speakers and all organising teams have been given a deadline, 15<sup>th</sup> October 2004, to submit their reports and papers. Deadlines and details have already been e-mailed to you, and I very much hope to receive all the material in due course. And then it just needs a little bit of polishing up – and the proceedings is ready; perhaps with a little delay due to the review process.

We will continue to maintain the web-site which you have been consulting widely, I suppose. We will maintain it for the coming four years up till the Mexico congress in July 2008. And we invite all teams to continue using the web-site as a platform for exchange and for further discussion and elaboration on what they have been accomplishing in the different groups. So, please look at the web-site from time to time and use it as a source of information on all news pertaining to the aftermath of the congress.

Well, it is then my pleasant duty to thank you all for having come. It has been an intensive week for all of us – for some it has been more than a week. I wish you a safe trip back, farewell, “ha’ det godt”, as we say in Danish, and be well. We are very much looking forward to meeting you again in all sorts of ways, in all sorts of places, if not before then in Mexico at ICME-11. Thank you!

### **Musical interlude, The Young Danish String Quartet**

Swedish hymn from Dalarne

### **Bernard Hodgson, Secretary General of ICMI**

We are now in a transition process from ICME-10 to ICME-11 and there are two steps which need to be taken in this direction. First, we have the feeling, that although ICME-10 is officially closed the congress is not quite over yet, so in order to have a proper end to this wonderful event I now invite ICMI President Hyman Bass to come to the podium to take care of an essential ingredient of this session.

### **Hyman Bass, President of ICMI**

It takes many, many people to make a congress and for this truly wonderful and enriching congress we owe warm thanks to an army of hard working and good humoured hosts and organisers. On behalf of ICMI Executive Committee, I want to take a moment to pay special tribute and more tangible thanks to the four people mentioned by Bernard who played key leadership roles in ICMI-10, Mogens Niss, Chair of the International Programme Committee, Morten Blomhøj, Chair of the Local Organising Committee, Elin Emborg, Administrative Secretary of the Local Organising Committee and the International Programme Committee, and Gerd Brandell, Chair of the Nordic Contact Committee.



I C M E  
1 0  
2 0 0 4

Closing Session

Gerd successfully led the committee that created and sustained the impressive collaborative effort among the five Nordic countries, Denmark, Finland, Iceland, Norway, and Sweden. We present her with a silver necklace with an amber pendant as a token of our appreciation.

Morten and Elin led the committee that provided the incredible energy and management that steered this awesomely complex event through to a successful completion. As a small token of our gratitude for this work we present them each with a giftcard for a dinner for two at the Brasserie Degas here in Copenhagen.

Finally, we pay a special honour to Mogens Niss. As chair of the International Programme Committee he provided the primary vision of the scientific programme of the congress and implemented it with great skill and sensitivity. Beyond the congress Mogens has played many leading roles in the mathematics education community with intellectual depth, rigour and eloquence. He is perhaps the most influential figure in ICMI in recent years having been a member of the Executive Committee for four years, Secretary General for eight years, and chair of the International Programme Committee of this congress for five years apart from many other services. When I asked Morten what qualities best characterise Mogens, he said "perfection". Mogens is a perfectionist. And he said, Mogens would likely agree saying, "yes, perfection suffices when it is perfect it is ok". We present Mogens with a fine ceramic vase produced by the well known artist Bodil Richard Manz.

### **Bernard Hodgson, Secretary General of ICMI**

Second, on behalf of the Executive Committee it is now my pleasure to pass the bâton, if I may use an Olympic analogy, from Denmark to Mexico. I now invite Professor Carlos Signoret, past President of the Mexican Mathematical Society, Sociedad Matemática Mexicana, and chair of the committee which prepared the successful bid to host ICME-11 to come to the stage to take charge of the last segment of this session.

### **Carlos Signoret, Chair of the Invitation Committee for ICME-11**

Distinguished colleagues from ICMI and from the organising committees, señor Ministro, dear colleagues from all around the world, dear friends.

Three years ago the Sociedad Matemática Mexicana organised in the Mexican city of Morelia, a joint meeting with the American Mathematical Society. It was at that time that we began to think about the possibility of placing a bid for hosting the ICME. Then we started wondering about the convenience of having the largest mathematics education congress in the world in our country. The community was consulted and the opinions we got back were almost unanimous. Hosting the ICME would be very beneficial to the mathematics education communities in Mexico and in Latin America. That was the idea we had in mind when we initiated the process, when we formed the pre-organising committee, when we placed the official bid, when we received our colleagues from ICMI, now our friends, for inspection visits, when we received the official "yes" from the EC and when we prepared the participation of Mexico in this ICME-10. And it is the main idea we have in our minds now that we are facing the tremendous responsibility



I C M E  
1 0  
2 0 0 4

Closing Session

and challenges that hosting ICME-11 represents. We are facing these challenges with a mature attitude knowing that the next four years will be full of intensive work. At the same time we are sure that the benefits that result from ICME are worth it, and therefore, we will remember this in every effort we make.

The Sociedad Matemática Mexicana, leader of the Mexican initiative has integrated the very heterogenous pre-organising committee in which every institution, every working group, every organisation related to mathematical education in our country is represented. Moreover, every institution or person who is interested in helping the organisation of ICME-11 for the sake of mathematics education is welcome. It is our perception that one of the multiple benefits that ICME brings to a particular community is the strengthening of unity and tolerance among its members. I am sure that many joint programmes with Latin America will emerge as a consequence of this congress. On behalf of the Mexican Mathematical Society I want to thank all the organisations that have made the Mexican bid a successful reality, CONACYT (Consejo Nacional de Ciencias Y Tecnología), SEP (Secretaría de Educación Pública), CINVESTAV, UNAM, UPN, Academia Mexicana de Ciencias, many provinces and university cities in Mexico, and the OCV Monterrey. And I want to express a special word of gratitude to the Mexican Embassy in Denmark, especially to the ambassador, Minister Vasconcellos Cruz, for his invaluable support to the Mexican National Presentation at this congress. Also many thanks to the Ministry of Foreign Affairs of Mexico for its support and help in bringing to Denmark most of the Mexican material for the National Presentation. I thank also Professors Mogens Niss, Morten Blomhøj, Elin Emborg, Henrik Nielsen, and the Local Organising Committee for their support to the Mexican delegation. Finally, I would like to thank the Executive Committee of ICMI for its positive answer to the Mexican bid. This shows confidence in our country in organising ICMI-11. You will not be disappointed. In particular, I want to thank Professors Hyman Bass, Bernard Hodgson, Michéle Artigue and Frederick Leung who visited our country, for their invaluable comments and questions that enriched both our bid and our scope of ICME. Exactly four years from now we will be in a closing ceremony like this one but in Monterrey. And I am sure we will be celebrating the most exciting meeting we have ever known: the Mexican ICME. Thank you!

Now let me introduce Professor Marcela Santillan, head of Universidad Pedagógica Nacional, to say some words.

### **Marcela Santillan, Rector of the National University of Pedagogy**

Dear colleagues and attendees to the 10<sup>th</sup> ICME.

In the early 70's Mexico started its work in mathematics education. Since then strong efforts to launch different programmes have been made to strengthen mathematics education in Mexico and in some of the Latin American countries with the participation of the main institutions in different countries. Another important feature of our Spanish speaking community has been the development of research and establishment of study groups in different areas. As a final remark I want to mention the growing interest of the Ministry of Education in having these groups as a reference to improve mathematics education in our country.

These are some of the reasons why, as mentioned by our president of the Mexican Mathematical Society, all the mathematics educators who have been invited to be part of the 11<sup>th</sup> international congress see this as a very important opportunity for Mexico and the other Latin American countries.



I C M E  
1 0  
2 0 0 4

Closing Session

Thank you very much to the ICMI Executive Committee and to the Local Organising Committee for the work at this ICMI-10 and for the support to ICME-11 that we have already received. They have joined us for quite some time so as to let us know what will be expected of us for the next four years. Once again, thank you very much to everyone. We hope very much to see you in four years in Monterrey in Mexico.

Finally, let me call upon Mr. César Ocaranza of the Mexican Embassy, Denmark.

### **César Ocaranza, Mexican Embassy, Denmark**

Good afternoon everybody! Distinguished members of the committee, ladies and gentlemen.

On behalf of the Mexican government it is for me an enormous honour and pleasure to extend to you a very warm invitation to ICMI-11 from 6<sup>th</sup> to 13<sup>th</sup> July 2008 in Monterrey, Nuevo León in Mexico. Every year Mexico receives millions of visitors from all over the world because of its landscapes, traditions, and people. Mexico is also a land of opportunity. On behalf of the Mexican government, I hope you will accept this invitation and join us in Mexico, Monterrey. You are very, very welcome. Thank you very much!

### **Musical final, The Young Danish String Quartet**

Carl Nielsen: String Quartet no. 4, F major, 2<sup>nd</sup> movement.

### **Ole Björkqvist**

I would like to remind everyone of the farewell gathering which will start immediately after this closing session, in this building. A Danish local Mexican band will play. Thank you!