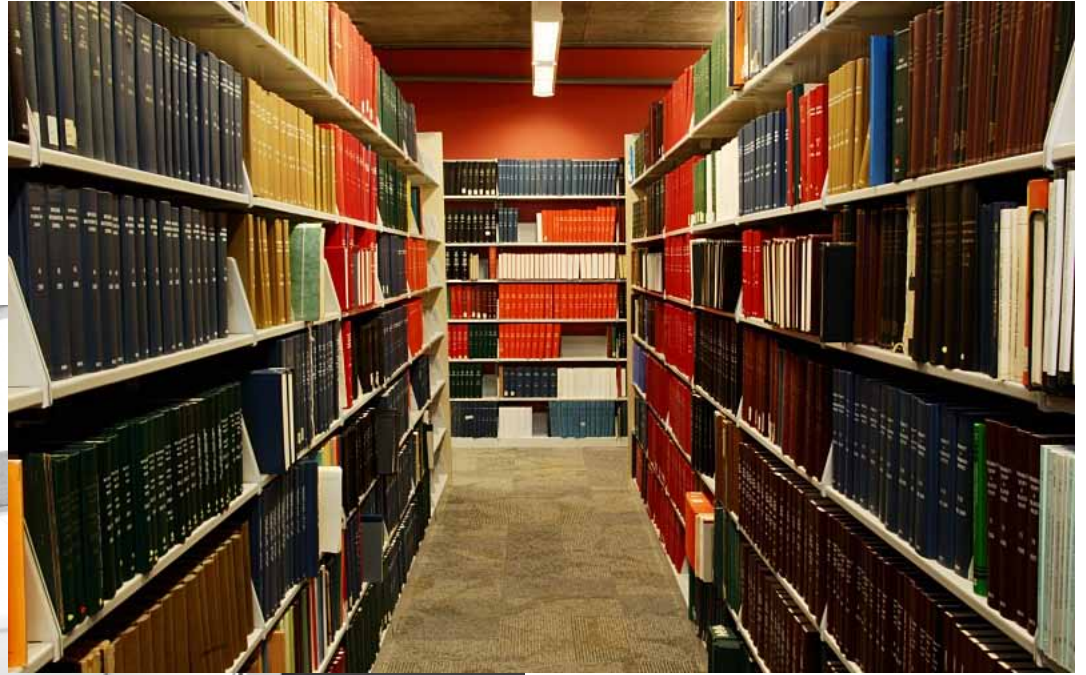


# Department of Mathematics

## Fall Newsletter - 2010



Photos Courtesy of Marco De la Cruz-Heredia



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## A Message from the Chair



This has been an excellent year and the department has a lot to celebrate and be proud of.

Three of our young colleagues (Spyros Alexakis, Larry Guth and Balazs Szegedy) received Sloan Fellowships, a record for our Department and for the University. Three members of the Department (Larry Guth, Alexander Nabutovsky and Jeremy Quastel) were invited to speak at the 2010 International Congress of Mathematicians, the largest number from any single Canadian university. Additionally, Bálint Virág won the Coxeter-James Prize and Joel Kamnitzer and Marco Gualtieri won Early Researcher Awards.

This year two of our staff (Beverley Leslie and Ida Bulat) and one faculty member (Jim Colliander) were recognized with Dean's Outstanding Achievement Awards. Three awards in one Department is another record!

In the upcoming year we hope to continue to build on our core strengths in research and teaching, finalize a bid to open a Center for Applied Mathematics and Statistics and expand our focus to accommodate an increasingly heterogeneous student population having a multiplicity of career goals. We also hope to increase our outreach activities and work more closely with our alumni and the general public.

I hope you will all join me in celebrating the great achievements of this Department over the past year as we look forward to even more in the coming year.

Kumar Murty  
Professor and Chair

## Who's Who in the Department

### Administrative Officers

- Murty, V. Kumar (Chair)
- Colliander, J. (Associate Chair)
- Sulem, C. (Associate Chair, Undergraduate)
- Bar-Natan, D. (Graduate Coordinator)

### Mathematical Sciences Library

[mathlib@math](mailto:mathlib@math), x88624

- Garrod, Bruce (Librarian)
- Vaez, Haleh (Library Technician)

### Administrative Support Staff

- **Birch, Donna** ..... **Undergraduate Administrator** ([dbirch@math](mailto:dbirch@math), x85082)
  - Responsible for undergraduate matters and student counselling
- **Brittain, Pamela** ..... **Executive Assistant to the Chair** ([pamb@math](mailto:pamb@math), x83317)
  - Provides secretarial services to the Chair; letters for visitors; tenure; promotion; academic search; CRC applications; seminar announcements; website content
- **Bulat, Ida** ..... **Graduate Administrator** ([ida@math](mailto:ida@math), x87894)
  - Graduate matters and student counselling
- **De la Cruz-Heredia, Marco** ..... **Computer Systems Administrator** ([marco@math](mailto:marco@math), x87893)
  - Provides technical guidance and tutorial service for faculty, staff and students; assists in maintaining our computer systems
- **TBA** ..... **Financial Assistant** ([tempmath@math](mailto:tempmath@math), x83460)
  - Accounts payable, accounts receivable, research accounts, teaching assistants payroll and records, postdocs and visitor payments
- **LeBlanc, Emile** ..... **Systems Manager** ([leblanc@math](mailto:leblanc@math), x83950)
  - Responsible for the operation of the Department's computing system
- **Leonardo, Diana** ..... **Receptionist** ([dianal@math](mailto:dianal@math), x83323)
  - General and manuscript typing, duplicating requests, keys and visitors; TA applications and database
- **Leslie, Beverley** ..... **Department Manager** ([leslie@math](mailto:leslie@math), x85194)
  - Administration of the Department, supervision of administrative staff, research assistant to the Chair, departmental budget
- **Merisca, Jemima** ..... **Department Office & Graduate Program Assistant** ([jmerisca@math](mailto:jmerisca@math) x83822)
  - Provides departmental secretarial services and manuscript typing, types NSERC applications and final exams, graduate office support and Postdocs letters

## Departmental Information

Telephone Number ..... (416) 978-3323  
FAX Number ..... (416) 978-4107  
Home Page ..... [www.math.utoronto.ca](http://www.math.utoronto.ca)  
Mathematical Sciences Library ..... (416) 978-8624  
Address ..... Department of Mathematics  
University of Toronto  
40 St. George Street, Room 6290  
Toronto, Ontario M5S 2E4 CANADA

## Emergency Contacts

Emergency: 911 (dial additional 9 first if calling from a dept. phone)

Campus Police:  
416-978-2222 (emergency)  
416-978-2233 (non-emergency)

Emergency Building Maintenance:  
416-978-3000

Caretaking  
416-978-6252

# Announcements

## New Faculty

Mark Braverman joined the Departments of Mathematics and Computer Science as a tenure-stream Assistant Professor effective July 1, 2010

Robert Young will join U of T Scarborough as an Assistant Professor effective July 1, 2011

Florian Herzig will join U of T as an Assistant Professor effective July 1, 2011

## Changes In Appointment

Catherine Sulem assumed the role of Associate Chair Undergraduate effective July 1, 2010

James Colliander assumed the role of Associate Chair effective July 1, 2010

## Faculty On Leave

### July 1 - December 31, 2010

Sergey Arkhipov, Victor Ivrii, Askold Khovanskii, Stevo Todorcevic, Balint Virag, Michael Yampolsky

### July 1, 2010 - June 30, 2011

John Bland, Larry Guth, Bill Weiss

### January 1 - June 30, 2011

Thomas Bloom

## New PostDocs

Name	Sponsor(s)	Field
Alexander Castro	Khesin, Fields, McCann, Khanin	Applied differential geometry. Focused on singularity theory and contact geometry (with applications to CR-Geometry and Symplectic Geometry)
Dezhong Chen	Alexakis, McCann	Differential geometry, geometric analysis
Dmitry Kerner	Milman, Kamnitzer, Kapovich, McCann, Scherk, Murty, Arkhipov	Singularity Theory; Algebraic Geometry
Meng Fai Lim	Rochon, Murty	Algebraic Number Theory, specifically Iwasawa theory
Quentin Merigot	Jerrard, McCann, Fields AGA	Approximation questions in geometry
Amir Moradifam	MITACS award; Robert McCann	Elliptic Partial differential equations, Calculus of Variations, Functional inequalities, Mathematical physics, and Fluid Mechanics
Daniel Moskovich	Bar-Natan	Low-dimensional topology; finite type invariants, applications of knot theoretical invariants, algebraic geometry, TQFT, knot concordance, combinatorics
Daniel Remenik	Quastel, Fields	Probability theory and stochastic processes
Fedor Soloviev	Khesin, Gualtieri, Jeffrey, Karshon, Kamnitzer	Integrable systems, isomonodromic deformations, algebraic geometry.
Hamid Usefi	Murty	Lie Algebras, group algebras, combinatorial algebra, representation theory, coding theory, cryptography
Oded Yacobi	Kamnitzer, Meinrenken, Arkhipov	Representation theory of Lie groups, and its interactions with invariant theory, combinatorics, and algebraic geometry
Tatiana Yarmola	Khanin	Dynamical Systems and Statistical Mechanics
Ke Zhang	Khanin	dynamical systems (Hamiltonian dynamics and Arnold diffusion), ergodic theory and thermodynamic formalism

## Graduate News

This year we have 134 graduate students registered with the School of Graduate Studies: 20 MSc (19 new + 1 returning), 8 MSc Part-time (4 new + 4 returning), 102 PhD (10 new + 17 continuing from their MSc + 75 continuing), and 4 Special students (3 exchange students + 1 continuing). We also have 7 visiting students registered in other programs abroad and are here for periods of 1 month to 1 year.

## Congratulations

Congratulations go to Professor Natalie Zemon Davis of the History Department here at the University of Toronto (Professor Chandler Davis' wife) who has been awarded the prestigious Holberg Prize for outstanding scholarly work in the fields of the arts and humanities, social science, law or theology. The prize, awarded annually, is worth \$785,000US.

## Faculty Announcements

Florian Herzig has accepted our tenure-track offer to fill the Arithmetic Algebraic Geometry position. Florian graduated from Harvard in 2006 and has been a postdoc at Northwestern for the past three years. He will spend the year 2010-2011 at the IAS and will come to Toronto in the summer of 2011.

Robert Young has accepted the offer of a tenure-stream appointment in the Department of Computer and Mathematical Sciences at Scarborough and the Graduate Department of Mathematics. Robert received his Ph.D. from the University of Chicago in 2007 and works in geometric group theory. He spent 2007-2010 at the IHES in France and he is currently a postdoc at the Courant Institute. He will join us on July 1, 2011.

## Birth Announcements

Jemima and John Merisca are proud to announce the arrival of their daughter Isabelle on January 15, 2010.

Congratulations to Andrew Kellam and his wife Emily as they welcome their second daughter, Lorelei Linda Holbert Kellam, born on August 13, 2010

## Farewell

The Department sends good wishes to Charles Pugh, Michael Shub and Federic Rochon who finished their term with our Department on June 30, 2010.

We wish Andrew Kellam and his family all the best as they are leaving the city at the end of October.

## In Memorandum

We were deeply saddened by the loss of Professor Avner Magen. He was on a climbing expedition in Alaska's Denali National Park and Reserve with Dr. Andrew Mark Herzenberg on Saturday, May 29, 2010 when they were killed by an avalanche. Professor Magen was an associate professor in the Department of Mathematical and Computational Sciences at the University of Toronto Mississauga.

Additionally, Professor Jerry Marsden from Caltech passed away on September 21, 2010. Prof. Marsden was the first Director of the Fields Institute and he had a significant involvement with Canadian mathematics.

On September 30th, 2010 the mathematics community lost Professor John Coleman. He was a CMS president, a CMESG founder, and was described as an altogether remarkable man. He was also known for his work as senior editor of the Gage series of school mathematics textbooks which effectively brought the "New Maths" to Canada. His presence will be deeply missed.

# Honours and Awards

## Department Members Honoured

On April 14th, 2010 one faculty member and two staff members were honoured with Dean's Outstanding Achievement Awards.

Ms. Beverley Leslie, Department Manager was awarded with the Dean's Distinguished Service and Ms. Ida Bulat, Graduate Administrator was honoured with the Dean's Student Life Award.

In addition Professor James Colliander received the Dean's Outstanding Teaching Award.

For their achievements each were profiled in the Faculty of Arts and Science Newsletter.

Beverley speaks about her almost 25 years in the department and her reactions to winning such a prestigious award: "I just try to provide a high-quality environment for teaching and research, and the service that people deserve." Which anyone in the department knows, she does on a daily basis.

Ida is quoted as saying: "I'm not here to get awards, I'm here to do my job." The article is an excellent profile of the selflessness that Ida shows towards her job and the department as a whole.

Professor Colliander's article focuses on how he uses cold hard cash (a loonie) to entice his students to think "outside the box".

Congratulations to all three!



## 3 Sloans, a New Record

This year the department celebrated the receipt of three Sloan Fellowship Research Awards.

The winners were Larry Guth, Spyros Alexakis and Balazs Szegedy (UTSC)

UofT Bulletin wrote: "With three Sloan recipients, the Department of Mathematics has set a new U of T record for the number of fellowships going to a single department. Of 19 Sloans awarded to mathematicians this year, three went to U of T, two went to SUNY, Stony Brook and 14 other universities, got one each."

## Humboldt Award

Professor Ragnar-Olaf Buchweitz was awarded the prestigious Humboldt Research Award from Germany.



In a recent article for the University of Toronto's 'the Bulletin' Professor Buchweitz was quoted as saying "I was delighted that I was awarded this prize. I am also humbled by this wonderful recognition by the German scientific and academic community."

## Coxeter-James Prize

Professor Bálint Virág of the Department of Computer and Mathematical Sciences (UTSC) and the Graduate Departments of Mathematics and Statistics on the St. George campus was awarded this year's Coxeter-James prize in Mathematics.

## Andre Lichnerowicz Prize

The Andre Lichnerowicz prize was established in 2008 to be awarded for notable contributions to Poisson geometry. This year's prize went to Professor Marco Gualtieri.

*If you would like to bring someone forth for an award nomination please contact the Awards Committee chaired by [Professor Almut Burchard](#)*

# Honours and Awards (cont)

## Former Students Win Prestigious Award

Two former students of Professor Askold Khovanskii have won significant awards in Mathematics.



Valentina Kiritchenko was one of 3 winners of the 2009 Dynasty Foundation Award and Vladlen Timorin was one of 2 winners of the 2009 Pierre Deligne Award.

## 1st Annual Atkinson Award

The inaugural Atkinson Teaching Award for excellence in undergraduate teaching by a Post Doctoral Fellow was awarded this year in April. The winner of this year's award was Marina Chugunova. The winners are chosen based on nominations and comments from faculty and students.

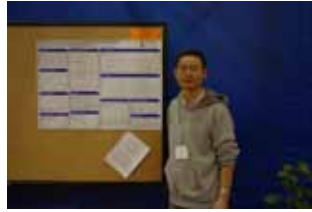
## Student Wins Rising Stars Poster Prize

Congratulations go to Sergio DaSilva whose poster, titled "Oda's Strong Factorization Conjecture and its Implications in Toric Geometry", won for the most outstanding poster in his section at the Rising Stars of Research.

More information on the contest can be found here:

<http://www.risingstars.ubc.ca/>

## Student Poster Wins CMS Award



Xiao Liu, a second year PhD student currently working with Professor Catherine Sulem, was recently honoured by the CMS for his poster presentation on "Numerical Simulations of Resonant Tunneling of Fast Solitons for Nonlinear Schrodinger Equations".

## TA Shortlisted for Award

Andrew Holm, a TA within the Mathematics Department, was recently nominated for the 2010 Teaching Assistants' Training Program (TATP) Teaching Excellence Award.



Out of 189 nominated TAs (with over 500 nominations) he was one of 12 chosen to be short-listed for the award.

The purpose of the award is to recognize outstanding achievements of teaching assistants across all four divisions in the School of Graduate Students at the University of Toronto.

It is a great achievement for Andrew and once again recognizes the excellence in our TAs within the department.

## Delury Award Winners

The Delury Award is given annually to recognize excellence in the department's teaching assistants. It is usually given to a senior TA (but not always) and is used to recognize the best TAs in the department.

This year's winners were:

Omar Antolin Camarena  
Yuri Burda  
Brendan Pass

## Alumni Honoured with Order of Canada

Congratulations to alumnus John Mighton, an award-winning playwright, founder of the Junior Undiscovered Mathematical Prodigies (JUMP Math) program and triple graduate of U of T, who was named an officer of the Order of Canada.

The Order of Canada is this country's highest civilian honour for outstanding lifetime achievement. The awards were announced on June 30 by Governor General Michaëlle Jean and welcomed 74 new appointments to the order. This included five U of T faculty members and seven alumni.

# Contests and Competitions

## Undergraduate Mathematics Competition

The contest, started by Professor Edward Barbeau in the spring of 2001, provides an opportunity for undergraduate students to compete in mathematics and practice their competition skills. The contest is open to all undergraduate students. This year there were 31 participants.

This year's winners were:

- 1st place: Alexander Remorov
- 2nd place: Sida Wang
- 3rd place: Keith Ng
- 4th place: Victoria Krakovna
- 5th place: Sergei Sagatov

Congratulations to all participants!

## Math Kangaroo and Tournament of Towns

This year marked the 4th annual Kangaroo Math competition.

The 60 minute, multiple choice contest was written by over 500 students in grades 3 - 12 on Sunday, March 28th across all three campuses.

An awards ceremony was held in late April to congratulate the winners.

Many staff, faculty and students from the faculty volunteered their time to help ensure the day was a success.

## Putnam Competition Results

The Department would like to congratulate this year's Putnam competition team. Once again the Mathematics Department at the University of Toronto has placed in the top ten. We share this honour with MIT, Harvard, CalTech, Stanford, Princeton, Duke, Maryland, Virginia and Waterloo

This year's team:

Victoria Krakovna - This is the fourth time she has participated in the competition and last year she won the Elisabeth Putnam prize for best result by a female student.

Alexander Remorov - This is the second time he has participated.

Konstantin Matveev - This is his third participation in the competition where he made the top 20 last year and the year before that.

*Thanks go to Edward Barbeau, Iia Binder, Victor Ivrii and Olga Zatiseva for organizing and running many of the competitions and contests taking place in the department this past year.*



# Featured Article

## A Showcase of Undergraduate Research

Article By: Brian Pigott

Each year senior undergraduates in the Math Specialist program at the University of Toronto take a seminar course taught by a senior faculty member. A glance at the course calendar provides almost no information about the course, with the exception of the phrase "Student presentations will be required."

During the 2009-2010 term, this course was taught by Professor P. Milman who took the presentations to a new level using a new Departmental Wiki page to showcase these innovations. When asked about the purpose of the course Professor Milman said "I wanted to force them to prepare good talks that the other students could absorb."

Students were required to prepare notes on a topic approved by Professor Milman using Beamer, a LaTeX document class used for preparing slides for presentations. These slides would then be distributed to the audience to be used as an aid for following the seminar. Professor Milman reviewed the notes ahead of time to make sure they were succinctly brief so as not to be read like a book during presentations. This brevity meant that questions played an integral role in the seminars with Professor Milman assigning participation marks to the students based on their level of engagement in the presentations. "If you want to be a mathematician, you have to learn to ask questions," he said.

The presentation topics themselves were diverse, covering major theorems from differential topology, algebraic geometry, resolution of singularities, and others. For many of the students, this was their first time reading research articles or advanced textbooks. From the perspective of the students, the workload was enormous. Will Pazner, a third-year undergraduate who was registered in the course, said, "I have never worked that hard on a single project before, especially leading up to the presentation date."

That hard work paid out in the end, though. Janet Li, a fourth-year student in the course, said that she took away a confidence in her ability to prepare and deliver a good presentation. "(Professor) Milman's dedication really motivated us," she said. According to Paul Harrison, a fourth-year undergraduate, "It gave me a whole new appreciation for how much work the professors put into preparing lectures."

Professor Milman put in his share of hours as well, from spending six hours on the phone on a Sunday with Janet Li, to what Will Pazner figured to be twenty hours in his office answering questions. Paul Harrison said that he felt more like a collaborator than a student with Professor Milman.

Altogether there were fifteen presentations given in the course, with one talk being given by a student who wasn't officially part of the course but who wanted to participate nonetheless.

At the end of the course, each student received a gift from Professor Milman: a CD with a class photo, preliminary materials prepared by Professor Milman, and the slides from each of the presentations.

When asked what it was that he hoped students took away from the course, Professor Milman replied, "I wanted them to see mathematics as a whole (though none of the students chose a topic in analysis) and to experience at least some aspects of the working life of a mathematician."

For more information or to see the slides from the presentations, please visit the official Wiki page for the course: [http://wiki.math.toronto.edu/TorontoMathWiki/index.php/2009-2010\\_MAT477\\_Seminar](http://wiki.math.toronto.edu/TorontoMathWiki/index.php/2009-2010_MAT477_Seminar)

# Events

## 2009/10 Scholarship Reception

On March 31st, staff, faculty, alumni and students gathered in Hart House to celebrate recent scholarship winners and donors.

The Mathematics Department was proud to celebrate this event with a number of outstanding scholarship winners from the department as well as Professor George Elliott, an honoured donor.



## Science Rendezvous

On Saturday, May 8th the Department of Mathematics participated in the 3rd annual Science Rendezvous. The event is a celebration of science and follows a festival format to bring science education and UofT research to the general public.



## Spring Reunion 2010

On Saturday, May 29th the University of Toronto held it's Spring Reunion for Alumni who graduated in a year ending in 0 or 5.

The Math Department held it's own event as part of it entitled "A Celebration of Mathematics". The turn-out was good and participants were treated to a series of three lectures from three distinct speakers.

Participants heard a brief history of the Department from Professor Kumar Murty. They then heard from one of the department's undergraduate specialist math students and head of the undergraduate math union Richard Cerezo. The final talk was a brief taste of Professor Jeremy Quastel's International Congress of Mathematics (ICM) talk.

# IT Updates

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The main computing help page is at:

<http://www.math.toronto.edu/cms/computing>  
(or click "About" then "Computing" from the main departmental page).

There you will find information about email and spam filtering, wireless networking, contacting people for help, setting up blogs and wikis, and so on.

There is a Search button on the upper right corner of the main departmental webpage and that can be helpful for finding information.

## Printing

The main printers are "lw2" in the mail room (Room 6290A) and "lw3" in the computer room (Room 6200). There are other printers in various other buildings on campus where the math department has offices.

If these printers run out of paper or if the toner is low please see Diana at the front desk.

The "pdftk" command has been installed for PDF file manipulation. Try "pdftk --help" for more information. Also, the "psutils" family of commands for PostScript file manipulation are installed. Try "man psselect" to find out how to select certain pages from a (conforming) PostScript file. PDF appears to be the more useful format these days, though.

We have a local command "Print" for handling most print jobs and running "Print -d file" will display the file on your screen (if you are running an X server) and you can preview what will be printed. Running just "Print" will give a summary of options for the Print command (for example "-M" selects manual feed).

## New Equipment

The new departmental photocopier can scan and email the results to your account. There is also a scanner in BA6200 that can be used.

For IT and technical help please speak with Emile LeBlanc or Marco De la Cruz-Heredia in the main office. Website questions should be directed to [webmaster@math.utoronto.ca](mailto:webmaster@math.utoronto.ca)

Other contacts can be found on our website at:  
<http://www.math.toronto.edu/cms/contact>