For the four weeks we were housed by MITACS in the townhouses at SFU Residences. I really cannot describe the experience of having everyone live together for a month; all I can say is that it was incredibly awesome. The summer school would not be the same without this component.

What were the best parts? Learning in an environment that centred on investigation and innovation instead of around midterms and final exams. Getting an idea of what it is to work on industry problems and what I can do with my math degree when I graduate. Working and living with amazing math students from around world, who I would otherwise never have met.

Interested students for the upcoming summer school should definitely apply. Keep an eye out for the application form in early March 2010 on the MITACS website.

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Want info on everything involving math? Okay, we can't promise we have everything concerning math, but if you would like to receive notices and information about scholarships, conferences, graduate schools, job openings, and just about anything else useful to Canadian mathematics students, we can help. Our mailing lists are designed specifically for undergraduate and graduate math students. You can gain access to all the information you need by going to: **www.cms.math.ca/Students/Listserv** and joining our mailing list today!

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Géométrie pour tous

Contributor: Louis-Xavier Proulx

J'ai assisté il y a 2 ans à une conférence donnée par le professeur Étienne Ghys de l'École Normale Supérieure de Lyon. Cette conférence était présentée dans le cadre des Grandes Conférences du Centre de recherches en mathématiques (CRM). Données par des scientifiques dotés d'un excellent sens de la vulgarisation et de communication, elles ont pour objectif d'introduire le grand public à un domaine mathématique.

J'avais été très impressionné par les liens entre les systèmes dynamiques et la géométrie dans la présentation du Dr. Ghys. Les images utilisées avaient été fournis par un collaborateur de Ghys, Jos Leys qui a plusieurs galleries d'images disponibles sur son site web.

Il y a quelques mois, je suis tombé sur un nouveau projet de Ghys et Leys. Il s'agit d'une série vidéo, disponible en plusieurs langues, présentant de jolies résultats en géométrie. Destinée au grand public, elle mérite largement le détour, particulièrement la section traitant de la Fibration de Hopf. Bon visionnement!

http://www.dimensions-math.org/
http://www.josleys.com/

Math in Moscow Program

Contributor : Sarah Plosker

There are so many opportunities to travel when you speak the international language of "math". For instance, did you know about the Math in Moscow program? The Natural Sciences and Engineering Research Council (NSERC) and the Canadian Mathematical Society (CMS) offer three scholarships each year to attend one semester of classes at the Independent University of Moscow.

Canadian undergraduate students majoring in mathematics or computer science are eligible, although certain restrictions apply. The scholarships are $9,000 each and are meant to cover most of the costs involved in attending the program. All courses are taught in English, although courses in Russian literature and history (taught in Russian) are available for those who wish. The emphasis of the mathematics courses is on creativity and problem solving rather than memorizing theorems.

This program is a wonderful opportunity for any math or computer science undergraduate who is interested in pursuing graduate studies in the future. This is an invaluable experience that will help you in your mathematics career. We encourage all interested students to apply for the scholarship and the program.

Deadlines are March 31 for the fall semester and September 30 for the winter semester. Don't wait until the last minute to start working on your application!

http://www.cms.math.ca/Scholarships/Moscow/
http://www.mccme.ru/mathinmoscow/

MITACS Industrial Math Summer School 2008

Contributor: Natasha Richardson

This summer thirty undergraduate students from around the world came to Simon Fraser University for the MITACS Industrial Math Summer School. I had the incredible privilege of being one of these thirty students.

The summer school ran from July 14 – Aug 8, 2008. Over these four weeks, we worked in teams of five on an industrial math problem submitted by a company. The problems varied in scope and included topics such as finance, image processing and queuing theory.

In order to solve these problems we were required to synthesize the mathematics that we were learning as part of our undergraduate coursework with novel concepts specific to the problems. In addition, we had to work closely with the companies meeting their requirements of practicality as well as optimality. The summer school culminated with a final presentation of our solutions. Let me tell you, we accomplished a lot in a month.

The backgrounds of the thirty students were just as varied as the industry problems. Some of the areas of study of the participants include pure and applied mathematics, computer science, engineering, physics, statistics and business finance. Moreover, participants came from UBC, SFU, U of C, U of T, and McGill in Canada and other universities in the United States, Hong Kong, Mexico and Germany. The diversity of all of our backgrounds allowed for dynamic and successful team building and problem solving.

Get Involved

Contributor: Kseniya Garaschuk

Every University has a series of outreach programs, but somehow the Departments always struggle to find volunteers for these events. If you are interested in doing hands-on puzzles with kids, helping prepare math lectures for high school students or maybe even leading a problem solving session, then check out your home Department and you will find all sort of things happening.

Every year in summer several Universities across Canada host regional CMS Math Camps for students from grades 9 and 10. These Camps are by invitation only and are designed to provide students with a variety of activities, let them experience challenging yet fascinating mathematics. At Simon Fraser mathematicians engage the university community and the general public in a range of talks in "A Taste of Pi" lecture series. At University of Victoria math students and faculty participate in Math Mania, an event for grade two to five kids that presents a variety of interactive activities to demonstrate to children - and their parents! - fun ways of learning both math and computer science concepts.

All of these events are highly popular: for example, the waiting time for a school wishing to host a Math Mania event is about a year. So get involved and share you passion.

Mathematicians ranked as America's best job

Contributor: Kseniya Garaschuk

Compiling research on 200 different positions in US, this year's JobsRated.com report ranks mathematician as the country's best job, followed by actuary and statistician.

200 professions were evaluated according to five criteria: work environment, income, employment outlook, physical demands and stress. Mathematicians (defined as "people who apply mathematical theories and formulas to teach or solve problems in a business, educational, or industrial climate) fared best in part because they typically work indoors and in places free of toxic fumes or noise and also aren't expected to do any heavy lifting, crawling or crouching - unlike those toward the bottom of the list (lumberjacks, dairy farmers and taxi drivers).

Mathematicians' annual income was pegged at $94,160. Biologists, software engineers, computer systems analysts, historians, sociologists, industrial designers and accountants complete the top ten of best jobs. You can view complete ratings at **http://www.careercast.com/jobs/jobsRated**.

Contribute to Our Newsletter

Would you like to see your article features in the Fall Edition of our newsletter? If so the deadline for this is May 1, 2010. Send your submissions to **student-editor@cms.math.ca**

When Does Pure Math Become Useful?

Contributor: Nathaniel Johnston

At a conference this past summer, I presented a talk that discussed how one particular tool from operator theory (known as the "multiplicative domain") can be used to tackle a problem in quantum computing. Since a large portion of the audience consisted of physicists, this went over reasonably well – math was being used for something "useful." However, I then presented a generalization of the multiplicative domain and briefly discussed how and why it couldn't be used to tackle the associated more general problem in quantum computing. This diversion seemed to go over less well, as during the question period that followed, and again later at one of the breaks, someone (a physicist) asked me something along the lines of "what are those generalizations good for?"

Mathematics research is a funny sort of thing, since even in its most applied areas, new developments will not be seen in the "real world" for close to a decade, and in its least applied areas, new developments may take centuries to be linked with something concrete. As a result, it's all too common that, when telling relatives (or physicists) what we do, we get blank stares and responses of "what's that good for?" I suppose this is a fair question, since most of the time there is no immediate application. When the multiplicative domain was originally conceived and explored in 1974, it wasn't because there was a burning problem in quantum computing that needed solving – quantum computing had barely even been considered. So why was the multiplicative domain studied? Why waste time and money exploring something that has no apparent application?

In my mind, there are two reasons. Firstly (and I feel that this is the "standard mathematician answer"), it was studied because it's beautiful. Our way of understanding the world is through numbers and abstract concepts. No experimental error and no second-guessing; what's right is right. Secondly (and this is the answer that may actually appease non-mathematicians somewhat), it was studied because it would have an application eventually, even if the original author had no idea what that application would be. It's not a freakish coincidence that the multiplicative domain happens to describe and help us better-understand something very real – it happens all the time in mathematics. Science keeps coming up with new difficult problems, and we will always need a strong arsenal of mathematical tools to dip into. These tools might not be used for a "practical" purpose for 50 or 100 years, but they eventually will be.

So while the generalizations of the multiplicative domain that I presented don't appear at this very moment to be useful for practically solving problems in quantum computing, that's not the point. The point is that they will be useful. Maybe not for solving this particular problem in quantum computing, and maybe not for anything that we've ever heard about in our current world, but maybe in 35 years another student will be giving a talk on how generalized multiplicative domains can be used to solve problems in a science that hasn't even been invented yet.

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