



# Annual Report

2005-2006

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**Statistics and Applied Probability**

University of California, Santa Barbara





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## *Statistics and Applied Probability*

### **Welcome to Statistics and Applied Probability Department 2005-06 Annual Report!**

Big changes were in the air during the whole past year: 2005-06 was a year of bringing Financial Math to a new level in the Department and at UCSB. The Department expanded in so many ways that we ran out of office space.

To begin with, in Winter 2006 we welcomed our new faculty member, Dr. Jean-Pierre Fouque, Professor of Statistics and Applied Probability, Associated Editor of the *Annals of Applied Probability*, whose resume lists over 60 publications, including the well-known Cambridge University Press book, *Derivatives in Financial Markets with Stochastic Volatility* (joint with G. Papanicolaou and R. Sircar). Dr. Fouque has already assumed the lead of our graduate and undergraduate programs in Financial Mathematics and Statistics. He is also the first Director of the newly established interdisciplinary Center for Research in Financial Mathematics and Statistics (CRFMS).

The new Center will provide national and international leadership in quantitative finance from different perspectives. The Center will bring together faculty, students, and visitors affiliated with the departments of Statistics and Applied Probability, Economics (Econometrics and Finance), Mathematics (Applied Mathematics), Computer Science and others on the UCSB campus and facilitates interdepartmental cooperation in mathematical modeling, statistical data analysis and efficient computational methods specific to financial data.

Although CRFMS is only a few months old, it already has a full scope of activities: Spring quarter saw meetings of the founding members of CRFMS, weekly seminars, numerous short-term visitors from Princeton, Stanford, UC Irvine, Columbia University, etc. The Center successfully sponsored the nomination of Dr. Bruno Dupire, Bloomberg LP New York, a major Wall Street figure, as one of the 2006-07 Regent's Lecturers. Dr. Dupire will be visiting our campus in Spring 2007.

In Summer we welcomed to the Department three postdoctoral faculty, associated with the Center: Dr. Hasan Sayit, Dr. Jose Figueroa-Lopez, and Dr. Jesus Rodriguez. Dr. Hyunyoung Choi, who joined us in

Summer 2005, will continue handling our actuarial program.

The official CRFMS Inauguration event is planned for October 16th, 2006, featuring lectures by three distinguished speakers: Peter Carr (Bloomberg and NYU), Thaleia Zariphopoulou (UT Austin), and Peter Cotton (Morgan Stanley).

Other exciting events were the election of Dr. Yuedong Wang as a Fellow of the American Statistical Association and the promotion of two of our junior faculty, Dr. Drew (Andrew) Carter and Dr. Dawn Holmes, to tenured positions.

Last March we hosted the 3rd Annual Sobel Lecture, delivered by Dr. Raymond Carroll, Distinguished Professor of Statistics, Nutrition, Toxicology and Epidemiology & Biostatistics; Director of the Bioinformatics Training Program and Core Director of the Center for Environmental and Rural Health at Texas A & M University.

Both undergraduate and graduate programs seem to have reached a healthy equilibrium. For several years our graduate enrollment in Fall has been at the steady level of 50-60 students, with 8 PhD degrees awarded during the year. We also graduated 16 students with the terminal MA degree in Applied Statistics. The undergraduate actuarial program remains at about 50 students, but we added about 30 majors and another 30 premajors in Financial Mathematics and Statistics. Three graduating Financial Math and Stats seniors were supported by the Barbara and Robert Lowes Scholarship this year: Jens Olsen, Jesse Gardeman and Daniel Romotsky.

We are now looking forward to a new productive academic year. Future attractions include the October 16th CRFMS Inauguration Day and Spring public lectures by our distinguished Regents' Lecturer, a department-wide wireless network, a new webpage design, new students and new courses, recruitment of a new faculty and more! Read about it next summer in the 2006-07 Annual Report!

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## *Computing Facilities*

Over the course of the year the performance of the compute cluster has been enhanced to handle more users running heavier computational jobs.

The department added wireless access to the graduate tower cubicle area, front office, and computer lab. This secure setup allows authorized staff, faculty and graduate students to utilize a private wireless network in the department.

The computing section of the department website was overhauled to include the most recent information and documentation, especially related to the cluster.

The Computing Team created a new computer lab image for easier access to statistical applications and faster logins.



## *Statlab Report*

StatLab continues to attract a large number of clients, both faculty and students from within UCSB, as well as an occasional consulting from the SB community. This year has been typical with many walk-in clients from various departments such as Education, Geology, Geography, Computer Science to name a few. Professor Yuedong Wang (F) and Professor Jammalamadaka (WS) served as the StatLab Directors with graduate-students Deepali Paradkar (FWS), Homin Jang (F), Edward Montoya (W) and Aleem Siddiqi(S) helping out with the more routine statistical consulting activities. This we believe is one of the most useful services this department provides for a research campus such as ours.

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## *Faculty*

Guillaume Bonnet, PhD University of North Carolina, Chapel Hill 2002  
Andrew V. Carter, PhD Yale University 2000  
János Engländer, DSc Technion, Haifa, Israel 1997  
Raisa E. Feldman, DSc Technion-Israel Institute of Technology 1987  
Jean-Pierre Fouque, PhD Universite de Paris VI 1979  
David Hinkley, PhD London University 1969  
Dawn Holmes, PhD University of Bradford 2000  
John Hsu, PhD University of Wisconsin, Madison 1990  
Sreenivasa Rao Jammalamadaka, PhD Indian Statistical Institute, Calcutta 1969  
Wendy Meiring, PhD University of Washington 1995  
Yuedong Wang, PhD University of Wisconsin 1994

## *Emeritus Faculty*

Joseph Gani, Professor Emeritus; PhD Australian National University 1955; DSc, University of London 1970  
Svetlozar Rachev, PhD Lomonosov University, Moscow 1979; DSc Steklov Institute, Moscow 1986  
James Robertson, PhD Indiana University 1964

## *Visiting Faculty*

Bjornstad, Jan  
Radu Lazar  
Hyunyoung Choi

## *Staff*

Claudia Carlson, Management Services Officer  
Juliana Espinosa, Undergraduate Program Assistant  
Gail Kelley Murray, Graduate Program Assistant  
Troy Small, Computer Systems Administrator  
Dēnna Zamarron, Financial/Personnel Coordinator

### *Student Staff:*

Adriana Solano, Staff Assistant  
Deanna Jean R. Sarreal, Student Assistant  
Angela Yamagata, Student Assistant  
Deanna N. Scott, Actuary President

## *Graduate Students*

John Can Arikli	Eduardo Montoya
Biliana Bagasheva	Neha Pandey
David Baker	Deepali Paradkar
Nathan Bennett	Stephen Pettinato
Elaina Deabay	Binh Pham
Samuel Frame	Hoon Rhew
Fuying Gao	Roberto Rivera
Hamid Ghofrani	Amy Roth
Kathryn Grace	Raj Sau
Michael Grebeck	Byung-Dong Seo
Richard Harang	Julianne Shan
Mohammad Hassanpour	Song Shi
Ching-Chi Huang	Joonho Shin
Homin Jang	M. Aleemuddin Siddiqi
Yihua Jiang	Marick Sinay
Visnja Juric	Anna Tchernobai
Naohisa Kaneda	Trent Thomas
Aleksandr Keyfes	David Tung
Shahryar Khorsandravan	Cory Vandenberg
Mee-Kyung Kim	Alex Villacorta
Nancy Kim	Dezhong Wang
Eli Kollman	Seth Wayland
Leslie Kwor	Micah Witt
Noureddine Laanaoui	Brian Wignall
Dong Haeng Lee	Junqing Wu
Jeongjun Lee	Minjun Zhang
Xiaofang Lei	Yongli Zhang
Edwin Lopez	Jingjing Zhang
Qun Luo	Wenfeng Zhang

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## Degrees Awarded 2005-06

### *Bachelor of Arts/Science*

#### **Statistical Science, B.S.**

Chim, Vannak  
Lau, Sze Man  
Matthews, Eli Michael  
Pluhar, James William Jr  
Custer, Robyn Louise  
Tong, Hank Yale  
Wu, Ruey Bin  
Beaudoin, Shauna Jean  
Calcagno, John Richard  
Copper, Steven Matthew  
Lee, Michelle Nayoung  
Murillo, Franco Rodrigo  
Rubinshteyn, Mikhail  
Schmeichel, Nathan Andrew  
Scott, Deanna Nicole  
Vickery, Conrad Lee Jr

#### **Statistical Science, B.A.**

Popular, Wade Lincoln  
Plog, Kevin Winters  
Masumi, Satoshi

#### **Financial Mathematics & Statistics, B.S.**

Grubwieser, Stephanie Ann  
Becker, Ashley Rose  
Reyes, George Angelo  
Rodriguez, Alberto Nino  
Baez-Winkleman, Christopher Mig  
Black, Natalie Helene  
Bravo, Eric Joseph  
Chong, Kevin  
Gardeman, Jesse Mats  
Irwin, Christopher Dylan  
Jenkins, Alexander Livingston  
Johnson, Peter Francis  
Katzen, Daryn Thomas  
Nunez, Michael David  
Olson, Jens Patrick  
Price, Robert Matthew  
Romotsky, Daniel Ian  
Scheppmann, Eric Robert

#### **Minors**

Boyadjian, Isabel Anahid  
Perucho, Mark Anthony Yadao  
Wold, James Thomas  
Baldinger, Ivan Sanderson  
Fan, Lulu

#### **Rama Thogarati Prize**

*Awarded to*

#### ***Robyn Custer***

The Rama Thogarati Prize is awarded annually to a senior undergraduate student for high academic achievement. The prize is in memory of Rama Thogarati, a graduate student.

#### **Lowes Scholarship**

*Awarded for Support in 2006-2007*

***Wan Chen***

***Shushan Sadjadi***

***Greg Trowbridge***

The Robert and Barbara Lowes Scholarships in Financial Mathematics and Statistics are awarded each year to talented undergraduate students enrolled in the major.

#### ***Masters of Arts***

Elaina Deabay  
Kathryn Grace  
Nancy Kim  
Leslie Kwor  
Xing Liu  
Edwin Lopez  
Neha Pandey  
Byung-Dong Seo  
Song Shi  
Marick Sinay  
Dezhong Wang  
Seth Wayland  
Bei Wu  
Junqing Wu  
Jingjing Zhang  
Minjun Zhang

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***PhD Degrees Awarded***

Tiejun Tong  
Jiacheng Yuan  
Xiaofang Lei  
Michael Grebeck  
Samuel Frame  
Anna Chernobai  
Mohammad Aleemuddin Siddiqi  
Alexander Villacorta

**Ruth and Joe Gani Prize**

*Awarded to*

***Tiejun Tong***

Awarded for excellence in research, selected by the faculty for the best PhD dissertation.



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## Colloquia

### Fall Quarter

October 3, 2005, Christof Weinhardt, University of Karlsruhe (TH), Germany School of Economics and Business Engineering Information Management and Systems, CAME - Computer Aided Market Engineering

October 3, 2005, Stefan Seifert, University of Karlsruhe (TH), Germany School of Economics and Business Engineering Information Management and Systems, Posted Price Offers in Internet Auction Markets

October 12, 2005, Dale Umbach, Ball State Univ., Some Properties of Skew-Symmetric Distributions

Oct 19, 2005, Radu Lazar, UCSB, Computations for Bayesian Procedures Under Linear Constraints in Finite Population Sampling

Oct 26, 2005, Hira L. Koul, Michigan State University, Goodness-of-fit testing in interval censoring case 1

Nov 2, 2005, Joe Romano, Stanford, Generalized Error Control in Multiple Hypothesis Testing

Nov 9, 2005, Willa Chen, Texas A&M, Efficiency in Estimation of Long Memory

November 14, 2005, Guillaume Bonnet, UCSB, The Long Time Behavior of a Stochastic Lotka-Volterra System with Jumps

November 16, 2005, Hyunyoung Choi, UCSB, A Bayesian Methodology of Random Intervention Model with Panel Data: Impact Study on Interest Rate Futures Market

### Winter Quarter

February 8, 2006, Jan Bjornstad, Visiting Professor at UCSB and Director of Research for Statistical Methods, Central Bureau of Statistics, Norway, Likelihood theory for prediction

February 15, 2006, Kenneth J. Hochberg, Bar-Ilan University, Israel, Hierarchically Structured Branching-diffusing Systems

March 8, 2006, Ingo Ruczinski, Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Logic Regression

March 14, 2006, Raymond J. Carroll, Distinguished Professor of Statistics Professor of Nutrition and

Toxicology, Department of Statistics, Texas A&M University, "Measuring Diet"

March 15, 2006 SOBEL LECTURE, Raymond Carroll, Distinguished Professor at Texas A & M University, Semiparametric methods for gene-environment case-control studies

### Spring Quarter

April 5, 2006, Kevin Plaxco, UCSB Department of Chemistry and Biochemistry, My protein folds faster than yours: using protein folding rates to test protein folding theories.

April 12, 2006, John Boscardin, UCLA Biostatistics, Seemingly simple questions: models for multivariate repeated measures data

April 26, 2006, Jeff Dozier, Bren School, UCSB, "Historical trends in the Sierra Nevada snow cover",

May 3, 2006, Hal Stern, University of California Irvine, Assessment of Ancestry Probabilities in the Presence of Genotyping Errors

May 17, Valdo Durrleman, Stanford University, "Coupling Smiles"

May 22, 2006, Ronnie Sircar, Princeton University, Impact of Risk Aversion on Credit Derivatives

May 24, 2006, Levon Goukasian, Pepperdine University, "Optimal Risk Taking with Flexible Income" (joint work with J. Cvitanic of Caltech and F. Zapatero of USC)

May 31, 2006, Ker-Chau Li, UCLA Statistics, Likelihood of false positives in hypotheses with strongest evidence from multiple testing: the p-value memoryless conversion approach

June 7, 2006, Nan Chen, Columbia University, IEOR, A tale of two simulations

June 12, 2006, Suhas Nayak, Stanford University, Stochastic volatility surface estimation

June 21, 2006, Chuan-Hsiang Han, Department of Quantitative Finance, National Tsing-Hua University, Taiwan, Option pricing, Hedging, and efficient Monte Carlo methods

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## *Research Interests*

### **GUILLAUME BONNET**

Research interests include: statistical analysis of high dimensional data and infinite dimensional probability models with applications in population genetics and Internet traffic .

### **ANDREW CARTER**

Research interests include: asymptotic statistical inference, comparisons of statistical experiments, density estimation and nonparametric function estimation.

### **JANOS ENGLANDER**

Research interests include: working on problems related to different kinds of spatial stochastic processes with a strong emphasis on their relation to linear and nonlinear partial differential equations. As far as applications concerned, my main interest lies in different models of mathematical finance.

### **RAISA E. FELDMAN**

Research interests include: stochastic differential equations with non-Gaussian noises, time series, filtering problems.

### **JEAN-PIERRE FOUQUE**

Research interests include Stochastic Processes, Stochastic Partial Differential Equations, Waves in Random Media, Financial Mathematics.

### **JOSEPH GANI**

Dr. Gani has been working on an ecological model for a plantation-nursery system, as well as some epidemic models for SARS and the spread of HIV by infected syringe needles. He has also written on the development of Statistics at the Australian National University since 1952.

### **DAVID V. HINKLEY**

Research interests include: resampling methods, model selection, nonparametric curve fitting (including wavelet methods), comparisons between objective Bayes and frequentist inference.

### **DAWN HOLMES**

Main research interest is Bayesian Networks. Recent work in this area includes estimating priors using the maximum entropy formalism, quantum computing and maximum entropy in Gaussian networks. Other interests include: How humans process causal knowledge, foundations of Bayesianism, Brouwer's programme and intuitionistic Markov chains. Issues in statistical education.

### **JOHN HSU**

Dr. Hsu continues to work on Bayesian estimation of covariance matrices. The Bayesian estimation for the linear mixed effects models, with a very flexible prior structure, has been fully developed. He is also working on a project of Bayesian methods in estimating ordered mortality rates. The project is interesting, however, the computation is challenging due to the constraints of the parameters.

### **S. RAO JAMMALAMADAKA**

Dr. Jammalamadaka continues to be interested on topics related to directional data, spacings and nonparametric goodness-of-fit. As part of the ITR project on biomolecular images, techniques of clustering and pattern recognition for high-dimensional data were investigated.

### **WENDY MEIRING**

Research interests include: spatial/temporal data analysis, geophysical model evaluation, and functional data analysis in the environmental sciences.

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**S.T. RACHEV**

General research projects: non-Gaussian models in mathematical and empirical finance, financial econometrics, factor models for asset returns, market and credit risk management, operational risk assessment and forecast, asset liability modeling, optimal choice of performance measures, momentum and risk-neutral strategies, statistical arbitrage, optimal portfolio theory for highly volatile markets, option pricing with stable GARCH-type processes for the underlying risk factors, statistical tests for CAPM and APT in the presence of heavy-tailed distributed financial returns, Bayesian methods in finance, stability of stochastic models.

**YUEDONG WANG**

Research interests include: smoothing spline, smoothing spline ANOVA, generalized linear model, mixed-effects models, model selection, survival data, longitudinal data, spatial-temporal data, computational statistics, statistical software, microarray data analysis and biostatistical modeling (circadian rhythm, hormone pulses).



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## Publications

### ANDREW CARTER

A continuous Gaussian process approximation to a nonparametric regression in two dimensions, *Bernoulli*, Vol 12, No. 1, Feb. 2006. pp. 143-156

### JANOS ENGLANDER

Non Existence of Solutions in  $(0,1)$  For K-P-P-Type Equations for all  $d \geq 1$  (with Peter L. Simon), *Electronic Journal of Differential Equations*, Vol. 2006, No. 09, pp. 1-6

Law of large numbers for a class of superdiffusions (with A. Winter), *Annales de l'institut Henri Poincaré (B) Probabilités et Statistiques*, Vol 42/2 pp 171-185

### JEAN-PIERRE FOUQUE

Imaging of a dissipative layer in a random medium using a time-reversal method (with J. Garnier, A. Nachbin and K. Sølna). Proceedings of the conference "Monte Carlo and Quasi-Monte Carlo Methods 2004", (Nice, 2004), H. Niederreiter and D. Talay, eds., Springer, Berlin, 2006, pp. 127–145.

Stochastic Volatility Effects on Defaultable Bonds (with R. Sircar and K. Sølna). *Applied Mathematical Finance* 42(3), September 2006.

Time reversal detection in one-dimensional random media (with O. Poliannikov). *Inverse Problems* 22 (2006) 903-922.

### JOSEPH GANI

Fifty years of statistics at the Australian National University, 1952-2002, *Hist.Rec.Austral.Sci.* 16 (2005) 31-44

A continuous time Markov chain model for a plantation-nursery system (with L. Stals), *Environmetrics* 16 (2005) 849-861

Allocating infected needles randomly among susceptibles (with R.J. Swift), *Inter. J. Appl.Math.Sciences* 2, No.2 (2005) 220-229

A counter-intuitive result in the AIDS epidemic. *Math.Scientist* 31 (2006), 167-171

### DAVID HINKLEY

Bootstrap diagnostics and Remedies (with A. Canty, A.C. Davison, V. Ventura), *Canadian J. of Statist.*, 23

### DAWN HOLMES

Optimizing Inequality Constrained Priors in Bayesian Networks, Bayesian Inference and Maximum Entropy Methods in Science and Engineering. American Institute of Physics 25<sup>th</sup> Conference Proceedings American Institute of Physics

Innovations in Machine Learning: Theory and Applications. Series: Studies in Fuzziness and Soft Computing, Vol. 194, Springer Verlag

Review of 'Applied Bayesian Modeling andausal Inference from Incomplete Data Perspectives' Wiley

### JOHN HSU

Book Review of "Statistical Analysis and Data Display: An Intermediate Course With Examples in S-Plus, R and SAS", *Biometrics*, 61, 1137-1138

Bayesian Analysis of the Additive Mixed Model for Randomized Block Designs (with Jenting Wang), *Australian & New Zealand Journal of Statistics*, 48, 225-236

### S.RAO JAMMALAMADAKA

Small sample asymptotics for higher-order spacings, (with R. Gatto), in "Advances in Distribution Theory, Order Statistics, and Inference," (Eds. Balakrishnan, N., Castillo, E., and Sarabia, J.M.), Birkhauser, (2006), 239-252.

2. Use of Mean Residual Life in testing departures from Exponentiality, (with E. Tauffer), *Jour. of Nonparametric Statistics*, (2006), **18**, 277-292.

### S.T. RACHEV

Fat-Tailed and Skewed Asset Return Distributions: Implications for Risk Management, Portfolio selection, and Option Pricing, JohnWiley, Finance, 2005 (with Menn C. and Fabozzi F.)

The proper use of risk measures in portfolio theory *International Journal of Theoretical and Applied Finance*, **8**( 8 ), 1107-1133, 2005 (with Ortobelli, S., Stoyanov, S., Fabozzi, F. and Biglova, A.)

An Empirical examination of daily stock return distributions for U.S. stocks. In : *Data Analysis and Decision Support, Springer Series in Studies in Classification, Data Analysis, and Knowledge Organization*,: Daniel Baier, Reinhold Decker, and Lars Schmidt-Thieme (eds.), Berlin: Springer-Verlag, 269-281, 2005 (with Stoyanov, S., Biglova, S., Fabozzi, F.)

The impact of different distributional hypothesis on returns in asset allocation. *Finance Letters*, **3** (1),

- 17-27, 2005 (with Bertocchi M., Giacometti R., Ortobelli S.)
- Stochastic programming methods in asset-liability management, *Investment Management and Financial Innovations*, **1**, 82-90, 2005 (with Grebeck, M.)
- Distributional Analysis of the Stocks Comprising the DAX 30, *Probability and Mathematical Statistics*, **25**(2), 363-383, 2005 (with Hoehstoetter, M., Fabozzi, F.)
- Credit Portfolio Risk and PD Confidence Sets through the Business Cycle, *Journal of Credit Risk*, **1** (4), 2005 (with Trück S.)
- Stable Modeling of different European Power Markets, *Investment Management & Financial Innovations*, **3**/2005 (with Mugele, C., Trück S.)
- Calibrated FFT-based Density Approximations of  $\alpha$ -Stable Distributions: *Computational Statistics and Data Analysis*, **50** (8), 1891-1904, 2006 (with Menn C.)
- Hernandez J. and Rachev S. Construction of Levy Drivers for Financial Models, *Journal of Computational Analysis and Applications*, **8**(4), 335-356, 2006
- Zhang Y. and Rachev S. Risk Attributions and Portfolio Performance Measurements, *Journal of Applied Functional Analysis*, **4**(1), 373-402, 2006
- Chernobai, Rachev S. Applying robust methods to operational risk modeling, *Journal of Operational Risk*, **1**(1), 2006
- Rachev S., Chernobai A. and Menn, C. Empirical Examination of Operational Loss Distributions, in "Perspectives on Operational Research", M.Morlock at al.(eds) Deutscher Universitaet-Verlag/GWV Fachverlage GmbH, Wiesbaden, 379-401, 2006
- Hausen, F., Rachev S. and Trück S., Eine empirische Untersuchung der Performance und Faktorenbestimmung von Hedgefonds, *Risiko-Manager*, **(4)**6, 2006.
- Hausen, F., Rachev S. and Trück S., Performance-Analyse und Style Factors von Hedgefonds, *Risiko-Manager*, **(3)**6, 2006
- Hausen, F., Rachev S. and Trück S., Klassifikation und Anlagestrategien von Hedgefonds, *Risiko-Manager*, **(2)**6, 2006
- Array CGH Data Analysis (Yuedong Wang and Sunwei Guo), DNA Microarrays, U. Nuber (eds), BIOS Scientific Publishers, 281-289
- Asymptotics of the Covariate-Matched U-Statistic Residual Variance Estimator (Tiejun Tong, Anna Liu and Yuedong Wang), *Proceedings of the American Statistical Association* ASA Section on Nonparametric Statistics [CD-ROM], Alexandria, VA: American Statistical Association
- Modeling of Hormone Secretion with Marked Nonhomogeneous Poisson Process (Liu A and Wang Y), *Proceedings of the American Statistical Association*, ASA Section on Nonparametric Statistics [CD-ROM], Alexandria, VA: American Statistical Association
- PULSE: A Suite of R Functions for Detecting Pulsatile Hormone (Yang YC, Liu A and Wang Y), *Proceedings of the American Statistical Association*, ASA Section on Nonparametric Statistics [CD-ROM], Alexandria, VA: American Statistical Association
- Transcriptional Characterizations of Differences between Eutopic and Ectopic Endometrium (Wu Y, Kajdacsy-Balla A, Strawn E, Basir Z, Halverson G, Jailwala P, Wang Y, Wang X, Ghosh S, Guo SW), *Endocrinology*, **147**(1), 232-246
- Detecting Pulsatile Hormone Secretions Using Nonlinear Mixed Effects Partial Spline Models (Yu-Chieh Yang, Anna Liu, Yuedong Wang), *Biometrics*, **62**, 230-238
- The prevalence of endometriosis in women with chronic pelvic pain (Guo SW and Wang Y), *Gynecologic and Obstetric Investigation*, **62**, 121-130
- Genomic alterations in the ectopic and eutopic endometrium of women with endometriosis (Wu Y, Strawn E, Basir Z, Wang Y, Halverson G, Jailwala P, Guo SW), *Gynecologic and Obstetric Investigation*, **62**, 148-159

## YUEDONG WANG

- Estimating residual variance in nonparametric regression using least squares (Tiejun Tong, Yuedong Wang), *Biometrika*, **92**, 821-830
- Rejoinder to "On Analyzing Circadian Rhythms Data Using Non-linear Mixed Models With Harmonic Terms" (Yuedong Wang, Chunlei Ke and Morton B Brown), *Biometrics*, **61**, 1120-1122

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## Work Accepted For Publication

### **GUILLAUME BONNET**

The Burger Superprocess (with R. Adler), *Stochastic Processes and Their Applications*

### **JANOS ENGLANDER**

The compact support property for measure valued processes (with R.G. Pinsky), *Annales de l'institut Henri Poincaré (B) Probabilités et Statistiques*

### **JEAN-PIERRE FOUQUE**

A Martingale Control Variate Method for Option Pricing with Stochastic Volatility (with C.H. Han), *ESAIM*.

Time Reversal Super Resolution in Randomly Layered Media (with J. Garnier and K. Sølna), *Wave Motion*

### **S.RAO JAMMALAMADAKA**

The effect of wind direction on Ozone levels—a case study (with U. Lund), *Environmental and Ecological Statistics*

Small sample asymptotics for higher order spacings (with R. Gatto), *Advances in Distribution Theory, Order Statistics and Inference* (Eds. Castillo et al)

An asymptotically distribution-free test of symmetry (with M. Ekstrom), *Jour. of Stat. Planning and Inference*

### **WENDY MEIRING**

Oscillations and Time Trends in Stratospheric Ozone Levels: A Functional Data Analysis Approach (Wendy Meiring). Previously titled "Mid-Latitude Stratospheric Ozone Variability: a Functional Data Analysis Study of Evidence of the Quasi-Biennial Oscillation, Time Trends and Solar Cycle in Ozone Sonde Observations", *Journal of the American Statistical Association*

### **S.T. RACHEV**

The Proper Use of the Risk Measures in the Portfolio Theory, *International Journal of Theoretical and Applied Finance* (with Ortobelli S., Stoyanov S., Fabozzi F. and Biglova A)

Modeling Catastrophe Claims with Left-Truncated Severity Distribution, *Computational Statistics* (with Chernobai, A., Burnecki, K., Trck S. and Weron R.)

Treatment of Incomplete Data in the Field of Operational Risk: The Effects on Parameter Estimates, EL and UL Figures in: E. Davis (ed), *The Advanced Measurement Approach to Operational Risk, Risk Books*, (with Chernobai, A., Menn, C., Trck, S., Moscadelli M.)

VaR, CVaR and Time Rules with Elliptical and Asymmetric Stable Distributed Returns, *Investment Management and Financial Innovations* (with Lamantia F., Ortobelli S.)

An Empirical Comparison among VaR Models and Time Rules with Elliptical and Stable Distributed Returns (with Lamantia F., Ortobelli S., *Investment Management and Financial Innovation*

Computing the portfolio Conditional Value-at-Risk in the  $\alpha$ -stable case (with Stoyanov, S., Samorodnitsky, G., Ortobelli S., *Probability and Mathematical Statistics*

Calibrated FFT-based density approximations for alpha-stable distributions (with Menn C.) *Computational Statistics and Data Analysis*

Credit Portfolio Risk and PD Confidence Sets through the Business Cycle, *Journal of Credit Risk* (with Trueck S.)

Bayesian Applications to the Investment Management Process, in *Handbook on Information Technology in Finance*, Editors, Detlef Seese, Christof Weinhardt and Frank Schlottmann, Springer (with Bagasheva, B., Hsu, J., Fabozzi, F.)

### **YUEDONG WANG**

Sources of Heterogeneities in the Estimation of Prevalence of Endometriosis in Infertile and Previously Fertile Women (Guo SW and Wang Y), *Fertility and Sterility*

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## *Presentations*

### **GUILLAUME BONNET**

The long time behavior of a Stochastic Lotka-Volterra system with jumps, Department of Statistics and Applied Probability Colloquium, UCSB

The long time behavior of a Stochastic Lotka-Volterra systems with jumps, Department of Mathematics Probability Seminar, University of Wisconsin, Madison

Nonlinear SPDEs for Highway Traffic Flows, Conference: "Markov Processes and Related Topics, University of Wisconsin, Madison

### **ANDREW CARTER**

Approximating nonparametric regression experiments by continuous Gaussian processes when the variance is unknown, Thirtieth Conference on Stochastic Processes and their Applications, Santa Barbara, CA (contributed paper)

Asymptotic Approximation to a Nonparametric Regression Experiment with Unknown Variance, JSM, Section on Nonparametric Statistics. Seattle, WA. (contributed paper).

### **JANOS ENGLANDER**

Existence and uniqueness problems concerning a class of semilinear equations (invited speaker), EQUADIFF Conference, Comenius University, Bratislava

Branching Brownian motion in random media, Technical University of Budapest

The Compact Support Property for Measure-Valued Processes, The conference "Markov Processes and Related Topics in Honor of Tom Kurtz", U. Wisconsin, Madison, WI

### **JEAN-PIERRE FOUQUE**

SAMSI Workshop on Credit Risk, November 1, 2005.

Invited talk in the Special Session SIAM-AMS on Time Reversal Methods: Analysis and Applications. AMS Meeting, San Antonio, Texas. January 12-15, 2006.

Invited speaker in the Seminar Series on Quantitative Finance, The Fields Institute, Toronto, Canada. April 26, 2006.

Invited plenary talk in the SIAM Conference on Financial Mathematics and Engineering, Boston, July 9-12, 2006.

Invited Lecturer at the Summer School in Stochastic Finance, Island of Chios, Greece, July 17-22, 2006.

### **DAWN HOLMES**

Optimizing Inequality Constrained Priors in Bayesian Networks, 25th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering (MaxEnt 2005), San Jose State University, San Jose, CA, (Refereed )

### **JOHN HSU**

Illustrations of Bio-related Data Analysis Methods (contributed poster with W.Meiring, Y.Wang, BioDiscovery Symposium, UCSB

### **S.R. JAMMALAMADAKA**

Department of Mathematics, Hong Kong Polytechnic University, "General Censoring Schemes," August 24, 2005.

Department of Mathematics, Universiti Brunei Darussalam, Brunei, "Near Matches and Applications," August 31, 2005.

Maseeh Distinguished Lecture, Department of Mathematics, Portland State University, "Directional Statistics," January 20, 2006.

### **WENDY MEIRING**

A Study of Roadside Remote Sensing Mobile Emissions Data, Joint Statistical Meetings, Minneapolis, Minnesota

Illustrations of Bio-Related Data Analysis Methods"= (Wendy Meiring, Yuedong Wang and John S.J. Hsu), BioDiscovery Symposium, UCSB

### **S.T. RACHEV**

Portfolio Optimization, Factor models and Momentum Strategies, University of Sofia, Faculty of Mathematics

Stable Models for Intergrated Risk Management, University of Bergamo, Italy

Portfolio Management in Volatile Markets, Barclays Global Investors, London, UK

Momentum Strategies and Risk Adjusted Portfolio Measures, 10th Karlsruhe Econometric Workshop, Risk Assessment: Decisions in Banking and Finance

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Risk Management, Portfolio Management and Option Pricing, Hector School, International Department, University of Karlsruhe  
Momentum Strategies using Risk-adjusted Stock Selection Criteria, CARISMA , New Directions in Financial Modelling London

**YUEDONG WANG**

Optimal shrinkage estimation of variances with applications to microarray data analysis, Academy of Mathematics and Systems Science, Chinese Academy of Science  
Building Models With Smoothing Spline ANOVA Decompositions, Academy of Mathematics and Systems Science, Chinese Academy of Science  
Semi-parametric Nonlinear Mixed Effects Models and Their Applications, New Frontiers of Statistics Workshop in Beijing  
Detecting Pulsatile Hormone Secretions Using Nonlinear Mixed Effects Partial Spline Models, Joint Statistical Meetings in Minneapolis

Spline Smoothing with Correlated Random Errors, Boeing Math Group  
Statistical Methods for Array-based Comparative Genomic Hybridization Analysis', FDA  
Optimal shrinkage estimation of variances with applications to microarray data analysis, Department of Statistics, UCR  
Optimal shrinkage estimation of variances with applications to microarray data analysis, Department of Statistics, Texas A&M University  
Optimal shrinkage estimation of variances with applications to microarray data analysis, Human Genetics Center, The University of Texas-Houston Health Science Center



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## Other Professional Activities

### JEAN-PIERRE FOUQUE

Appointed for a three year term (2006-2009) as a member of the Pure and Applied Mathematics Grant Selection Committee (GSC 337) at the Canadian Natural Sciences and Engineering Research Council (NSERC).

Co-editor of the volume *Advances in Econometrics: Econometrics of Risk Management* (Volume 22, 2007) to be published by Elsevier Science.

Associate editor of the *Annals of Applied Probability* (2006-)

### DAWN HOLMES

Reviewer: *International Journal of Knowledge-Engineering Systems*

Reviewer: *Journal of Statistics Education*

Reviewer: *IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans*

Associate Editor (continuing) *International Journal of Knowledge-Engineering Systems*

Freshman Seminar: "Thinking Through Statistics"  
*StatClass* Dawn E. Holmes and Lubella A. Lenaburg.  
McGraw-Hill Custom Publishing.

Appointed to Editorial Board *Neurocomputing* 2006  
Elsevier B.V

Member of the International Program Committee  
*Knowledge-Engineering Systems - 2006*  
Conference

### S.RAO JAMMALAMADAKA

Dr. Jammalamadaka continues his collaborations with the ECE, CS and MCDB faculty on the NSF-funded ITR project on biomolecular imaging, which collects and analyzes retinal image and microtubular data. During the year, he also continued guiding students under the IGERT program on digital multimedia, which spans a large number of departments on the campus.

Dr. Jammalamadaka is the President-Elect during this year of the international professional statistical organization called the International Indian Statistical Association (see <http://www.stat.ohio-state.edu/~hnn/IISA.html>) and is also the Program Chair for their upcoming Biennial meeting in Cochin India (January 2-5, 2007).

He continues to be an Associate Editor for *Statistics and Probability Letters* and *Jour of Nonparametric Statistics*, besides providing referee services to a large number of other journals. During this period, he served as an External Reviewer for the Department of Mathematics and Statistics at the primary campus of the University of Nevada at Reno.

He also served on the NSF Panel for Mathematical Statistics, and reviewed other proposals for the NSF for CAREER Awards.

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## *Administrative Staff*

In fall 2005, Juliana Espinosa's article was published in the *Foreign Affairs Undergraduate Journal* here at UCSB. Her article, "Sweden: Pre-EMU Referendum" analyzes the effects of Swedish political parties on the "no" majority vote to joining the European Monetary Union.

This past year, Juliana has placed a greater emphasis on recruitment for the Actuary Club and as director, has encouraged new students to join both the club and the major. She also proctors actuary exams for the Society of Actuaries in the department for better convenience to the students.

Denna Zamarron was selected from a large applicant pool to participate in the Leadership Development Program. This is a one-year professional development program that is designed to prepare participants to pursue leadership positions in the administration of academic departments. Only 10-15 individuals college-wide are selected each year to receive advanced training in the deepest, darkest secret inner workings of the university system.

After completing the requirements of the Business Officers Institute as a prerequisite, Denna was enrolled in the Financial Management Certificate Program which is an advanced program that transitions to management. The topics include: Ethics & Fraud in the Workplace, UC Budget process, UC tax issues, Resource Management, Data Integrity and the Computing Environment, Disaster & Business Continuity Planning.

Last year, Gail Kelley Murray processed approximately 100 graduate applications received from all over the world. She has attended classes on Graduate procedures, being educated on the latest changes implemented by the Graduate Division. In her spare time, Gail took courses in the Religious Studies Department at UCSB and served as Editor of her church newspaper.

Troy Small installed a wireless network in the department. Everywhere you look, the Department is adorned with amplifiers and antennas—the latest décor for the modern office. Troy also updated the computer section of the department's web site to include more thorough and updated information.

Claudia Carlson teamed up with graduate student, Hoon Rhew, to make the Department's web site more professional and user friendly. She redesigned the Rachev Room to better suit the way the students use it and arranged for additional computing in the student conference room. Major renovations were required this year for incoming faculty and for the CRFMS Center.

The administrative staff members work hard to smooth the way for faculty and students to meet difficult bureaucratic requirements. They actively keep up with all the changes by attending workshops and taking additional courses. They are a valuable asset to our department.



*The staff members enjoying a tropical lunch at the beach hosted by Dr. Rachev.*

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## *Committees and Service*

### *Department Chair*

Raya Feldman

### *Academic Advising Committees*

#### *Undergraduate Programs*

David Hinkley, Director of Undergraduate Studies

Dawn Holmes, Undergraduate Advisor

#### *Graduate Programs*

John Hsu, Graduate Advisor

Drew Carter, Recruiting and Admissions

### *Colloquia*

Wendy Meiring, Chair

### *Faculty Computer Liaison*

Guillaume Bonnet

### *Concurrent Enrollment Liaison*

Dawn Holmes

### *Library Representative*

Janos Englander

### *Qualifying Exam Committees*

#### *Applied Statistics*

Yuedong Wang, Chair

John Hsu

Wendy Meiring

#### *Theoretical Statistics*

David Hinkley, Chair

Drew Carter

S.Rao Jammalamadaka

#### *Probability*

Raya Feldman, Chair

Janos Englander

Guillaume Bonnet

### *Search Committee*

Guillaume Bonnet

Raya Feldman

Jean-Pierre Fouque

David Hinkley

### *Statistical Laboratory*

Yuedong Wang, Director (Fall)

S.R. Jammalamadaka (Winter/Spring)

### *Student Representative*

Roberto Rivera

### *TA Training*

Dawn Holmes, Faculty Liaison

Eli Kollman, Lead TA

### *Gani Dissertation Prize Committee*

Wendy Meiring, Chair

Drew Carter

John Hsu

## *University Committees*

### *Faculty Legislature Representative*

Wendy Meiring

### *UCSB University Fellowship Committee*

John Hsu

### *Member, Council on Planning and Budget, and its Committee on Capital and Space Planning*

S.Rao Jammalamadaka

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### *Contact Information*

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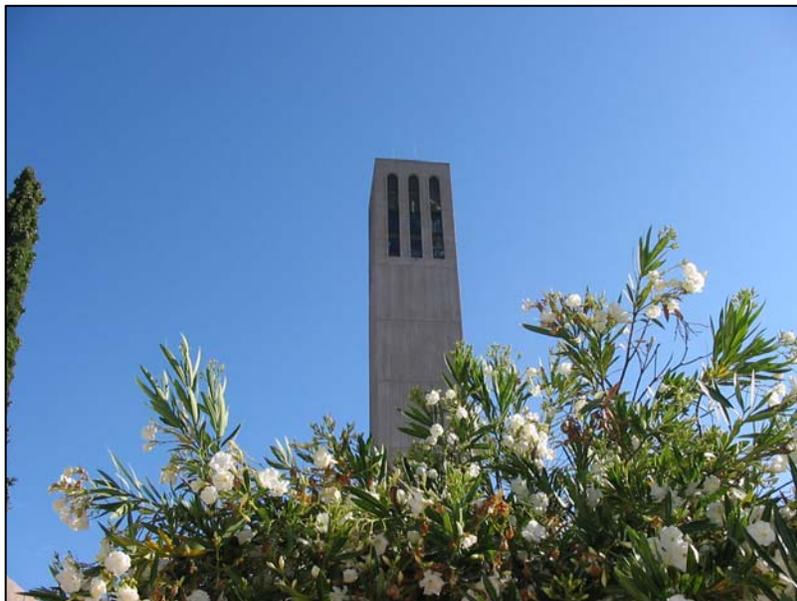
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