Plenary activities

There will be translation for all plenary activities

First large theme:
"Comparison of experiences"
1. Plenary speaker: **Liping Ma,** Senior scholar, the Carnegie Foundation for the Advancement of Teaching, Menlo Park, California. Title to come

    Liping Ma has had a tremendous impact in the US and was very effective in her presentations at the CMS Meeting in Vancouver. She has written a book "Knowing and teaching elementary mathematics: teachers' understanding of fundamental mathematics in China and United States" reviewed by Roger Howe in the Notices of the AMS, vol. 46, number 8, 1999, page 881).
2. Panel: 4 panelists, one from each region of the country. Each panelist presents one or two problems of mathematical education put in context. He/she can also present one or two strengths.
3. Groups in each region of the country are organizing the panel and the witten documents to be distributed on the situation in each province. Persons in charge:
    - Edgar Goodaire et al , Atlantic
    - Stewart Craven, Ontario
    - Jean Dionne, Québec
    - Florence Glanfield, West

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Second large theme:
 "Critical thinking"
A subtitle is *"Mathematics to stimulate the brain; mathematics to enable students to function and innovate in the modern world"*

Plenary speaker : **Jean-Pierre Kahane,** Université de Paris-Sud

    Jean-Pierre Kahane, mathematician, a Past President of ICMI (International Commission of Mathematical Instruction), is a first-rank mathematician, and a very good speaker. He is a member of the French Academy of Sciences. He has chaired over the last few years the "Commission Kahane" appointed by the French Minister of Education to bring recommendations for the revision of all mathematics programs in the French schools (primary and secondary). The Commission Kahane has published dozens of Studies of all kinds on math school education.

Titre: *« Est-il bien utile d'enseigner les mathématiques? »*

Résumé:
On n'a plus besoin d'apprendre à faire des multiplications, ni à résoudre des équations, ni à représenter des fonctions: les calculatrices sont là, et le font mieux que nous! On n'a plus besoin de cours de mathématiques: de bons logiciels d'enseignement font l'affaire! Oui mais... Est-il encore utile de réfléchir, de raisonner, d'affronter l'inconnu? Ne sera-ce pas de plus en plus utile au cours de l'existence des enfants d'aujourd'hui? Comment

préparer les jeunes à un avenir imprévisible? Les mathématiques peuvent-elles y contribuer? Fournissent-elles, à la fois dans leur permanence et dans leur mouvement, des éléments de repères à la fois fiables et mobiles? Les professeurs n'ont-ils pas une importance nouvelle? On s'efforcera de donner plus de poids à ces interrogations qu'aux exclamations qui précèdent.

Plenary response : to be confirmed

Third large theme:
"Mathematics in the modern school: goals and challenges"
 Panel covering several themes: panelists
- Competitions and math circles: Ravi Vakil, Stanford University
- The need of industry in a mathematical education: panelist to be determined
- Goals and challenges in the classroom: André Deschênes, teacher, Québec
- Goals and challenges in the classroom: Kanwal Neel, Past President, BC Association of Mathematics Teachers

Kanwal Neel *"How does a teacher make their Math class interesting and improve Numeracy?"*

Abstract: Numeracy is Not just Numbers. One must teach Number Sense, Spatial Sense, Statistical Sense, and Sense of Relationship; Use Multiple Intelligences to teach and learn numeracy; Make students communicate their thinking and reasoning for any incorrect answers; Encourage discussion of mental strategies within the curriculum, puzzles and games which require logical thinking; Rehearse and provide development time for memorizing the "basic facts"; Activate Prior Knowledge and integrate Problem Solving; Connect Numeracy with Literacy and other subjects; You need to create a classroom atmosphere where the students feel secure, take risks in their learning and extend their learning potential. Always have a POSITIVE attitude!!!

André Deschênes *« À l'heure de la Réforme »*

Résumé : L'Éducation au Québec est en pleine effervescence. Le Ministère de l'Éducation vient tout juste de présenter un nouveau programme de l'École québécoise largement axé sur les thèses socioconstructivistes. Implanté au primaire depuis quelques années, le nouveau programme sera obligatoire au premier cycle du secondaire dès septembre 2004. L'enseignement des mathématiques, comme des autres disciplines, sera modifié de façon importante et les ordres d'enseignement supérieurs, collégial et universitaire, auront des ajustements importants à opérer. Voilà tout un défi pour les toutes personnes qui enseignent les mathématiques. Un avenir sombre ou ensoleillé ?!

Fourth large theme:
"Teachers education and development"

Plenary speakers: **Hyman Bass,** Dept of mathematics and **Deborah Ball,** Dept of educational Studies, University of Michigan

> They are very involved in ICMI: Hyman Bass is ICMI President and also President of the American Mathematical Society (AMS). Deborah Ball is co-chairing the Program Committee for the ICMI Study on Teacher Education. Deborah Ball and Hyman Bass have regularly given talks together. Both are excellent lecturers. As a matter of fact, they are together plenary speakers at the 25th Anniversary meeting of CMESG (Canadian Math Education Study group), May 2002 at Queens. On November 2 and 3, 2001 in the United States the Conference Board of the Mathematical Sciences, which guided the development of *The Mathematical Education of Teachers (MET)*, launched *MET* with a **National Summit on the Mathematical Education of Teachers** Deborah Ball and Hyman Bass gave a joint talk "Teaching, Learning, and Learning to Teach in Elementary Mathematics Methods" with many examples to show how much mathematics a teacher must know to teach even the most basic arithmetic.

Title "A Practice-Based Theory of Mathematics Knowledge for Teaching"

Abstract:
Teachers face problems and use mathematics in ways that are distinctively different from other mathematically-intensive professions such as engineering, physics, economics, or nursing. The problems that teachers have to solve demand flexible use of fundamental mathematical ideas, and fluency with mathematical representation, language, and reasoning. We argue that careful analysis of actual teaching practice can offer insights into the mathematical demands of teaching. Such insights can usefully ground improvements in the design of mathematics learning opportunities for both preservice and experienced teachers. This session will engage participants in firsthand experience with some of the mathematical problems that arise in teaching, and will also offer possible directions for new designs for teacher education.

Fifth large theme:
 "Summing up with a vision for the future"

All activities are plenary.

1. First panel: *"How to bring the ideas of the forum to the public? How to raise awareness of the importance of learning mathematics in schools?"*

The panel will bring together panelists from the media, from the scientific research councils, persons involved in popularization of mathematics. Two panelists confirmed: Heather Sokoloff of the National Post, Peter Calamai, science reporter at the Toronto Star. Other panellists invited: Ivar Ekeland, UBC, Yannick Villedieu, Radio-Canada.

2. Second panel: "*Going to the second Forum: how to increase the collaboration of mathematics educators across educational and across provincial boundaries*". The panelists raise shortly the issues as they are seen from various mathematics education groups. The participants in the plenary are then asked to suggest ways to address these issues or to address any other issue of collaboration that they would like to raise. Only one facilitator remains to chair the meeting and ensure that suggestions are raised but not

debated at any length. In particular the working groups present the directions of action they have identified in the working groups. A Canadian ICMI subcommission is one of the options arising out of this exercise. We hope to form subgroups that will work in regional meetings between the two Fora.

The minutes of this session will be recorded and a committee will be struck to work on the suggestions and to develop a report with recommendations that will be scheduled for presentation to a plenary session at the next Forum in Toronto.

The second Forum will be two years later, organized by Fields. At least 50% of the participants should have been already participants of the First Forum.

Conférence publique

Jean-Marie de Koninck, Université Laval

Titre : « Le plaisir des mathématiques »

Résumé :
Pourquoi s'acharne-t-on depuis des siècles à trouver de plus en plus de décimales du nombre π? Peut-on parler de la beauté des mathématiques? Est-il possible de comprendre les idées derrière certaines grandes d\'e\-cou\-ver\-tes récentes en mathématiques sans être un expert\,? Comment se fait-il qu'on est encore incapable de résoudre certains problèmes pourtant faciles \`a formuler, comme c'est le cas pour la conjecture de Goldbach (qui affirme que chaque entier pair supérieur à 2 peut s'écrire comme la somme de deux nombres premiers)\,? Voilà autant de questions que peut se poser le profane. Dans cet exposé qui s'adresse au grand public, nous allons entre autres illustrer comment on peut éprouver autant de plaisir à résoudre un problème mathématique qu'à écouter une belle pièce de musique ou à savourer un excellent repas. Nous allons aussi montrer que les mathématiques ne servent pas seulement à mieux comprendre le monde dans lequel nous vivons, mais qu'elles peuvent aussi s'avérer des plaisirs de l'esprit. Nous allons également défendre le point de vue de ceux qui prétendent que les mathématiques sont davantage un art qu'une science. Somme toute, nous allons montrer que les mathématiques peuvent être une activité amusante, enrichissante et passionnante.

One possible person from industry: Elisa Shahbazian, director of the research division at Lockheed Martin.