DREXEL UNIVERSITY
College of
Arts and Sciences

Department of Mathematics

Annual Report 2014-15

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Message from the Department Head

Dear Alumni and Friends,

It is with pleasure that we present our department's annual report which highlights the activities and accomplishments of our faculty, staff and students.

The last few months have been difficult for the math department with the loss of Malinda Gilchrist, our colleague and friend. The department and in particular the front office won't be the same without her.

Despite this loss, however, 2014-2015 was a year of tremendous accomplishment for Drexel Mathematics. We've designed new freshmen course sequences, taught thousands of students successfully, and graduated more PhD students than ever. Our faculty have been awarded several grants from the National Science Foundation and the Simons Foundation. Many of our mathematics majors have received awards and honors. We've improved our math major with more flexible requirements, and we've even expanded our seminar room.

We also give a warm welcome our new faculty members, tenure track Assistant Professor Xiaoming Song, adjunct faculty Shwetketu Virbhadra , and visiting faculty Taoufik Meklachi.

We hope that you are as excited about our department as we are. Please share with us any feedback you may have, or come by and visit us in Korman center.

Thank You and Best Wishes,
Shari Moskow, Professor & Department Head

Tenure / Tenure Track Faculty

David M. Ambrose, Ph.D. (Duke University) Associate Professor—Associate Department Head.
Applied Analysis and Scientific Computing for Non– linear Systems of Partial Differential Equations, especially free-surface problems in fluid dynamics.

Jonah Blasiak, Ph.D. (University of California, Berkley). Assistant Professor.
Algebraic Combinatorics. Theory and Complexity Theory.

Robert P. Boyer, Ph.D. (University of Pennsylvania) Professor—Associate Department Head.
Functional analysis, C^* -Agebras and the theory of Group Representations.

Patrick Clarke, Ph.D. (University of Miami) Assistant Professor.
Homological Mirror Symmetry, Landau-Ginzburg Models, Algebraic Geometry, Symplectic Geometry.

Pavel Grinfeld, Ph.D. (Massachusetts Institute of Technology) Associate Professor.
Application of the Differential Calculus of moving surfaces and Variational Calculus with heavy emphasis on computation, to problems in Bioengineering, Low temperature Physics, Quantum Mechanics and Elasticity.

Yixin Guo, Ph.D. (University of Pittsburg) Associate Professor.
Biomathematics, Dynamical Systems, Ordinary and Partial Differential Equations and Math Education.

R. Andrew Hicks, Ph.D. (University of Pennsylvania) Professor.
Robotics, Computer Vision, Catadioptics.

Pawel Hitczenko, Ph.D. (Warsaw University) Professor.
Probability Theory and its applications to analysis, Combinatorics, Wavelets and the Analysis of Algorithms.

Dmitry Kalyuzhnyi-Verbovetskyi, Ph.D. (Kharkov National University). Associate Professor.
Operator theory, Systems theory, complex analysis, C^* -Algebras and Harmonic Analysis.

Georgi S. Medvedev, Ph.D. (Boston University). Associate Professor.
Applied Dynamical Systems, Mathematical Neuroscience.

Tenure / Tenure Track Faculty

Jennifer Morse, Ph.D. (University of California, San Diego). Professor.
Undergraduate Advisor. Algebraic and Tableaux Combinatorics, Discrete Math, Symmetric and Special Functions, Basic Hypergeometric Series.

Shari Moskow, Ph.D. (Rutgers University) Professor—Department Head.
Applied PDEs and Numerical Analysis in particular Homogenization Theory, Inverse Problems and Related Asymptotic and Numerical Methods.

Ronald K. Perline, Ph.D. (University of California at Berkeley). Associate Professor. Applied Mathematics, Numerical Analysis, Symbolic Computation, Differential Geometry, Modeling of Non-linear Optical Phenomena, Mathematical Physics.

Marci A. Perlstadt, Ph.D. (University of California at Berkeley). Associate Professor.
Applied Mathematics, Computed Tomography, Numerical Analysis of Function Reconstruction, Signal Processing, Combinatorics.

Eric Schmutz, Ph.D. (University of Pennsylvania). Professor.
Probabilistic Combinatorics.

Li Sheng, Ph.D. (Rutgers University). Associate Professor.
Discrete optimization, Operations Research, Graph Theory and its Applications , Biostatistics.

Gideon Simpson, Ph.D. (Columbia University). Assistant Professor.
Partial Differential Equations, Computing and Applied Mathematics.

Justin R. Smith, Ph.D. (Courant Institute, New York University). Professor.
Homotopy Theory, Operad Theory, Quantum Mechanics, Quantum Computing.

Xiaoming Song, Ph.D. (University of Kansas). Assistant Professor

Stochastic Calculus, Large Deviation Theory, Theoretical Statistics, Data Network Modeling and Numerical Analysis

Tenure / Tenure Track Faculty

Hugo J. Woerdeman, Ph.D. (Vrije University, Amsterdam). Professor.
Matrix and Operator Theory, Systems Theory, Signal and Image Processing and Harmonic Analysis, Multivariable Interpolation and Factorization Problems and Matrix Theory Problems arising in Quantum Computing.

J. Douglas Wright, Ph.D. (Boston University). Associate Professor.
Partial Differential Equations, particularly the behavior of non-linear waves in systems arising in Hydrodynamics, Optics and Cell Biology.

Thomas Yu, Ph.D. (Stanford University). Professor.
Multiscale Mathematics, Wavelets, Applied Harmonic Analysis, Subdivision Algorithms, Non-linear Analysis, Applied Differential Geometry and Data Analysis.

Teaching Faculty

Jason Aran, MS (Drexel University) Assistant Teaching Professor.

Daryl Falco, MS (Drexel University). Assistant Teaching Professor. Discrete Mathematics and Automata Theory.

Raymond J. Favocci, *III, MS* (Drexel University). Assistant Teaching Professor.

Carlo Fazioli, Ph.D. (University of Illinois). Assistant Teaching Professor. Computational Fluid Dynamics, Free Problems.

Anatolii Grinshpan, Ph.D. (University of California, Berkeley). Assistant Teaching Professor. Function Theory and Operator Theory, Harmonic Analysis, Potential Theory.

Teaching Faculty

Robert Immordino, MS (Drexel University). Assistant Teaching Professor.

Huilan Li, Ph.D. (York University). Assistant Teaching Professor. Algebraic Combinatorics.

Hwan Yong Lee, Ph.D. (University of Utah). Assistant Teaching Professor. Electromagnetic Wave Propagation in Composite Media, Optimization and Inverse Problems.

Marna A. Mozeff, MS (Drexel University). Associate Teaching Professor.

Adam C. Rickert, MS (Drexel University). Associate Teaching Professor.

Oksana P. Odintsova, Ph.D. (Omsk State University). Associate Teaching Professor. Math Education.

Dimitrios Papadopoulos, MS (Drexel University). Instructor.

Patricia Henry Russell, MS (Drexel University). Teaching Professor. Probability and Satistics.

Jeanne Steuber, MS (Boston University). Assistant Teaching Professor.

Teaching Faculty

Kenneth Swartz, Ph.D. (Harvard University). Assistant Teaching Professor. Applied Probability and Statistics.

Vaishalee Wadke, MS (Columbia University). Instructor.

Richard White, MS (St. Joseph's University). Assistant Teaching Professor.

Dennis G. Yang, Ph.D. (Cornell University). Assistant Teaching Professor. Dynamical Systems, Neuro Dynamics.

Visiting Faculty

Lei Cao, Ph.D. (Drexel University). Visiting Assistant Professor. Determinantal representations of stable polynomials and compressive sensing.

Ryan Kaliszewski, Ph.D. (University of North Carolina at Chapel Hill). Visiting Assistant Professor. Algebraic Combinatorics and Algebraic Geometry –specifically positivity results for generating polynomials.

Taoufik Meklachi Ph.D. (University of Houston). Visiting Assistant Professor. Applied PDEs, Cloaking and Mathematical Physics

Aijun Zhang, Ph.D. (Auburn University). Visiting Assistant Professor. Dynamical Systems, Differential Equations and their Applications, Biomathematics.

New Tenure Track Faculty

Xiaoming Song, Ph.D. (University of Kansas). Assistant Professor

Xiaoming Song received her PhD in Mathematics from the University of Kansas in 2011 under the supervision of Yaozhong Hu and David Nualart. She was a Postdoctoral Research Associate at the University of North Carolina at Chapel Hill in 2011-2013, then she worked at Ritsumeikan University in Japan as a senior researcher in 2013-2014. In December 2014 she joined the Department of Mathematics at Drexel University.

New visiting Faculty

Taoufik Meklachi Ph.D. (University of Houston). Visiting Assistant Professor.

Taoufik Meklachi received his PhD in Mathematics from the University of Houston in 2014 under the supervision of Daniel Onofrei. He was a Postdoctoral Research Associate at the University of Houston in summer 2014 and co-mentor of an undergraduate research group at University of Houston. In September 2014 he joined Drexel University as an Assistant Visiting Professor and works in scattering theory and waves in collaboration with Shari Moskow.

Adjunct Faculty

1. John P. Coppola, MS., Widener University
2. Harold D. Gilman, MS., Temple University
3. June K. Gordon, MS., Drexel University
4. Boris L. Kheyfets, Ph.D., Drexel University
5. Elana M. Koublanova, Ph.D., Leningrad State University
6. Wanda M. Kunkle, Ph.D., Drexel University
7. Leo W. Lampone, Ph.D., Drexel University
8. George Watson, MS., Purdue University
9. Yun Yoo, Ph.D., Drexel University
10. Sergio Zefillipo, MA., Villanova University
11. Shweetketu Virbhadra, Ph.D., Physical Research Laboratory
12. Yihong Zhang, Ph.D., University of Alabama

Emeritus Faculty

1. Loren N. Argabright, Ph.D., University of Washington—Professor Emeritus
2. Robert C. Busby, Ph.D., University of Pennsylvania—Professor Emeritus
3. Ewaugh F. Fields, Ed.D., Temple University—Dean Emeritus—Professor Emeritus
4. William M.Y. Goh, Ph.D., Ohio State University— Associate Professor Emeritus
5. Charles J. Mode, Ph.D., University of California at Davis—Professor Emeritus
6. Chris Rorres, Ph.D., Courant Institute, New York University—Professor Emeritus
7. Jet Wimp, Ph.D., University of Edinburgh—Professor Emeritus

Professional Staff

C. Gene Phan
Computer Specialist

Malinda Gilchrist
Graduate Program Coordinator

Kenneth Hemphill
Budget Coordinator

Sobha Philip
MRC Manager

Paige Chmielewski
Undergraduate Program Coordinator

Teaching & Research Assistants

Gulnara K. Abduvalieva

Myles Akin

Jeffrey Armstrong

Charles Burnette

Jingmin Chen

Teaching & Research Assistants

Yuyue Chen

Andrew Eshelman

Timothy Favor

Benjamin Grossmann

Timothy Hayes

Shunlian Liu

Michael Minner

Alexander Onderdonk

Amanda Parshall

Archana Patel

Sarah Rody

Scott Rome

Patrick Shields

Jonah Smith

Leonard Stevenson

Teaching & Research Assistants

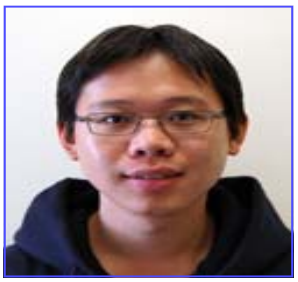
David Sulon

Xuezhi Tang

James Thomas

Kelly Toppin

Daniel Watkins



Chung Wong

Faculty Grants

Ambrose, David

National Science Foundation, DMS 1016267, Collaborative Research: Efficient Surface-Based Numerical Methods for 3D Interfacial Flow with Surface Tension, 2010-2015, $269,989

Blasiak, Jonah

National Science Foundation, DMS 14071174, Quantizing Schur Functors, 2012-2015, $120,000

Grinfeld, Pavel

Steffens 21st Century Foundation, Hamilton Fluid Films, 2011-2014, $31,000

Guo, Yixin

National Science Foundation, DMS 1226180, Closed-loop Deep Brain Stimulation, Synchrony breaking and Chimera State, 2012-2015, $164,996

Hitczenko, Pawel

Simons Foundation, Collaborative research in Combinatorics and Probability, 2011-2016, $35,000

Kaliuzhnyi-Verbovetskyi, Dmitry

US-Israel Binational Science Foundation, BSF 2010432, Noncommutative Function Theory and its Applications, 2011-2015, $88,000

Medvedev, Georgi

National Science Foundation, DMS 1412096, Dynamics of Large Networks, 2014-2017, $150,000

National Science Foundation, DMS 1109367, Mathematical Analysis of Synchronization in Complex Networks, 2011-2014, $139,835

Moskow, Shari

National Science Foundation, DMS 1108858, Collaborative Research: Direct Reconstruction Methods for Optical Tomography and Related Inverse Problems, 2011-2014, $289,998

National Science Foundation, DMS 1153905, Timed for a Successful Career: NSF/AWM Travel Grants for Women in the Mathematical Sciences 2011-2014, $492,399

Faculty Grants

Moskow, Shari

National Science Foundation, DMS 1411721, Nonlinear spectral problems in electromagnetics: asymptotics and inversion. 2014-2017, $191,670

Simpson, Gideon

National Science Foundation, DMS 1409018, Computational and Analytical Challenges in Non-linear Dispersive Wave Equations, 2014-2017, $146,118

United States Department of Energy, DE-SC0012733, Theory and Computation for Mescopic Materials Modeling, 2014-2017, $88,715.20

Woerdeman, Hugo, and CoPIs Anatolii Grinshpan, Dmitry Kalyuzhniy-Verbovetskyi,

National Science Foundation, DMS 0901628, Decompositions for Mulivariable Schur-class Functions, Christoffel-Darboux Type Formulas, and Related Problems, 2009-2015, $475,578

Wright, J. Douglas

National Science Foundation, DMS 1105635, Degenerate Dispersive Effects in Partial and Lattice Differential Equations, 2011-2014, $202,837

Yu, Thomas

National Science Foundation, DMS 1115915, Topics in Geometric and Multiscale Numerical Methods, 2011-2014, $230,827

Faculty Appointments & Conference Organizations

Ambrose, David

Co-chair of the organizing committee, The 2016 SIAM Conference on Nonlinear Waves and Coherent Structures, Philadelphia, PA, August 2016

Blasiak, Jonah

Scientific committee member, Mid-Atlantic Algebraic Geometry and Combinatorics Workshop, Philadelphia, PA, April 2015

Guo, Yixin

Co-organizer of mini-symposium, “Mathematical Modeling of Basal Ganglia” at the SIAM Conference on Applications of Dynamical Systems. Snow Bird, UT, May 2015

Hitczenko, Pawel

Program committee member, Analytic Algorithmics and Combinatorics, San Diego, California, January 4, 2015

Scientific program committee member, Lebanese International Conference on Mathematics and Applications, Beirut, Lebanon, May 2015

Kaliuzhnyi-Verbovetskyi, Dmitry

Co-organizer, special session “Progress in Free Analysis and Free Probability” at Joint Mathematical Meetings in Baltimore, MD, January 2014

Medvedev, Georgi

Co-organizer of special session, “Nonlocally coupled dynamical systems” at the Tenth Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, July 2014

Morse, Jennifer

Scientific committee, Mid-Atlantic Geometry & Combinatorics Conference, May 2014

Executive officer, Formal Power Series and Algebraic Combinatorics, Chicago IL, June/July 2014

Faculty Appointments & Conference Organizations

Moskow, Shari

Co-organizer or minisymposium, “Hybrid Inverse Problems”, AIMS conference series on Dynamical Systems and Differential equations, Madrid, Spain, July 2014

Woerdeman, Hugo J.

Vice president of steering committee, International Workshop on Operator Theory and its Applications, Tbilisi, Georgia, July 2015

Chair, International Linear Algebra Society (ILAS) Institutional Membership Committee

Member of the scientific organizing committee, 2016 International Linear Algebra Society (ILAS) meeting, Leuven, Belgium, July 2016

Member of the International Program Committee, International Symposium on Mathematical Theory of Networks and System Groningen, The Netherlands, July 2014

Faculty Publications

Ambrose, David, The zero surface tension limit of two-dimensional interfacial Darcy flow, Journal of Mathematical Fluid Mechanics, 16, p. 105-143, 2014

Ambrose, David, and J. Wilkening, Dependence of time-periodic vortex sheets with surface tension on mean vortex sheet strength, Procedia IUTAM, 11, p.15-22, 2014

Ambrose, David, and D.P. Nicholls, “Fokas integral equations for three-dimensional layered media scattering”, Journal of Computational Physics, 276, p. 1-25, 2014

Ambrose, David, J.L. Bona, and D.P. Nicholls, “On ill-posedness of truncated series models for water waves”, Proceedings of the Royal Society A, 470:20130849, 2014

Ambrose, David and ***J. Douglas Wright***, “Non—existence of small doubly periodic solutions for doubly periodic solutions for dispersive equations,” Comptes Rendus Mathematique, 352, p. 597— 602, 2014

Aristoff, D., T. Lelievre, and ***Gideon Simpson***, “The parallel replica method for simulating long trajectories of Markov chains”, AMRX, 2, p. 332-352, 2014

Bal, G. and ***Shari Moskow***, “Local Inversions in Ultrasound Modulated Optical Tomography.” Inverse Problems, 30(2), 025005, 17p., 2014.

Faculty Publications

Ball, J.A. and ***Dmitry Kaliuzhnyi-Verbovetskyi***, "Rational Cayley inner Herglotz--Agler functions: Positive-kernel decompositions and transfer-function realizations", Linear Algebra and its Applications 456, p. 138—156, 2014

Blasiak, Jonah, "Quantum Schur-Weyl duality and projected canonical bases", Journal of Algebra, 402, p. 499–532, 2014

Cao, Lei and ***Hugo J. Woerdeman***, "A normal variation of the Horn problem: the rank 1 case", Annals of Functional Analysis, 5(2), 138–146, 2014

Croke, C. and ***Hicks, R. Andrew***, "A Solution to the Bundle-to-Bundle Mapping Problem of Geometric Optics Using Four Freeform Reflectors", Journal of the Optical Society of America A, 31 (9), p. 2097-2104, 2014

Duchamp, T., G. Xie and ***Thomas Yu,*** **"**On a New Proximity Condition for Manifold-Valued Subdivision Schemes", Approximation Theory XIV: San Antonio 2013. Springer Proceedings in Mathematics & Statistics, 83, p. 65-79, 2014

Grinshpan, Anatolii, Dmitry S. Kaliuzhnyi-Verbovetskyi, V. Vinnikov and ***Hugo J. Woerdeman***, "Stable and Real Zero Polynomials in Two Variables", Multidimensional Systems and Signal Processing, DOI 10.1007/s11045-014-0286-3, 2014

Grinshpan, Anatolii, Dmitry Kaliuzhnyi-Verbovetskyi and ***Hugo Woerdeman***, "The Schwarz Lemma and the Schur-Agler Class", Proceedings of the 21st International Symposium on Mathematical Theory of Networks, p. 1834-1836 2014

Gaison, Jeremy, Shari Moskow, J. Douglas Wright and ***Qimin Zhang***, "Approximation of polyatomic FPU lattices by KdV equations", Multiscale Modeling and Simulation, 12(3), p. 953-995, 2014

Hicks, R. Andrew, Sarah G. Rody and ***J. Douglas Wright***, "Bundle Separation, Obstructions to Perfect Imaging and other Qualitative Aspects of Simultaneous Multiple Surface Design R", Optical Engineering, 53(3), 2014

Hitczenko Pawel and S. Janson, "Weighted random staircase tableaux", Combinatorics, Probability and Computing, 23, p. 1114-1147, 2014

Hitczenko Pawel and G. Letac, "Perpetuity property of Dirichlet distribution", Journal of Applied Probability, 51, p. 400-416, 2014

Kaliuzhnyi-Verbovetskyi, Dmitry and V. Vinnikov, "Foundations of Free Non-commutative Function Theory", Math Surveys and Monographs, 199, AMS, 183 p., 2014

Marzuola J. L., S. Raynor, and ***Gideon Simpson***, "Dynamics near a minimal mass soliton for a generalized Korteweg-de Vries equation," Dynamical Systems, 29(2), p. 285-299, 2014

Faculty Publications

Lam, T., L. Lapointe, ***Jennifer Morse***, A. Schilling, M. Shimozono, and M. Zabrocki, " K-Schur functions and affine Schubert calculus", Fields Institute Monographs, Springer, 216 p., 2014

Medvedev, Georgi S., "The nonlinear heat equation on W-random graphs", Archive for Rational Mechanics and Analysis, 212(3), p. 781-803, 2014

Medvedev, Georgi S., "The nonlinear heat equation on dense graphs and graph limits", SIAM Journal on Mathematical Analysis, 46(4), p. 2743-2766, 2014

Medvedev, Georgi S., "Small-world networks of Kuramoto oscillators", Physica D, 266, p. 13-22, 2014

Morse, Jennifer, and A. Schilling, "Flag Gromov-Witten invariants via crystals", Discrete Math and Theoretical Computer Science, Proceedings, p. 489-500, 2014

Perline, Ron, "Double-mirror catadioptric sensors of ultrawide field of view and no distortion" Applied Optics, 53(4), p. 528-536, 2014

Smith, Justin, Introduction to Algebraic Geometry, CreateSpace Independent Publishing Platform, 638 p., 2014

Woerdeman, Hugo., The autoregressive filter problem for two variables, and related problems, in: Mathematisches Forschungsinstitut Oberwolfach Report No. 17/2014,

Faculty Presentations

Ambrose, David

"Nonexistence of small coherent structures for dispersive equations", Applied Analysis and Computation Seminar, University of Massachusetts at Amherst, Amherst, MA, October 2014
"Dispersion vs. Backwards Diffusion, Applied Mathematics Seminar", Air Force Institute of Technology, Wright-Patterson AFB, OH, October 2014

"Nonexistence of small coherent structures for dispersive equations", Brown-BU Dynamics and PDE Seminar, Boston University, Boston, MA, October 2014

"Nonexistence of small coherent structures for dispersive equations", Applied Mathematics Seminar, University of Illinois at Chicago, Chicago, IL September 2014

"An efficient boundary-integral method for 3D flow with surface tension: Numerical results and numerical analysis", minisymposium, SIAM Conference on Nonlinear Waves and Coherent Structures, Cambridge, UK, August 2014

Faculty Presentations

Ambrose, David

"Vortex sheet formulations and initial value problems: Analysis and computing", Summer School on Water Waves, Isaac Newton Institute, Cambridge, UK, August 2014

"Ill-posedness of truncated series models of water waves", Theory of Water Waves program, Isaac Newton Institute, Cambridge, UK, July 2014

"Nonexistence of small, time-periodic, spatially periodic solutions for equations with strong dispersion", Workshop on Dynamics of Geometric Dispersive Equations and the Effects of Trapping, Scattering, and Weak Turbulence, Banff International Research Station, Banff, Alberta, Canada, May 2014

"Analysis, computing, and numerical analysis for 3D interfacial flows with surface tension", Analysis of Fluids and Related Topics Seminar, Princeton University, Princeton, NJ, April 2014

"Design and convergence of an efficient boundary integral method for 3D interfacial Darcy flow with surface tension", minisymposium, SIAM-SEAS Conference, March 2014

"Ill-posedness issues for truncated series models of water waves", Joint Mathematics Meetings, Special Session on Regularity Problems for PDEs Modeling Fluids and Complex Fluids. Baltimore, MD, January 2014

Blasiak, Jonah

"Generalized Knuth equivalence for Schur positivity", Simon's Institute Workshop on Geometric Complexity Theory, Berkeley, CA, September 2014

"Generalized Knuth equivalence for Macdonald polynomials", CAGE seminar, Philadelphia, PA, October 2014

Guo, Yixin

"Mathematical Models of Deep Brain Stimulation", The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, July 2014

"Traveling Pulses in a Neural Network with Asymmetric Coupling
and Non-saturating Gain", Department of Mathematics, Indiana University-Purdue University Indianapolis, Indianapolis, IN, September 2014

Faculty Presentations

Hicks, R. Andrew

"Controlling Ray Bundles with Reflectors", Department of Mathematics, Haverford College, Haverford, PA, September 2014

Hitczenko, Pawel

"Perpetuity laws for Dirichlet and quasi-Bernoulli distributions", Stochastic Processes and Applications, Buenos Aires, Argentina, July/August 2014

"On the distribution of parameters in random weighted staircase tableaux", Latin American Congress of Probability and Mathematical Statistics, Cartagena de Indias, Colombia, September 2014

Kaliszewski, Ryan

"Combinatorial Fillings and their Correspondence with Reverse Plane Partitions", AMS Sectional Meeting/AMS Special Session, The University of North Carolina at Greensboro, Greensboro, NC, November 2014

"Hook Coefficients of Chromatic Symmetric Functions", Permutation Patterns Conference, East Tennessee State University, Johnson City, TN, July 2014

Kaliuzhnyi-Verbovetskyi, Dmitry

"Realizations of lossless positive-real functions of several variables, semi-plenary talk", The 21st International Symposium on Mathematical Theory of Networks and Systems, Groningen, The Netherlands, July 2014

"Fixed point theorems for noncommutative functions", special session talk The 21st International Symposium on Mathematical Theory of Networks and Systems, Groningen, The Netherlands, July 7—11, 2014

"Schur--Agler and Herglotz--Agler Classes of Functions: Positive-Kernel Decompositions and Transfer-Function Realizations", special session talk, The 21st International Symposium on Mathematical Theory of Networks and Systems, Groningen, The Netherlands, July 2014

"Learning from Arov: Scattering systems", special session talk, International Workshop on Operator Theory and its Applications, Amsterdam, The Netherlands, July 2014

"Implicit/inverse function theorems for free noncommutative functions", special session talk International Workshop on Operator Theory and its Applications, Amsterdam, The Netherlands, July 2014

Faculty Presentations

Li, Huilan

"Combinatorial Hopf algebras and representation of Towers of algebras", AMS special session on Combinatorial Representation Theory, Fall Eastern Sectional Meeting, Dalhousie University, Halifax, Canada, October 2014

Medvedev, Georgi

"Using Graph Limits for Studying Dynamics of Large Networks", minisymposium talk, SIAM Conference on Nonlinear Waves and Coherent Structures, University of Cambridge, Cambridge, UK, August 2014

"Dynamics of Large Networks: Taking It to the Limit", special session, AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, July 2014

"Nonlocally Coupled Dynamical Systems: Analysis and Applications", minisimposium talks, AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, July 2014

"Graph Limits and Dynamics of Large Networks", Theoretical Biology Seminar, Pennsylvania State University, State College, PA, October 2014

Morse, Jennifer

"Flag Gromov-Witten invariants and Macdonald polynomials", Joint Mathematics Meetings, AMS-AWM Special Session on Geometric Applications of Algebraic Combinatorics, Baltimore, MD, January 2014

Moskow, Shari

"Inverse Born series for the Calderon problem and related inverse problems," Schlumberger-Tufts joint Inverse Problems Seminar, Boston, MA, March 2014

"Inverse Problems: Determining the Equation from the Solution", colloquium, Portland State University, Portland, OR, January 2014

"Inverse Born series for the Calderon problem and related inverse problems," colloquium, Purdue University, West Lafayette, IN, May 2014

"Local inversions in ultrasound modulated optical tomography." European Scientific Institute, Vienna, Austria, May 2014

Faculty Presentations

Moskow, Shari

"Local inversions in ultrasound modulated optical tomography," minisymposium, AIMS conference, Madrid, Spain, July 2014

"Asymptotic Expansions for Transmission Eigenvalues in the Presence of Inhomogeneities," minisymposium, AIMS conference, Madrid, Spain, July 2014.

"Asymptotic Expansions for Transmission Eigenvalues in the Presence of Inhomogeneities," special session, IPTA conference, Bristol, UK, August 2014

"Inverse Born series for the Calderon problem and related inverse problems," colloquium, University of Houston, Houston, TX, November 2014

"Inverse Problems: Determining the Equation from the Solution," undergraduate seminar speaker, University of Houston, Houston, TX, November 2014

Odintsova, Oksana

"Information Technologies in Mathematics and Mathematical Education" , III International Conference, Krasnoyarsk, Russia, November 2014

Simpson, Gideon

"Algorithms for Nonlinear Bound States in Hamiltonian PDE", AMS Sectional Meeting, San Francisco State University, San Francisco, CA, October 2014

"Petviashvilli's method for the Dirichlet problem", AMS Sectional Meeting, Michigan State, East Lansing, MI, March 2015

"Workshop on Multiscale Models of Crystal Defects", Banff, Alberta, Canada September 2014

"Relative Entropy Preconditioning for Markov Chain Monte Carlo", AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, July 2014,

"Relative Entropy Preconditioning for Markov Chain Monte Carlo", DelMar Numerics Day, University of Maryland, Baltimore County, Baltimore, MD, May 2014

"Relative Entropy Preconditioning for Markov Chain Monte Carlo", Colorado State University, Fort Collins, CO, October 2014

"Petviashvilli's Method for the Dirichlet Problem", University of Cincinnati, Cincinnati, OH, January 2015.

Faculty Presentations

Simpson, Gideon

"Are We There Yet? Rare Events in Physical Systems", colloquium: Wake Forest University, Winston-Salem, NC, December 2014

Woerdeman, Hugo

"The Schwarz Lemma and the Schur-Agler class", minisymposium, 2014 Joint Mathematics Meetings, Baltimore, MD January 2014.

"The autoregressive filter problem for two variables, and related problems", plenary talk, Real Algebraic Geometry With A View Toward Systems Control and Free Positivity, Oberwolfach, Germany, April 2014.

"Stable and real zero polynomials, and their determinantal representations", semi-plenary, The 25th International Workshop of Operator Theory and its Applications, Amsterdam, The Netherlands, July 2014

"The Schwarz Lemma and the Schur-Agler Class", minisymposium, The 21st International Symposium on Mathematical Theory of Networks and Systems, Groningen, The Netherlands, July 2014

Wright, J. Douglas

"Approximation of Polyatomic FPU Lattices by KdV Equation", University of Delaware Numerical Analysis and PDE Seminar, Newark, DE, February 2014

"Approximation of Polyatomic FPU Lattices by KdV Equations" , University of Pennsylvania Analysis Seminar, Philadelphia, PA, March 2014

"Approximation of Polyatomic FPU Lattices by KdV", PDE and Analysis Seminar Equations, University of Pittsburgh, Pittsburgh, PA, April 2014.

"Approximation of Polyatomic FPU Lattices by KdV", Analysis Seminar, Temple University, Philadelphia, PA, April 2014

"Approximation of Polyatomic FPU Lattices by KdV", Analysis Seminar, University of Rochester, Rochester, NY, September 2014

"Higher order corrections to the KdV approximation for water waves", Boston University Dynamics Seminar, Boston, MA, November 17, 2014.

Schmutz, Eric

"Products of Involutions", colloquium/seminar, Carleton University, Ontario, Canada, November 2014

Editorial Positions

Ambrose, David, Division editor, *Journal Mathematical Analysis and Applications*

Hitczenko, Pawel, Editorial board member, *Open Journal of Discrete Mathematics*

Kaliuzhnyi-Verbovetskyi, Dmitry, Editor, "Linear operators and linear systems", *Complex Analysis and Operator Theory*

Medvedev, Georgi, Editorial board, *Discrete and Continuous Dynamical Systems B*

Morse, Jennifer, *Managing Editor , Journal of Combinatorics*

Woerdeman, Hugo, Associate editor, *Indagationes Mathematicae*

Woerdeman, Hugo, Editor, *International Journal of Information and System Sciences*

Graduate Student Award

Sarah Rody is the recipient of the 2015 **Albert Herr Teaching** Assistant Award. Sarah received this prestigious award from Dr. Robert Boyer on June 8, 2015.

The Albert Herr Teaching Assistant Award is presented to a Teaching Assistant of the Department of Mathematics who has excelled in teaching. This award is established in honor of Albert Herr (1935 –1995) for the unsurpassed standards he set in the teaching of mathematics and for his lasting and distinguished service to the department from 1957 to 1993.

Employee Service Award Recipients

The Drexel University Employee Service Awards Ceremony was held on December 2014 at the Sheraton Philadelphia Center City Hotel. The following members of the Drexel Mathematics department were recognized for their service at Drexel University.

20 YEAR AWARD RECIPIENT

Marna Mozeff

15 YEAR AWARD RECIPIENTS

Andrew Hicks

Pawel Hitczenko

10YEAR AWARD RECIPIENT

Gene Phan

5YEAR AWARD RECIPIENT

Vaishalee Wadke

Departmental Committees 2014-15

Tenure and Promotion

Thomas Yu - Chair & CoAS T&P Rep

All tenured faculty members

Graduate Admissions Committee

Andrew Hicks – chair & CoAS graduate rep for admissions

Jonah Blasiak— Gideon Simpson— Xiaoming Song— Doug Wright (Spring)

Graduate Program Committee

Robert Boyer – chair & grad advisor & CoAS graduate rep for curriculum

Patrick Clarke—Pawel Hitczenko—Justin Smith

Undergraduate Program Committee

David Ambrose – chair & CoAS undergraduate Rep

Li Sheng—Hugo Woerdeman—Jason Aran—Jennifer Morse (undergrad advisor)

Teaching Faculty Promotion

Marci Pearlstadt – chair

Marna Mozeff—Oksana Odintsova—Adam Rickert—Patricia Russell—Dmitry Kaliuzhnyi-Verbovetskyi—Georgi Medvedev
(All teaching faculty associate and above are members)

Tenure-Track Hiring Planning Committee

Jennifer Morse-chair

Hugo Woerdeman—Gideon Simpson—Shari Moskow (ex officio)

Postdoc Search Committee

Pawel Hitczenko - chair

Yixin Guo- Spring—Jonah Blasiak—Georgi Medvedev—Patrick Clarke

Teaching Innovations Committee— Daryl Falco - chair

Jason Aran—Marna Mozeff—Oksana Odintsova—Carlo Fazioli—Pavel Grinfeld (spring) - David Ambrose

College and University Events Coordinator—Dimitri Papadopoulos

Colloquium Coordinator & Distinguished Speaker Coordinator—Ron Perline

Library Liaison—Ken Swartz

Departmental Committees 2014-15

University 101— Ron Perline & Thomas Yu

Math Competition coordinator— Dmitry Kaliuzhnyi-Verbovetskyi

Mathematics Student Organization faculty advisor— Dimitri Papadopoulos

Placement Exam Coordinator—Ray Favocci

Problem of the month coordinator—Justin Smith

Pi Day coordinators
Jason Aran—Marna Mozeff—Adam Rickert—Daryl Falco—Carlo Fazioli

Assistant Scheduler—R. Andrew Hicks

Calculus Practicum Coordinator—Jason Aran

CoAS Research Day Representative—Li Sheng

Fall Coordination assignments:

Math 100: Ray Favocci
Math 101: Jeanne Steuber
Math 102: Adam Rickert
Math 110: Robert Immordino
Math 121: Jason Aran, Dimitrios Papadopoulos

Winter Coordination assignments:

Math 101: Ray Favocci
Math 102: Adam Rickert, Jeanne Steuber
Math 121: Robert Immordino
Math 122: Jason Aran, Dimitrios Papadopoulos

Spring Coordination assignments:

Math 101: Vaishalee Wadke
Math 102 Ray Favocci
Math 119 Adam Rickert
Math 122: Huilan Li
Math 200: Jason Aran, Dimitrios Papadopoulos

Distinguished Speaker Series

The 2014-15 , Department of Mathematics , College of Arts and Science distinguished speaker was Irene Fonseca , Ph.D., Carnegie Mellon University, Pittsburgh, PA. She gave a lecture on Mathematics of Imaging on September 9, 2014.

The speaker with Donna Murasko, Ph.D., Dean of CoAS, and Shari Moskow, Ph.D., Professor and Head of Mathematics Department.

University Teaching Awards

Three faculty members received university teaching and service awards from the Provost office. They were honored at the Faculty Recognition Dinner on May 20, 2015 in Behrakis Grand Hall.

Pavel Grinfeld (Christian R. and Mary F. Lindback Award for Distinguished Teaching)

Jason Aran (Barbara G. Hornum Award for Teaching Excellence)

June Gordon (Stanley J. Gwiazda Professorship).

(Shari Moskow, June Gordon, Donna Muraska, Dean , CoAS, Pavel Grinfeld, Jason Aran, Hugo Woerdeman)

Degrees Awarded

Bachelor Degree

Mathematics Majors

McLaughlin, Ben T
Speroni, Juliana M (Summa Cum Laude)
McKenzie, Patrick L
Xiao, Junyi (Magna Cum Laude)
Pangburn, Tayler Anne (Cum Laude)
Borodyansky, Michelle
Chu, Thang T (Summa Cum Laude)
Egan, Andrew J (Magna Cum Laude)
Saltzman, Daniel C
Xu, Yangzi (Magna Cum Laude)
Caruso, Paul
Hutchinson, Faith
Joshi, Pooja
Lee, Yun Hye
Lu, Jiachao
Muller, Brandon
Chen, Fengfan
Connison, Kyle
Fisher, Gregory (Magna Cum Laude)
Gaison, Jeremy (Summa Cum Laude)
Han, Shuyi (Magna Cum Laude)
Horyn, Vasyl
Patron, Kayle (Summa Cum Laude)
Sparaco, Stephanie
Wisnewski, Nicholas
Zhang, Kaijie (Magna Cum Laude)
Zhang, Jun
Ciocys, Samuel (Magna Cum Laude)

Graduate Degree

Mehta, Sajjan S

Bachelor Degree

Mathematics Minors

Chen, Ruohao
Jiang, Zeyu
Kennedy, Ian Andrew
Meyers, Michael C
Weinstein, Adam Michael
Beck, William Francis
Benjamin, Rishon
Benjamin, Alex
Bergquist, Cory
Bevinahally Raghunath, Ananth
Boccelli, Danielle
Bui, Linh
Conway, Michael
Daugherty, Ryan
Duong, Anh
Giang, William
Kennedy, Ian
Koven, Rose
Lucidi, Michael
Mox. Daniel
Muoio, Joseph
Park, Ellen
Patel, Rishir
Ruffo, Toni
Rummel, Brian
Seidl, Christopher
Smith, Robyn
Sneider, Casey
Subramony, Sharanya
Temples, Dylan
Walters, Shauna
Zhou, Xiaohang

Doctor of Philosophy Degree Awarded

Jingmin Chen presented and defended with success her Ph. D thesis entitled: “Sub division Methods and the Uniqueness for the Canham—Helfrich Model of Biomembranes.” Her Ph.D. advisor was Professor Thomas Yu. Conferred : May 2015

Gulnara Abduvalieva presented and defended with success her Ph. D thesis entitled: “Fixed Point and Implicit/Inverse Functions Theorem for Noncommutative Functions.” Her Ph.D. advisor was Professor Dmitry Kaliuzhnyi-Verbovetskyi. Conferred : June 2015

Scott Rome presented and successfully defended his Ph.D. thesis "Asymptotic Methods in Inverse Scattering". His Ph.D. advisor was Professor Shari Moskow. Conferred: June 2015.

Jonah Smith presented and successfully defended his Ph.D. thesis "A new class of Integrable Surfaces Related to Bertrand Curves". His Ph.D. advisor was Professor Ronald K Perline. Conferred: August 2015.

Jeffrey Armstrong presented and successfully defended his Ph.D. thesis "The homotopy theory of modules of curved A—infinity categories.” His Ph.D. advisor was Professor Patrick Clarke. Conferred: September 2015.

Graduate Presentations

Charles Burnette

Representing Random Permutations as a Product of Two Involutions, Graduate Student Combinatorics Conference, University of Kentucky, Lexington, KY, March 28, 2015.

Representing Random Permutations as a Product of Two Involutions, 28th Cumberland Conference on Combinatorics, Graph Theory, and Computing, Interdisciplinary Mathematics Institute, University of South Carolina, Columbia, SC, May 17, 2015.

Posters:

Representing Random Permutations as a Product of Two Involutions, IMA Annual Program Year Workshop: Probabilistic and Extremal Combinatorics, University of Minnesota - Twin Cities, Minneapolis, MN, September 9, 2014.

Representing Random Permutations as a Product of Two Involutions, DIMACS Conference on Challenges of Identifying Integer Sequences, Rutgers, The State University of New Jersey - New Brunswick, Piscataway, NJ, October 10, 2014.

Products of Multiple Involutions, 2nd Mid-Atlantic Algebraic Geometry and Combinatorics (MAAGC) Workshop, Drexel University, Philadelphia, PA, April 25, 2015.

Representing Random Permutations as a Product of Two Involutions, Drexel University Research Day, May 1, 2015.

Daniel Watkins

Convergence of the Robbins-Monro Algorithm in Infinite-Dimensional Hilbert Spaces D.M. Watkins and G. Simpson ,SIAM Conference on Computational Science and Engineering, Salt Lake City, UT March 16, 2015.

COLLOQUIUM

October 6, 2014

Nick Wormwald, Monash University

Title: Random graphs, random regular graphs and combs

October 20, 2014

Georgi S. Medvedev, Drexel University

Title: Graph limits and Dynamics of Large Networks

November 3 , 2014

Brian-Lindsey Rushton, Temple University

Title: Fractals at infinity: Finite Subdivision Rules

November 17 , 2014

Robin Pemantle, University of Pennsylvania

Title: Sizes of Invariant Sets of Random Permutations

January 26, 2015

Brian Rider, Temple University

Title: Continuum Limits of Random Matrices

COLLOQUIUM

February 9, 2015

Yaiza Canzani, Harvard University

Title: Geometry and Topology of Zero sets of Schrodinger Eigenfunctions

February 23, 2015

Holley Friedlander, Dickinson College

Title: Multiple Dirichlet Series and Arithmetic

March 2 , 2015

Yusra Naqvi, Muhlenberg College

Title: Symmetric Polynomials and Young Diagrams

April 6 , 2015

M. A. Kaashoek, Vrije University, Amsterdam

Title: A State Space Analysis of Dirac Differential Systems with Rational Data

April 20 , 2015

Vladimir Itskov, Penn State University

Title: A Topological Approach for Investigating Intrinsic Structure of Neural Activity

COLLOQUIUM

April 27, 2015

Alexander Yong, University of Illinois at Urbana-Champaign

Title: The H– index , combinatorics and number theory

June1, 2015

Joseph A. Ball, Virginia Tech

Title: Interpolation and Transfer Function Realization for the non-commutative Schur- Agler.

Special Topic Courses

Fall Quarter , 2014-15
Math 498 001 Combinatorics (Undergrad)

Winter Quarter , 2014-15
Math 680 001 Measure Theory Probability (Grad)

Spring Quarter , 2014-15
MATH 680 001 Differential Geometry (Grad)
MATH 680 002 Topics in Matrix Analysis (Grad)

ANALYSIS SEMINAR

FALL, 2014

October, 17

Simon Foucart— University of Georgia
Two extra structures in spares recovery: Non negativity and disjointedness.

October, 24

Robert Boyer — Drexel University
Inequalities for Square Roots of Di logarithms.

October, 31

Hugo Woerdeman — Drexel University
Grace's Theorem

November, 7

Lei Cao—Drexel University
Horn's Problem, Vinnikov Curves and Interpretations of Hives.

November, 14

Gulnara Abduvalieva—Drexel University
Implicit/Inverse Function Theorems for Free Non Commutative Functions.

November, 21

Anatolii Grinshpan—Drexel University
Herbert Stahl's Proof of the BMV Conjecture.

December, 5

Benjamin Grossman—Drexel University
Generalized Choi Maps in Three-Dimensional Matrix Algebra.

ANALYSIS SEMINAR

Winter, 2015

February 27

Charles Burnette — Drexel University
Representing Random Permutations as a Product of Two Involutions

March 13

Dmitry Kaliuzhnyi-Verbovetskyi — Drexel University
Contractive Determinantal Representations of Stable Polynomials

Spring , 2015

April 10

Hugo Woerdeman — Drexel University
Ritz Values of Normal Matrices and Ceva's Theorem (After Carden & Hansen)

April 17

Amanda Parshall — Drexel University
The Asymptotic Distribution of Parameters in Random Weighted Staircase Tableaux

April 24

Gulnara Abduvalieva — Drexel University
Implicit/Inverse Function Theorems on the set of Nilpotent Matrices

May 8

Anatolii Grinshpan — Drexel University
Of Ball and Cube

ANALYSIS SEMINAR

May 22

Jean-Luc Bouchot — RWTH Aachen
A Muti-level Compressed Sensing Petrov-Galerkin method for the approximation of the parametric PDEs

May 29

Per Alexandersson — U Penn
Banded Toeplitz Matrices and Linear Recurrences

FIRST YEAR STUDENTS ACHIEVING 4.0 GPA

Stephen Costa & Yuwei Zhou

SIAM CERTIFICATE OF RECOGNITION

Siam chapter awarded the student chapter certificate of recognition to **Charles Burnette** for outstanding service and contributions to the chapter.

Combinatorics & Algebraic Geometry Seminars

September 11, 2014

Matthias Beck—San Francisco State University
Very ample and Koszul Segmental Fibrations

September 16, 2014

Igor Pack —UCLA
Counting Irrational tilings

September 23, 2014

Margie Readdy—University of Kentucky
Negative q– analogues

October 2 , 2014

Jonah Blasiak—Drexel University
Generalized Knuth Equivalence for Macdonald Polynomials

October 16, 2014

Anderi Negut—Columbia University
The m/n Pieri Rule

October 23, 2014

Jonathan Novak—MIT
Lozenge Tilings and Hurwitz Numbers

October 30, 2014

Tara Holm, Cornell
The Topology of Toric Origami Manifolds

Combinatorics & Algebraic Geometry Seminars

November 11, 2014

Ben Salisbury—Central Michigan University

The Gindikin-Karpelevich Formula , The Casselman-Shalika Formula and Crystals of Tableaux

November 20, 2014

Richard Ehrenborg—University of Kentucky

(Cyclically) Consecutive 123-avoiding Permutaions

November 25, 2014

Joseph Landsberg—Texas A&M and The Simons Institute

What is geometric Complexity Theory and Why is it Good for Algebraic Geometry and Combinatorics

January 29, 2015

Per Alexandersson—University of Pennsylvania

Gelfand-Tsetlin Polytopes

February 5, 2015

Siddhartha Sahi—Rutgers

Coxeter DAHA

February 26, 2015

Becky Patrias—University of Minnesota

Dual Filtered Graphs

March 3, 2015

Greta Penova—University of Pennsylvania

Statistical Mechanics via Asymptotics of Symmetric Functions

March 19, 2015

Martha Yip—University of Kentucky

Categorifying the Stanley Chromatic Polynomial

Combinatorics & Algebraic Geometry Seminars

April 24 , 2015

Mark Shimozono—Virginia Tech
Elliptic Hall Algebra via Symmetric Function Operators

April 30, 2015

Li-Ping Mo —University of Pennsylvania
q-Hit Polynomials have only real roots

May 12, 2015

Ricky Liu —North Carolina State University
Complete Branching Rules

May 18, 2015

Anne Schilling —University of California, Davis
Braid moves in Commutation Classes of the Symmetric Group

June 5, 2015

Sarah Mason —Wake Forest, Winston –Salem, NC
TBD



PDE/Applied Math Seminars

Fall 2014:

October 2nd, 2014

Ron Perline, Drexel-Ray optics in thin films

October 9th, 2014

Timur Akhunov, U. Rochester—Hypoellipticity beyond Hormander's bracket crite rion

October 23rd, 2014

David Kelly, Courant—Fast-slow systems with chaotic noise

October 30th, 2014

Deniz Bilman, UIC—On Hamiltonian Perturbations of the Toda Lattice

November 20th, 2014

Nawaf Bou-Rabee, Rutgers—How to simulate stochastic differential equations without discretizing time?

Winter 2015:

January 29th, 2014

Taoufik Meklachi, Drexel—Some Cloaking Scenarios

February 12th, 2015

Christopher Larsen, WPI—Energy-Based Fracture Evolution

February 19th, 2015

Miles Wheeler, NYU—The slope of steady water waves with vorticity

PDE/Applied Math Seminars

Winter 2015:

February 26th, 2015

David Nicholls, UIC— High-Order Simulation of Surface Plasmon Resonances: A Method of Field Expansions

March 6th, 2015

Jacob Bedrossian,U. Maryland— Mixing and enhanced dissipation in the inviscid limit of the Navier-Stokes equations near the 2D Couette flow

Spring 2015:

April 2nd, 2015

Jian Song, University of Hong Kong—On a class of stochastic partial differential equations

April 9th, 2015

Tai-Ho Wang, CUNY—Optimal execution with uncertain order fills

April 30th, 2015

Celia Reina, U. Penn—Kinematics of continuum elastoplasticity in the regime of large deformations

May 14th, 2015

Scott Cook, Swarthmore—Billiard Dynamics and Stochastic Thermodynamics

May 28th, 2015

Michael Goldberg, University of Cincinnati—Counting cusp singularities in two-dimensional Discrete Dispersive Equations

Dynamical System Seminars

October, 8

Myles Akin—Drexel University
Estimating the structure of small dynamical networks from the state time evolution of one node

October, 15

Kelly Toppin—Drexel University
Patterns of synchrony in neuronal networks : The role of synaptic inputs

October, 22

Aijun Zhang — Drexel University
Existence and Non-existence of travelling pulses in lateral Inhibition Neural Network

October, 29

Kelly Toppin—Drexel University
Chaos in TC Neuron with periodic inputs

November, 5

Myles Akin —Drexel University
Identification of dynamical states in stimulated Izhikevich neuron models by using a 0-1 Test

November, 12

Dennis Yang—Drexel University
Localized stationary solutions in 1D Neural Field Models with general couplings and gains

Dynamical System Seminars

November, 19

Kelly Toppin —Drexel University
Periodic and Non-Periodic responses of membrane potentials in Squis Giant Axons during sinusoidal current stimulation

January, 14

Kelly Toppin —Drexel University
Deep brain stimulation for Parkinsonian networks.

January, 21

Dennis Yang —Drexel University
Localized stationary solutions in 1D Neural Field Models with General Couplings and Gains

January, 28

Aijun Zhang —Drexel University
Existence and non-existence of travelling pulses in Lateral Inhibition Neural Network

February, 4

Alexander Onderdonk —Drexel University
Neuronal spike Trains and stochastic point processes I by D. H.Perkel, G. L.Gerstein and G. P. Moore

February, 11

Alexander Onderdonk —Drexel University
Neuronal spike Trains and stochastic point processes II by D. H.Perkel, G. L.Gerstein

Dynamical System Seminars

February, 28

Kelly Toppin —Drexel University
Auto Dynamical Programming—A tutorial

March , 4

Myles Akin —Drexel University
Neuronal Networks (D. Terman , J. E Rubin and C. O. Dikeman)

March , 11

Alexander Onderdonk —Drexel University
Dynamics of Pattern Formation in Lateral Inhibition type Neural Fields by Shun-ichi Amari

March , 31

Kelly Toppin —Drexel University
Irregular activity arises as a natural consequence of synaptic inhibition (D. Terman, J. E . Rubin and C. O. Diekman)

April, 4

Alexander Onderdonk —Drexel University
Dynamics of Pattern Formation in Lateral Inhibition type Neural Fields by Shun-ichi Amari

Honors Day Awards

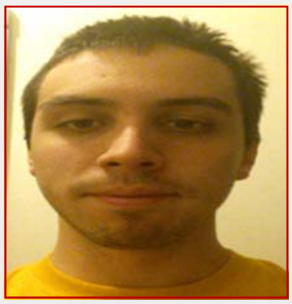
The Drexel University College of Arts and Sciences Honors Day was held on May 21, 2015 in Behrakis Grand Hall.

Frank H. M. Williams Prize in Mathematics—Winner

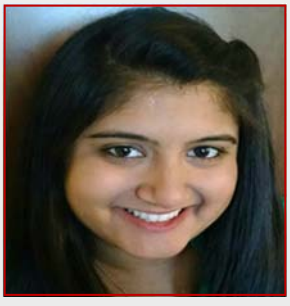
Weichen Zhou is a Mathematics Major and a member of the Pennoni Honor's College in Drexel with a goal to pursue a career in Statistical Analysis or Mathematical research. Weichen was hired as a undergraduate tutor in the Math Resource Center in Winter2014 and she was awarded to be one of the best tutors in Winter2015. Being in Drexel's 5-year-Co-op program, she is currently on her second Co-op assignment working as a market analyst Co-op with Monitoring Analytics, LLC. This is her second time working with the company and she is determined to learn more and achieve more at her position. Having found her great interest in Math, she is determined to pursue a PhD degree in Mathematics. And she will be serving as the President of the Math Student Organization of the 2015-2016 academic year.

Robert J. Bickel Endowed Scholarship Fund—Winners

Austin Rineer is currently a second year math major student at Drexel University. He is a member of the Math Student Organization. This year I have been working on research in combinatorics with Ryan Kaliszewski, and am currently on co-op at the Penn State Navigation Research and Development Center in Warminster. The math program at Drexel has provided me with many of the tools necessary to be successful in these endeavors and I am thankful for all the professors who have guided me to this point.



Brandon Locke is a junior at Drexel University and currently working as a co-op in the Math Department under the supervision of Dr. Shari Moskow. He had previous co-ops at Independence Blue Cross, as well as Monitoring Analytics both as a Data Analyst. He originally came into Drexel as a Physics student, but switched to Math prior to his sophomore year. The most intriguing course he has taken was Modern Analysis, but the most fun course was Graph Theory.



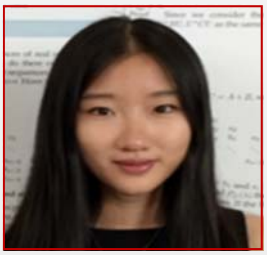
S**onya Gheewala** - I am currently in my junior year at Drexel University, pursuing a Bachelor of Science in Mathematics, with an interest in finance. For my third coop, I am returning to the Informatics department of Independence Blue Cross as a research analyst, working primarily with the Finance, Underwriting, and Actuarial departments. Throughout the year, I also serve as a teaching assistant for Civic 101 and a mentor at the Lindy Center for Civic Engagement teaching 6-8th graders math and literacy.

Honors Day Awards

Robert J. Bickel Endowed Scholarship Fund—Winners

Kevin Proska -My experience with Drexel's Math Department has been very enriching. In addition to majoring in mathematics, I am also physics major, so my courses have helped strengthen my understanding of the specific mathematics that governs the laws of nature. In addition, my math courses have helped me greatly on my last two co-ops, which I spent at Lockheed Martin's Advanced Technology Laboratory (ATL). At ATL, I have been able to use my strong mathematical background to develop cost-effective solutions to a wide variety of complex military problems. Indeed, my experience with the math department has been both intellectually stimulating and professionally rewarding.

Sean Miller is a pre-junior mathematics major from the Philadelphia area. He is pursuing a B.S. in Mathematics with intent to declare minors in both Computer Science and Finance while also working to graduate in the Pennoni Honors College. While he hasn't decided on his career plans yet, Sean is working hard in everything he is trying and is keeping an open mind to find what he wants to spend his life doing. Sean is a National Merit full-tuition scholar and a former STAR research scholar. He served his first co-op writing financial software for Ameriquest Business Services and he is currently on his second co-op doing mathematics research with Professor Hugo Woerdeman on the subject of determinantal representation of polynomials.



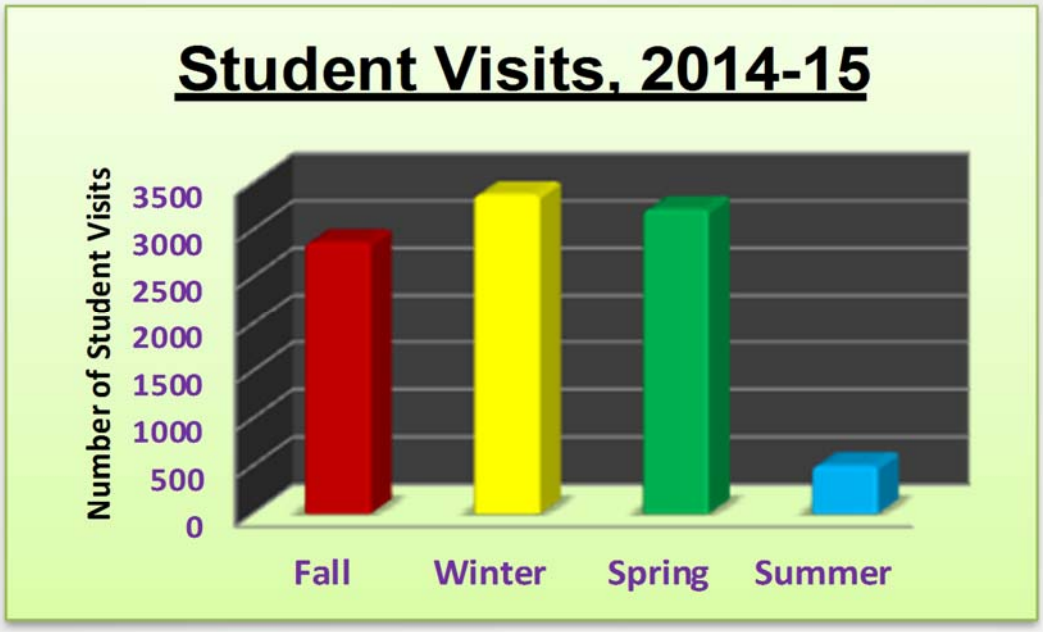
Yilin Yang was a Chinese Musician before she came to Drexel in 2013. She is now a pre-junior in math department and Pennoni Honors College with a 4.0 GPA. Yilin is a tutor at the Math Resource Center and she has been doing research in theoretical mathematics under the mentoring of Dr. Lei Cao since her freshmen year. Yilin has her first paper "On the Construction of Jacobi Matrices from Mixed Data " published on Alabama Journal of Mathematics and she has done four conference and research presentations on her projects this year. She wants to thank the department and all the faculties and staff that have been supporting her and she is looking forward to making new progress on her research. Yilin will pursue a Ph.D. in Mathematics after graduating.

Jimmy Zhao : No information available

Math Resource Center

The Drexel students who enrolled in a Math course visit the MRC on a regular basis. The center offers a comfortable environment to the students to get one on one help in Mathematics. The center is run by math faculties, graduate students and undergraduate students mainly math majors. Students can walk in any time during the hours of operation. The center is open to the students from 10:00 am to 7:00 pm, Monday to Thursday and 10:00 am to 4;00 pm on Friday. The student survey results shows that the students visit the center on a regular basis improved their scores from a C to A. A minimum of six tutors are available at the center every hour.

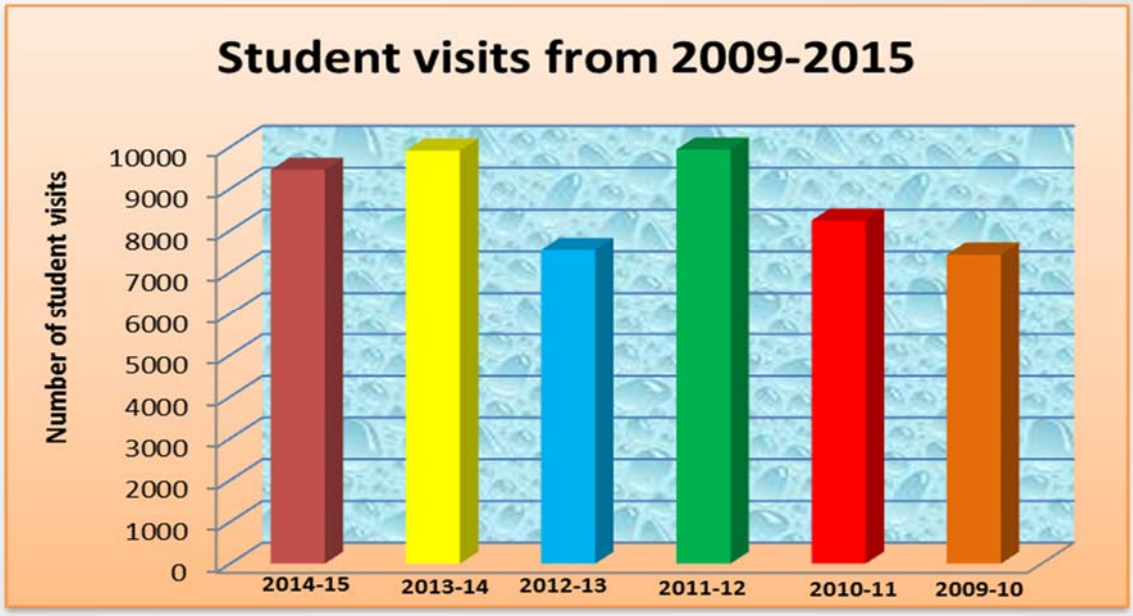
The following graph represents the student visits in the 2014-15 academic year.



Student Tutor Orientation: Student tutors with Dr. Shari Moskow, Math Department Head.

Math Resource Center

During 2014-15 academic year , 9643 student visits were recorded at the center. In this academic year, student per week averaged 241. The following graph shows a comparison of student visits from 2009—2015.



Student Survey Reviews:

This is the best place to get one on one help. MRC helped me go from a "C" student to an "A" in a year in math courses.

The MRC is a great resource and I am thankful for it. Keep up the good work!

The MRC is an excellent resource and need a large facility with private rooms. It would be great if you have longer hours.

Leadership Learning Engage Fun

STUDENT Activities

Mathematics Student Organization

Drexel's Mathematics Student Organization has had quite an exciting year! In the fall, we attended the play *QED* at the Lantern Theater in Philadelphia, along with Drexel's Society of Physics Students. In the winter, we held various meetings featuring many board games as well as movies such as *Good Will Hunting* and *A Beautiful Mind*. We had a guest come and teach us how to make math origami for one of our events, and the healthcare soft- ware company Epic visited one week to give us an infor- mation session on their co-op/ career options. In addition, we once again joined forces with the Society of Physics Students to hold a Poker Tournament in Feb- ruary. In the spring, we held some more game nights and had an MSO dinner at Landmark Americana for organization members to get to spend some more time together. Lastly, we held a bake sale to raise money for the organization, with members helping to make and sell the baked goods.

Math Bytes

Math Bytes is the Mathematics Department's graduate student organization. We seek to promote interest and research in the field of mathematics and also to protect and attend to the interests and concerns of our students. Membership is open to all students pursuing a graduate degree in mathematics at Drexel. The Graduate Student Association provides funding and support for each of our events. For the 2014-2015 academic year, Math Bytes' officers were Benjamin Grossmann, President; Daniel Watkins, Vice President; Chung Wong, Treasurer; Charles Burnette, Secretary.

Math Bytes started the year with a new event, the Thanksgiving Potluck/Cook Off. Graduate students were able to show off their cooking skills and socialize together. The winners were Sarah Rody for appetizers, David Sulon for entrees, and Timothy Favor for desserts.

Our 2nd annual e Day celebration was held on February 6th, 2015. The festivities included foods starting with the letter "e", e recitation contest, and an e-themed haiku writing contest. Math Bytes then co-sponsored Board Game Night with Physics Graduate Student Association (PGSA) during the winter term. Lastly, along with the Mathematics department and Mathematics Student Organization, Math Bytes took part of the department's Pi Day celebration.

During the spring term, Math Bytes co-sponsored with PGSA for Video Game Night and FrisBBQ (Frisbee and BBQ). Unfortunately, for the fourth year in a row, it was rained out and turned into Board Game Night Math Bytes also co-sponsored with PGSA, BGSA, and ChemGSA for Science on Tap Quizzo. At the End of the Year Sendoff, we said goodbye to our departing graduate students and wish them the best of luck in their futures.

On Graduate Students Day, Math Bytes was rewarded with the Most Collaborative Award due to our commitment to create a friendly environment with other student organizations. Once again, thanks to the leadership of Chung Wong, Charles Burnette, Benjamin Grossman, and Daniel Watkins, MathBytes has the best year to date.

SIAM Student Chapter

The Society for Industrial and Applied Mathematics (SIAM) is one of the largest applied mathematics and computational science organizations in the world and sponsors almost 100 student chapters around the globe. For the 2014-2015 academic year, the officers of Drexel's student chapter for SIAM were Charles Burnette, President; Chung Wong, Vice President; and Amanda Lohss, Treasurer.

Our chapter held a biweekly seminar consisting of fourteen individual talks from Drexel graduate students as well as presentations from the mathematics department's own Ryan Kaliszewski, David Ambrose, and Shari Moskow. The seminar invited one outside speaker – Ahmad Sabra from Temple University. Throughout the year, Timothy Faver and Charles Burnette gave three-part talk series on Bochner-Lebesgue spaces and additive combinatorics, respectively.

The 5th annual Epsilon Talks, a special event where our math department's first-year graduate students give mini talks, were held on June 3rd and brought our seminar to a close for the year. We awarded the SIAM Student Chapter Certificate of Recognition to Charles Burnette for outstanding service and contributions to the chapter.

PI DAY

On Thursday, March 12, 2015, the Math Department was proud to celebrate our 10th annual Pi Day celebration. The festivities occurred during the final week of the winter term, allowing our majors to relax and have fun before they headed into finals and then out on co-op.

Pi Day always includes food, fun, games and prizes. This year's events included favorite games from years past such as Jeopardy and Bingo, all Pi-themed of course!

Our Integration Bee is still going strong. This mathematical take on a spelling bee has teams of students solve increasingly difficult integrals until one team is crowned Integration Champions! This year was our sixth annual bee, and we changed the rules a bit so that all participants would be able to play every round. The students were happy and excited, and we believe that this change made a great game even better!

A great time was had by all at our 2015 Pi Day celebration. We are already looking forward to Pi Day 2016!

The department head Dr. Shari Moskow hosted a party on September 29, 2014 at her residence

Annual Holiday Reception

The department celebrated a pot luck holiday party on December 10, 2014, in the Math Resource Center

Weekly Teas

Each Monday during the term at 2:30 pm faculty, students and staff gather in room 207 to chat , eat and relax.