



Department of Mathematics & Statistics 2009 Newsletter



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Chair's Message

Despite that we are experiencing the unprecedented financial difficulties in the last 30 years, the Department is achieving historical success in research, providing excellent instruction to students, and delivering outstanding services to both professional and local communities. In the past year, 18 new grants and contracts have been awarded to 21 professors of the Department. Nine of the awards are from the National Science Foundation. All 7 research labs of the Department are conducting externally funded research. These labs are Biomathematics Lab, Climate Informatics Lab, Communication Math Lab, Dynamical Systems Lab, Mathematics Technology Lab, Center for Mathematics and Science Education, and Statistics Consulting Center. The faculty and students published in top journals, including *Nature-Geosciences*, *Annals of Statistics*, *Physics Review Letters*, and *Journal of the American Statistical Association*. SDSU Mathematics and Statistics has become a research powerhouse featuring the outstanding strength in applied mathematics, applied statistics, and mathematics education.

This year our department had the most nominations on campus for the SDSU Favorite Faculty Member Award: Guillermo Alvarez, Corey Manchester, and Helen Noble. Alvarez and Manchester won the award. We are very proud of our outstanding instructors.

We always pay attention to community services. Our tutoring program for Pershing Middle School, located in an economically disadvantaged region, helped the students dramatically improve their state Academic Performance Index scores and won the San Diego Union School District's "Exemplary Partnership" award in 2007. Our partnership with

Torrey Pines High School and Canyon Crest Academy High School, *US News'* Top 100 public schools, taught hundreds of students college mathematics and opened doors for these students to the top universities.

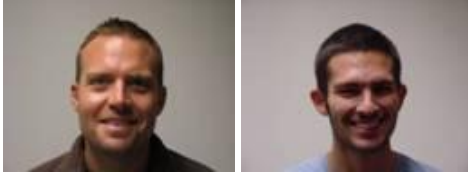
Because of the shortage of state support, our faculty are working much harder than before, and we are facing grand financial challenges: reduced fund for lecturers, no state funds for the departmental operations, and even no state funds for purchasing stationary and classroom supplies. This has dramatically increased the faculty's work load in order for us to achieve the excellence in research, teaching and service. Sustainable development is a way to build a world class department. I have decided to spend much of my time to raise funds for our various departmental programs, including endowment for distinguished professors, student scholarships, colloquium talks and public lectures, and visiting researchers and lecturers. The Department has much to offer to form partnerships with you and your organization and to prosper with you. I would appreciate if you can help the Department with this endeavor by making contacts for us. I'd be delighted to visit you, your colleagues, and your family and friends. Please feel free to contact me at shen@math.sdsu.edu or call 619-594-6191.

Sam Shen, Chair
Department of Mathematics and Statistics



Honors & Awards

Corey Manchester & Guillermo Alvarez



Corey Manchester and Guillermo Alvarez are tied to win this year's Favorite Faculty Member Award. Each spring, the Residential Education Office at SDSU gives the award to the faculty member who receives the greatest number of student votes. Helen Noble was one of the other nominees this year, and the Mathematics and Statistics Department was the best-represented of all departments on campus.

The award has been given since the 2003-2004 school year. Corey won the award in 2006-2007, and has been nominated every year since 2003. Other past nominees include Kevin Cavanaugh and former colleague Amy McElroy.



Rich Levine has been appointed the editor of the Journal of Computational and Graphical Statistics (JCGS). This is the premier journal in Dr. Levine's research field of Statistical Computing, being one of the cornerstone American Statistical Association (ASA) journals. JCGS is an official journal of the ASA, the Institute of Mathematical Statistics, and the Interface Foundation of North America. Dr. Levine's editorial service began July 1, 2009 and will take him through 2013. Dr. Levine is also the founding Co-Director of the Computational Statistics joint PhD program concentration between SDSU and Claremont Graduate University.



Sam Shen (center) was invited by Chinese Academy of Sciences to attend China's 60 Year National Day celebration in Beijing on October 1, 2009. Among the 40 plus invited guests were Physics Nobel Laureate Samuel Ting of MIT and Fields Medalist S.T. Yau of Harvard.



Computational Statistics PhD student **Jonathan Wilson** received the Director's Award for his poster "A Multinomial Dirichlet Model for Analysis of Competing Hypotheses" at the Computational Science Research Center's ACSESS event in March 2009.



Statistics master's student **José Fuentés** was awarded a travel grant to attend a psychometrics workshop hosted by the Statistical and Applied Mathematical Sciences Institute in July 2009.

Doctoral Programs

Computational Science

The doctoral program in Computational Science is an interdisciplinary program involving mathematics, computer science, engineering and physical science, administered by SDSU and Claremont Graduate University.

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San Diego State University
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San Diego, CA 92182-1245
Phone (619) 594-3430
Fax (619) 594-2459
castillo@myth.sdsu.edu
www.csrc.sdsu.edu/csrc/programs/phd.php

Computational Statistics

The Computational Statistics Ph.D. concentration is a joint program with Claremont Graduate University. This program imparts to students expertise in statistical methods and computational machinery, invaluable to the modern-day statisticians and opening opportunities in all walks of statistical life. Browse our web page, peruse the program for study, and see for yourself that Computational Statistics in San Diego is the place to be.

Computational Statistics Ph.D. Program
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www.csrc.sdsu.edu/csrc/Compstat/

Mathematics and Science Education

The Mathematics and Science Education doctoral program is administered jointly by the University of California, San Diego and SDSU. In this program, students with a baccalaureate and master's degree in mathematics, biology, chemistry, or physics complement their discipline knowledge with studies of how people learn mathematics and science. MSED offers a supportive environment where students pursue their own research interests while working closely with faculty on both campuses. The interdisciplinary course requirements (including courses in cognitive science and philosophy) strike a balance between theoretical and practical classes, including a teaching practicum.



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www.sci.sdsu.edu/CRMSE/msed/



Colloquia & Seminars

Peng Zhao, Santarus, Inc., December 4
Clinical Trial Monitoring and Interim
Analysis

Jan Callahan, Callahan Associates, Inc.
November 12
Statistics Problems in Bioassay

James Cruickshank, National University of
Ireland, Galway, November 3
Configuration Spaces of Linkages

Kung-Jong Lui, SDSU, October 23
Estimation of Risk Ratio in
Noncompliance Randomized Clinical
Trials with Trichotomous Dose Level

Hon Keung Tony Ng, SMU, October 9
Genetic Model Selection in Two-Stage
Analysis for Case-Control Association
Studies

Jinchi Lv, Yingying Fan, USC, October 2
Lv: A Unified Approach to Model
Selection and Sparse Recovery Using
Regularized Least Squares
Fan: High-Dimensional Classification
Using Features Annealed Independence
Rules

Sam Shen, SDSU, September 25
HHT Analysis of the Climate Normals

Thomas Smith, NOAA, September 3
Progress in Historical Reconstruction of
Global Precipitation

Loki Natarajan, UCSD, May 1
Identifying Outlier Genes via Capture-
Recapture Across Multiple Microarray
Gene Expression Studies

Antonio Palacios, SDSU, April 29
A Mathematical Model of Motor Neuron
Dynamics in the Heartbeat of the

Medicinal Leech

Juanjuan Fan, SDSU, April 24
Tree Methods for Correlated Survival Data

Carmelo Interlando, SDSU, April 22
Algebraic Decoding of Non-Binary
Quadratic Residue Codes

Kagba Suaray, CSU Long Beach, April 17
A New Trick for the Old Dog of Survival
Analysis

Peter Blomgren, SDSU, April 15
Structure Enhancement Diffusion and
Contour Extraction for Electron
Tomography of Mitochondria

Chi-Hong Tseng, UCLS, April 10
Joint Modeling of Survival Data and
Longitudinal Measurements Under Nested
Case-Control Sampling

Vanamamalai Seshadri, McGill
University, March 26
When is the Sum of the First N Integers a
Perfect Square?

Mark Dunster, SDSU, March 25
Prolate Spheroidal Wave Functions

Hector Lemus, SDSU, March 20
Modeling Multivariate Biomedical Data
with Polynomial Smoothing Splines

Ricardo Carretero, SDSU, March 18
Faraday Waves in Bose-Einstein
Condensates

Don Lutz, SDSU, March 4
Asymptotic Factorization for Differential
Equations; Some New Results on Old
Problems.

Michael O'Sullivan, SDSU, February 25
The Sum-Product Algorithm on Some
Simple Graphs

Milne Anderson, University College,

London, February 19
Univalence Criteria and Quasicircles

Peter Salamon, SDSU, February 11
Pumping a Swing

Daniel Herrlin & Jonathan Wilson, SDSU,
February 6
A Double Header

Vadim Ponomarenko, SDSU, February 4
The Joys of LaTeX

Steve Hui, SDSU, January 28
A Differential Equation from Unknown
Input Observer Design

Theses & Dissertations

Theses Defenses

Paula Chapman, MS Statistics
The impact of a high school exit exam:
A comparison of psychological indicators
between those who have and have not
passed the exit exam
December 18, 9:00am GMCS 405
Chair: C.D. Joey Lin

Kaya Yuki, MA Mathematics
Multi-dimensional Frobenius Problem -
Partial Solution to N-2 Case
October 30, 4:00pm GMCS 405
Chair: Dr. Vadim Ponomarenko

Eunju Park, MA Mathematics
On the Frobenius Numbers
October 28, 3:30pm GMCS 418
Chair: Dr. Vadim Ponomarenko

Courtney Worman, MS Statistics
Predicting Baseball Pitcher Injury Using
Change Point Analysis
October 19, 9:00am GMCS 405
Chair: Dr. Richard Levine

Jonathan Boiser, MS Applied Mathematics
Computational Problems in the Braid

Michael Boone, MS Applied Mathematics

Group
August 23, 5:00pm GMCS 405
Chair: Dr. Imre Tuba

Stefan Kolb, MS Applied Mathematics
On Portfolio Optimization in the Case of
the RDEU Criterion for the Geometric
Brownian Motion Model
July 10, 11:00am GMCS 405
Chair: Dr. Vladimir Rotar

Patrick Dussler, MS Applied Mathematics
Analytic and Numerical Examples of
Weather Derivate Pricing
July 9, 2:00pm GMCS 405
Chair: Dr. Sam Shen

Suchitra Jadgdish, MS Applied
Mathematics
Density Symmetry Breaking in Binary
Bose-Einstein Condensates
June 30, 10:00am GMCS 405
Chair: Dr. Ricardo Carretero

Scott Strachan, MS Applied Mathematics
An Analysis of the Non-Linear Annual
Climate Cycle
June 17, 3:00pm GMCS 405
Chair: Dr. Sam Shen

Marcus Bantle, MS Applied Mathematics
Error Analysis, Assessment and Design of
the Alberta Acid Deposition Network
June 17, 2:00pm GMCS 405
Chair: Dr. Sam Shen

Laleh Shojania Howard, MS Statistics
A Comparison of Two Track Fusion
Algorithms
June 10, 10:00am GMCS 418
Chair: Dr. K.J. Lui

Anya Umlauf, MS Statistics
Stratified Sampling of Low-Density
Parity-Check Codes
May 18, 12:00pm GMCS 405
Chair: Dr. Michael O'Sullivan

The Preservation of Ultrametricity After Lumping
May 14, 10:00am GMCS 405
Chair: Dr. Peter Salamon

Veeral Patel, MS Applied Mathematics
Study, Modeling, and Simulation of the Claim Arrival Process Generated by Catastrophic Events
May 14, 1:30pm GMCS 405
Chair: Dr. Vladimir Rotar

Susan Guyler, MS Applied Mathematics
Modeling and Simulation of the Dynamics of a Superconducting Quantum Interference Filter (SQIF) Device
April 30, 10:00am GMCS 405
Chair: Dr. Antonio Palacios

Scott Nelson, MS Statistics
Hedging Weather Derivative Basis Risk
April 28, 1:00pm, GMCS 405
Chair: Dr. Barbara Bailey

Wei Chen, MS Statistics
Application of Dynamic Linear Regression Model & Hypothesis-Testing for Damage Detection of Highway Bridge
April 21, 9:00am, GMCS 405
Chair: Dr. K.J. Lui

Ryan Humphrey, MS Applied Mathematics
Inpainting Using Anisotropic Diffusion and Its Application to Synthetic Aperture Radar Interferograms
April 20, 11:00am, GMCS 405
Chair: Dr. Peter Blomgren



Christine Lee, Ms Biostatistics
El Nino Factor Analysis and USHCN V2 Error Analysis
March 27, 3:30pm, GMCS 405
Chair: Dr. Sam Shen

Zhirui Yang, MS Statistics
Auxiliary Covariates in Random Effects Logistic Regression Models with Application to Epidemiological Study
March 20, 12:30pm, GMCS 405
Chair: Dr. Jianwei Chen

Ryan Moore, MA Mathematics
On Short Minimal Zero Sequences
February 20, 2:00pm, GMCS 418
Chair: Dr. Vadim Ponomarenko

Dissertation Defense

John Aven, Ph.D. Computational Science
Claremont Graduate University and San Diego State University
Stochastic Dynamics in Coupled Cell-Systems with Applications to Coupled Sensor Devices
November 18, 12:00PM GMCS 405
Advisors: Dr. Antonio Palacios, SDSU and Dr. Visarath In, SPAWAR, San Diego

Resources for Graduate Students

Graduate Division Office
gra.sdsu.edu/grad/index.html

Graduate Program Forms
rohan.sdsu.edu/~gra/grad/graforms.html

Master's Degree - Procedural Steps
rohan.sdsu.edu/~gra/grad/csmasteps.html

Doctoral Programs - Procedural Steps
rohan.sdsu.edu/~gra/grad/phdprocsteps.html

Events

2009 Outstanding Graduate Candidates and Faculty Awardees

Outstanding Baccalaureate Candidate Mathematics & Statistics



Julien Pierret

B.A., Mathematics, and B.S., Statistics

Most Influential Faculty in Statistics



Helen Noble

Selected by Julien Pierret

Academic Excellence Mathematics

Timothy Busken

B.S., Applied Mathematics

Academic Excellence Statistics

Jessica Collett

B.S., Statistics

Most Promising Secondary School Mathematics Teacher

Kirsten Schmidt

B.A., Single Subject Teaching Credential

Distinguished Woman Student Mathematics

Katherine Dinwiddie

B.A., Mathematics

The William Lowell Putnam Exam is the premiere mathematics competition for undergraduates in the United States and Canada. A total of 3627 students from 545 colleges and universities took part; the top three teams this year were from Harvard,

Princeton, and MIT respectively. SDSU also fielded a team, consisting of Ryan Rosenbaum, Amy Arita, and Sara Melvin. They successfully completed a difficult exam in which half the participants scored 0 points. Ryan Rosenbaum's performance is particularly noteworthy -- he scored 10 points, which placed him in the top third of all participants, who themselves are the best undergraduate mathematics majors in the US and Canada., according to exam-coach, Vadim Ponomarenko.

SDSU Math Club student president, John Ashley, welcomes all mathematics and statistics students and faculty to participate in the club. Check the club's website for more details:

<http://www-rohan.sdsu.edu/~mathclub/>

PhD students John Aven and Huy Vu, and Masters student Susan Guyle were awarded the *2009 Summer Naval Research Enterprise Internship* at Space and Naval Warfare Systems Center, San Diego..



Tuesday Tea Time

Every Tuesday at 3:15 pm, our faculty and grad students gather in GMCS 405 for tea, coffee and cookies. We are grateful to have our energetic graduate students: Jennifer Cheung, Max Rietmann, and Aaron Donahue to coordinate the tea time events. These social events have greatly benefitted and enhanced the graduate studies experience for our students.

Nature Press Office had a press release on Feb. 22, 2009 about a *Nature-Geoscience* paper on biomass burning in Indonesia authored by Sam Shen and his student Robert Field and another collaborator G.R. van der Werf. The paper was reported by *New York Times* and *New Scientist*.



Fund Drive

Kindly make a gift to the Department of Mathematics & Statistics in support of the following programs:

1. Colloquium talks and public lectures;
2. Endowed Chair professorship;
3. Graduate student scholarships;
4. Undergraduate student scholarships;
5. The Gene Lopez and Edgar Howard Memorial Fund:
<http://www.math.sdsu.edu/memorial.htm>,
for mathematical experiences, and
6. Any program agreed upon between the Department and the donor(s).



You may make your donation by *check* payable to *Campanile Foundation*. Kindly specify which department program you prefer, and mail to:



Department of Mathematics & Statistics
Campanile Foundation
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-7720

Your gift of any size is welcomed and appreciated. Be sure to inquire if you work for a matching gift company. Refer to website for details:
<http://www.matchinggifts.com/sandiegosu/>.

You may also make your donation *online*, kindly use the University giving form, link
<http://giveonline.sdsu.edu/giving/>

In the section with the heading, *Gift Information*, be sure to designate your donation on the line which reads, "Please direct my gift to another school, department, or program." Select one of the programs and type it in the space provided.



Thank you for your generosity and aid to the Department.

Contact Info

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Statistics
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