The Student Mathematical Communicator

Published by the CMS Student Committee

October 2001. Volume 2. http://www.cms.math.ca/Students

8th Annual CUMC a Great Success

The 8th annual Canadian Undergraduate Mathematics Conference was held at the Université Laval in June 2001.

Students attended and presented their research to huge cheering audiences.

The next conference is to be held at the University of Calgary from July 2-7, 2002. Plan now to attend.

For more information see http://cumc.math.ca.

CMS Winter meeting December 8-10, 2001 at Toronto

Why should I go?

Well, it's an opportunity to present your research in an oral or poster session.

On the other hand, you can attend some of the festivities such as plenary talks by expert mathematicians.

You can probably get money from your department or faculty to help with travel expenses. In addition, you can also get support from the meeting. See

http://www.cms.math.ca/Events/winter01/announce.html#grad_travel

Putnam Prowess

A team of three students (Jimmy Chui, Pavel T. Gyrya, Pompiliu Manuel Zamfir) from the University of Toronto placed 5th in the *61st International William Lowell Putnam Mathematical Contest.*

A team from the University of Waterloo (Sabin Cautis, Richard M. Hoshino, Joel Kamnitzer) placed 6th.

See http://math.scu.edu/putnam.

5 Medals at IMO

Competing against students from 83 other countries this past July in Washington, USA, Canadian high school students have won one gold and four bronze medals at the *42nd International Mathematical Olympiad (IMO).*

See Dr. Christopher Small's report at http://www.stats.uwaterloo.ca/~cgsmall/imo2001.public.report.html.

The six members of the 2001 Canadian IMO team are:

- Daniel Brox (Gold), Sentinel Secondary School, West Vancouver, BC,
- Paul Cheng (Bronze), West Vancouver Secondary School, BC,
- Liang Hong (Bronze), University of Toronto Schools, Toronto, ONT,
- Nima Kamoosi (Bronze), West Vancouver Secondary School, BC,
- Roger Mong (Bronze), Don Mills Collegiate Institute, Toronto, ONT,
- Shu Niu, **Port Moody Secondary School, Port Moody, BC.**

Prominent Article en Français!

Les enseignements à l'université se font en deux parties: d'une part, le cours magistral (CM), dans un amphithéatre face à une grande audience -- jusqu'à plus de trois cents personnes dans certains cas--, l'enseignant donne l'ensemble des résultats et la théorie; d'autre part, les travaux dirigés (TD), l'enseignant, avec des petits groupes d'une trentaine de personnes, passe en revue et applique les résultats vus en cours. La majeure partie de l'effectif des étudiants est dans les deux premières années du cursus : le DEUG (Diplôme d'Études Universitaires Générales). Il y a, en fait, à ce niveau, peu d'étudiants dans la filière mathématiques -- qui est, au niveau DEUG, soit une filière mathématiques-physique, soit mathématiques-chimie, soit encore mathématiques-informatique. Cependant, il y a beaucoup d'enseignements mathématiques dans les autres filières telles que la biologie ou les sciences de la terre. Les programmes des cours portent sur l'analyse de base (suites, séries, dérivations, intégrations, développement limitées, etc.) et l'algèbre linéaire (espaces vectoriels, morphismes, matrices, etc.). En général, ils comportent des sujets dont l'intérêt pour la filière en question est assez discutable. Bien que cela soit de moins en moins vrai, les étudiants qui viennent à l'université arrivent là pour la plupart parce qu'ils n'ont pas pu aller ailleurs -- notamment dans ce qu'on appelle les «classes préparatoires» -- ce qui explique un manque flagrant de motivation dans les années de DEUG, et se traduit dans les faits par un très grand pourcentage d'échec aux examens de passage.

Une fois les deux années du DEUG assées, les étudiants arrivent en Licence (une année d'étude) et doivent se spécialiser dans une matière. Pour les mathématiques, ils ont le choix entre mathématiques pures et mathématiques appliquées. La filière mathématiques pures n'offre que peu de débouchés : l'enseignement, dans le primaire ou le secondaire pour la plupart, dans le supérieur pour une très petite partie, ou la possibilité de rejoindre une école d'ingénieurs. La filière mathématiques appliquées permet des débouchés vers l'industrie (avec un passage ou non dans une école d'ingénieurs), la recherche, mais assez difficilement vers l'enseignement primaire ou secondaire. Les personnes se dirigeant vers l'enseignement secondaire peuvent passer un Maîtrise (un an d'étude) après la Licence. Les étudiants intéressés par l'industrie peuvent, après la Maîtrise, passer un DESS (Diplôme d'Études Supérieures Spécialisées) qui leur
donne un diplôme équivalent à un diplôme d'ingénieur. Pour la recherche, il faut, après la Maîtrise, entrer en DEA (Diplôme d'Études Approfondies) puis effectuer la Thèse. A partir de la Licence, l'enseignement ne comprend plus d'autre matière que celle choisit. Mais, bien sûr, les mathématiques, comme toutes les matières, se déclinent en un grand nombre de sous-matières parmi lesquelles les étudiants font leur choix.

We thank Dr. Xavier-François Roblot, l'Université Claude Bernard, Lyon, France, for contributing this article. The full article may be appreciated on our website.

CMS Student Committee Report

Chair Update

Since 1999, the CMS Student Committee has been actively involved in developing and sponsoring many student events and activities. August 31st sounded the end of the term of office for some of the founding members of the Committee. We would like to take the opportunity to thank the outgoing members of the Committee here and introduce our new members to the community. Information on individual members can be found on the Student Committee website.

The outgoing members are regional representatives Tullia Dymarz (Chicago, formerly at Alberta), Benoit Charbonneau (MIT, formerly at UQAM), and Student

Webmaster Andrew Irwin, (Rutgers, formerly at Queen's).

A number of founding members have been reappointed to maintain continuity within the Committee and complete current projects. They are regional representatives Susan Cooper (Queen's)—Susan also serves on the CMS Board of Directors, David Morgan (Alberta, formerly at MUN), Student Editor Robert Juričević (formerly Concordia), and Chair and Board member Daniel Piché (Waterloo). Regional representative Lindsey Shorser (Toronto) and Board Alternates David Burggraf (McGill) and Deidre Maher (McGill) continue their present terms for another year. In addition, Robert Woodrow (Calgary) continues to serve as Faculty Advisor, along with Graham Wright (Ottawa) an ex-officio on the Committee as CMS Executive Director.

Many new members are joining the Committee at this time. They are regional representatives Ana Duff (Ottawa) and Renato Dedić (Bishops), Webmaster Boris Krivulin (SFU) and the new CUMC President Andy Culham (Calgary).

A number of new positions have also been created. These include the Associate Student Editor position that will be filled by Antoine Khalil (Concordia). Antoine will be taking on the role of Student Editor as of July 2002. Andrew Irwin has accepted to serve as Associate Student Webmaster for the coming year to assist with the transition. Sylvain Hallé (Laval) will serve as Past CUMC Organizer. And last, but not least, the Committee has appointed Drew Vandeth (Ottawa) as Editor, CUMC Proceedings. Drew has already been working tirelessly to get students' articles so that we may begin a yearly publication of the Proceedings.

And finally on a personal note, I wish to thank everyone who has volunteered and contributed their time and energy to the Committee over the past two years and thank the new and returning members for their assistance in our continuing endeavours.

Sincerely,

Daniel Piché
Chair, CMS Student Committee

Regional Conferences Update

One of the ways the CMS Student Committee fosters relations between mathematics students across the country is by supporting regional conferences.

Since its inception, it has supported five regional conferences to a total of $800.

- Graduate Industrial Mathematics Modeling Camp, Simon Fraser University, May 2000, Pizza Party, $200.
- Industrial Problem Solving Workshop, University of Alberta, June 2000, Student Prize, $150.
- APICS Math/CS Conference, Dalhousie University, October 2000, Undergrad Pizza Party, $150.
- IAM-PIMS Undergrad Workshop, University of British Columbia, February 2001, Reception, $150.
- ISM Graduate Student Conference, McGill University, May 2001, Reception, $150.

If you would like to apply for this funding, send a proposal to student-funding@cms.math.ca. Proposals should be (at most) 50 lines and detailing the following:

- What, when, and where the event/conference/workshop is.
- How many students will attend.
- Which provinces the students generally come from.
- What their level of studies are (undergraduate or graduate).
- How much funding is needed (up to a maximum of $150).
- How the funding will be used.
- How the funding will be acknowledged (a few words at the event, a small sign, publication in a participant package, etc.).

Reported by David Morgan, Computer Science Student, University of Alberta.

Science Fairs

The Canadian National Science Fair was held at Queen's University and was a great success!

Students (grades 6 and up) from across Canada presented their work to the science community. Our team—Edward Barbeau (Queen's), Susan Cooper (Queen's), Pierre Gravel (RMC), Lucien Haddad (RMC), Morris Orzech (Queen's), David Wehlau (RMC) of judges presented 3 students with CMS awards. The recipients were:

Senior award:
Robyn Maler,
Wavelets and Brain Rhythms.
Intermediate award:
Yichuan Wang,
Math Challenge: The Card Game of 24.
Junior award:
Mahmoud Bazargan,
Calculating The Number of Triangles.

The CMS Student Committee looks forward to future involvement with Science Fairs, both regional and national.

Reported by Susan Cooper, Math Student, Queen's University.

HomePlay

Old Problem (from March Newsletter):

Let $S(p)$ be the length of the curve $y = x^p, 0 \le x \le 1.$ Show that $S(p)$ is an increasing function of p for $p \ge 1.$

Solution:

See Dr. Ken Davidson's solution at http://www.math.uwaterloo.ca/~krdavids/MATH/Assign7.pg4.sol.gif.

New Problem:

For any vector $a = (a_1, a_2, \ldots, a_n),$ with positive entries $a_i,$ let $G(a)$ denote the geometric mean of the entries: $G(a) = \sqrt[n]{a_1 \times a_2 \times \cdots \times a_n}$.

Prove that $G(a+b) \ge G(a) + G(b),$ for all such vectors a, b of n positive entries.

Establish when equality occurs.

Proposed by Dr. Christopher Small, University of Waterloo.

Address solutions to the address below.

The *Student Mathematical Communicator* is produced by the CMS Student Committee and is distributed to all math departments in Canada.
Address correspondence to student-editor@cms.math.ca.
The opinions expressed in the *Student Mathematical Communicator* are not necessarily those of the CMS Student Committee and its members, or of the Canadian Mathematical Society. Unless otherwise stated, all submitted material is the property of the *Student Mathematical Communicator* and is reviewed by the editors in accordance with existing policy, which is available on request. The editors reserve the right to make final editing decisions. Comments should be sent to the contact address given above.

©2001 CMS STUDENT COMMITTEE