The George Washington University

Department of Mathematics
Newsletter

December 2011

Book Publication: Professors Robbie Robinson and Dan Ullman published a book "A Mathematical Look at Politics" that discusses some mathematical ideas that arise in politics, including voting methods, apportionment, game theory and an analysis of the Electoral College. See http://www.taylorandfrancis.com/books/details/9781439819838/. This has led to a newly created course (Math 1007: "Mathematics and Politics") which is very popular among GW undergraduates in liberal arts.

Simons Foundation Grants: Professors Svetlana Roudenko and Hao Wu each received a Simons Collaboration Grant for Mathematicians. This is a new initiative from the Simons Foundation that seeks to increase collaborative contacts in the community of mathematicians working in the United States. It provides five years of support for each award recipient. In addition, the mathematics department receives an additional $1,000 per award that can be used to enhance the research atmosphere within the department. Congratulations to Professors Svetlana Roudenko and Hao Wu for being among the 188 awardees nationwide for this award! The list of the awardees for last year's Simons Collaboration Grant can be found at: https://simonsfoundation.org/collaboration-grants-awardees

Math Department Coffee Hour: The funding from Simons Foundation has allowed us to start a weekly Math Department Coffee Hour (Tuesdays 12:15- 1:00) which creates an environment for faculty and students to interact each other regularly. It provides an opportunity for our faculty and students to meet and interact regularly. It also provides a platform for us to invite friends and guests to our department.

Summer Program for Women in Mathematics: The Summer Program for Women in Mathematics (http://www.gwu.edu/~spwm/), directed by Professor Murli Gupta, continues to be extremely successful. Has just concluded its 17th year; funding request for the next two years is currently pending. SPWM 13th reunion will be held in Boston on January 5, 2012 in conjunction with the Joint Math Meetings (JMM). Info at: http://www.gwu.edu/~spwm/reunion.html.

Knots in Washington: Professors Valentina Harizanov, Jozef Przytycki (PI), Alexander Shumakovitch, and Hao Wu received an NSF grant for Knots in Washington Conferences ("Knots in Washington; A Conference Series on Knot Theory and its Ramifications") for 3 years starting September 1, 2011. The next conference, "KNOTS IN WASHINGTON XXXIII Categorification of Knots, Algebras, and Quandles; Quantum Computing", will take place December 2-4 2011 (see http://home.gwu.edu/~przytyck/knots/knotsinwashington33.htm); the conference organizers are: Valentina Harizanov, Mark Kidwell, Jozef H. Przytycki, Yongwu Rong, Radmila Sazdanovic, Alexander Shumakovitch and Hao Wu. Valentina Harizanov and

Jozef Przytycki are also co-editors of recently published two volumes of the conference Proceedings (in JKTR).

The following description of the conferences is from Wikipedia: Knots in Washington is an international conference on knot theory and its ramifications held once or twice per year since 1995. The main organizers are Jozef Przytycki and Yongwu Rong, both at George Washington University. This conference has become an important topological event in the Washington Metropolitan Area and regularly attracts participation of many well known topologists from other areas of the US and from other countries. For example, Knots in Washington XVIII, held in May of 2004, was the first conference fully devoted to the Khovanov homology, with Mikhail Khovanov giving a series of talks and leading experts, Dror Bar-Natan, Lev Rozansky, and Oleg Viro giving plenary talks. Knots in Washington XX was dedicated to the 60th birthday of Louis H. Kauffman (Wikipedia http://en.wikipedia.org/wiki/Knots_in_Washington). Valentina Harizanov and Jozef Przytycki are also co-editors of recently published two volumes of the conference Proceedings (in JKTR).

NSF Grants: Professor Valentina Harizanov is a Principal Investigator (PI) for the individual NSF research grant DMS-0904101: "Topics in computable mathematics," July 2009 – June 2012. This grant has provided support for books, travel or summer stipend for Jennifer Chubb, Kai Maeda and Leah Marshall.

A $1.2 million NSF grant has been awarded to Professors Yongwu Rong, Chen Zeng (Physics), and Rahul Simha (Computer Sciences) to do their collaborative research on topology and dynamics of biological networks.

Professor Svetlana Roudenko received a new Analysis NSF grant to do research on nonlinear dispersive PDEs for $125K for 3 years. Because she also has an NSF grant, she had to give up some of the money from Simons Collaboration Grant, for which she deserves another congratulation!

American Mathematical Society (AMS) Regional Meeting: GWU will host an AMS Regional Meeting during March 17-18, 2012. A special lecture, the **Einstein Lecture**, will be delivered by Professor Gunther Uhlmann of UC-Irvine on Saturday, March 17, at 5:00 pm in Funger Hall, room 108 (http://www.ams.org/meetings/sectional/2194_events.html).

To mark the **100th anniversary of Turing's birth**, the Turing Centenary Advisory Committee is coordinating the Alan Turing Year, a year-long program of events around the world honoring Turing's life and achievements. One of such events is a special session on Computability (in honor of Alan Turing) being organized by Professor Valentina Harizanov at the AMS meeting at GWU in Spring 2012. Invited speakers include Jennifer Chubb, Rumen Dimitrov and Kai Maeda. Also, Harizanov and Chubb have been invited to give a talk at the Isaac Newton Institute Workshop on the Incomputable, Kavli Royal Society International Centre, Chichley Hall, UK, June 2012 http://www.mathcomp.leeds.ac.uk/turing2012/inc/

Outside Collaboration: Professor Valentina Harizanov played a key role (with mathematicians

from Notre Dame and Wisconsin) in organizing research collaboration of US with Russia/Kazakhstan in computable mathematics. This collaboration has been funded by NSF since 2000. Our recent new proposal "Collaboration in Computability," PI: Julia Knight of Notre Dame, was funded, May 2011 – April 2014. Our alumni, Jennnifer Chubb and Rumen Dimitrov, are also on this new grant. Last spring Dmitry Trushin, Moscow State University, visited at spoke at GWU as part of this collaboration. Professor Harizanov gave a plenary talk at the Mal'cev Meeting (international conference on algebra, mathematical logic, and applications), Sobolev Institute of Mathematics, Novosibirsk, Russia, October 2011. High profile speakers included: Peter Shor (MIT, Nevanlinna Prize), Samson Abramsky (Oxford, co-director of Quantum Group), Bob Coecke (Oxford), Christopher Monroe (Joint Quantum Institute), and Jeffrey Bubb (University of Maryland).

Center for Quantum Computing, Information, Logic and Topology was chartered at GWU starting January 1, 2011. Its primary faculty members are: Valentina Harizanov, Jozef Przytycki, Ali Eskandarian (Physics) and William Parke (Physics). The primary mission of the Center is to add synergistic coherence to GW contributions toward advancing the subject of quantum computing. By promoting scholarship, collaboration, and dissemination via research volumes, seminars, workshops, and conferences at GW, the Center provides leadership for the Washington area in quantum computation and information theory. Info at: http://www.gwu.edu/~qubits/index.htm.

Research Collaboration: J. Chubb (our alumna), A. Eskandarian and V. Harizanov are co-editing a research volume Lecture Notes in Logic: Logic and Algebraic Structures in Quantum Computing and Information, to be published by Cambridge University Press. This volume grew out of the annual meeting of the North American Association for Symbolic Logic held at GWU in spring 2010. At this meeting, Goedel lecture was given by Alexander Razborov (Nevanlinna Prize recipient).

Graduate Student Invited Talk: Jing Wang (PhD student of Professor Jozef Przytycki) gave an invited talk "*Homology of a small category with functor coefficients and barycentric subdivision"* at the AMS Special Session on "Category Theory in Graphs, Geometry and Inverse Problems", 2011 Fall Western Section Meeting, University of Utah, Salt Lake City, UT October 22-23, 2011.

Facebook Presence: We have created a department Facebook page. It can be easily accessed from our department website http://www.gwu.edu/~math/ and click the link GWUMath on Facebook (http://www.facebook.com/pages/GWUmath/169080473142257). We hope you will "**like**" it.

Other news of significance:

- Professor Dan Ullman became Associated Dean for Undergraduate Studies at the Columbian College of Arts and Sciences. We are excited with the opportunity to work

with him in this capacity to significantly improve our undergraduate teaching.

- In an effort to hear directly from our undergraduates, we started a sequence of "Round Table Conversation with GW Undergraduates" this semester.
- Two math clubs have been formed this semester. One is the "GW Math Club," led by Dina Daniyarova (president) and Landon Elkind (vice president). The other is "Mothers Functions," led by Samantha Emanuele (president).
- Our graduate students continue to run our Graduate Student Seminar.
- GW 2010 Putnam exam students do well.
- GW 2011 Mathematical Contest in Modeling team earns honorable mention.
- MSRI "Circle on the Road" to come to campus in spring 2012.
- Our math major (double with Physics) Clarke Smith has been awarded GW George Gamow Undergraduate Research Fellowship for 2011–12 to work on a categorical semantics of quantum protocols with Professor Valentina Harizanov.

Donate to GW Mathematics Department and to GWU

Previous donations to our department have been used to support our teaching and research activities such as seminar and colloquium talks, travel to conferences, department events such as welcome parties and graduation parties, prizes for our students, and travel for graduate students some of which comes from the Rodica Simion Memorial Fund. Looking ahead, we see many good ways to make use of money from our donors. For example: we can create new awards for our students such as teaching awards for our teaching assistants, or outreach awards that encourage students to think outside the box. We can use money to establish a postdoctoral position, or an endowed professorship. We can use the money to provide spring water for our students so they will not have to drink tap water. We can use the money to bring in visitors.

A group of math faculty has volunteered match any monetary donation to Math Department during Professor Rong's term as chair, up to $1,000. If you would like to donate to GW Math Department, please go to the following link on our website:
http://www.gwu.edu/~math/giving/giving.html

Please write to us at mathalum@gwu.edu or to me personally at rong@gwu.edu.

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