

# Oakland University

## Department of Mathematics and Statistics Newsletter Winter 2008



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# Oakland University

## Department of Mathematics and Statistics

### Newsletter

Winter 2008



Text

### Notes from the Chair

The best-laid schemes o' mice an' men Gang aft agley; the procrastinators ode. The last newsletter was Summer 2004 and here it is Winter 2008. We'll try to do better with intervals between newsletters.

As you can tell we are trying something a little different this time: a webbased newsletter.

This newsletter's "Where are they now?" column covers the faculty of 1969-1970: three of us are still teaching at Oakland, Professors Chipman, Nachman, and Schochetman (although Winter 2008 is the last semester for Curt Chipman). Others have retired or moved on. We are not sure of the whereabouts of two of the faculty who came to work at OU that year, Mike Brand (last seen teaching math at Essex Community College in Baltimore) and Steve Takiff. If you have any information about them, please let us know.

The department has added a new hanging to its wall collection. Through a generous gift from Professor Jerrold Grossman, we now have a large graph depicting the mathematical genealogy of the current mathematics and statistics faculty (yours truly is descended almost directly from Gauss). In addition, a smaller collaboration graph illustrating the joint publications of members of the department is also on display.

Since 2004 we have lost several faculty. In statistics, Professor James Pan left us to work in industry and Professor Ananda Sen left us for a research job at the University of Michigan. Professor Jack Tsui retired this year and Professor Curt Chipman finishes his last semester of phased retirement this Winter. Alan Park returned from a leave with the Korean Institute of Advanced Study, and resigned this Fall. Since the previous newsletter we have hired three new faculty and are conducting a search this year for another statistician. Professor Harvey Qu (pronounced Chiew) hired in 2004, comes to us from the Statistics Department of the University of Michigan by way of Pfizer. Originally from Albania, Professor Tony Shaska, an algebraic geometer, did his undergraduate work at University of Michigan-Dearborn, his Ph. D. at University of Florida, and came to us in 2005, after two years as a Visiting Professor at University of California at Irvine and two years as an Assistant Professor at the University of Idaho. Professor Dorin Drignei graduated from the Department of Statistics at Iowa State, did some post-doc work at the National Center for Atmospheric Research and we hired him in Fall of 2006. This year we are searching for a new statistician.

Ravi Khattree was made a fellow of the American Statistical Association in Summer 2004. Eddie Cheng became our latest full Professor this summer. Anna Spagnuolo received a well deserved promotion to Associate Professor in Fall of 2005. Similar well deserved promotions to Associate Professor were earned by Professor Serge Kruk in Summer 2006, and Professor László Lipták in Summer of 2007. Jack Nachman was appointed chairperson for a second 3 year term in Summer 2006.

The past three years has seen a leap in the number of externally funded grants. Bo-nan Jiang, Anna Spagnuolo (see below), and Peter Shi have received NSF research grants, Eddie Cheng and Serge Kruk have received grants from General Motors, Jack Nachman received an NSF REU grant (see below), Wendy Zhang has received support from the Oak Ridge National Laboratory. Tony Shaska has received NSF funding for an international conference held here at Oakland and a NATO Advanced Study Institute Grant (see below). Ravi Khattree and Gary McDonald have received funding from General Motors for a workshop (see below). We're applying for and getting more external dollars.

For the past several years the Department has provided the stipend for one Ph.D. teaching assistantship from money donated by alumni and friends (hint, hint). More information about our Ph.D. students appears below.

Let us know how you are doing. Send us your current address and/or email address.

Jack Nachman  
Chairperson  
nachman@oakland.edu

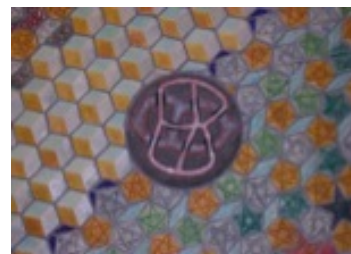


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### Anna Spagnuolo receives an NSF grant

Prof. Spagnuolo is the PI on the NSF Grant: Collaborative Research: Hurricane Storm Surge Modeling on Petascale Computers for \$330,679 (OU) beginning October 1, 2007 and lasting four years. Also working on the grant are Prof. Spagnuolo Ph.D. students, Michael DuChene and Daniel Coffield. This grant is a collaborative project involving two other institutions. It is headed up by Clinton Dawson, PI and main PI at the University of Texas at Austin and by Joannes Westerink, PI at the University of Notre Dame.

### Peter Shi receives an NSF grant

Professor Peter Shi received an NSF grant to study a new finite element solver algorithm that has optimal speed and robustness.

### Conferences at Oakland Last Year

#### SIAM Great Lakes Section 2007 Spring Meeting

Numerical Partial Differential, Equations, Modeling, Algorithms and Applications, April 21, 2007

On April 21, 2007 it was held at Oakland University the Great Lakes Section Sprint Meeting on Numerical Partial Differential, Equations, Modeling, Algorithms and Applications. The principal organizer of this event was **Wen Zhang** with assistance from Kevin Andrews, **Dorin Drignei**, Bo-nan Jiang, **Peter Shi**, **Meir Shillor**, and Jack Nachman. Among invited speakers were Gang Bao (Michigan State University), **Marsha Berger**, (Courant Institute), et al.

The url for the website of the conference is:

[www.engin.umd.umich.edu/glsiam/SIAMGL.htm](http://www.engin.umd.umich.edu/glsiam/SIAMGL.htm)



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### 13th International Conference on Applications of Computer Algebra held at Oakland University

Applications of Computer Algebra (ACA), June 2007.

The ACA series of conferences is devoted to promoting the applications and development of Computer Algebra and Symbolic Computation. Topics include computer algebra and symbolic computation in engineering, the sciences, medicine, pure and applied mathematics, education, communication and computer science.



Figure 1. Poster of the ACA conference

The 13th ACA was held at Oakland University during June 19-22, 2007. Its primary organizer was Tony Shaska with help from J. Nachman. Graduate students S. Wijesiri and R. Sanjeewa helped with organizing tasks.

There were 130 participants from all over the world. The conference was organized in 8 special sessions. The conference was funded by NSF and the Provost's office. Among many well known speakers were W.C. Huffman, D. Joyner, V. Tonchev, A. Sommese, C. Wampler, J. Verschelde, et al.

The conference banquet was held on June 29 at Meadow Brook Hall. Our graduate students D. Kirkwood and S. Wijesiri presented their work in the special session "Computational Algebraic Geometry".

Detailed information about the conference can be found at:

<http://www2.oakland.edu/aca/>



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Contributed by,  
Tony Shaska



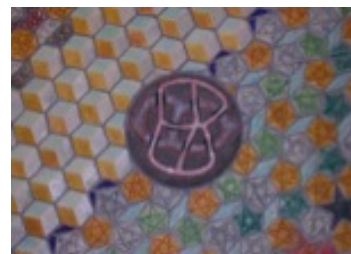
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Erdős Numbers

Other Conferences

## Six Degrees of Separation, Mathematicians' Style

Oakland University is home to the Erdős Number Project website <http://www.oakland.edu/enp/> which provides information on the connectivity of the mathematical research community.

Started by Professor Jerrold Grossman as something of a lark during his sabbatical leave in 1994-95, the project has grown over the past decade and generated considerable interest throughout the mathematical community. Articles have appeared in SIAM News (the newsletter of the Society for Industrial and Applied Mathematics), The Mathematical Intelligencer, and elsewhere, and the website records about 200 visits per day.

Paul Erdős (1913-1996) wrote more mathematical papers (over 1500) and had more research collaborators (over 500) than any other mathematician in history. Since the 1950s, researchers have been computing their "Erdős number" to measure how close they are to the center of the community. Erdős has Erdős number 0, people who have published a jointly-authored paper with Erdős have Erdős number 1, these folks' other coauthors have Erdős number 2, and so on. (The most well-known take-off on this is the Kevin Bacon Game, which finds analogous connections among movie actors.) About 84% of the 300,000 mathematicians who have published co-authored papers have finite Erdős numbers, which range as high as 13. Using data from the American Mathematical Society, Grossman has amassed an amazing amount of information about this network of interconnections. If you have published a paper with someone else, even if it is in another area like computer science or biology, chances are that you, too, have a finite Erdős number. Check out the website for more information.



Contributed by  
Jerry Grossman

## NATO Advanced Study Institute

Vlora, Albania, April 27-May 9, 2008

Our faculty member Tony Shaska has received a NATO grant to organize an Advanced Study Institute with theme "New Challenges in Digital Communications" which will take place in Vlora, Albania from April 27 to May 9, 2008. The following well known mathematicians will be lecturers at the Institute: D.J. Bernstein, A. Elezi, J. Gutierrez, W.C. Huffman, K. Magaard, G. Nebe, D. Joyner, V. Pless, T. Shaska, S. Shpectorov, I. Shparlinski, V. Tonchev, and V. Usimenko. Invited speakers include Mirela Ciperiani of Princeton University. There will be approximately 80 participants in the conference. NSF has also provided funds for US based young mathematicians to attend the conference.

The goal of the Advanced Study Institute is to establish a research network in Eastern Europe in areas of cryptography and coding theory. Several of our graduate students will attend the conference.

More information about this activity can be found at <http://www.albmath.org/nato>.



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Figure 2: Poster of the NATO Advanced Study Institute



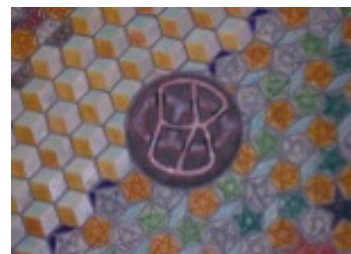
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## Department of Mathematics and Statistics

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### The Reality of Computer Models: Statistics and Virtual Science

### Graduate Students

On March 13 and 14, the Department of Mathematics and Statistics will co-sponsor with General Motors Research and Development Center a two-day workshop entitled “The Reality of Computer Models: Statistics and Virtual Science.” The workshop will be conducted by two leading experts in this emerging field: Professor Jerome Sacks, Director Emeritus and Senior Fellow, National Institute of Statistical Sciences, and Professor Emeritus, Duke University; and by Professor William Welch, Head of the Department of Statistics, University of British Columbia.

This workshop is particularly timely as many industries are striving to reduce development time and cost of new products by replacing physical tests with mathematical and computer simulations. However, computer models are imperfect representations of real phenomena and assessing the validity of the models requires a structure, heretofore lacking, that also accommodates the presence of calibration or tuning parameters. These demands can be met through statistical design and analysis of virtual experiments on complex computer codes. This workshop will provide a comprehensive review, with applications, of the methods, concepts and structure developed over the last two decades on this very important topic.

For more details and registration form go to [http://www.math.oakland.edu/comp\\_model\\_workshop](http://www.math.oakland.edu/comp_model_workshop)

### New graduate courses

With the recent renewed interest in all things Algebra, the department has created two new graduate courses in **Commutative Algebra**, **Algebraic Geometry**, and **Algebraic Number Theory**. We will also be offering a special topics course this spring in **Constraint Logic Programming**. If you're thinking about taking some sort of “stay intellectually and mathematically alive” course and you're in the area, you might want to give it a try.



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**Racheal Zhang** defended her PhD thesis, *Analytical Characteristics of the Ridge Regression Trace*, in March of 2005. Her adviser was Gary McDonald. She is currently a research intern at the Van Andel Research Institute in Grand Rapids, MI.

**Zhengzhi Xia** defended his PhD thesis, *Some Contributions to Multiple Comparison Methods for Longitudinal Data and General Linear Mixed Effects Models*, in March of 2006. His advisers were Subbaiah Perla and Ravi Khattree. He is currently a Senior Research Analyst, Office of Institutional Research, Macomb Community College.

**Nibedita Bandyopadhyay** defended her PhD thesis, *Models and Methodology for Recurrent Event Data*, in October of 2006. Her advisers were Ravi Khattree and Ananda Sen. She is currently a Senior Biostatistician at Johnson and Johnson in Philadelphia.

**Nart Shawash** defended his PhD thesis on December 12, 2007. The thesis was titled *Relationships Among Popular Interconnection Networks and their Common generalizations*. His adviser was Eddie Cheng. Nart is now working for Energy Conversion Devices: Ovonics.

**Dan Kirkwood** defended his PhD thesis on October 16, 2007. The thesis was titled “A hybrid algorithm for the common zero problem.” His adviser was Charles Cheng.

**Sujeva Wijesiri** gave a talk at the New Orleans annual meeting of AMS. She also spoke on the coding theory session at ACA '07, and at the AMS sectional meeting at DePaul University in Chicago. Wijesiri co-authored two papers: one published by the Proceeding of the AMS titled “Codes, lattices, and their theta functions” with her adviser T. Shaska, and the another paper with Emma Previato (Boston University) and T. Shaska, published by the Albanian Journal of Mathematics.

There are 4 new teaching assistants this Fall. **Kevin Pate** is one of our own undergraduate students. He graduated with a Bachelor's Degree in May 2007 and joined our graduate program in Fall 2007. **Ariana Angjeli**, originally from Albania, graduated from University of Michigan- Dearborn. **Grzegorz Kosciak** comes from Poland. **Andrew Kuhs**, is one of our own graduates.

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## Department of Mathematics and Statistics Newsletter

### Department of Mathematics and Statistics receives an NSF REU grant.

Jack Nachman received an NSF grant of \$ 352, 000 to run a three year Research Experiences for Undergraduates (REU). Several faculty members will be involved in these activities (E. Cheng, L. Liptak, H. Qu, T. Shaska, M. Shillor, A. Spagnuolo, and J. Nachman).

#### Computational and Numerical Statistics and Mathematics (CanSam).

CaNSaM offers undergraduate students the opportunity to participate in active numerical and computational research. The participants will gain insights and develop skills for identifying and solving problems that are amenable to computer simulation or solution. They will also develop visual, written, and oral skills in communicating mathematics and statistics. The close contacts developed in this program will be an incentive for participants' further study and eventual employment in mathematics or statistics. Participants in the program will become role models for underrepresented minorities to help encourage mathematically talented students to pursue careers in mathematics and statistics. Students in the program will be encouraged to make themselves visible in their respective communities.

The subjects for the 2008 REU are:

1. Medical simulations
2. Mathematical Models  
in Engineering
3. Interconnection  
networks
4. High throughput in  
screening analysis
5. Algebraic curves and  
their automorphism  
groups



The faculty who will be involved with the REU are:

1. Jack Nachman  
(Principal Investigator)
2. Eddie Cheng
3. László Lipták
4. Harvey Qu
5. Tony Shaska
6. Meir Shillor
7. Anna Spagnuolo



Anna Spagnuolo with student William Lindsey

The webpage of the CaNSaM is

<http://gauss.math.oakland.edu/dept/REUSite/REUSite/Home.html>

Contributed by  
Jack Nachman

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6. Scientific visualization

course



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#### Oakland University Summer Mathematics Institute

#### The Michigan Mathematics Prize Competition (MMPC), 2007-2008

##### Update on the Oakland University Summer Mathematics Institute (OUSMI)

The department continues to organize the Summer mathematics Institute for gifted high school students. Oakland University Summer Mathematics Institute (OUSMI) is a program funded by an anonymous donor. It is a free opportunity for bright and gifted pre-college students to interact with university faculty and each other, to take some challenging math classes that earn college credit, and have fun in an academic atmosphere. Admission is competitive and we usually limit the size to about 36 students. The Institute runs approximately from late June through the first week of August each summer. For the past 12 years, a number of advanced courses were offered including Number Theory, Abstract Algebra, Probability, Applied Statistics, Linear Programming, Graph Theory, Enumeration, Advanced Mathematical Thinking, Topology, Geometric Structures and Linear Algebra.

The Institute at Oakland University will provide an exciting mathematics program to stimulate the mathematical development of bright students from Southeast Michigan. Students are selected based on both exceptional talent and interest in mathematics. Those selected will generally have completed the tenth or eleventh grade, but very bright students at the ninth grade level who have exceptional talent and have accelerated their mathematical studies should also apply.

A major component of The Summer Mathematics Institute at Oakland University is the teaching of advanced undergraduate mathematical concepts from probability theory, number theory, group theory, combinatorics, graph theory, statistics, linear algebra, for college credit, in a creative environment with a high level of mathematical activity. These are interesting topics which can expand the horizons and confidence of bright students, and encourage them to work to their fullest potential. During the program the students also participate in supervised computer lab activity.

The Institute has the use of a computer laboratory reserved for the participants. Students at the Institute are given instruction on the use and ideas behind symbolic mathematical software (such as Maple or Mathematica), which enable computers to answer sophisticated mathematical questions. Students will also be

For the years 2005 through 2008, the department has hosted the Michigan Mathematics Prize Competition. Professor Eddie Cheng is the director.

The Michigan Mathematics Prize Competition is offered by the Michigan Section of the Mathematical Association of America to encourage students to develop their interests and abilities in mathematics.

Part I of the MMPC is open to all students in Michigan high schools. This exam consists of 40 multiple-choice questions involving topics from high school mathematics. From approximately 14,000 participants in Part I, the top 1,000 students are invited to take Part II of the MMPC. These students work on five challenging problems and write their solutions providing full justification and proof of their claims.

The students with the top 100 scores in the two parts of the competition are honored at an awards program. Approximately \$21,000 in scholarships ranging from at least \$250 to \$2,600 will be awarded this year. The host institution for the 49th, 50th, and 51st MMPC, 2005-2008, is **Oakland University**. For the past two years, Provost Moudgil was the invited speaker of the awards ceremony.

OUSMI alums usually perform very well in MMPC. For example, in the most recent MMPC, four of the top ten awardees and 24 of the top 100 awardees are OUSMI alums. On the other hand, some of the MMPC participants learned about our OUSMI program during the awards program and decided to apply; four of the top 100 awardees joined this year's OUSMI.

Contributed by  
Eddie Cheng



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encouraged to explore self-directed mathematical investigations independently.

<http://www.math.oakland.edu/ousmi04/ousmi04.html>

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Eddie Cheng



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#### News from Alumni

Send us your news. Let us know if we can share it with others through this newsletter.

#### **Frank Gurnee, 1972**

Professional Information: Retired after 25 years in the computer industry designing communications systems for voice and data. As staff scientist for NET, developed architectures for integrating voice onto ATM and IP transports. While working for Amdahl, spent three years in Japan designing a data communications controller. Now teaching mathematics at Notre Dame High School.

Personal Information: Lynn (wife, also OU Alum) is an elementary school principal, daughter Amanda is married and is an engineer for a company that makes radars, and son Randy works with handicapped kids in elementary school. We spend a good deal of time boating.

#### **Kathy (Wilkowski) Swaim, 1980**

(Excerpts from Kathy's Professional History)

I began my career in Texas in early 1981 as a circuit forecaster for GTE (Verizon for the younger set) progressing to network senior forecaster. I ended up in Texas as Michigan was suffering from a recession and there was little prospect for employment. GTE was looking for math majors.

After getting married and moving to the Dallas/Fort Worth area, I worked for a company called Symbolics Financial Systems that was looking for a math major to assist in coding the mathematic calculations required for calculating APR's per the government regulation Z. It was pretty scary to walk down the aisles and hear programmers talking about fractions and could only describe a denominator as "you know, the bottom of a fraction"! I was in a small group of mathematicians who understood how to use COBOL (gosh, I am a dinosaur) to actually complete calculations. Alas, this company no longer exists.

From there I took a position as a programmer for a company called ATC (Advanced Telemarketing Corp – you know, those awful people who call you during dinner to sell you stuff.) I was again hired because of my math degree, but only because the director had a math degree and thought it was great! I

#### **Dave Tomczyk, 1990 (BS), 1998 MS in Applied Stat**

Professional Information: Since 2001 I've lived in Wilmington, North Carolina, serving Corning's Optical Fiber Division as a statistician at the largest optical fiber producing plant in the world. I am a resource to engineering, production, and R&D – providing analytical support to various projects, including assisting in the design and analysis of experiments, and developing/teaching in-house statistics classes. I picked up my Six Sigma Black Belt and am also a member of the American Statistical Association. Prior to that I worked in the Detroit area with automotive suppliers for 14 years, analyzing data for process/product improvement. I also spent a few semesters teaching as an adjunct lecturer at Baker College in Auburn Hills.

Personal Information: I am the father of two adult daughters, an avid gardener, a tone deaf musician, an unpublished writer, and spend time enjoying the Appalachians in my pop-up camper. Recently I was ordained as an Interfaith Minister and began assisting others pursuing their spirituality. Life on the coast in southeastern NC is sunny, (too) hot, and beautiful, but I do miss winter - although nobody actually believes me either here or in Michigan!!

#### Where are they now?

#### Department Faculty 1969-1970

**Harvey Arnold**, Professor Emeritus, Ohio

**Mike Brand**, Maryland ??

**Lou Bragg**, Professor Emeritus, Michigan

**Curt Chipman**, Professor, OU

**John Dettman**, Professor Emeritus, Ohio

**Ron DeVore**, Professor and Director, Industrial Mathematics Institute, University of South Carolina

**George Feeman**, Professor Emeritus, Michigan

**Jon Froemke**, Deceased

**Will Hoffman**, Professor Emeritus, Arizona

**Phil Johnson**, Professor Emeritus, Michigan

**Peter Lawes**, Professor Emeritus, Computer Science Department, Northern Illinois University

**Jim McKay**, Professor Emeritus, Michigan

**Don Malm**, Professor Emeritus, California

**Jack Nachman**, Professor, OU

**Ernie Schochetman**, Professor, OU

**Harvey Smith**, Professor Emeritus, Arizona State University

**Steve Takiff**, ??

**Yel-Chiang Wu**, California

stayed less than 2 years. This company is still in existence and is now called AEGIS.

My next stop was Zales, the jeweler! I was hired as a COBOL programmer. I was able to build my retail business knowledge with this position. After that I worked for nearly three years for Neiman Marcus as a Senior Programmer Analyst. I worked on additional financial systems and helped implement a Sales Audit system coded in Power Builder using Sybase and UNIX while maintaining a dinosaur Sales Audit system coded (very badly) in COBOL and Assembler.

Finally, I am at Michaels. I have been here just over 8 years. I have done very little coding (and am having withdrawals with nothing very technical). However, in the IS world, I could go no further without developing my business background. This is something I never thought I would ever do! I always thought I would use my Statistics in a much more beneficial way. Things don't always go the way we plan. However, I am very happy with the choices I made.



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