

**San Diego
State University**
Minds that move the world

**Department of
Mathematics & Statistics
2010 Newsletter**



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Chair's Message

The Department has gone through another financially difficult year due to the state budget cuts and the national economic crisis. Faculty and staff had a two-day per month furlough for an entire year to help the university continue its operation and provide students with high quality education. Many faculty members actually spent more time adjusting their schedule to teach and tutor their students in order to ensure that students learned their materials properly. Mathematics learning has to follow rigorous steps. Missing a step may mean diminished progress. I sincerely appreciate the unselfish sacrifice of our excellent faculty and staff to contribute to the excellence of SDSU. Despite our efforts, many classes were cut, and some regular sized classes were merged into larger classes. Some students found it difficult or impossible to graduate on time. Many faculty members were overworked in order to excel in both research and teaching. Restoration of public funding to education is urgent and essential. Ongoing funding is required to make a modern knowledge-based economy sustainable and to maintain California's leadership in a creative economy.

Despite the financial challenges we faced, our faculty still had outstanding achievements and earned international recognition. Rich Levine became an elected fellow of the American Statistical Association. Chris Rasmussen was invited by the Mathematical Association of America to start a new journal. Several faculty members were invited to serve on the National Science Foundation's grant review panels. All seven research labs of the Department are conducting externally funded research. These labs are Biomathematics Lab, Climate Informatics Lab, Communication Mathematics Lab, Dynamical Systems Lab, Mathematics Technology Lab, Center for Research in Mathematics and Science Education, and Statistics Consulting Center. Twelve new research grants were received last year from the National Science Foundation, Department of Energy, Department of Defense, and other agencies. These projects provided excellent research opportunities for our faculty and students.

Developing collaborative partnerships with other math departments in the region is important to our own development. During the past year, I met with both the incoming chair and exiting chair of UCSD,

visited the Mathematics Department of the University of San Diego and UC-Irvine, presented a public lecture at the SDSU-Imperial Valley campus, and visited Imperial Valley College's Division of Science, Math, and Engineering.

We are committed to community services. Our tutoring program for Pershing Middle School, which is located at an economically disadvantaged region, continues helping students improve their state Academic Performance Index scores. Our partnership with Torrey Pines High School and Canyon Crest Academy High School, which are listed in US News' Top 100 public schools, taught hundreds of high school students college mathematics and opened doors for these students to the top universities. SDSU mathematics faculty participated in the Torrey Pine Open House for the students' mathematics projects. Grade 11 student, Eric Guan, was selected in the summer of 2010 as team member for the NSF's Research Experience for Undergraduates at SDSU.

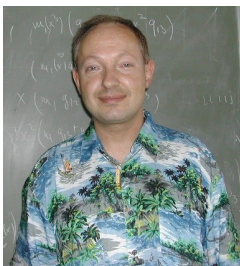
The Department is growing under support from the State, grants, and also private donations. Some donors send checks in every month. I can understand that your money is also limited, but you are committed to our excellence. Sustainable development is a way to build a world class department. I have decided to spend much of my time to raise funds for various departmental programs, including endowment for distinguished professors, student scholarships, colloquium talks and public lectures, and visiting researchers and lecturers. Your generous support is critical to our common success. The Department has much to offer in forming partnerships with you and your organization. We want to prosper with you! I would appreciate your kind assistance with this endeavor by making contacts for us. I'd be delighted to visit you, your colleagues, your family, and friends. Please feel free to contact me at shen@math.sdsu.edu or Tel: 619-594-6191.

Sam Shen, Chair
Department of Mathematics and Statistics



Honors & Awards

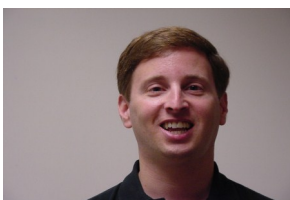
Mark Dunster contributes to a popular mathematics handbook. SDSU mathematics professor Mark Dunster is the author of the Legendre functions chapter for a new and popular mathematics handbook. This 2010 book updates the classical and well used Handbook of Mathematical Functions, edited by Abramowitz and Stegun in 1965. National Institute of Standards and Technology (NIST) has taken 10 years and involved over 20 international experts to complete this massive mathematics project.



The US Society for Industrial and Applied Mathematics wrote that “The NIST Handbook is indeed a monumental achievement, and the many, many individuals who participated in its creation and dissemination are to be congratulated and thanked.”

Optics and Photonics News recognized that “The National Institute of Standards and Technology (NIST) and Cambridge University Press are to be congratulated for publishing a treasury. It is eminently readable with clear, sharp, high-contrast text, mathematical notation and colored graphs and figures. People who work with functions will delight in this handbook.”

Being invited to author a chapter for this important handbook is a special honor and an international recognition of one’s expertise in special functions. Professor Dunster also helped the writing of other chapters of the handbook.



Rich Levine elected ASA Fellow. Statistics professor Richard Levine was among 53 people named Fellow of the American Statistical Association (ASA). The Fellows, who came from the United States,

Israel, Italy, the Netherlands, Belgium, New Zealand and South Korea, received certificates during a ceremony at the annual Joint Statistical Meetings in Vancouver, Canada, on Aug. 3. Levine was chosen for his “outstanding methodological contributions and groundbreaking applicants in the area of Monte Carlo statistical methods, for curricular developments and teaching innovations in computational statistics, and for exemplary service to the profession.” The designation of Fellow has been an exceptional honor in the ASA for more than 90 years. Each year the ASA Committee on Fellows can elect no more than

one-third of one percent of the total ASA membership as Fellows. Individuals are nominated for the honor by fellow members and, to be selected, must have an established reputation and made outstanding contributions in some aspect of statistical work and to the statistics profession.

Most favorite faculty award nominees: **Kevin Cavanaugh** and **Corey Manchester** were among the 21 nominees for the Most Favorite Faculty award sponsored by SDSU Residential Education Office. Manchester won the award for 2006/07 and 2008/09, and has been nominated every year since 2003.

The **William Lowell Putnam exam** is the premiere mathematics competition for undergraduates in the United States and Canada. The seventieth competition was held on December 5, 2009. A total of 4036 students from 546 colleges and universities took part; the top three teams this year were from MIT, Harvard, and Caltech respectively.

SDSU fielded a team consisting of math students including **Ryan Rosenbaum**, **Maria Molla Silvela**, and **Sara Melvin** and their exam coach, **Vadim Ponomarenko**. They successfully completed a difficult exam in which half the participants scored 0 points. Ryan's performance is particularly noteworthy scoring 20 points, which placed him in the top fifth of all participants, who themselves are the best undergraduate mathematics majors in the US and Canada. Maria scored 1 point, which places her in the top half.

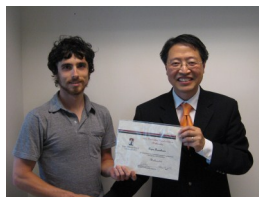
The San Diego Chapter of the **ARCS** (Achievement Rewards for College Scientists) Foundation selected Computational Science student, **Lucie Nguyen**, as one of six new 2010-2011 ARCS scholars at SDSU.

Presidential Leadership Award: Last November, **Mike O'Sullivan** received an SDSU Presidential Leadership Award.

Conference grants: In January 2010, **Antonio Palacios** received a conference grant from ONR for 2010 International Conference on Applications in Nonlinear Dynamics (ICAND 2010). In March 2010, Chris Rasmussen received a conference grant from NSF for Conference to Promote the Integration of Research on Undergraduate Mathematics, Physics, and Chemistry Education.

Congratulations to the following 2010 Awardees

Outstanding Baccalaureate Candidate in Mathematics



Ryan Rosenbaum
B.A., Mathematics

Most Influential Faculty in Mathematics

Carmelo Interlando
Selected by Ryan Rosenbaum

Academic Excellence in Mathematics

Leo Arzu
B.S., Mathematics, emphasis Applied Mathematics

Academic Excellence in Statistics

David Ragan
B.S., Statistics

Most Promising Secondary School Math Teacher

Parween Maronesy
B.A., Mathematics, Single Subject Teaching Credential

Distinguished Woman Student in Mathematics

Janessa Goodhart
B.S., Mathematics, emphasis Applied Mathematics

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.

Computational Science Research Center
<http://www.csrc.sdsu.edu/csrc/programs/phd.php>
Dr. Jose Castillo
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-1245
Phone: (619) 594-3430

Computational Statistics

Formally the Joint Doctoral Program in Computational Science with Concentration in Statistics, the Computational Statistics Ph.D. concentration is a unique program imparting to students expertise in statistical methods and computational machinery, invaluable to the modern-day statistician 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 Science Joint Doctoral Program

<http://www.csrc.sdsu.edu/csrc/Compstat/>

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Fax: (619) 594-6746
rlevine@sciences.sdsu.edu

Mathematics and Science Education (MSED)

The Mathematics and Science Education doctoral program is administered jointly by the University of California, San Diego (UCSD) and San Diego State University (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.

Center for Research and Science Education

<http://www.sci.sdsu.edu/CRMSE/msed/>

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lobato@saturn.sdsu.edu

Colloquia & Seminars

The Department offers an active slate of speakers on topics in mathematics, mathematics education, and statistics. This year's talks noted below. View online bulletins here:

<http://www.math.sdsu.edu/colloqsemsarchive.htm>

Kung-Jong Lui, SDSU

Test Non-Inferiority (and Equivalence) Based on the Odds Ratio Under a Simple Crossover Trial

Mia Minnes, UCSD

Randomness in Computation

Colleen Kelly, Moores UCSD Cancer Center

Group-Sequential Designs for Phase I/II Cancer Immunotherapy Trials

Sean Larsen, Portland State University

A Local Instructional Theory for the Guided Reinvention of the Quotient Group Concept

Farhad Jafari, University of Wyoming

Variations on a Classical Moment Problem

C.J. Park, SDSU

On Waiting Time Distribution of Runs of Ones or Zeroes in a Bernoulli Sequence

Ming Ji, SDSU

Statistical Challenges in Genetic Testing

Michael Donohue, UCSD

The Relative Efficiency of Time-to-Threshold and Rate of Change in Longitudinal Data

Jiri Lebl, UCSD

Polynomials Constant on a Hyperplane

Jun Li, UC Riverside

Nonparametric Classification Procedure Based on DD-plot

Joseph Kang, Northwestern University

Differential Causal Inference with Recursive Partitioning

Yaming Yu, UC Irvine

Multiplicative Algorithms: why do they converge and how to make them faster

Robert Guralnick, USC

Generators and Relations for Finite (Simple) Groups

Donatello Telesca, UCLA

Modeling Dependent Gene Expression

Robert Ellis, Illinois Institute of Technology

An Improved Liar Game Strategy from a Deterministic Random Walk

Lynn Russell, UCSD

Will Aerosol Particles Prevent Global Warming?

Wei Cheng, ISIS Pharmaceutical

Stay Ahead of the Curve - Learn New Features to Enhance Your SAS Programming Skills in Pharmaceutical Industry

Tim McMurray, DePaul University

Functional Clustering for Time-Course Gene Expression Experiments Using ARMA(p,q)

Babak Shahbaba, UC Irvine

Bayesian Gene Set Analysis

Karen Messer, UCSD

Toxicity-Evaluation Designs for Phase I/II Cancer Immunotherapy Trials

Richard Levine, SDSU

Frailty Modeling via the Empirical Bayes Hastings Sampler

Theses

Ling Han, MS Statistics

Flexible Sequential Designs in Toxicity-Evaluation Clinical Trials

Chair: Dr. Kong-Jong Lui

Suzanne Papp, MS Statistics

Extending Longitudinal Analysis to Estimation of Coefficients in HIV-1 Dynamics,

Chair: Dr. Jianwei Chen

Bridget Druken, MA Mathematics

Nets and the Line Graph

Chair: Dr. Michael O'Sullivan

Brendan Fahy, MS Computational Sciences

Three-dimensional Concurrent Solver for a Non-linear Schrodinger Equation

Chair: Dr. Michael Bromley

Fabian Bosler, MS Applied Mathematics

Predicting the Oil Price Three Different Approaches

Chair: Dr. Barbara Bailey

Jennifer Cheung, MS Applied Mathematics
The Design of S-boxes
Chair: Dr. Carmelo Interlando

Yang Dai, MS Statistics
Semi-parametric Estimation for Random Effects Logistic
Regression Model with Surrogate Outcomes
Chair: Dr. Jianwei Chen

Jochen Wieland, MS Applied Mathematics
Modeling and Comparing Temperature Processes for
Pricing Weather
Chair: Dr. Barbara Bailey

Tobias Regele, MS Mathematics
USHCN data gridding, error estimation, and the changes
of extreme weather over the contiguous US since 1895
Chair: Dr. Sam Shen

Jemily Malvar, MS Statistics
Analysis of HIV-Associated Neuropathic Pain: GLMM
versus Survival Analysis
Chair: Dr. Juanjuan Fan

Eric Freiling, MS Applied Mathematics
Paradoxical Decompositions and the Axiom of Choice
Chair: Dr. Stefen Hui

Donald Adams, MA Mathematics
Structure of Minimal Zero-Sum Sequences of Maximal
Length in $Z_n \times Z_n$
Chair: Dr. Vadim Ponomarenko

Burak Cebecioglu, MA Mathematics
A Computerized Proof of the Hypergeometric Identities
with Gosper and Zeilberger Algorithms
Chair: Dr. Vadim Ponomarenko

Vincent Dayes, MS Statistics
Modeling Multi-Entry Competitions
Chair: Dr. Richard Levine

Natalie Selinski, MA Mathematics
Student Reasoning and Justification for the Invertible
Matrix Theorem:
An Analysis Using Adjacency Matrices
Chair: Dr. Chris Rasmussen

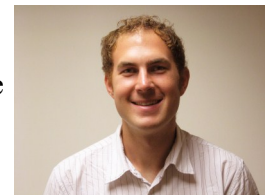
Todor Kitchev, MA Mathematics
Integer-Valued Polynomials
Chair: Dr. Vadim Ponomarenko

Maximilian Rietmann, MS Applied Mathematics
Directed Ratcheting Current for Particles and Solitons
Under Modulated Potentials,
Chair: Dr. Ricardo Carretero

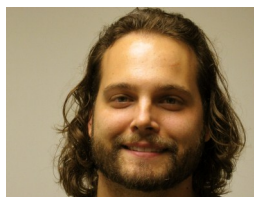
Aaron Donahue, MS Applied Mathematics
Solutions to the Forced Korteweg-de Vries Equation
Chair: Dr. Sam Shen

Meet our new
GRADUATE TEACHING ASSISTANTS

Alexander Weithmann
Degree objective: MS Applied Math
Further plans: Finish a second degree
in Germany, Diplom in Business
Math.



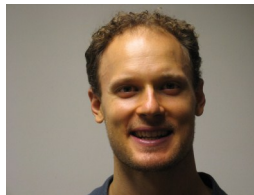
Benjamin Gerke
Degree objective: MA Math
Future plans: Ph.D. in Math Educa-
tion and teach.



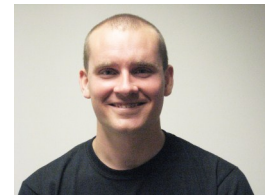
Dane Dormio
Degree objective: MS Physics and
MS Applied Math, concentration
Dynamical Systems
Future plans: To save the world.



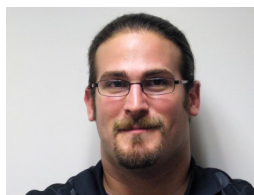
David Lewis
Degree objective: MS Applied Math,
conc. Theory of Communication
Future plans: Teach high school math
and Ph.D. in Math Ed at SDSU.



David New
Degree objective: MS Applied Math,
concentration Dynamical Systems
Future plans: Ph.D. in Economics.



Dov Zazkis
Degree objective: Ph.D. in Math and
Science Education
Future plans: Become a professional
race car driver.



George Richardson
Degree objective: MS Statistics
Future plans: Ph.D. in Stats with arti-
ficial intelligence.





Geri Volz
 Degree objective: MA Teaching Service, Community College Teaching
 Future plans: To teach community college math.

Jacqueline Hamed

Degree objective: MS Statistics
 Future plans: Ph.D. and pursue a career in education.



Jonathan Wilson
 Degree objective: Joint Ph.D. Program in Computational Statistics
 Future plans: To work as a statistician in academia or private sector.

Kelly Chase

Degree objective: Joint Ph.D. Program in Computational Statistics
 Future plans: I have no plans other than making people call me "Doctor."



Kyle Marshall
 Degree objective: MS Applied Math, concentration Math Theory of Communication
 Future plans: Ph.D. in Applied Math.

Lauren Susoeff (photo unavailable)

Sarah Dyer

Degree objective: MS Statistics
 Future plans: To teach community college and pursue a CA teaching credential.



Valerie Chau
 Degree objective: MA Teaching Service
 Future plans: To find more teaching work.

Yi Lu

Degree objective: MS Statistics
 Future plans: To become a statistician working in pharmaceutical industry.



Youssef Francis

Degree objective: MA Math
 Future plans: To teach community college math.



Events

SDSU Math Club. The SDSU Mathematics Club is dedicated to supporting interest in mathematics and mathematics education throughout the campus and community. We do this by welcoming students in *all* areas of mathematics, statistics, and computer science and connecting them to professors and professionals in related fields. The club provides a social network, shared experiences, and support for all members in their academic endeavors at SDSU. Current Board includes Student President, Staci Benak, Vice-President Mandy Lenham, Treasurer, Kayleigh Neel, and Secretary Mariana Salas. Visit the Math Club website: <http://sdsumathclub.webs.com/>

SDSU Math Team for the Putnam Exam. On the first Saturday in December, the SDSU Math Team will compete with about 3000 undergraduates around the world. Math Advisor, Peter Salamon, invited students to try their luck and skill at some of the toughest problems around. He states that Putnam Exam winners are eligible to get a free ticket to graduate school. Peter held weekly training sessions to examine problems from other years and explore methods of attack for this year. Good luck SDSU Math Team!

Thank you from the **San Diego Food Bank.** In October, SDSU Aztecs won the San Diego Food Bank food drive competition for the third year in a row. The Math Dept. collected food from faculty and staff providing the Food Bank with 33 cans of food, 2 bags of dried beans, and one box of pasta. That's nearly 30 pounds of food just from the Math Dept. Overall, the SDSU effort collected 18,841 pounds of food, compared to second-place UCSD's 5,726 pounds, and third-place CSU San Marcos' 1,698 pounds. That's team spirit!

The Math Department hosted a special filming for the History Channel with guest lecturer, Scott Flansburg, the "**Human Calculator.**" Dr. Sam Shen and Dr. Tom Scott invited math faculty and TA's who used calculators and computers to compete in the challenge with Mr. Flansburg. Faculty and TA's using electronics with speed and technology in their favor were no match against the brain of the "human calculator." See this

fascinating math documentary on the History Channel created by Stan Lee in his *Superhumans* series excerpted here: http://video.sdsu.edu/reference/user/dept_mathematics/SUPERHUMAN.mov

Fund Drive

Milestones

A new birth. Congratulations to Kristin and Chris Duncan on the birth of their new baby, **Macklin Duncan**, born on 7/16/10 weighing 7 pounds and 8 ounces, and 19.5 inches long.



A new retirement. Congratulations to **Bob Grone** on his recent retirement. Bob is FERPing and maintaining his office for academic advising for MA Math grad students.

And **a memorial** to a revered faculty. **Charles Bernard Bell, Jr.** died October 26, 2010 in Los Angeles, CA. He was 82. He was born in New Orleans, LA on August 20, 1928 to Charles B. Bell Sr. and Estelle T. Bell.

Dr. Lesley writes, “I want to comment on the life of Chuck Bell, a remarkable man who has recently died. Chuck was from New Orleans and graduated from Xavier University, the only historically black Catholic University in the United States. He went on to earn his Ph.D. (1953) in Statistics from the University of Notre Dame. Chuck worked for Douglas Aircraft Co. for 4 years before and after finishing his Ph.D., and spent time at Xavier and at Stanford before joining our faculty at SDSU in 1958. Chuck was the second black faculty member at SDSU, and the first to be tenured. In 1964 he began a 2 year sabbatical that took him to several European centers, and on his return he took a position at Case Western, from which he went on to Professorships at Michigan, Washington and Tulane. He taught at the Univ. of Madrid in 1964 and in Sept. 1965 he went to the Institut de Statistiques (ISUP) in Paris. Kjell Doksum was there that year. He also visited statisticians in Tokyo and ISI in Calcutta. He spent time collaborating with Statisticians in Kenya, Nigeria and India.

It is pretty clear that Chuck and his wife, Mary, were travelers. They also made a point of learning the language spoken wherever they were. It was hard to name a place that Chuck had not been to. I recall a conversation about Timbuktu. Chuck returned to SDSU in 1981, and stayed until 1992, when he retired.”

Kindly make a generous 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, at this 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. Your donation is an investment in the future for the many talented students in the Department of Mathematics & Statistics at San Diego State University.

Contact Info

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