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Dear Alum and Friend,

It is a pleasure to inform you each year on the department’s accomplishments. A huge change for us has been the decision to teach all our freshmen courses in small sections (of up to 35 students). It has been greatly rewarding to see how our students perform so much better under this new format. This new commitment required that we had to attract many new faculty members and it has been gratifying that we were able to attract excellent new members.

Another major event this past year was that we hosted the Mathematics Association of America’s local section meeting. We had renowned speakers at this event including Gilbert Strang from MIT and Philip Holmes from Princeton. In addition, a math contest for high school students was conducted with a grand prize of a scholarship to Drexel.

This year, as in previous year, we were fortunate to have several prize winners in the department. Dr. Robert P. Boyer received the Crawford Award from the Mathematical Association of America for his 30+ years in dedication of teaching. He received his award based on an extraordinary level of praise Dr. Boyer has received from his students. In many ways, Dr. Boyer has contributed to the educational mission of the department, including his strong support to our graduate program, his innovative Financial Mathematics courses, his constant mentoring of our students (both undergraduate and graduate), etc. Dr. Yixin Guo, one of our talented young faculty members, was awarded with the Antelo Deveraux Award for Young Faculty. The award was based on her proposal on the mathematical modeling of deep brain stimulation, with the purpose of trying to find solutions to Parkinson’s disease.

Also our students have done very well. Our graduate students Wei Wang and Caroline Shapcott were the recipients of the Al Herr award. Our undergraduates have been successful as well with our award winning students Heather Hoenninger, Ian Johnston, Jonah Smith, John L. Stake, recipients of the Harry E. Muchnic Award; Daniel Jordan, recipient of the Frank Williams Prize; and Andrew Jerista, winner of the Robert Bickel Award.

As a department we continue to grow rapidly. This year Associate Professor Shari Moskow and Assistant Professor J. Douglas Wright have joined our department. As you will be able to tell from this report, both Dr. Moskow and Dr. Wright are great assets to our department with their research and teaching accomplishments. Also our undergraduate teaching mission is greatly enhanced by the new auxiliary faculty members, Professors Avinash Dalal, Michael Daniel, Abed Elhashhash, William Keith, Taylor Kingsbury, and Richard White.

Dr. William (Bill) Y. Goh retired this past year after 20 years of dedicated service to Drexel University. Dr. Goh has a distinguished career as a researcher with numerous publications in his name. He was a demanding educator which was very inspiring to those students who enjoyed the challenge. Dr. Goh is currently teaching and continuing his research in his country of birth, China.

Our Mathematics Resource Center continues to grow in popularity. This year we have been able to hire a full time manager, David Shen. He has been doing a terrific job in enhancing the services of the resource center. Overall we served Drexel’s students with 5000+ student tutoring hours.

We hope that you are as excited about our department as we are. We greatly appreciate your feedback and your involvement as it greatly helps in accomplishing our mission of excellence in research and education.

Thank you and Best Wishes,

Dr. Hugo J. Woerdeman
Professor and Department Head
### Tenured/Tenure-Track Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Institution</th>
<th>Department</th>
<th>Research Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>William M.Y. Goh, Ph.D.</td>
<td></td>
<td>(Ohio State University)</td>
<td>Associate Professor</td>
<td>Number theory, approximation theory and special functions, combinatorics, asymptotic analysis.</td>
</tr>
<tr>
<td>Pavel Grinfeld, Ph.D.</td>
<td></td>
<td>(Massachusetts Institute of Technology)</td>
<td>Assistant Professor</td>
<td>Intersection of physics, engineering, applied mathematics and computational science.</td>
</tr>
<tr>
<td>Yixin Guo, Ph.D.</td>
<td></td>
<td>(University of Pittsburgh)</td>
<td>Assistant Professor</td>
<td>Biomathematics, dynamical systems, ordinary and partial differential equations and math education.</td>
</tr>
<tr>
<td>R. Andrew Hicks, Ph.D.</td>
<td></td>
<td>(University of Pennsylvania)</td>
<td>Associate Professor</td>
<td>Robotics, computer vision, catadioptics.</td>
</tr>
<tr>
<td>Pawel Hitczenko, Ph.D.</td>
<td></td>
<td>(Warsaw University)</td>
<td>Professor</td>
<td>Probability theory and its applications to analysis, combinatorics, wavelets, and the analysis of algorithms.</td>
</tr>
<tr>
<td>Dmitri Kalyuzhnyi-Verbovetzkii, Ph.D.</td>
<td></td>
<td>(Kharkov National University)</td>
<td>Assistant Professor</td>
<td>Operator theory, systems theory, complex analysis, C*-algebras and harmonic analysis.</td>
</tr>
<tr>
<td>Georgi S. Medvedev, Ph.D.</td>
<td></td>
<td>(Boston University)</td>
<td>Assistant Professor</td>
<td>Applied mathematics, nonlinear diffusion equations, mathematical biology, dynamical systems, numerical methods.</td>
</tr>
<tr>
<td>Jennifer Morse, Ph.D.</td>
<td></td>
<td>(University of California, San Diego)</td>
<td>Associate Professor</td>
<td>Algebraic and tableaux combinatorics, discrete math, symmetric and special functions, basic hypergeometric series.</td>
</tr>
</tbody>
</table>
### Tenured/Tenure-Track Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Position</th>
<th>Research Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shari Moskow, Ph.D.</td>
<td>(Rutgers University)</td>
<td>Associate Professor</td>
<td>Applied PDEs and numerical analysis, in particular homogenization theory, inverse problems, and related asymptotic and numerical methods.</td>
</tr>
<tr>
<td>Ronald K. Perline, Ph.D.</td>
<td>(University of California at Berkeley)</td>
<td>Associate Professor</td>
<td>Applied mathematics, numerical analysis, symbolic computation, differential geometry, mathematical physics.</td>
</tr>
<tr>
<td>Marci A. Perlstadt, Ph.D.</td>
<td>(University of California at Berkeley)</td>
<td>Associate Professor</td>
<td>Applied mathematics, computed tomography, numerical analysis of function reconstruction, signal processing, combinatorics.</td>
</tr>
<tr>
<td>Eric Schmutz, Ph.D.</td>
<td>(University of Pennsylvania)</td>
<td>Associate Professor</td>
<td>Probability, combinatorial optimization.</td>
</tr>
<tr>
<td>Li Sheng, Ph.D.</td>
<td>(Rutgers University)</td>
<td>Associate Professor</td>
<td>Discrete optimization, probabilistic methods in combinatorics, operations research, graph theory and its application in molecular biology, social sciences and communication networks, biostatistics, computer science.</td>
</tr>
<tr>
<td>Justin R. Smith, Ph.D.</td>
<td>(Courant Institute, New York University)</td>
<td>Professor</td>
<td>Homotopy theory, operad theory, quantum mechanics, quantum computing.</td>
</tr>
<tr>
<td>Hugo J. Woerdeman, Ph.D.</td>
<td>(Vrije Universiteit, Amsterdam)</td>
<td>Department Head, Professor</td>
<td>Matrix and operator theory, systems theory, signal and image processing, and harmonic analysis.</td>
</tr>
<tr>
<td>J. Douglas Wright, Ph.D.</td>
<td>(Boston University)</td>
<td>Assistant Professor</td>
<td>Partial differential equations, particularly the behavior of nonlinear waves in systems arising in hydrodynamics, optics and cell biology.</td>
</tr>
<tr>
<td>Thomas Yu, Ph.D.</td>
<td>(Stanford University)</td>
<td>Associate Professor</td>
<td>Multiscale mathematics, wavelets, applied harmonic analysis, subdivision algorithms, nonlinear analysis, applied differential geometry and data analysis.</td>
</tr>
</tbody>
</table>
Auxiliary Faculty

Avinash Dalal, M.S. (University of Maryland) Instructor.

Michael Daniel, Ph.D. (University of Colorado) Senior Lecturer. Number Theorist specializing in Modular Forms and Function Fields.

Alexander Dolgopolosky, Ph.D. (Case Western Reserve University) Senior Lecturer. Applied mathematics.

James W. Donnelly, M.S. (Drexel University) Senior Lecturer. Math foundations of engineering.

Daryl Falco, M.S. (Drexel University) Instructor. Discrete mathematics and automata theory.

Raymond J. Favocci, III, M.S. (Drexel University) Instructor.

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

Patricia Henry, M.S. (Drexel University) Associate Head of the Mathematics Department, Senior Lecturer. Probability and statistics.

Robert Immordino, M.S. (Drexel University) Instructor.
Auxiliary Faculty

William Keith, Ph.D. (Pennsylvania State University) Instructor.

Taylor Kingsbury, M.S. (Drexel University) Instructor.

Elaine Kyriacou, M.S. (Rutgers University) Instructor. Mathematics curriculum content and methods of instruction.

Marna A. Mozeff-Hartmann, M.S. (Drexel University) Advisor, Instructor.

Gregory L. Naber, D.A. (Carnegie-Mellon University) Senior Lecturer. Topology, differential geometry, and mathematical physics, particularly relativity and gauge theory.

Oksana P. Odintsova, Ph.D. (Omsk State University) Senior Lecturer. Math education.

Adam C. Rickert, M.S. (Drexel University) Instructor.

Judy T. Smith, M.A. (West Chester University) Instructor.

Jeanne Steuber, M.S. (Boston University) Instructor.
Emeritus Faculty

Loren N. Argabright, Ph.D. (University of Washington) Professor Emeritus. Functional analysis, wavelets, abstract harmonic analysis, the theory of group representations.

Robert C. Busby, Ph.D. (University of Pennsylvania) Professor Emeritus. Functional analysis, C*-algebras and group representations, computer science.


Herman E. Gollwitzer, Ph.D. (University of Minnesota) Associate Professor Emeritus. Applied mathematics, differential equations, data analysis, user interface design, visualization, scientific computing.

Charles J. Mode, Ph.D. (University of California at Davis) Professor Emeritus. Probability and statistics, biostatistics, epidemiology, mathematical demography, data analysis, computer-intensive methods.


Jet Wimp, Ph.D. (University of Edinburgh) Professor Emeritus. Applied mathematics, special factors, approximation theory, numerical techniques, asymptotic analysis.

Staff

Byron C. Greene
Administrative Assistant

Margaret A. Mercer
Budget Coordinator

Alissa Morris-Alexander
Graduate Program Coordinator

C. Gene Phan
Computer Specialist

David Shen
Resource Room Coordinator
# Teaching Assistants and Research Assistants

<table>
<thead>
<tr>
<th>Jason Aran</th>
<th>Christopher Novak</th>
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<tr>
<td>Lei Cao</td>
<td>Nattapol Ploymaklam</td>
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<tr>
<td>Meredith Coletta</td>
<td>Caroline Shapcott</td>
</tr>
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<td>Derek Heilman</td>
<td>John Vogel</td>
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<tr>
<td>David Kimsey</td>
<td>Wei Wang</td>
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<tr>
<td>Emek Kose</td>
<td>Yun Yoo</td>
</tr>
<tr>
<td>Selcuk Koyuncu</td>
<td>Le Yu</td>
</tr>
<tr>
<td>Dmitry Leiderman</td>
<td>Svitlana Zhuravytska</td>
</tr>
</tbody>
</table>
New Faculty Profiles

Avinash Dalal earned his B.A. in Mathematics and B.S. in Computer Engineering from Drexel University in 2001. He received his M.S. in Applied Mathematics from the University of Maryland at College Park in 2003.

During his graduate career he worked as a Teaching Assistant and was researching Cryptography. After graduate school he worked at Raytheon and Sirius Satellite Radio and was teaching part time at a local community college as an adjunct. He now teaches as an auxiliary faculty member in the Mathematics Department at Drexel.

Michael Daniel earned his BA in Mathematics at Cornell University in 1990. He traveled extensively before continuing his studies at University of Colorado at Boulder. He earned PhD in Mathematics from that university in 2007.

Mike is a Number Theorist specializing in Modular Forms and Function Fields. He is currently teaching Calculus.

Abed Elhashash received his B.A. in Mathematics from the American University of Beijut, and he received his Masters and Ph.D. in Mathematics from Temple University. While doing his graduate studies at Temple University, he worked as an adjunct faculty member in various institutions and departments in the Philadelphia area including the Mathematics, Physics, and Computer Science department in the University of the Sciences and Temple University's Statistics department.

His specialty is matrix theory and his research interests include: Generalizations of Nonnegative Matrices, the Perron-Frobenius Theory Generalizations and Extensions to Cones in Hilbert and Banach Spaces, Generalizations of M-Matricies and ODE's on manifolds.

Taylor Kingsbury received his bachelor's degree in Mathematics from Penn State University in 2005. He then proceeded to attend graduate school at Drexel University where he worked as teaching assistant for the TDEC and Calculus course sequences.

In 2007, after earning an M.S. in Mathematics, Taylor joined the Drexel University Mathematics Department faculty as an instructor.

William J. Keith earned B.S. degrees in Mathematics and Physics from the University of Texas at Austin in 1999. He attended graduate school at the Pennsylvania State University, choosing to study mathematics, and earned his Ph.D. in 2007. During his time at Penn State he taught a wide range of undergraduate classes, such as pre-calculus, calculus, and linear algebra.

William joined Drexel's faculty in the Fall Quarter of 2007 as a Senior Lecturer and has been teaching calculus courses and staffing in the Math Resource Center. His research is in partition theory.
New Faculty Profiles

**Shari Moskow** received her Ph.D in Applied Mathematics from Rutgers University in 1996. After that she held a joint postdoctoral appointment with the University of Minnesota and Schlumberger-Doll Research, an oil services company. She has since then been at the University of Florida, and has had visiting appointments at Ecole Polytechnique in France and Rice University.

Her research interests include applied PDEs and numerical analysis, in particular homogenization theory, inverse problems, and related asymptotic and numerical methods.

**Richard D. White, Jr.** received his B.S. in Mathematics Education from St. Joseph’s University in 1975 and received his M.S. in Mathematics Education in 1986. Throughout the years he has worked in various high schools as a mathematics teacher, registrar, and admissions director as well as numerous colleges and universities as an adjunct professor of mathematics.

**J. Douglas Wright** completed his Ph.D. in Mathematics at Boston University in 2003. He was a post-doctoral fellow at the Fields Institute for Research in Mathematical Sciences and a Dunham Jackson Assistant Professor in the School of Mathematics at the University of Minnesota before joining Drexel University in 2007.

His research interests include partial differential equations, particularly the behavior of nonlinear waves in systems arising in hydrodynamics, optics and cell biology.

New Staff Profiles

**Byron Greene** received his B.S. in Mathematics from Delaware State University in 2006. Prior to pursuing a B.S. in Mathematics Byron was an Aviation Science student earning a private pilot license.

At Delaware State University Byron served as a student manager for the Delaware State University Men’s Basketball team. As a student manager, Byron was a NCAA and NIT Tournament participant. In 2005 and 2006 he served as a Mathematics teacher in the Classic Upward Bound Program.

**David Shen** earned his B.A. in Holistic Education and B.S.E. in System Science & Engineering from the University of Pennsylvania in 1980. He worked 18 years at Philadelphia University and 5 years at Temple University. He won two teaching awards at Philadelphia University.

Since 2005, he has worked at Drexel University and in the fall of 2007 became the manager of the Math Resource Center. He most enjoys instilling math confidence in students who haven’t had math in 20 years or more. In 1994, he won a grant in fiction from the Pennsylvania Council on the Arts for his book *China, Home*. 
**Faculty Awards**

**Dr. Yixin Guo** was the 2008 recipient of the Antelo Deveraux award for Young Faculty.

Yixin Guo received her PhD in Mathematics from the University of Pittsburgh in 2003. Yixin spent three years in postdoctoral training in mathematical biology. Her research focus is computational neuroscience and dynamical systems. Her most recent and ongoing project is on modeling Parkinson’s disease and Deep Brain Stimulation. She joined the Mathematics Department at Drexel University in 2006. Her papers have appeared in SIAM Journal on Applied Dynamical Systems and Journal of Neurophysiology.

**Dr. Robert Boyer** was the 2008 recipient of the Crawford Award from the Mathematical Association of America.

Robert Boyer received his PhD in Mathematics from the University of Pennsylvania in 1979. Robert is Professor of Mathematics and Graduate Advisor for the programs in mathematics at Drexel University. His research interests are in group representation theory, the mathematics of computer vision, and approximation theory. His research in representation theory has been supported multiple times by the National Science Foundation. His papers have appeared in Advances in Applied Mathematics, Journal of Operator Theory, Journal of Functional Analysis, Duke Mathematical Journal, and Applied Numerical Analysis. He’s a member of Sigma Xi and the Society of Industrial and Applied Mathematics.

**Service Awards**

The Drexel University Employee Service Awards Ceremony was held on Thursday, December 13, 2007 in the George D. Behrakis Grand Hall in the Creese Student Center. The following members of the Drexel Mathematics department were recognized for their service at Drexel University.

- **Georgi Medvedev** Five Year Award Recipient
- **William Goh** Twenty Year Award Recipient
- **Marci Perlstadt** Twenty Five Year Award Recipient
Faculty Grants

R. Andrew Hicks, National Science Foundation, IIS 0413012, Micromirror Arrays for Imaging Sensors, 2004-2008, $340,000


Georgi Medvedev, National Science Foundation, IOB 0417624, Irregular firing patterns in dopamine neurons and related problems, 2004-2008, $263,114

Jennifer Morse, Anne Schilling, Mark Shimozono, National Science Foundation, DMS 0652641 FRG: Collaborative Research: Affine Schubert Calculus: Combinatorial, geometric, physical, and computational aspects, 2007-2010, $671,270

Jennifer Morse, National Science Foundation, DMS 0652668, FRG: Affine Schubert Calculus: Combinatorial, geometric, physical, and computational aspects, 2007-2010, $103,528

Shari Moskow, National Science Foundation, DMS 0749396, Asymptotics at Resonant Scales: Applications to inhomogeneous material simulation, discretization and inversion, 2006-2009, $192,451

Hugo J. Woerdeman, National Science Foundation, DMS 0500678, Multivariate Moments and Factorization and Other Problems in Analysis, 2005-2009, $89,000

J. Douglas Wright, National Science, Foundation, DMS 0807738, Dynamics and interactions of free fluid interfaces, 2008-2011, $110,000

Thomas Yu, National Science Foundation, DMS 0542237, Multiscale Data Representatives in Geometric and Nonlinear Settings, 2005-2008, $149,982

Faculty Appointments / Conference Organizations

Robert P. Boyer
- Member, Executive Committee, Mathematics Association of America
- Organizer Regional Mathematical Association of America meeting, Drexel University, November 10, 2007

Alexander Dolgopolosky
- Member of Organizing Committee, International Conference on Plasma Medicine (ICPM) –I, Corpus Christi, TX, October, 2007

Dmitry Kaliuzhnyi-Verbovetskyi
## Faculty Appointments / Conference Organizations

**Gregory Naber**
- Standing Committee, 10th International Conference on Geometry, Integrability and Quantization
- Editor for Journal of Dynamical Systems and Geometric Theories
- Editor for Journal of Geometry and Symmetry in Physics

**Georgi Medvedev**
- Co-organizer, AIMS 7th International Conference on Synchronization Oscillations and Synchronization in Neuronal Networks, Arlington, TX, May 2008

**Jennifer Morse**
- Organizer, Formal Power Series and Algebraic Combinatorics, Chile, 2008
- Co-organizer, Drexel/Penn/Swarthmore Algebraic Combinatorics/Geometry seminar

**Shari Moskow**
- Organizer, SIAM Conference on Analysis of PDE, Mesa, Arizona, December 10-12, 2007
- Organizer, Minisymposium at SIAM Conference on Analysis of PDE, Mesa, Arizona, December 10-12, 2007
- NSF Reviewer

**Li Sheng**
- Co-Organizer, Sixth International Workshop on Machine Learning in Biomedicine and Bioinformatics, Cincinnati, Ohio, Dec 13-17, 2007
- Reviewer for Sixth International Workshop on Machine Learning in Biomedicine and Bioinformatics
- Co-Organizer, DIMACS Workshop on Computational Methods for Predicting Outcome in Cancer, Rutgers University, Piscataway, New Jersey, May 29 – 30, 2007

**Hugo Woerdeman**
- Panel Review Member, National Research Council/National Academy of Sciences
- Editor of SIAM J. Matrix Anal. Appl., 2002-present
- Editor of International J. of Information and System Sciences

**J. Douglas Wright**
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Faculty Presentations


**Michael Daniel**, *Eisenstein Series with Polynomial Level in a Function Field of a Finite Field*, invited, Bryn Mawr Summer Seminar, Bryn Mawr College, Bryn Mawr, PA, July 2008

**Yixin Guo**, *Modeling Parkinson’s Disease and Brain Stimulations*, invited, Seminar Talk held at HRL Laboratory, Malibu, CA, September 2008

**Yixin Guo**, Multi-site *Local Field Potential stimulation to Restore Thalamocortical Relay Fidelity*, Seminar, invited, Mathematical Neuroscience Seminar, Indiana University Purdue University Indianapolis, Indianapolis, IN, September 2008


**Yixin Guo**, *Desynchronization of Subthalamic Bursting Clusters and the Application in Parkinson’s Disease*, Conference, invited, International Conference on Cognitive Neurodynamics, Shanghai, P.R. China, November 2007

**Yixin Guo**, *Modeling Parkinson’s Disease and Brain Stimulations*, invited, College of Arts and Science Dean’s Seminar, Drexel University, Philadelphia, PA, October 2007


**Pawel Hitczenko**, *Statistics on Permutation Tableaux*, Session, invited, Special Session on Algorithmic Probability and Combinatorics, Chicago, IL, October 2007

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<tr>
<th>Name</th>
<th>Title</th>
<th>Venue</th>
<th>Date</th>
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</thead>
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<tr>
<td>Pawel Hitczenko</td>
<td>Computing Walsh-Hadamard Transform</td>
<td>Seminar, invited, Probability Seminar, Warsaw University, Warsaw, Poland</td>
<td>March 2008</td>
</tr>
<tr>
<td>Pawel Hitczenko</td>
<td>Partitions with Restricted Part Sizes</td>
<td>Oberseminar Stochastik, invited, Universität Hannover, Hannover, Germany</td>
<td>April 2008</td>
</tr>
<tr>
<td>Pawel Hitczenko</td>
<td>Applications of Martingales</td>
<td>Seminar, invited, Combinatorial Optimization and Distributed Algorithms Seminar, LIPN, Université Paris-Nord, Paris, France</td>
<td>May 2008</td>
</tr>
<tr>
<td>Pawel Hitczenko</td>
<td>Tails of Perpetuities</td>
<td>Conference, invited, X Conference on Probability, Bedlewo, Poland, May</td>
<td>2008</td>
</tr>
<tr>
<td>Georgi Medvedev</td>
<td>Noise-induced Bursting in Electrically Coupled Ensembles of Neural Oscillators</td>
<td>Workshop on Complex Dynamics in Large Coupled Systems, Weierstrass Inst. For Applied Analysis, Berlin, Germany</td>
<td>November 2008</td>
</tr>
<tr>
<td>Georgi Medvedev</td>
<td>Multimodal Oscillations: from Dopamine Neurons to Solid Fuel Combustion</td>
<td>Physics Colloquium, Drexel University, Philadelphia, PA</td>
<td>May 2008</td>
</tr>
<tr>
<td>Georgi Medvedev</td>
<td>Using One-Dimensional Maps for Analyzing Neuronal Dynamics</td>
<td>Dynamical Systems Colloquium, Georgia Tech, Atlanta, GA</td>
<td>October 2007</td>
</tr>
<tr>
<td>Georgi Medvedev</td>
<td>Noise-Induced Bursting</td>
<td>Conference on Mathematical Neuroscience, Centre de Recherche Mathématique, Université de Montreal, Montreal, Quebec</td>
<td>September 2007</td>
</tr>
</tbody>
</table>
### Faculty Presentations


**Jennifer Morse**, *Applications of Macdonald Polynomials*, invited, Banff International Research Station, September 2007


**Shari Moskow**, *An Approximation Method for Scattering and Resonances of Thin Photonic Structures*, Society of Engineering Science Conference, College Station, TX, October 2007


**Shari Moskow**, *An Approximation Method for Scattering and Resonances of Thin Photonic Structures*, Analysis Seminar, invited, University of Maryland, College Park, MD, March 2008


**Eric Schmutz**, *Central Limit theorems in Combinatorics*, Probability Seminar, University of Delaware, Newark, DE, September 2007


Faculty Presentations


**J. Douglas Wright**, *Shooting and Exit Manifolds of Pulse Interactions in One Dimensional Reaction-Diffusion Equations*, Dynamical Systems Seminar, Boston University, April 2008


**Thomas Yu**, *Smooth and Accurate Approximation of Manifold-Valued Data*, Workshop on Subdivision and Refinability, Pontignano, Siena, Italy, May 1-4, 2008

Winter 2007
MATH 680 – Topics in Matrix Analysis
Instructor: Hugo J. Woerdeman
This course is a follow up on Math 504: Linear Algebra and Analysis. Central to this course are the following ten theorems, which will be treated along with their background, consequences and applications: Toeplitz-Hausdorff Theorem, Ando's characterization of the numerical radius unit ball, Lyapunov's Theorem, Fischer's Inequality for M-matrices, Birkhoff's Theorem, A. Horn's Matrix Product Theorem, A. Horn's Sufficiency Theorem, Solvability Theorem for AX+XB=C, Schur Product Theorem, Lie Product Formula

MATH 680 – Bifurcations and Chaos
Instructor: Georgi Medvedev
The language and techniques from the dynamical systems theory are used in the fields as diverse as physics, economics, and biology. The goal of this course is to present several important topics from this theory in a setting that is as simple as possible. Specifically, we shall study the basic theory for the dynamics of iterated one-dimensional maps. The topics include structural stability, bifurcations, symbolic dynamics, and chaos. The only prerequisite for this course is a solid background in calculus.

MATH 640 – Functional Analysis I
Instructor: Dmitry Kaliuzhnyi-Verbovetskyi
Graduate students who took a walk around the three-dimensional space of Multivariate Calculus and then traveled to higher-dimensional spaces of Linear Algebra are invited to undertake a new journey: to infinite-dimensional spaces of Functional Analysis. In the winter term I will guide you through Hilbert spaces.

Spring 2008
MATH 645 – Transform Theory I
Instructor: Thomas Yu
What do modern digital image compression, X-Ray tomography, and the analytic solution of heat equation have in common? They are all based on special linear transformations applied to the underlying objects of interest. This course will focus on the mathematical foundation of these transforms, and will discuss some of the applications of the theory.

MATH 641 – Functional Analysis II (=Fourier Analysis)
Instructor: Dmitry Kaliuzhnyi-Verbovetskyi
Fourier (or harmonic) analysis is a discipline which lies in the intersection of classical and functional analysis and has many applications to differential equations, operator theory, probability and statistics, number theory, and many other areas of mathematics, physics, and engineering.
Honors Day Awards

The Drexel University College of Arts and Sciences Honors Day was held on May 22, 2008 in the Mandell Theater. This year’s winners are:

Robert J. Bikel Award – Andrew Jerista
Harry Muchnic Award – Heather Hoenninger, Ian Johnston, Jonah Smith, John L. Stake
Frank Williams Prize – Daniel Jordan

Andrew Jerista enrolled at Drexel in September 2005 as a Physics major, but later that year decided to pursue a degree in Mathematics instead. He had one co-op experience at Select Greater Philadelphia as an economic development research assistant, where he worked with the Research department in compiling information for companies located in the Greater Philadelphia area. With three terms of classes left, he hopes to pursue a minor in finance and upon graduation in June 2009 plans on attending graduate school to study Financial Mathematics. Andrew received the Robert J. Bickel award for his outstanding academic performance.

Heather Hoenninger started at Drexel in September 2004. She always knew that she was going to study mathematics in college. She is graduating in June 2008 with a BS in Mathematics with a minor in Finance. She had her only co-op experience at SEI, in Oaks, on the Investment and Case Analysis Team. She will be returning to SEI at the end of July with a full-time position on the Global Strategy Team. Heather received the Harry E. Muchnic Scholarship for outstanding academic performance, leadership and industry performance.

Ian Johnston came to Drexel in September 2005 wanting to explore careers in applied mathematics through the university's co-op program. From 2006 to 2008, he served as a research assistant three times studying topics such as oceanography and computer vision. Ian is expected to graduate with a bachelor’s degree in Mathematics, and a minor in Japanese in the summer of 2010. He received the Harry E. Muchnic scholarship as well as First Honors for his extraordinary academic performance.

Jonah Smith started at Drexel in September, 2006. After debating whether to major in music, philosophy, or mathematics, he decided to pursue mathematics which he had concentrated on at community college. He enrolled as a non-co-op student desiring only to learn more about mathematics, one of his many interests. After Jonah graduates (in June 2008) he will be attending Drexel for graduate study in mathematics. Jonah was awarded the Harry E. Muchnic Scholarship for his outstanding academic performance.
Honors Day Awards

John. L Stake started attending Drexel in September 2005. He always knew he would study mathematics and eventually work in a math intensive career, but he wasn’t sure what type of job would be the right one for him. He decided to attend Drexel because of their co-op program. Mr. Stake spent his first co-op working at Susquehanna International Group as an assistant trader in the energy department. He designed, built, and managed Excel trading books for trade entry and position monitoring and was responsible for reconciling ten multimillion dollar accounts. Mr. Stake’s current co-op is at Penn Mutual Life Insurance Company, working as an assistant actuarial analyst. Mr. Stake says he could see himself starting a career in either of these two distinct fields and is excited to try a third and final co-op in spring 2009. He knows that his co-op experiences at Drexel will allow him to make an educated choice and one that he will be able to enjoy when finally selecting his future career.

Mr. Stake passed the first actuary exam in February 2007 and has taken the second actuary exam last week. He is a member of the Pennoni Honors College and despite Drexel’s plus and minus grading system has a current 3.95 GPA. He is currently considering a double major in Mathematics and Finance.

At this year’s College of Arts and Sciences, Honors Day, Mr. Stake received the Harry E. Muchnic Scholarship for his outstanding performance in Mathematics. Mr. Stake is honored to have been an award recipient each of his three years at Drexel, first in 2006, as a first-year student achieving a 4.0 GPA and in 2007 receiving The Dr. Richard and Professor Dorothy Sasin Endowed Scholarship Fund for Students of Math and Chemistry.

Daniel Jordan enrolled at Drexel in the Fall of 2003 as an Architectural Engineer but later changed his major to Mathematics. He completed one co-op at the Philadelphia Streets Department and two co-ops at Susquehanna International Group as a trading assistant, where he worked on the fixed income trading desk developing tools for trade analysis and reporting. He will be going back to Drexel in Fall of 2009 to pursue a Ph.D in Mathematics. Daniel received the Frank H. M. Williams Award in recognition of his outstanding academic achievement in mathematics. Frank William’s son, Don Williams presented the award to Daniel.
Undergraduate Awards

First-Year Students Achieving 4.0 GPA
- Justin Mangiaracina

Senior First Honors
- Ian Johnston

Senior Second Honors
- Nathaniel Beers
Albert Herr Teaching Assistant Award

Drexel University’s Department of Mathematics has established an endowed Teaching Assistant Award in memory of Albert Herr, a distinguished and much-admired faculty member of over thirty years. It is awarded annually to a teaching assistant in the Mathematics Department. The first award was presented in the spring of 1997. Al’s family gave a generous initial contribution to the award fund and we hope that Al’s many friends, students, and colleagues will add to the fund so that this award will continue to be a worthy testament to Al’s contribution to mathematics education.

Wei Wang and Caroline Shapcott recipients of the 2008 Albert Herr Teaching Assistant Award.

Caroline Shapcott graduated from Shippensburg University in 2003 with a B.S in Mathematics. Before entering graduate school, Caroline spent several years teaching secondary math courses and writing curriculum for an online school in Philadelphia. Her experience there ignited an enthusiasm for both math and education which led her to Drexel’s Applied Math PhD program in 2006. In addition to earning a Dean’s Fellowship, Caroline serves as a teaching assistant for the Math Department and was selected for the 2008 Al Herr Teaching Assistant Award.

Wei Wang graduated from Wuhan University, China in 2006 with a BS degree in Mathematics and a Minor in Finance. She joined the Math Department in 2006 and graduated in June 2008 with a Master's degree. During her stay at Drexel, she worked as a Teaching Assistant and received the Albert Herr Award in 2008. Currently, she is working at Keppler Asset Management Inc. as a Portfolio Administrator Assistant and Research Analyst.

Robert Boyer and Caroline Shapcott
Robert Boyer and Wei Wang
Student Presentations and Papers

Daniela Jordon and Daniel Szymkowiak, undergraduate students, presented “A Mathematical Model of Gliomas Brain Tumors Using Dendritic Treatments for Cytotoxic T Lymphocytes Stimulation” at the Mathematical Association of America EPaDel (Eastern Pennsylvania and Delaware Section) Conference, Drexel University, November 2007. The project was performed under the guidance of Dr. Yixin Guo.

Emek Kose Can, graduate student, presented “Double Mirror Catadioptric Sensors Which Are Rectifying,” at the Mathematical Association of America EPaDel (Eastern Pennsylvania and Delaware Section) Conference, Drexel University, November 2007.

Emek Kose Can, graduate student, presented "A Method For Catadioptric Sensor Design" at the Annual Meeting of the Society for Industrial and Applied Mathematics (SIAM), San Diego, July, 2008. The paper was joint work with joint work with Dr. Ronald Perline.

David Kimsey, graduate student, presented "Minimal normal and commuting completions" at the International Workshop on Operator Theory and its Applications (IWOTA), Williamsburg, VA, July 2008. The paper was joint work with Hugo J. Woerdeman.

Selcuk Koyuncu, graduate student, presented "A Toeplitz Solver for the Multivariable Case" at the Eighteenth International symposium on Mathematical Theory of Networks and Systems (MTNS2008), Blacksburg, VA, July 2008. The paper was joint work with Lei Cao and Hugo J. Woerdeman.

Svitlana Zhuravytska, graduate student, participated in the 2008 Summer Graduate Program at the Mathematical Biosciences Institute in Columbus Ohio, July 2008. With fellow participants Einat Bergman, Sam Hsiao, Robert McDougal, she worked under the guidance of Dr. Andrew Oster, on the project "Development of the primary visual cortex: ocular dominance, competition for neurotrophins, and the cortical laminae"
## Bachelor of Science Degrees Awarded

<table>
<thead>
<tr>
<th>Mathematics Majors</th>
<th>Mathematics Minors</th>
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<tbody>
<tr>
<td>Jonathan Hopkins</td>
<td>Boris Block</td>
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<tr>
<td>Rebekah Isaak</td>
<td>Thomas Long</td>
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<tr>
<td>Stephen Burghart – <em>Magna cum Laude</em></td>
<td>David Turner</td>
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<tr>
<td>Jeffrey Hayes</td>
<td>Jason Puckey</td>
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<tr>
<td>Ashley Horton</td>
<td>Bryan Pyles</td>
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<td>Adam Prince</td>
<td>Philip Aidoo</td>
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<tr>
<td>Kyle Binder</td>
<td>Oguzhan Ayakta</td>
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<tr>
<td>Benjamin Burton – <em>Magna cum Laude</em></td>
<td>Joesph Babiasz</td>
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<td>Brain Chmielews</td>
<td>Heather Hoenninger</td>
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<td>Steven Guyardi</td>
<td>Daniel Jordon</td>
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<tr>
<td>Heather Hoenninger</td>
<td>Joshua Karstendick</td>
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<tr>
<td>Daniel Jordon</td>
<td>Sarah Linn</td>
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<tr>
<td>Joshua Karstendick</td>
<td>Vincent Liong</td>
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<tr>
<td>Sarah Linn</td>
<td>Jacy Moreno – <em>Magna cum Laude</em></td>
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<tr>
<td>Vincent Liong</td>
<td>Megan O’Donnell</td>
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<tr>
<td>Jacy Moreno – <em>Magna cum Laude</em></td>
<td>Jonah Smith – <em>Summa cum Laude</em></td>
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<tr>
<td>Megan O’Donnell</td>
<td>Thomas Wise – <em>Cum Laude</em></td>
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<tr>
<td>Jonah Smith – <em>Summa cum Laude</em></td>
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<td>Thomas Wise – <em>Cum Laude</em></td>
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## Masters of Science Degrees Awarded

<table>
<thead>
<tr>
<th>Salvador Rodriguez-Martin</th>
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<tr>
<td>Mianyu Wang</td>
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<tr>
<td>Jason Aran</td>
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<td>Kyle Binder</td>
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<td>Henry Chen</td>
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<tr>
<td>Gabriel Feinberg</td>
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<td>Christopher Novak</td>
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<tr>
<td>Nattapol Ploymaklam</td>
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<tr>
<td>John Vogel</td>
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<tr>
<td>Wei Wang</td>
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</tbody>
</table>
MAA EPaDel Meeting

The department was the host of the fall meeting of the Eastern Pennsylvania and Delaware Section (EPaDel) of the Mathematical Association of America on Saturday, November 10, 2007. This biannual meeting attracted nearly 160 mathematicians including more than 85 students. The conference used the facilities of the Bossone Research Enterprise Center on Market Street.

Dean Donna Murasko and John Meier (EPaDel President) opened the conference with their welcoming remarks. The keynote speakers were Professor Stephen Dunbar, University of Nebraska, who spoke on "The American Mathematics Contests;" Professor Gilbert Strang, MIT, who gave the talk: "Everyone Can Teach Applications"; and, in the afternoon session, Professor Philip Holmes of Princeton University, who gave the lecture: "What Do Poems and Differential Equations Share? Some Thoughts on Metaphors and Models," which included some of his own poetry.

There were parallel sessions for both undergraduate and graduate student paper presentations as well as a panel discussion on choosing a graduate program in mathematics. The panel included Professors Charles Weibel (Rutgers), Rhonda Hughes (Bryn Mawr), Jennifer Morse (Drexel), and Murli Gupta (George Washington). In addition, we conducted a math contest for high school students. The students Mark Welser (Winslow Township High School) and John Hanna (Raleigh Charter High School) claimed the top prize, a scholarship to Drexel.
Fall Term Colloquium

September 27, 2007

Roger Horn
University of Utah
“Matrix Analysis and Google’s PageRank”

October 4, 2007

Grigori Olshanski
University of Pennsylvania
“Representation Theory and Random Point Processes”

October 9, 2007

Bernardo Galvao-Sousa
Carnegie-Mellon University
“Phase Transitions in Thin Films”

October 18, 2007

David Ambrose
Clemson University
“Free Surface Problems in Fluid Dynamics”

October 25, 2007

Jennifer Morse
Drexel University
“Matrix Distance Problems”

November 15, 2007

Herbert Wilf
University of Pennsylvania
“The Lore of Coupon Collecting”

November 29, 2007

John Schotland
University of Pennsylvania
“Optical Tomography”

December 6, 2007

DISTINGUISHED VISITOR LECTURE

Yakov Sinai
Princeton University
“The Littlewood Conjecture and Ergodic Theory”

Yakov Sinai and Hugo Woerdeman
Winter Term Colloquium

January 17, 2008
Michael Daniel
Drexel University
“Eisenstein Series in a rational Function Field”

January 24, 2008
Alexander Volberg
Michigan State University
“Analytic Capacity and Geometric Measure Theory”

January 31, 2008
Victor Vinnikov
Ben-Gurion University
“Von Neumann Inequality and its Generalizations”

February 7, 2008
Victor Matveev
New Jersey Institute of Technology
“Neural Circuits and Coupled Oscillator Dynamics Beyond Weak Coupling: Loss of Synchrony and Bursting in a Two-Cell Inhibitory Network”

February 11, 2008
Robert Boyer
Drexel University
“Asymptotics for Appell Polynomials”

February 21, 2008
William Keith
Drexel University
“Signed Partitions: New Theorems for Old”

February 28, 2008
Bud Mishra
Courant Institute
“Algebra, Automata, Algorithms, Biology and Beyond”
Spring Term Colloquium

May 29, 2008

Abdul Rahman Elhashash
Drexel University
“Perron-Frobenius Properties of General Matrices”

April 3, 2008

Gitta Kutyniok
Stanford University
“The Geometric Separation Problem”

April 10, 2008

Victor Moll
Tulane University
“Matching Images Beyond Correspondence”

April 24, 2008

Issa Zakeri
Drexel University
“My Adventures in Wonderland”

May 1, 2008

Horatio Rotstein
New Jersey Institute of Technology
“Dynamic Aspects of Medial Entorhinal Cortex Stellate Cell Activity”

May 22, 2008

David Pettey
Susquehanna International Group
“The Role of Risk in Understanding Capital Markets”

June 5, 2008

Boris Kheyfets
(Drexel University)
“Two Techniques for Solving Recurrences Arising in compositions of Integers”
October 15, 2007  
**Abed Elhashash**  
“Characterizations and Properties of General Matrices Enjoying the Perron-Frobenius Property”

October 22, 2007  
**Anatolii Grinshpan**  
“Imbedding of Hermitian and normal matrices (after Fan and Pall)”

October 29, 2007  
**Hugo Woerdeman**  
“Schur complements”

November 5, 2007  
**Hugo Woerdeman**  
“Schur complements (continued)”

November 12, 2007  
**Hugo Woerdeman**  
“Christoffel-Darboux formula”

November 26, 2007  
**Hugo Woerdeman**  
“Gohberg-Semencul via Christoffel-Darboux”

December 3, 2007  
**Anatolii Grinshpan**  
“Some matrix inequalities (after Bhatia)”

January 7, 2008  
**Dmitry Kaliuzhnyi-Verbovetsky**  
“The operator-valued Schur class”

January 14, 2008  
**Dmitry Kaliuzhnyi-Verbovetsky**  
“The operator-valued Schur class (continued)”

January 28, 2008  
**Dmitry Kaliuzhnyi-Verbovetsky**  
“The operator-valued Schur class (continued)”

February 4, 2008  
**Anatolii Grinshpan**  
“The von Neumann Inequality in one and several variables”

February 11, 2008  
**Hugo Woerdeman**  
“The Hamburger moment problem”
Analysis Seminar

February 18, 2008
**Tom Bella**
“Quasiseparable matrices and polynomials. Fast and accurate algorithms.”

February 25, 2008
**Robert Boyer**
“Asymptotics for Appell polynomials”

March 3, 2008
**Robert Boyer**
“Asymptotics for Appell polynomials”

March 10, 2008
**Hugo Woerdeman**
“Representation of block Hankel matrices”

April 8, 2008
**Abed Elhashash**
“A survey of matrix functions preserving non-negative and related matrices”

April 15, 2008
**Thomas Yu**
“Uncertainty Principles and Sparse Representation”

April 22, 2008
**Ron Perline**
“Differential equations and the symmetric eigenvalue problem”

April 29, 2008
**Ron Perline**
“Differential equations and the symmetric eigenvalue problem (continued)”

May 6, 2008
**Selcuk Koyuncu**
“Inverse of multilevel Toeplitz matrices”

May 13, 2008
**Selcuk Koyuncu**
“Inverse of multilevel Toeplitz matrices (continued)”

May 20, 2008
**Greg Naber**
“Lomonosov’s invariant subspace theorem”

May 27, 2008
**Lei Cao**
“The saturation conjecture”
**Analysis Seminar**

June 2, 2008  
**Lei Cao**  
“The saturation conjecture (continued)”

June 12, 2008  
**Le Yu**  
“Gershgorin disks and the field of values”

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**Applied Dynamical Systems Seminar**

In the winter and spring terms there was also an Applied Dynamical Systems Seminar with participants Yixin Guo, Georgi Medvedev, J. Douglas Wright and Svitlana Zhuravytska.

**Dean’s Seminar**

**J. Douglas Wright**  
April 9, 2008  
“Nonlinear Waves”

Abstract: Not all systems react to input in a linear way. It is not always the case that if you put twice (or thrice) as much into a system, you get twice (or thrice) as much out. The relationship between in and out might be yet more complicated. It turns out that this sort of “non-linearity” is extremely important when investigating the propagation of signals and waves in many different physical settings, be they on the surface of the ocean or in an axon in your nervous system.

Dr. Wright will discuss the crucial role non-linearity plays in the generation and behavior of these types of waves.
Thomas Yu
January 16, 2008

“Multiscale Data Representation”

Abstract: The current “data deluge” inundating science and technology is remarkable not only for the overwhelming volumes of data, but also for the rapid proliferation in new data types. In any case, multi-scale data representation has been an indispensable tool for efficient manipulation of such data, leading to state-of-the-art methods for compression, transmission, noise removal, classification, etc. of data.

Yixin Guo
October 3, 2007

“Modeling Parkinson’s Disease and Deep Brain Stimulation”

Abstract: The therapeutic effectiveness of deep brain stimulation (DBS) of the subthalamic nucleus (STN) may arise through its effects on inhibitory basal ganglia outputs, including those from the internal segment of the globus pallidus (GPI). Changes in GPI activity will impact its thalamic targets, representing a possible pathway for STN-DBS to modulate basal ganglia-thalamocortical processing. We use computational models to examine thalamocortical (TC) relay cell responses to an excitatory input train, under a variety of GPI inhibitory signals obtained from both single-unit experimental recordings and stochastic simulations. Specifically, inhibitory inputs featuring correlated bursts yielded compromised TC relay, whereas relay fidelity improved under relatively tonic inhibition. These results support the hypothesis that STN-DBS alters parkinsonian GPI activity in a way that may improve TC signal processing.
## Departmental Committees

**Tenure-Track Search:**  
- Pawel Hitczenko, Chair (fall),  
- Robert P. Boyer, Chair (winter, spring)  
- Jennifer Morse  
- Georgi Medvedev  
- Advisory Member: Hugo J. Woerdeman

**Tenure and Promotion:**  
- Justin Smith, Chair  
- Pawel Hitczenko, Vice Chair  
- All tenured faculty members

**Graduate Program:**  
- Jennifer Morse, Chair  
- Thomas Yu  
- Li Sheng  
- Graduate Advisor: Andrew Hicks  
- Qualifying Exam Subcommittee appointed by Graduate Program Committee

**Undergraduate Program:**  
- Marci Perlstadt, Chair  
- Dmitry Kalyuzhnyi-Verbovetzkii  
- Douglas Wright  
- Undergraduate Advisor: Marna Mozeff

**Actuarial Science/ Financial Math Program Committee:**  
- Hugo J. Woerdeman, Chair  
- Robert P. Boyer  
- Pavel Grinfeld

**Computer:**  
- Andrew Hicks, Chair  
- Georgi Medvedev  
- Justin Smith  
- Yixin Guo  
- Computer Specialist: Gene Phan

**Grants:**  
- Shari Moskow, Chair  
- Ronald Perline  
- Pawel Hitczenko  
- Li Sheng

**Auxiliary Search:**  
- Marci Perlstadt, Chair  
- Marna Mozeff  
- Patricia Henry  
- Hugo J. Woerdeman

**Colloquium Coordinator:**  
- Gregory Naber

**Library Liaison:**  
- Dmitry Kalyuzhnyi-Verbovetzkii
### Departmental Committees

<table>
<thead>
<tr>
<th>Position</th>
<th>Contact Person(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Center Coordinator</td>
<td>Li Shen</td>
</tr>
<tr>
<td>CoAS Undergraduate Program representative</td>
<td>Marci Perlstadt</td>
</tr>
<tr>
<td>CoAS Graduate Program representative</td>
<td>Jennifer Morse</td>
</tr>
<tr>
<td>CoAS Space representative</td>
<td>Patricia Henry</td>
</tr>
<tr>
<td>CoAS Tenure and Promotion representative</td>
<td>Robert P. Boyer</td>
</tr>
<tr>
<td>School of Education Liaison</td>
<td>Patricia Henry</td>
</tr>
<tr>
<td>Goodwin Liaison</td>
<td>Marna Mozeff</td>
</tr>
<tr>
<td>University 101 representative</td>
<td>Marci Perlstadt (Fall), Ronald Perline (Winter)</td>
</tr>
<tr>
<td>Math 121-122-200 coordinator</td>
<td>Ronald Perline</td>
</tr>
<tr>
<td>Math 123 coordinator</td>
<td>Marci Perlstadt</td>
</tr>
<tr>
<td>Math 101-102 coordinator</td>
<td>Marna Mozeff (COB), Adam Rickert</td>
</tr>
<tr>
<td>Math 100 coordinator</td>
<td>Judy Smith</td>
</tr>
<tr>
<td>Math 110 coordinator</td>
<td>Patricia Henry</td>
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<tr>
<td>Math Competition coordinator</td>
<td>William Goh</td>
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<tr>
<td>PiMuEpsilon Liaison</td>
<td>Pavel Grinfeld</td>
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<tr>
<td>EPaDel Meeting coordinator</td>
<td>Robert P. Boyer</td>
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<tr>
<td>Barbara G. Hornum Teaching Excellence Award Committee Member</td>
<td>James W. Donnelly, Marna Mozeff</td>
</tr>
<tr>
<td>Dragon Drive Coordinator</td>
<td>Margaret Mercer</td>
</tr>
</tbody>
</table>
Mathematics Resource Center

The Mathematics Resource Center (MRC) continues to have success after success. Open 42 hours per week, utilizing 48 tutors, the MRC seems to have become a very effective complement to classroom instruction. A main ingredient is the fact that the tutors in the MRC are faculty members and teaching assistants who themselves teach the courses, making the tutoring very effective and to the point. This year the MRC helped 1196 students--27% of all students who took math courses at Drexel. On average we saw 175 students per week, an increase of 29% from 2007 (see chart below). Students return on average 4 times. In total we provided 5135 student tutoring hours.

New in September 2007 was the center’s first full-time manager, David Shen. He was able to improve the services the center offered, organizing tutors more effectively and implementing a system identifying when help was available in upper level math courses. In addition to freshmen courses, there was now also extensive tutoring in sophomore courses such as Differential Equations and Linear Algebra.

Another big change was that we moved to the larger room Korman 247. We did this in the spring of 2007. With the funds from the University for the MRC, we were able to put new carpet in the room and place partitions, and make an office for the fulltime manager. Though these were great improvements, there was still a large problem. During busy periods, with 8 tutors and 20+ students at the same time in the center, it came to the point where the students could not hear the tutors anymore, and where tutors nearly had to shout to make themselves heard. Using the generous donations of our alumna Carol Sangtinette, we were able to order sound absorption panels which were installed in the summer of 2008. This has significantly reduced the noise during busy periods.
Mathematics Resource Center

We like to think of the MRC as a great model to improve math achievement across a broad spectrum of students. The students comments we have received seem to confirm this.

“During my first term at Drexel, I took Math 101 class and was able to receive an A+ for that class due to the Math Recourse Center. Having realized the great tutoring system available at the Math Recourse Center, I confidently switched to a higher Calculus I level of math in the following term. Even though I had some lacks in basic mathematical concepts prior to taking Calculus I, I was able to fill up all my gaps by constantly attending the Math Center and as a result received an A+ for Calculus I.”

“During my freshman year, I took Calc I and Calc II, having to withdraw once before I completed it the next term. I got a C- and a C….During my sophomore year, I decided to go to the MRC...[for help] in Calc III and Calc IV….I was able to practice every problem in the book and when I got stuck I asked for help…..I ended up with A’s in Calc III and Calc IV.”

“I would be doing a lot better in my other classes if they had tutoring centers similar to this one.”

“I probably would not have gotten an “A” in math if it wasn't for the tutors…. Now, I always tell people to get help because I know it works! Some people have an innate talent towards math, but I struggle to receive grades which I am proud of…..Going to the center is a great use of time.”

“It's definitely the perfect compliment to math class.”
Starting the fall of 2007 we were able to offer all of our Calculus courses in the small section format. We tried to keep the maximum number of students per section at 30. In doing so we found that more students earned higher grades and fewer students failed or withdrew. The two charts show a comparison of grades from 2006-07 when there were large lectures to 2007-08 when we taught the smaller sections. In order to do this, we increased our teaching faculty by an additional 6 instructors/senior lecturers.
Student Activities

SIAM Chapter

Selcuk Koyuncu, president of Drexel’s SIAM Chapter, was a recipient of the SIAM Student Chapter Certificate of Recognition, which are awarded to students who have made outstanding contributions to their SIAM student chapters. Dr. Robert P. Boyer is the Faculty Advisor of the Chapter.

Graduate Student Seminars

January 21, 2008
Evandro Manica
University of Pittsburgh
“The Role of Coupling and heterogeneity on a Small Network of pre-Botzinger Complex Cells”

February 8, 2008
Svitlana Zhuravyska
Drexel University
“Selected Topics from Probability Theory”

February 15, 2008
Jason Aran
Drexel University
“RSA Algorithms”

February 22, 2008
David Kimsey
Drexel University
“Matrix Completion Problem”

February 29, 2008
Emek Kose
Drexel University
“Catadioptric Sensor Design”
Student Activities

Graduate Student Seminars

March 7, 2008

Derek Heilman
Drexel University
“Fractals”

April 16, 2008

Selcuk Koyuncu
Drexel University
“Multilevel Toeplitz”

April 23, 2008

Yun Yoo
Drexel University
“Mixed-mode Oscillations with Folded Node Singularity”

May 7, 2008

Lei Cao
Drexel University
“Relationship Between Horn’s Conjecture and Saturation Conjecture”

May 14, 2008

Greg Naber
Drexel University
“The Invariant Subspaces Theorem”

Riemann Day
May 28, 2008
A day in honor of Bernhard Riemann (1826-1866) with speakers
Dr. Robert Boyer, Dr. Ronald Perline, and Dr. J. Douglas Wright.
Drexel University

Math Bytes

President: Svitlana Zhuravytska

Math Bytes held the following activities:
- November 28th, 2007. "PhD and after", lunch with Dr. Wright.
Donations

Donation of equipment to the Communities in Schools of Philadelphia.
Donation of print cartridges to St. Gabriel’s Episcopal Church for their recycling program.
Donation of tea to St. Gabriel’s Episcopal Church for their hospitality hour.

Social Events

On September 23, 2007 there was a brunch hosted by the Woerdemans
Social Events

On December 7, 2007 the annual Holiday reception and recognition of William Goh’s retirement was held at the Academic Bistro

Bob Boyer, Bill Goh, Robert Immordino

On June 10, 2008 the annual End of Year reception was held at Slainte