# Van Vleck Notes

## Spring 2011 Edition

*The newsletter of the University of Wisconsin Math Department*

## From the Editor

This edition of Van Vleck Notes again covers only a fraction of the events that happened last year in the Math Department. There have been many changes, mainly due to the retirement of many faculty members who shaped the Department in the past. Despite all the problems in the country and uncertainty regarding the future in Madison and UW, we have been very successful in the job market, taking advantage of reduced competition to hire five excellent new tenure-track Assistant Professors, several Van Vleck Assistant Professors and new graduate students.

Despite the uncertainty, our faculty continue to win awards and our students and postdocs go on to prestigious positions. Many conferences were organized at UW in 2010 and high level distinguished lecturers and visitors hosted. You can read more about this and other events in these notes. You can also find information on the faculty and student awards, promotions, retirements, etc. This issue has a new feature -Yvonne Nagel conducted interviews of an undergraduate student, graduate student, and faculty member, each moving on to a new role. We hope that this issue will keep you informed on the life of our Department and remember: you are always welcome in Van Vleck Hall and at our annual UW-Madison Reunion at the Joint Mathematics Meetings.

**Nigel Boston**

## Inside

# From the Chair

I am very pleased to share this issue of Van Vleck Notes with you. This past year has been particularly exciting for us - the department received high international rankings and we hired five excellent tenure-track faculty in a year when few Math departments in the nation had openings.

In 2010, the National Research Council (finally!) released its latest rankings of Ph.D. programs. The previous ranking was made in 1995, when our Ph.D. program ranked No. 13. The new ranking adopted a quantitative and interactive scheme that allows one to choose different weights for different priorities. The UW Math department ranked between 6 and 15 in the R-ranking (NRC regression-based quality score), and between 6 and 16 in the S-ranking (NRC survey-based quality score). In both rankings the average values placed our Ph.D. program No. 9 in the nation. Another ranking that has international impact is the Academic Ranking of World Universities made by China's Shanghai Jiao Tong University, which measures research productivity and academic achievements. In its 2010 ranking, the UW Math department ranked No. 13 in the world, and No. 9 in the US (UW as a university was ranked No. 17 in the world). We also ranked No. 16 in the 2010 US News and World Report ranking. These rankings reflected the high quality of our faculty's research as well as the strength of our Ph.D. program.

Five new tenure-track assistant professors were hired last year: **Scott Armstrong**, **Tulia Dymarz**, **Shamgar Gurevich**, **Richard Kent**, and **Andrej Zlatos**. We also hired a number of Van Vleck Visiting Assistant Professors. You will see these new department faces in this issue of the Notes. In addition, we hired three more tenure-track assistant professors this spring:

**Melanie Matchett Wood** (number theory and algebraic geometry), currently a five-year AIM fellow at Stanford, and **Philip Matchett Wood** (probability) , a postdoc at Stanford, a married couple, each with a 50% appointment; **Jun Yin** (probability), a postdoc at Harvard, and **Brian Street** (analysis), currently a Van Vleck at UW. They will be featured in next year's Van Vleck Notes.

While we have enjoyed success in hiring in recent years, we are not immune from the severe budget cuts facing the nation and the State of Wisconsin. The coming years will be more challenging. At this point I am extremely happy to report that the department will have a new captain for the next three years: **Alex Nagel**, a prominent analyst who served as the department chair (1991-1993) and Associate Dean of Physical Sciences of the College of Letters and Sciences (1993-1998), is stepping up again as our next chair. I highly appreciate his willingness to serve at this difficult time, and am optimistic that he will drive the boat of the department smoothly through the turbulence of budget cuts, and that all together we will sail into a bright future.

While serving as the department chair for the last three years, I have had the great pleasure to meet many of you at the Wisconsin Alumni Reunions and other occasions. I highly appreciate your passion about the Alma Mater, and your unselfish help and financial support, which are important for us to maintain our academic stature. Your continued support will be highly appreciated, and much more needed than ever before.

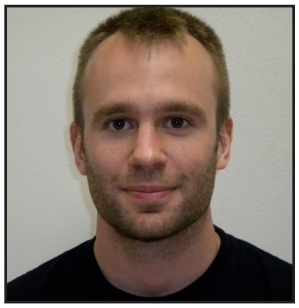
Until we see each other again next time, let me end this letter with Garrison Keillor's quote: *be well, do good work, and keep in touch.*

**Shi Jin**
**Chair**

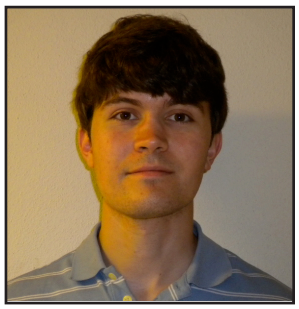
# Van Vleck Visiting Assistant Professors

**Uri Andrews** joined the UW logic group in 2010 after completing his PhD withTom Scanlon at Berkeley. His research interests are at the interface of model theory and computability theory; in particular, he was able to apply Hrushovski's constructions of so-called strongly minimal models to solve a number of long-standing open problems in computable model theory, opening up a new field one might call "computable stability theory".

**David Brown** received his PhD from Berkeley in August 2010, where his advisor was Bjorn Poonen and co-advisor Brian Conrad. He works on algebraic stacks and solving Fermat-like Diophantine equations. In addition, in 2009, he co-created the highly successful Math Q&A discussion site Math Overflow, together with Anton Gerashenko. His mentor at UW is Jordan Ellenberg.



**Bryden Cais** received his PhD from Michigan in August 2007, where his advisor was Brian Conrad. He spent three years as a postdoctoral fellow at the Centre de Recherches Mathématiques and McGill University, before coming to UW to work with Jordan Ellenberg. He works in arithmetic geometry, in particular p-adic Hodge theory, analytic spaces, and cohomology theories.



**Patrick LaVictoire** received his PhD from Berkeley in May 2010, under the direction of Michael Christ. He works in the area of harmonic analysis, in particular its applications to ergodic theory and pointwise convergence of nonstandard ergodic averages. His mentor at UW is Andreas Seeger.

**Gregorio Moreno Flores** obtained a Masters from the Pontificia Universidad Católica de Chile and his PhD in 2010 from Université Denis Diderot - Paris VII with advisor Francis Comets. His main interest is probability theory, more precisely, particle systems, statistical mechanics in random media, and recently, random matrices.

# New Faculty

**Scott Armstrong** Scott obtained his BS from Texas A&M in 2002 and his PhD from Berkeley in 2009 – his advisor was Lawrence C. Evans. He is currently a Dickson Instructor and NSF Postdoctoral Research Fellow at the University of Chicago and will join us in Fall 2011. He works on nonlinear elliptic and parabolic partial differential equations and has recently become interested in homogenization in random environments.

**Tullia Dymarz** Tullia received her BSc from the University of Alberta in 2001 and PhD from the University of Chicago in 2007 under the supervision of Benson Farb. After a semester at MSRI, she was a Gibbs Assistant Professor at Yale until last summer, when she moved to l'Université Paris-Sud 11 Orsay. She will join us later this year. Her research interests include geometric group theory, quasi-isometric rigidity, large scale geometry of finitely generated groups, solvable groups and quasiconformal analysis.

**Shamgar Gurevich** Shamgar received his PhD in 2005 from Tel-Aviv University under the direction of Joseph Bernstein. He then spent three years as a Morrey Assistant Professor at Berkeley, followed by one year as a Member at the Institute for Advanced Study at Princeton. He also held visiting positions in the UK, France, Germany, Sweden, Israel, Canada, and the US. He works in many areas, as evidenced by his giving three talks during his interview visit, one on his pure work in representation theory and algebraic geometry, one on his applications to signal processing, and one on his work on reconstruction of 3D molecules from noisy cryo-EM data. At UW he has been forging collaborations with faculty from several departments and WID and has introduced a new Topics in Applied Algebra course.

**Richard Kent** Richard obtained his BA in Mathematics and Literature from the University of North Carolina at Asheville. He went on to get a PhD in 2006 from the University of Texas at Austin under the supervision of Cameron Gordon, before moving to Brown University, where he was a Tamarkin Assistant Professor for four years. His research interests lie in hyperbolic geometry, mapping class groups, geometric group theory, and low-dimensional topology among other things.

**Andrej Zlatos** Andrej received his undergraduate degree and MSc from Comenius University in Slovakia and his PhD in 2003 from California Institute of Technology with Barry Simon as advisor. He is well-known to many here since he spent the next three years at UW as a Van Vleck. Then in 2006 he moved to the University of Chicago as an Assistant Professor, where he won a Sloan Fellowship, returning here as an Assistant Professor in 2010. His recent research has focused on reaction-diffusion and reaction-advection-diffusion equations, as well as on related linear parabolic equations.

# Faculty Promotions

### Promotion to Professor

**Gloria Mari-Beffa** Gloria earned her Licenciatura and Licenciatura con grado from the University of Malaga, Spain in 1985, and then moved to the University of Minnesota, which awarded her the PhD in 1991 under the supervision of Jack Conn. She became an Associate Professor at UW in 2006 and was promoted to Full Professor last year. Her research interests include geometrical aspects of infinite-dimensional integrable systems, geometrical reduction and symmetries, infinite-dimensional Poisson geometry, KdV and Toda-Hamiltonian structures, Adler-Gel'fand-Dikii brackets, and differential invariants and invariant differential evolutions. She has also been very actively involved in mentoring, particularly of young women, and in the Mathematics Department's proposal to the recent Madison Initiative for Undergraduates.

### Promotion to Associate Professor

**Sean Paul** Sean received his BS in 1996 from the University of Oklahoma and MS and PhD from Princeton in 2000. His advisor was Gang Tian and co-advisor Peter Sarnak. He spent from 2000 until 2006 as a Ritt Instructor and NSF Postdoctoral Fellow at Columbia University, except for one semester visiting MIT. In 2006 he moved here to begin a tenure-track Assistant Professorship. Last year he was tenured and promoted to Associate Professor. He works on complex differential and projective geometry and geometric analysis. He has given lectures all over the world, including India, China, Japan, Mexico, Portugal, Italy, France, and Germany.

**Jean-Luc Thiffeault** Jean-Luc began as a physicist, obtaining his BS in Physics from McGill University in 1993 and his MA and PhD in Physics from the University of Texas at Austin, the latter in 1998 under the supervision of Philip J. Morrison. From then until 2002, he worked with Allen Boozer at Columbia University, before starting as a Lecturer in Applied Mathematics at Imperial College, London in January 2003. He remained there until 2007, when he moved to UW as a tenure-track Assistant Professor. Last year he was tenured and promoted to Associate Professor. His research interests span both pure and applied mathematics, including chaotic and turbulent mixing in fluids, biogenic mixing, topological dynamics and topological chaos, braids, and dynamical systems.

## Awards

**Uri Andrews** won the prestigious Sacks Prize for the best thesis in logic worldwide in 2010. This award, named after Harvard/MIT logician Gerald Sacks, is awarded by the Association for Symbolic Logic each year to one or two young logicians. Uri was the only recipient this year, for his thesis entitled "Amalgamation Constructions in Recursive Model Theory".

**Zajj Daugherty** is one of fifteen UW Madison TAs who received an award for service from the College of Letters and Science.

**Jordan Ellenberg** was one of six up-and-coming UW faculty members awarded a Romnes Faculty Fellowship in 2010. This recognizes exceptional individuals, who have earned tenure within the last four years. This fellowship is named in honor of H.I. Romnes, later Trustee President of the WARF. With this fellowship, the University recognizes proven potential and provides an opportunity for critical judgment by the Fellow on the best strategies for development of an outstanding research program

Professor and Chair of the Mathematics Department **Shi Jin** received a Vilas Associates Award from the graduate school. This award provides summer research support for two years and a flexible research fund for scholarly activities.

**Daniel Lecoanet**, a UW senior who worked with Jordan Ellenberg, received a $250,000 Hertz Fellowship and a $50,000 Churchill Scholarship to pursue graduate studies in the field of applied physical science. Daniel was one of the 15 students chosen from a pool of 600.

**Alexander Nagel** and **Stephen Wainger** have been awarded the 2007-08 Stefan Bergman Prize for their fundamental contributions in collaborative work in the study of Bergman and Szego kernels, the geometry of control (Carnot-Caratheodory) metrics associated to vector fields, and the initial breakthroughs for singular integrals on curves, culminating in a general theory of singular Radon transforms. The Bergman Prize honors the memory of Stefan Bergman, best known for his research in several complex variables, as well as the Bergman projection and the Bergman kernel function.

**Timo Seppalainen** was elected Fellow of the Institute of Mathematical Statistics (IMS). Created in 1935, IMS is a professional society that promotes the theory and application of probability and statistics. About 6 percent of the membership of 4500 have the status of Fellow.

## Conferences


Our math department hosted the **Midwest Algebraic Geometry Conference** for graduate students in October 2010. The conference was organized by David Dynerman, Marci Hablicsek, and Junwu Tu. There were around 40 participants, mostly from other departments in the Midwest, but also from as far away as the University of Maryland and Stanford. The conference featured talks by graduate students on a wide range of topics aiming to provide accessible glimpses of the widely varied research topics in algebraic geometry. Particularly memorable was a talk presented by June Huh of UIUC presenting his algebro-geometric proof of a 40-year-old conjecture of Read and Rota that the coefficients of the chromatic polynomial of a graph are log-concave. Accommodation and travel funding was provided by the department's Number Theory and Algebraic Geometry NSF RTG grant and the department.

## *Conferences Continued...*

In April 2010 Jordan Ellenberg and Jean-Luc Thiffeault organized a weekend workshop on **"pseudo-Anosovs with small dilatation,"** sponsored by a grant from the Math Department. Pseudo-Anosovs are one of the three types of surface transformations. They change the measure on a pair of transverse foliations by a positive real factor, called the dilatation. The minimum value of the dilatation is related to the shortest geodesic of Teichmuller flow, so it is an important number from many points of view: topological, dynamical, algebraic, and geometrical. Moreover, the known smallest dilatations are Salem numbers, familiar to number theorists.

This workshop brought together a small number of experts in the field, mostly from the Midwest but also from as far away as France, Japan, and South Korea. Because of the Icelandic ash plume, a few participants couldn't come. The small number of participants ensured a very congenial atmosphere. A senior participant stood up at the end and called it the best workshop she had ever been to!

The Workshop **"Singularities in the Midwest"** was held at UW Madison March 19-20, 2010. Organized by Laurentiu Maxim, the workshop brought together a diverse group of researchers interested in studying the geometry, topology and algebra of singularities. The speakers included leaders in the fields of Algebraic and Geometric Topology, Algebraic Geometry, and Hodge Theory, with a common interest in Singularity Theory. While the workshop was research-oriented, it was also intended to introduce young researchers and graduate students from the Midwest to fast developing research areas in contemporary Singularity Theory. The event was remarkably successful at its goals, and demonstrated a thriving community with a common interest in singular spaces and their applications. Maxim intends to organize such a workshop once every two years.

*From right to left: Mircea Mustata (Michigan), Donu Arapura (Purdue), Joerg Schuermann (Muenster)*

April 9 - 11, 2010, UW held the 2010 **Great Lakes Geometry Conference**. In fact, UW held the inaugural conference 10 years ago and it is now a well-established annual conference that rotates around the universities in the Great Lakes region. The conference was mainly supported by NSF and by the UW Math Department. This year's main theme was toric geometry from the points of view of symplectic geometry, algebraic geometry, and Kähler geometry. The goal was to provide a common ground for the understanding of mirror symmetry of toric varieties in all its facets. About 40 graduate students and postdocs from various institutions around the Great Lakes and beyond attended, in addition to faculty members.

The **10th International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE 2010)** was held in the Math Department on May 24-26, 2010. This is an annual event held alternately between Spain and the US. Shi Jin was the chair of this meeting, co-chaired with UW alumnus Prof. Bruce Wade from the University of Wisconsin-Milwaukee. The conference featured plenary lectures by Russel Caflisch (UCLA), Pierre Degond (Universite Paul Sabatier-Toulouse, France), Benoit Perthame (University of Paris-VI, France) and Eitan Tadmor (University of Maryland-College Park), and more than 40 invited lectures by other junior researchers in applied mathematics and scientific computing. It attracted more then 60 participants.

# Special Lectures

**LAA Lecture**. The 2010 Linear Algebra and its Applications Lecture was given by **Pauline van den Driessche** of the University of Victoria, Canada. Its title was "Some Mathematical Models for the Transmission of Influenza" and she also gave a special seminar lecture titled "Drazin and Group Inverses of Bipartite Matrices". Pauline van den Driessche is one of Canada's leading applied mathematicians, known for her work in mathematical biology and linear algebra. Her work in mathematical biology has centered on the application of new mathematical methods to the study of the dynamics of epidemics. Many of the questions in matrix theory that she has worked on have arisen from problems in biological modeling. She is a recent recipient of the Canadian Mathematical Society's 2007 Krieger-Nelson Prize.

The **Spring 2010 Distinguished Lecture Series** was delivered by **Gunnar Carlsson** from Stanford. The titles of his talks were "Topology and Data I : Topological Shape Signatures", "Topology and Data II: Mapping Methods", and "Functoriality, Generalized Persistence, and Structural Signatures". This series formed the culmination of a multidisciplinary seminar series on "Topology and Data" organized by Nigel Boston, Jordan Ellenberg, and Rob Nowak (ECE) in 2009-10.

Gunnar Carlsson is the Anne and Bill Swindells Professor in the Department of Mathematics at Stanford University. He received his PhD from Stanford and was a professor at UC San Diego and Princeton before arriving at Stanford in 1991.

The **Fall 2010 Distinguished Lecture Series** was delivered by **Thomas C. Hales**, the Mellon Professor of Mathematics at the University of Pittsburgh. The titles of his talks were "Introduction to Formal Proofs", "Towards a Formal Proof of Kepler Conjecture on Sphere Packings", and "Proof Assistants in Practice". He also gave a number theory seminar on the work of the Fields Medal winner, Ngo Bao Chau, entitled "Fundamental Lemma for Beginners".

Tom Hales received his B.S. and M.S. degrees from Stanford University, completed Part III at Cambridge University, and received his Ph.D. from Princeton University under Robert Langlands in representation theory. He has held postdoctoral and faculty appointments at MSRI, Harvard University, the University of Chicago, the Institute for Advanced Study, and the University of Michigan. In 1998, Hales, with the help of a graduate student Samuel Ferguson, proved Kepler's 1611 conjecture (and part of Hilbert's 18th problem) on the most efficient way to stack oranges. Hales' current project, called Flyspeck, seeks to formalize his proof of the Kepler conjecture in the computer proof assistant HOL Light.

The **2010 Wolfgang Wasow Lecture** was given by **Peter Markowich**, Professor at the University of Cambridge, who was also a former postdoctoral fellow in the Mathematical Research Center at UW. The title of his talk was "Bohmian Measures and their Classical Limit". Prof. Markowich is a distinguished applied analyst and applied mathematician. He has made fundamental contributions to mathematical modeling of semiconductor devices, the semiclassical limit of quantum mechanics, and numerical analysis, among other areas. The honors he has received include a Wittgenstein Award of the Austrian Science Fund, Corresponding Member of the Austrian Academy of Sciences, Royal Society Wolfson Research Merit Award, and an Inaugural KAUST Investigator Award. He was also an invited speaker at the International Congress of Mathematicians in 2010.

## Other News

**Nigel Boston** gave a plenary address at CSNDSP 2010, an IEEE-IET International Symposium on Communication Systems, Networks and Digital Signal Processing.

**Richard Brualdi** was the principal speaker at a 2010 NSF-CBMS Regional Conference, "The Mutually Beneficial Relationship of Matrices and Graphs", at Iowa State University, July 12-16, 2010. He gave 10 lectures and these are the basis of a small monograph he is writing under the same name. He has also been appointed by President George Andrews to a three-year term on the Publications Committee of the American Mathematical Society (AMS) and has been elected to a three-year term on the AMS Nominating Committee.

**Jordan Ellenberg** gave an invited address at the AMS Central Section meeting in November.

**Shi Jin** was a "Copernicus Visiting Scientist" at the University of Ferrara, Italy, in June 2010. He was one of three organizers of the semester-long program on "Partial Differential Equations in Kinetic Theories" at the Newton Institute, University of Cambridge, UK, from August to December 2010. He also gave mini-courses at the Second I-Math School on Numerical Solutions of PDEs: New Trends and Applications, Malaga, Spain, Feb 8-12, 2010; and at the 5th Summer School on "Methods and Models of Kinetic Theory (M&MKT 2010)", Porto Ercole, Grosseto, Italy, June 13-19, 2010.

**Steffen Lempp** taught a 2-week summer course on priority arguments in Almaty, Kazakhstan, this past June.

**Selwyn Ng**, a logic postdoc, accepted a tenure-track position at Nanyang Technological University in Singapore and will leave this summer.

## REU

In 2010 the Department ran an REU in Number Theory. There were nine participants: Zana Chan, Rebecca Hoberg, Eric Larson, Pak Hin Lee, Keenan Monks, Ying-Ying Tran, Dmitry Vaintrob, Mckenzie West, and Alexandr Zamorzaev. The group was mentored by Ken Ono, David Brown, and Amanda Folsom, and they wrote five papers on elliptic curves, orthogonal polynomials, and partitions.

Keenan Monks, a high school student from Pennsylvania, published a paper on supersingular elliptic curves, and his research has been recognized on a national and international level. Monks was one of the top winners of the International S.-T. Yau High School Mathematics Research Competition, and he won 6th place in the 2011 Intel Science Talent Search. This is the most prestigious science competition in the US.This January, Maria Monks, a former UW REU participant and Keenan's older sister, was awarded the Frank and Brennie Morgan Prize for outstanding research by an undergraduate.

## 2010 Incoming Graduate Students

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|---|---|
| Nathan Clement | St.Olaf College |
| Edward Dewey | Swarthmore College |
| Keith Dsouza | California State University, Los Angeles |
| Elnur Emrah | Bilkent University |
| Derek Goto | Rice University |
| Meng-Che Ho | National Taiwan University |
| Lalit Jain | University of Waterloo |
| Dae Han Kang | Seoul National University |
| Yoosk Kim | Pohang University of Science & Technology |
| Lei Li | Tsinghua University |
| Tamvana Makuluni | Massachusetts Institute of Technology |
| Rohit Nagpal | Indian Institute of Technology |
| Ting-Ting Nan | National Taiwan Normal University |
| Daniel Ross | Cambridge University |
| Balazs Strenner | Eotvos Lorand University |
| Kejia Wang | University of Toronto |
| Kun-Chieh Wang | Purdue University |
| Huanyu Wen | University of Science & Technology of China |
| Yu Zeng | University of Science & Technology of China |

# Retirements

**Anatole Beck:** Having come from New York's famous Stuyvesant High School, Anatole obtained his PhD in 1956 from Yale University under the supervision of Shizuo Kakutani. He graduated 7 PhD students. Together with Michael Bleicher and Donald Crowe, he wrote a popular book titled "Excursions into Mathematics", in addition to editing several conference volumes, notably the "Probability in Banach Spaces" series. In recent years he spent much time at the London School of Economics, where a conference on "Search Games and Rendezvous" in honor of his retirement was held in July 2010. In addition to developing this field, he wrote on labor economics. He was a frequent commentator for WORF-FM. He retired in December 2009.


**Paul Rabinowitz:** Paul received his PhD from New York University in 1966 under the direction of Juergen Moser. From 1966 until joining UW in 1969, he held a postdoctoral appointment at Stanford University. He works in the fields of partial differential equations and nonlinear analysis and is well-known for his global bifurcation theorem and "mountain pass theorem". Other major themes in his work are variational methods and the study of Hamiltonian systems and their periodic orbits. He graduated 12 PhD students. He is the recipient of numerous honors and awards, including the George David Birkhoff Prize, awarded in 1998 by the American Mathematical Society and the Society of Industrial and Applied Mathematics, and election to the United States National Academy of Science in 1998. Before retiring in December 2009, he was the Edward Burr Van Vleck Professor of Mathematics and a Vilas Research Professor at the UW. He holds an Honorary Doctorate from the Université de Paris VI.

**Joel Robbin:** Joel earned his PhD from Princeton University in 1965 under the supervision of Alonzo Church. His thesis was on Subrecursive Hierarchies, a subarea of Mathematical Logic. Gradually Joel moved from logic into geometry/topology, in particular dynamical systems and symplectic geometry. He graduated 7 PhD students. In recent years, he very efficiently handled the role of Associate Chair of the Math Department and worked on computer-based education, producing a textbook "Matrix Algebra using MINImal MATlab". This was his second book, after "Mathematical Logic: A First Course". He retired in August 2010.

## *Retirements Continued...*

**Jean-Pierre Rosay:** Jean Pierre is an analyst working in the field of several complex variables. He earned his Ph.D. from the University of Grenoble in 1970 with a thesis on function algebras and subsequently worked as a Professor at the University of Provence. After visiting our department in 1986/87 he joined it as a Full Professor in 1987. Among the theorems that bear his name is the so-called Wong-Rosay theorem, which characterizes the unit ball in complex Euclidean space in terms of its automorphism group. His work with Walter Rudin on holomorphic automorphisms has had a lasting impact. In the past few years, Jean-Pierre has turned his attention to research on almost complex structures with minimal smoothness and he and his collaborators discovered many new striking phenomena in this area. He retired in May 2010 at a time when his research was as strong and vibrant as ever.

**Marshall Slemrod:** Marshall received his PhD in Applied Mathematics in 1969 from Brown University, working with Ettore Infante. He joined our faculty as Professor of Mathematics in 1987, after fourteen years at Rensselaer Polytechnic Institute. He works on the interface between continuum mechanics and partial differential equations. He has worked on a broad range of areas including abstract dynamical systems, problems of control and stabilization, non-Newtonian fluids, the dynamics of phase transitions, hyperbolic conservation laws, and kinetic theory. He graduated 3 PhD students and retired in July 2009.

## Annual Wisconsin Reunion and Reception

The annual Wisconsin Reunion was held at the Annual AMS Meeting in New Orleans on January 7, 2011. A large group of former Wisconsin PhDs, retirees, and some others with UW-Madison math connections gathered to renew friendships and catch up with the latest news about UW. As usual, refreshments and drinks were enjoyed by all. A photo from the reunion, taken by Shi Jin, is included here.

## 2010 PhD

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|---|---|
| **Alston, Garrett** (Oh) | Postdoctoral Fellow , Kansas State University |
| **Daugherty, Zajj** (Ram) | Assistant Professor, St.Olaf College |
| **Davis, Matt** (Ram) | Postdoctoral Fellow, Harvey Mudd College |
| **Ganguly, Arnab** (Kurtz) | Postdoc, ETH Zurich |
| **Guettes, Sabrina** (Kurtz) | Researcher, Jozef Stefan Institute, Slovenia |
| **Gupta, Ankit** (Kurtz) | Quantitative Engineer, Kuberre Systems |
| **Haack, Jeffrey** (Jin) | RTG Postdoc, University of Texas, Austin |
| **Hubler, Shane** (Craciun) | Postdoctoral Fellow, UW Chemistry Dept |
| **Kazalicki, Matija** (Ono) | Visi asistent (postdoc), University of Zagreb |
| **Kline, Jeffrey** (Ron) | Researcher, Ligo Group, UW Milwaukee |
| **Li, Qian** (Ferris) | Ernst & Young LLP, New York City |
| **Mantilla-Soler, Guillermo** (Ellenberg) | Postdoctoral Fellow, University of British Columbia |
| **Ozman, Ekin** (Ellenberg) | EPDI Postdoc (CRM, IHES, MPI) |
| **Pantea, Casian** (Craciun) | Research Associate, UW Biomolecular Chemistry Dept |
| **Remmel, Mark** (Smith) | Postdoctoral Fellow, UC Davis |
| **Simons, Julie** (Milewski) | Postdoctoral Fellow, UC Irvine |
| **Sun, Song** (Chen) | Postdoctoral Fellow, Imperial College |
| **Turetsky, Dan** (Lempp) | Postdoctoral Fellow, Victoria University, NZ |
| **Van Essen, Anton** (Nagel) | |
| **Yin, Weidong** (Chen) | Postdoctoral Fellow, Univ. of Connecticut |
| **Yip, Martha** (Ram) | Lecturer, UC San Diego |

## Graduate student awards

**College of L&S 2009 Teaching Fellow:** Seth Meyer

**Capstone PhD Award:** Zajj Daugherty

**2008-2009 Math Department TA awards:** Soledad Benguria, Achilles Beros, Sara Bockting, Andrew Bridy, Patrick Curran, Ankit Gupta, David Dynerman, Sara Jensen, Guillermo Mantilla, Zhan Wang

**Elizabeth Hirschfelder award:** Zajj Daugherty, Marie Jameson, Martha Yip

**Mary Ellen Rudin Award:** Christina Durfee

**John A. Nohel Prize:** Ankit Gupta, Jeffrey Haack, Casian Pantea

**Excellence in Mathematical Research Award:** Nicos Georgiou, Junwu Tu

## Undergraduate student awards

**AMEP Leadership Prize :** Yaroslav Vergun

**Frank D. Cady Scholarship:** Daniel Lecoanet, Larry Rolen

**Violet Higgitt Frank Scholarship:** Jonathan Bohn, Andrew Bolanowski

**A. David Lawrence Young Memorial Scholarship:** Nathan Bollig, Alejandro de la Rosa Gomez

**Irma L. Newman Scholarship:** Theresa Anderson, Ruth Stoehr

## Wisconsin Math Talent search honors day

On April 30, 2010 the winners of the 2009 - 2010 Talent Search among Wisconsin high school & middle school students were honored. Nigel Boston (UW-Math) gave a lecture "Cryptography And The Benefits Of Ignorance" and Jerry Yin (UW-Genetics) talked about "Flies R Us". Then, after lunch and presentation of awards, the participants went to learn more about the Ice Cube Project that was in its last year in the South Pole. Students honored for achievements on talent search honors day: Beiquan Cao, Brendan DuBois, Arjun Dhillon, Albert Gnadt, Nicholas Grabon, Charles He, Amy Hua, John Kegel, Alex Knoespel, Suhas Kodali, Willard Kwak, Max Luck, Jade Moon, Thomas Morgan, Khang Vu Nguyen, Hongkai Pan, Daniel Schmidt, Sohil Shah, Kyle Stankowski, Minh-Tam Trinh, Si Wang, Yang Yu, Xiaoqin Zhou. The winner of the prestigious Van Vleck scholarship was Hongkai Pan from Madison West High School.


## Alumni news:

**Erica Flapan** (PhD with Daniel McMillan Jr), Lingurn H. Burkhead Professor of Mathematics at Pomona College, received the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics from the Mathematical Association of America.

**Amanda Folsom** (postdoc with Ken Ono) is now a tenure-track assistant professor at Yale.

**Joseph Malkevitch** (PhD with Donald Crowe), now retired from teaching at York College of the City University of New York, received a Certificate for Meritorious Service from the Mathematical Association of America.

**Riad Masri** (postdoc with Ken Ono) is now a tenure-track assistant professor at Texas A&M University.

**Brian Weber** (PhD with Xiuxiong Chen) accepted a tenure-track offer from University of Pennyslvania, one of the main geometry centers in the US.

# Interviews

**Daniel Lecoanet** grew up on the west side of Madison. His father teaches French at UW Whitewater and his mother works at the UW-Madison Population Health Center. Neither of them is especially adept at math, so they were surprised at his strong interest in it. In elementary school he enjoyed solving logic puzzles and playing computer games, but it was in High School that his interest in math was piqued by participating in math meets. At Memorial High School he was encouraged by his math teacher, Mr. Levine. He also participated in the UW Math Department's Talent search during his senior year. He started taking math classes at UW during his senior year in high school. He was especially influenced by a CURL (Collaborative Undergraduate Research lab) linked to a topics course in Number Theory taught by Jordan Ellenberg.

When he came to UW as a freshman in 2006, he discovered it had a world-class faculty and that there were many opportunities for motivated undergraduates to work with outstanding faculty. He thinks the opportunities he had here were as good as any he might have had at places like Princeton or Harvard. During his undergraduate years at UW, he worked with mathematics professor Jordan Ellenberg on algorithms for solving problems in computational algebraic number theory. He also worked with astrophysics professor Ellen Zweibel on problems in plasma physics.

In 2008, he was one of three undergraduates who won a Frank and Violet Higgett Scholarship. This award is given by the UW Mathematics Department to recognize undergraduate mathematics research. Daniel graduated with honors in May 2010 with a double major in physics and mathematics. He also won two prestigious awards: The Churchill Scholarship and a Hertz Fellowship.

Since 1963, the Winston Churchill Foundation of the United States has awarded more than 430 Churchill Scholarships to American college graduates who have demonstrated extraordinary talent and outstanding achievement in the sciences, engineering, or mathematics. The award is worth up to $50,000 and covers all tuition and fees, a living allowance and travel. Daniel was the first Badger to win this prize in 30 years. He will attend Cambridge University in Fall 2010 where he will participate in Part III of the Mathematical Tripos for which he will receive a Masters in Advanced Study in Applied Mathematics.

The Fannie and John Hertz Foundation has awarded over 1,000 doctoral fellowships in the physical, biological and engineering sciences. The Fellowship covers full tuition as

well as a $31,000/9-month personal stipend for 5 years of graduate study. Daniel will use this Fellowship to pursue graduate work in plasma physics at the University of California - Berkeley starting in 2011.

Does he have any advice for incoming freshmen? Daniel advises them to develop a personal relationship with some professors, perhaps working with them on a research project. He has also tried to take a broad range of courses. Although he plans to study applied math, he confesses that he has never taken an applied math course. Instead, he has taken math courses in subjects as diverse as logic and algebraic topology, as well as number theory.

# Interviews

Graduate Student **Zajj Daugherty** earned her PhD in May 2010 under Arun Ram. Zajj grew up in Eugene, Oregon. Her unusual name comes from an album by Duke Ellington called "A Drum is a Woman", which tells the tale of a musician and his drum which he calls "Madame Zajj".

Both her parents are artists. Her mother used to make pottery and now designs and manufactures children's clothing. Her father worked in the theatre with musicians, but now writes poetry and works as an accountant. She is the first person in her immediate family to graduate from college. Her parents were very supportive of her academic decisions, although her father had thought she might go into theatre.

As a child she did poorly in math tests - so badly, in fact, that she was put in a remedial math class. However, her fourth grade teacher noticed that her real problem was that she was bored. She took an interest in Zajj and with her encouragement, Zajj was able to enter the honors track for math in fifth grade. By eleventh grade, she was able to take calculus. However she was not especially interested in math in high school, preferring English, theatre and band. As a senior she was able to take math courses at the University of Oregon at Eugene. Initially she saw this primarily as an escape from high school, but by the end of the year she discovered how exciting mathematics could be. Although she did not like calculus, she found that the number theory course required a lot of creativity.

She enrolled as an undergraduate at Harvey Mudd with a vague plan to study chemistry or physics. She was attracted to Harvey Mudd because of the creativity and enthusiasm of the students. She also wanted to challenge herself by leaving home. At college, her interests quickly concentrated on mathematics. She graduated in 2005 with a B.S. in mathematics with distinction.

When she decided to go to graduate school, she could choose between San Diego, Austin and UW Madison. Wanting to try new places again, she eliminated San Diego, which is on the West Coast. She finally chose Madison because she was attracted by the work of Arun Ram and Ken Ono. She also found the graduate student community here very welcoming.

During her time in Madison, Zajj worked hard at her research, but she also tried to achieve balance in her life with her hobbies of Swing and Salsa. She tried outdoor activities such as sailing and hiking and, of course, she liked sampling the Madison food culture and going to the Farmers' Market.

Zajj found the UW Math department very stimulating and supportive. She was very active in WIMAW (Women in Math at Wisconsin), the Math

Mentoring program (to encourage math talented high school girls) and the Education seminars run by Prof. Bob Wilson.

Her enthusiasm and dedication to teaching were recognized in 2008-09 when she won a Math Department TA award. In 2009-10 she also won the UW campus-wide Capstone Teaching Award and the Elizabeth S. Hirschfelder Award for Graduate Women in Mathematics.

Does she have any advice for future graduate students? "The most important thing is to pick an advisor you get along well with. It's almost more important than the subject you pick. Work hard, but balance your life with other interests. Don't get demoralized by the qualifying exam process. Figure out what it is you love about math and do it."

# Interviews

**Professor Robert E. Lee Wilson** retired from the UW Math Department in 2009. He was one of the most popular calculus teachers in the department and actively encouraged good teaching via a teaching seminar he ran.

Bob comes from a family with a long line of academics and mathematicians. One could even say his involvement with the UW Math Dept started before he was born. His father, Robert E. Lee Wilson, Sr. started graduate school at UW before WWII. He left to serve in that war. After the war, he returned to the math department with a family, including a young Bob Jr. He finally earned his PhD under Cyrus MacDuffee in '47 when Bob was five years old.

Bob's grandfather also earned a PhD and taught Mathematics. His grandmother started graduate school, but dropped out in 1916 to raise a family. At that time, it was unthinkable that a woman could do both. He has a brother who also has a math PhD and another who is a computer scientist. His daughter, Julia Wilson, is a topologist who teaches at SUNY Fredonia. His daughter is proud that she is fulfilling her great grandmother's dream. Because of his family history, Bob has tried to encourage women who want to study math.

Bob was a graduate student at UW in the sixties. He and his wife enjoyed their stay here. When he first came, the Math Dept was housed in North

Hall. He remembers the excitement of moving to Van Vleck when it opened in 1963. After earning his PhD in '69 he stayed on for six years, first as an instructor then as a non-tenure track assistant professor.

He has worked both in and out of Academia. Bob taught for nine years at Washington and Lee University in Lexington, VA. He also worked for two companies in Silicon Valley before returning to Madison with a joint appointment in Math and Outreach. In later years, he had a full-time appointment in the Math Department. Here are some of his thoughts about mathematics and teaching mathematics.

1. How would you say that the department has changed since the days when you were a student?

*"There is less interaction between faculty and students - even faculty and graduate students."*

2. When did you know you wanted to be a mathematician?

*"Freshman year. Surprised my father who had thought I would go into Physics."*

3. What do you like best about Mathematics?

*"It is a combination of discovering new things and knowing that what you prove will be true forever."*

4. What do you like best about teaching Mathematics?

*"Introducing people to math which I love. Helping them learn useful tools. Helping them overcome the feeling they can't do math. Have spent a lot of time thinking about the role of culture in math.*

*For example, in the U.S. people think you need a special gift to do math, whereas in Tokyo they think the important part is hard work."*

5. Do you have any advice for undergraduates who would like to major in math?

*"Math is not just calculating. The web is a great resource for learning mathematics (even though some of what you find may be bogus). Go into math if you enjoy it - not because you want to become famous or make a lot of money."*

6. Why is it important to know math?

*"A lot of what goes on in the world today depends on math. The skills you learn, such as logical thinking are useful anywhere."*

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