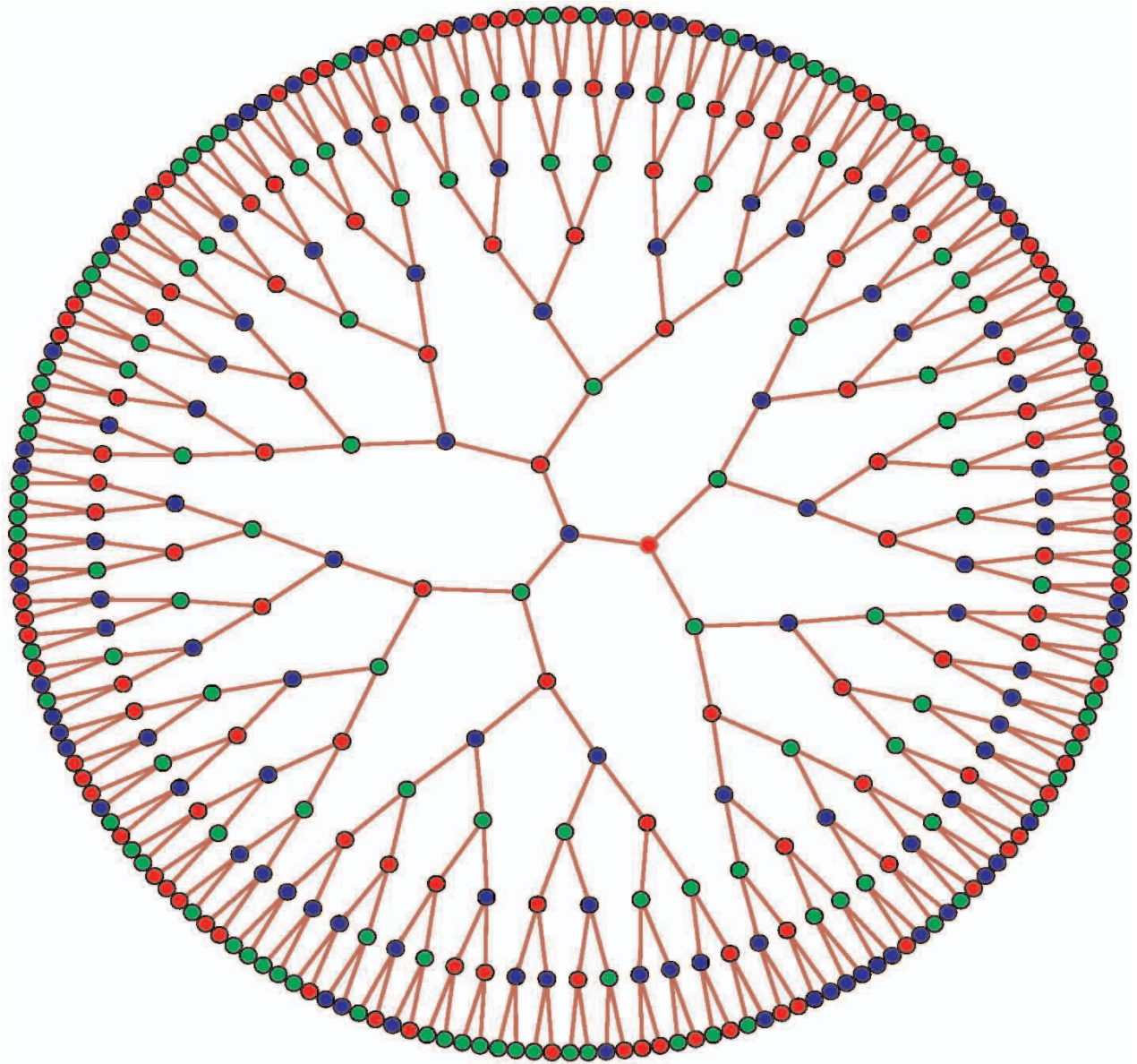


STATISTICAL NEWS



ENRICHING OUR DISCIPLINES

MSRI Special Semester Combines
Probability, Algorithms and Statistical Physics

WINTER 2004-2005

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Editorial Note:

Welcome to the eighth issue of the *Statistical News*. We hope you enjoy reading about the Statistics Department at Cal. We have received some alumni news and we hope many more of you will write in for our next issue. We would appreciate any comments and suggestions you have. An envelope for contributions is enclosed, which also has some space for alumni news. Please feel free to attach extra pages or email us—we always enjoy hearing from our alumni!

Cover Art:

“Part of a Locked 3-Coloring of T₂.” An example of tree colorings, studied by Graham Brightwell and Peter Winkler, which illustrates one type of problem that the MSRI Special Semester focuses on. See Page 3 for the article.

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STATE OF THE DEPARTMENT 2004

by Prof. Deborah Nolan, Department Head



Department Head
Deborah Nolan addresses
the 2004 graduates

The past year proved to be an exciting one for the department, especially for the probabilists, with many involved in organizing the Special Semester at the Mathematical Sciences Research Institute (MSRI) on Probability, Algorithms, and Statistical Physics. The main themes of the special semester are: mixing of Markov chains in physics and algorithms; phase transitions in computation and reconstruction; and models of real-world random networks. Elchanan Mossel's feature article gives the reader a taste of the research workshops and special events that are on-going throughout the spring semester at MSRI. For more information, turn to page 3 for a more in-depth look, or visit the MSRI website at www.msri.org.

Reflecting on VIGRE's Success

Fall was very busy, preparing for and hosting a site visit from the NSF to review our Vertical Integration of Research and Education (VIGRE) program for renewal of its final two years. Getting ready for the visit gave the department an opportunity to reflect on the changes that have taken place in our undergraduate and graduate programs in the past three years, catalyzed by the funding of the VIGRE program. At the undergraduate level, we have had success involving undergraduates in research projects. Each year, these projects are featured in a poster session organized by the department as part of Cal Day. The next Cal Day will be

April 16, 2005. If you are available, we invite you to stop by Evans Hall to meet the undergraduates and graduates involved in these projects.

We have also expanded our undergraduate and graduate curricula. At the undergraduate level, the major now requires a new course, Concepts in Computing with Data, which serves to introduce students to data analysis and statistical computing at an early stage in their studies. The course offers an introduction to computationally intensive applied methods, including visualization and graphics, data mining, model validation procedures, simulation and resampling, and databases. In the last newsletter, we mentioned the introduction of two new Designated Emphases to our Ph.D. program, one in computational and genomic biology and the other in communication, computation, and statistics. In addition, we have kept a new one-semester first-year Ph.D. course in probability and stochastic processes without measure theory. In general, our students are broadening their education in preparation for research in the interdisciplinary areas into which the department is expanding.

Changing Face

Tied with this expansion in research areas the face of the department continues to change as faculty retire and new faculty join the department. Lester Dubins took the plunge into retirement in the summer of 2004 (although he plans to teach occasional seminars for mathematics and statistics), and Warry Millar joined the ranks of the retired in October, 2003.

This fall, Martin Wainwright joined our department as an Assistant Professor. Martin hails from Canada, where he received his Bachelor's degree in Mathematics from the University of Waterloo. Martin obtained his Ph.D. in Electrical Engineering and Computer Science from MIT, and after holding a postdoc in EECS at Berkeley, he accepted a joint appointment with our department and EECS. He is

Continued on next page

State of the Dept. (Cont. from Page 1)

interested in large-scale statistical models, and their applications to communication and coding, machine learning, and statistical signal and image processing.

In addition to our cohort of assistant professors, a significant number of postdoctoral researchers contribute to the vigorous intellectual life of the department. This year we have been joined by Tai Melcher, who holds an NSF VIGRE postdoc, David Mease, holding an NSF postdoc, and Maxim Krikun, a visiting postdoc. Tai Melcher received her Ph.D. in Mathematics from the UC San Diego in 2004. Her research interests intersect probability, geometry, and analysis, with focus on stochastic analysis applications to geometry and classical analysis. David Mease joins us after a year as a postdoc at the Wharton School, University of Pennsylvania. David received his Ph.D. in 2003 from the University of Michigan. His research interests include classification and machine learning, reliability analysis, and the design of computer experiments. Maxim Krikun joins us from the Moscow State University, Russia. His research interests are in birth and death processes on random trees, and branching processes.

Changes and Challenges

On a final note, while we are in the midst of many changes to our graduate program and the

vibrant growth of our research community, we are also facing many challenges from several years of university-wide budget cuts. The greatest effect is seen in student support and services. And although we are a public university, we are coming to rely more and more on private donations to make ends meet. This is especially true of donations from our alums, who help us to go on offering the same stimulating environment and first-class education to others that they themselves found here. We thank you for the support you have given to the department in the past, and ask that you consider increasing your support this year. Or—if you haven't yet made a donation—think about making a contribution to one of the funds listed on Page 14. One very generous gift from Kamil A. Grajski has established an endowed fund to support travel for graduate students to professional meetings that directly impact their areas of technical expertise, interest and research. Please consider following Dr. Grajski's example, and make a special gift to support the students of statistics. And just in case you think your own gift can't match that in size or scope, think again. Every gift, whatever its size, will help both today's statistics students and tomorrow's.

Thank you all for your continued support!



All Work and No Play . . . ?
Not at all! We may work hard,
but folks in the Statistics
Department also took time out
for some socializing this year,
as well, as seen here at several
festive moments.



MSRI Special Semester Program: At the Interface of Probability, Algorithms and Statistical Physics

by Elchanan Mossel

Probability. Algorithms. Statistical Physics.

In the last decade or so we have begun to realize that these research topics have more than just a superficial similarity. Recent work in all three disciplines

has begun to create a common language, and all three are being enriched by this interaction.

For example, key notions from statistical physics, such as “phase transition” and “critical exponents,” are being applied to a variety of questions in computational complexity, the analysis of algorithms, and real-world random networks (e.g., models of the Internet). Conversely, techniques developed by combinatorialists and computer scientists to analyze randomized algorithms and graphs have been adopted by probabilists and mathematical physicists to study particle systems and other stochastic physical models.

Common Instances in Differing Fields

All the research topics involved share a common pursuit to understand large stochastic systems consisting of many particles. The behavior of a single particle or small number of particles follows a simple description, of course. The complexity arises with the size of the system.

To take a common instance, statistical physics is a branch of mathematical physics where macroscopic

properties of physical systems are derived from microscopic properties. For example, it aims to explain properties of steam, water and ice from the properties of the interaction of H_2O molecules, or to explain the magnetic properties of metals from the properties of single atoms, etc.

Probability studies similar models. In the theory “Percolation,” one studies connectivity properties of graphs, where some of the edges are removed. For example, consider a square lattice, where one tosses a coin and removes each edge of the lattice with probability p .

A common theme in probability, statistical

physics and computer science is that many times a random system is studied in order to gain insight into the behavior of complicated (but non-random) systems. For example, in the last decade dozens of models of the Internet were suggested and studied. Almost all of these models are “random graph” models. Similarly, “random interactions” are used in statistical physics in order to model the fact that some materials are heterogeneous. And in computer science, the performance of algorithms on random instances is considered as a bench-mark of their performance on real instances.

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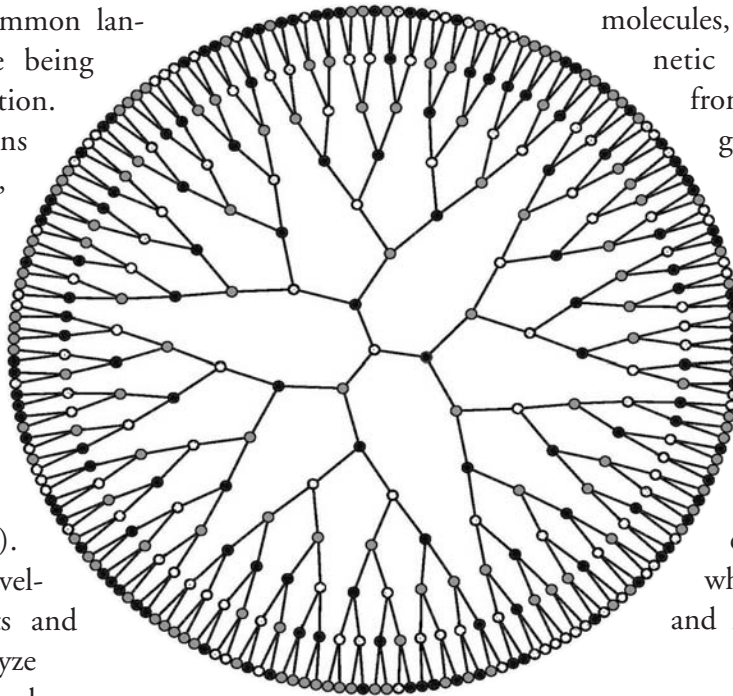


Figure 1. Part of a Locked 3-Coloring of T_2

Another common theme in all these fields is that systems undergo rapid phase transitions: Water suddenly becomes ice at a specific temperature, the lattice becomes highly disconnected at some specific value of p , and many algorithmic problems seem to become hard at some specific level of complexity.

Another example, this one studied by Peter Winkler (who will be present for the duration of the Special Semester) and Graham Brightwell, involves the colorings of the tree T_2 , shown both on the cover of this issue and in Figure 1, “Part of a Locked 3-Coloring of T_2 .” When the number of colors is small, the coloring may get “locked”—that is, a color cannot be changed without having two adjacent nodes with the same color.

The exchange of ideas between these different fields has already resulted in exciting developments and suggests future challenges.

Exciting Developments, Future Challenges

The exchange of ideas between these different fields has already resulted in exciting developments. Giorgio Parisi, Marc Mézard, Riccardo Zecchina and other researchers in theoretical physics have been studying algorithmic problems using tools from statistical physics. Not only have they predicted at which level of complexity some of these problems become hard, but they have also devised new algorithms to solve some of these problems. (Profs. Mézard and Zecchina will be both visiting MSRI for an extended period during the Special Semester.)

Studying the mathematical foundations and the scope of these new methods is one of the challenges

this Special Semester will focus on. These problems will also stand at the heart of the two of the three workshops that form part of the Special Semester.

Program Workshops: An Overview

The overall program of the Special Semester was organized by two members of U.C. Berkeley’s faculty, Profs. Yuval Peres (Statistics and Mathematics) and Alistair Sinclair (Statistics and Computer Science). The program is organized around the following three workshops:

Jan. 31 – Feb. 4: Markov Chains in Algorithms and Statistical Physics.

The Special Semester began with a workshop addressing a major challenge: understanding the relationship between “spatial mixing” and “temporal mixing.” Roughly speaking,

many experts believe that systems having strong correlations are rigid and therefore evolve slowly over time. Making sense of this heuristic picture stood at the center of the first workshop of the Special Semester, “Markov Chains in Algorithms and Statistical Physics,”

January 31 to February

4, organized by Fabio Martinelli of the Università degli Studi Roma III, Alistair Sinclair of the Computer Science Department division of EECS and Statistics in Berkeley, and Eric Vigoda of Georgia Tech.

March 7 – 11: Phase Transitions in Computation and Reconstruction.

The second workshop, “Phase Transitions in Computation and Reconstruction,” March 7 to March 11, was organized by Dr. Dimitris Achlioptas from Microsoft Research, and by Drs. Elchanan Mossel and Yuval Peres, both of the Statistics Department faculty. Many of the state of the art results in this field were obtained by our faculty, including results by Prof.

David Aldous on the $\zeta(2)$ limit for the “Random Assignment” problem, results by Achlioptas and Peres on satisfiability of random formulas and results by Elitza Maneva, Elchanan Mossel and Martin J. Wainwright on “Survey Propagation.”

April 18 – 22. Models of Real-World Random Networks. To what extent can we make useful probability models of real-world networks, such as the Internet? This is the focus of the program’s third workshop, “Models of Real-World Random Networks,” April 18 to April 22. The workshop’s main organizer is Prof. David Aldous, a leading researcher in the field of random graphs, who has become interested in real-world networks lately. The co-organizers of the workshop are Claire Kenyon, Jon Kleinberg, Michael Mitzenmacher, Christos Papadimitriou, and Prabhakar Raghavan

An Example: Playing “Minesweeper”

As a recreational example of the kind of problems to be studied in this semester, consider the following variant of the “Minesweeper” game. The game is played on an infinite board. Each site of the lattice is occupied by a mine with probability p and different sites are independent. The player aims to

find sites that are free of mines by clicking on them. A click on a mine terminates the game. Clicking on a non-mine site gives the player a number which is the number of adjacent mine sites. (See Figure 2)

It is easy to see that one cannot recover all the mines. However, is it possible to recover an infinite number of free sites? I recently studied this problem in a paper,¹ which shows that when the density of mines is high (say, $p > 0.9$), the task of finding an infinite number of free sites may not be achieved. On the other hand, if the density is small (say, $p < 0.01$), one may be able to play forever. Another question that is addressed in the paper is the comparison of different strategies for playing.

A Riddle: “Minesweeper”

Suppose we play the mine sweeper game on a 2×3 board with a single mine. The location of the mine is chosen at random. What is the best strategy for finding the mine? What is the success probability of this strategy?



Dr. Elchanan Mossel provides an example from the game “Minesweeper”

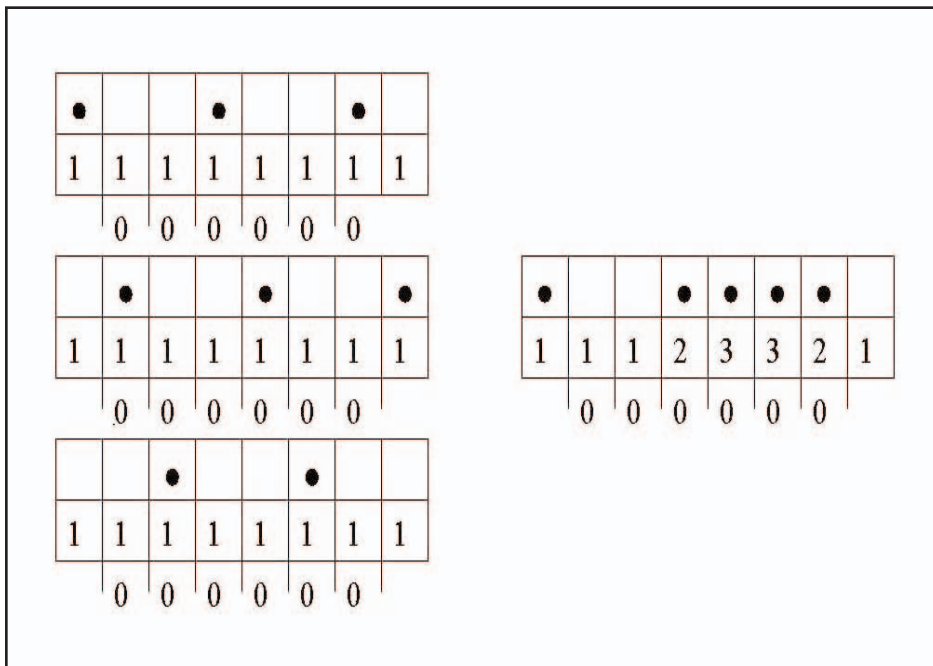


Figure 2. An example of “Minesweeper”

¹Elchanan Mossel. “The Minesweeper Game: Percolation and Complexity.” In *Combinatorics, Probability & Computing*, 11(5): (2002). See http://journals.cambridge.org/article_S096354830200528X

Dealing with Cloudy Data

by David Pescovitz

Looking up, it's easy to spot the clouds. The white fluff is strikingly contrasted by the blue sky. It's not so easy from space, especially above the Earth's poles. The clouds blend in against the vast expanses of snow and ice. This is a problem for scientists who use satellites to study clouds and climate. Recently though, UC Berkeley statistician Bin Yu, her graduate student Tao Shi, and their collaborators have devised a new algorithm that detects clouds even when the poles play tricks on the satellites' electronic eyes.

Professor Bin Yu's research is supported by National Science Foundation grants and by a Miller Research Professorship in 2004.

Understanding clouds is essential for scientists to computationally model Earth's current climate and make projections about the future. Historically, uncertainties about how clouds interact with radiation from the sun and the Earth have added to the difficulty of making accurate forecasts.

"Clouds have a cooling effect by reflecting the sun's radiation, but they also warm the Earth's surface by acting like a blanket," Yu says. "The tradeoff between cloud heating and cooling depends mainly on their thickness and height above the surface. So if you don't know where the clouds are and, as a result,

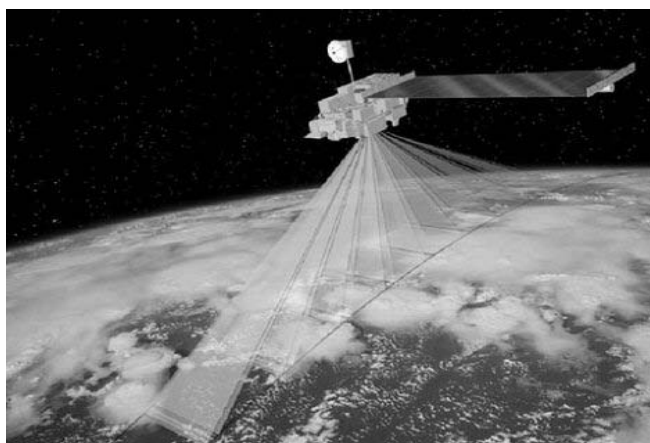


Illustration of both the NASA EOS Terra Satellite and the view directions of the nine MISR cameras. (Courtesy the researchers)

Prof. Bin Yu, whose work with cloudy data is described in this article, has recently been named to the Chang Jiang Chair Professorship at Peking University.



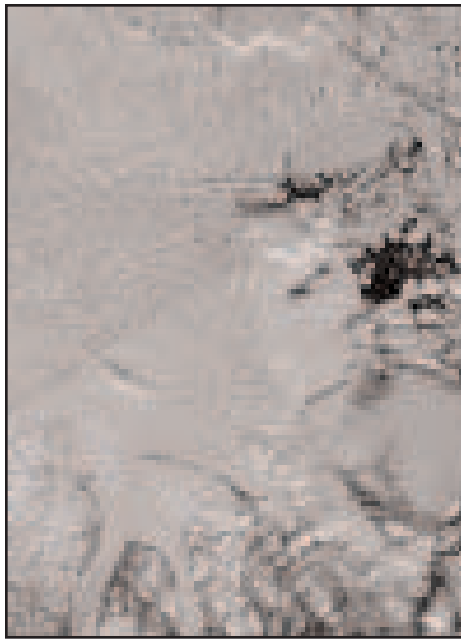
the way they feedback on the global climate, the climate models don't really work."

Today's cloud detection systems that sift through mountains of satellite measurements are notoriously error-prone when it comes to the polar regions. The detection schemes usually rely upon visual or thermal contrast between the clouds and the surfaces below them. But conventional approaches fail if such contrasts are lacking. This commonly happens in the polar regions, where the ground may be as bright and as cold as the cloud above it.

NASA's Earth Observing System (EOS) Terra satellite, launched in 1999, carries a suite of next-generation instruments that aim to revolutionize cloud detection from space. One of these devices is the Multi-Angle Imaging Spectroradiometer (MISR) that views Earth across several bands of the electromagnetic spectrum using cameras pointed at nine different angles. No data like MISR's have ever been collected from space before, opening up possibilities for new cloud detection approaches.

For example, the heights of reflecting surfaces can be derived from the multi-angle "stereo" views, and compared with the known elevation of the terrain below. If a surface is measurably higher than the terrain, it's classified as a cloud. When clouds are close to the ground though, as they often are at high latitudes, other approaches must be used.

Yu and Shi, in collaboration with Pennsylvania State University meteorologist Eugene Clothiaux



Before



After

To the left are two images that illustrate how the new algorithm clarifies cloudy data. The photo labeled "Before" is an MISR image collected over Greenland on June 20, 2001. This is a difficult scene for cloud detection due to the presence of the fork-shaped frozen river and low thin clouds which are invisible in this image. (The photo labeled "After" shows the classification results from the new algorithm. (Photos courtesy the researchers.)

and Amy Braverman, a statistician at NASA's Jet Propulsion Laboratory, developed an improved algorithm that leverages MISR's multi-angle capabilities in a novel way to dramatically improve cloud detection in polar regions.

"Instead of looking for clouds, we decided to look for ice," Yu says. "Since ice doesn't move, the data from MISR's multiple angles should be correlated when they're just viewing ice. The angles are filled with valuable information."

their algorithm could classify polar-region clouds in the satellite data about as well as scientists laboriously identifying clouds in the images by hand, even for some of the most complex scenes.

The new algorithm will be among several to be tested extensively with MISR data in the coming year. When the results are in, MISR will take advantage of the best qualities of each. Until then, Yu and her colleagues are devising web software powered by the algorithm to encourage scientists to process images and put the algorithm through its paces along the way.

Meanwhile, Yu and Shi are considering other applications for MISR data. Already, they've launched a joint effort with Peking University and several environmental scientists in the U.S. to study the dynamics of air pollution in China.

"I'm fascinated by the huge amounts of data collected by new

instruments that haven't been available before," Yu says. "The scientific fields that gather these data may be very different, but statistics is the common thread that connects them all together."

(Reprinted from Science Matters @ Berkeley, Volume 2, Issue 8, published by the College of Letters and Science.)

"If you don't know where the clouds are and . . . the way they feedback on the global climate, the climate models don't really work."

The researchers' new algorithm focuses on the reflective features of the surface. To distinguish icy terrain from clouds, this algorithm relies on correlations between such angular factors as the smoothness of the reflecting surface and its tendency to scatter light in a certain direction.

Using data from MISR, the researchers found

The Erich L. Lehmann Symposium: Statistics at the Cutting Edge

by Javier Rojo

Statistics Department, Rice University

The First Symposium, May 2002

The First Erich L. Lehmann Symposium took place in Guanajuato, México in May of 2002, and was financially supported in its totality by Centro de Investigaciones en Matemáticas (CIMAT). Its program, as well as a list of participants, can be found at <http://www.stat.rice.edu/lehmann/1st-Lehmann.html>. CIMAT, as always, was a splendid host and organized a rich cultural program that included a “callejoneada” and a tour of some of the historical towns where the Mexican war for independence originated. A subset of papers presented during the First Erich L. Lehmann Symposium has appeared as Volume 44 of the *Series of Lecture Notes and Monographs* published by the Institute of Mathematical Statistics. The volume was coedited by Javier Rojo and Victor Pérez-Abreu.

The idea of the Symposium originated about

four years ago as part of an informal discussion on the future of statistics between the writer and Victor Pérez-Abreu, then Director of CIMAT. It was observed that in the last few years, a vigorous increase in the applications of statistics to cutting edge scientific problems has guided and facilitated many successful advances in basic science as well as in other realms of application.

As a consequence of this success, professional meetings and, to some extent, professional journals, have become forums for many of these applications. The attention to applied problems is well deserved, and Statistics and statisticians must play an important role in solving the myriad of scientific problems that arise in the various disciplines.

Nevertheless, the significant benevolent neglect of theoretical developments, and in particular of Optimality theory, raises concerns regarding the



Participants in the First Erich L. Lehmann Symposium take time out to pose for a picture—and enjoy the sunshine—in Guanajuato, México

Honoring Erich Lehmann

Erich L. Lehmann, Professor Emeritus and Statistician Extraordinary, is too well-known to need introducing. Almost every student and faculty member who has been associated with the Statistics Department at Cal since the mid-1940s can name him as a colleague, friend, mentor and teacher who has made a difference to them. He has also made fundamental contributions to the theory of statistics for more than a half-century, and continues an active interest in the field—and the department—that make him an obvious choice to be honored with a Symposium such as this one. — *Editor*



Erich Lehmann (center) shares a moment with Symposium participants Juliet P. Shaffer and Joe Romano

impact that such a trend can have for Statistics as a discipline. The NSF-ASA report “Statistics: Challenges and Opportunities for the Twenty-First Century”, August 2004, edited by B. Lindsay, J. Kettenring, and D. Siegmund, provides an interesting discussion on the role that the “theoretical” – adjective and emphasis my own – core needs to play in the discipline. Data-driven knowledge, when supported by a body of systematic theoretical results,

becomes science. In many important cases, this body of systematic theoretical knowledge has preceded, and given birth to, healthy areas of experimental research which in turn confirm the theory. Two excellent examples are the theory of relativity and the existence of black holes; both of these cases being examples of elegant mathematical theories that preceded data collection by several years. It can also be pointed out that data-driven knowledge may, in some instances hinder theoretical developments. A case in point is Einstein’s cosmological constant. Here are two excerpts from “God’s Equation” by Amir D. Aczel. “So Einstein did what seemed right to him –he ignored what his theory told him, and sought to change the theory to suit the reality he saw: a static universe that somehow doesn’t fall inwards to its center.” And “... Einstein would never be able to live down its creation. The cosmological constant would haunt him for the rest of his life.”

Following the model of the famous and now defunct Berkeley Symposia, we decided to initiate a set of Symposia whose purpose is to catalyze theoretical research in statistics.

Continued on Page 10

Lehmann Symposium (Continued from Page 9)

Following the model of the famous and now defunct Berkeley Symposia, we decided to initiate a set of Symposia whose purpose is to catalyze theoretical research in statistics. Although probability has not had a strong presence in the first two Lehmann Symposia, it is our goal to increase the number of probability sessions and participants in future Symposia.

Erich L. Lehmann was thought to be an excellent person to honor through the Symposia because of his many professional contributions and his almost legendary concern for his graduate students and young members of the profession. In addition, Erich had first hand experience with the influential Berkeley Symposia.

The Second Symposium, May 2004

The Second Lehmann Symposium was held at Rice University during May 2004 organized by Victor Perez-Abreu and Javier Rojo. A total of 150 researchers and graduate students participated in the event. Special invited plenary speakers included, Erich L. Lehmann, Sir David Cox, Peter Bickel, Kjell Doksum, Persi Diaconis, Bradley Efron, Emanuel Parzen, and Ingram Olkin. The Scientific Organizing Committee was chaired by Javier Rojo

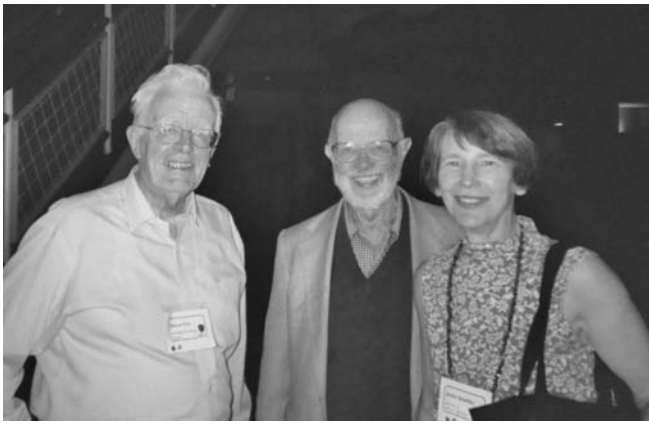
and its members included Jane-Ling Wang, Deborah Mayo, James R. Thompson, David W. Scott, Juliet P. Shaffer, and Jef Teugels. Several contributed sessions on various topics such as survival analysis, time series analysis, Nonparametric statistics, statistical genetics, also took place. A complete program for the Second Erich L. Lehmann Symposium may be found at <http://www.stat.rice.edu/lehmann> and a webcast of the Symposium is available at: <http://www.rice.edu/webcast/speeches/20040519LehmannConf.html>

A volume of papers presented during the Second Erich L. Lehmann Symposium will be published by the Institute of Mathematical Statistics as part of its Lecture Notes and Monographs Series. The Second Lehmann Symposium was generously supported by The National Science Foundation, The M.D. Anderson Cancer Center, Centro de Investigaciones en Matematicas, SyStat, and the Statistics Department at Rice University.

Many people helped to make these first two Symposia the thought-provoking, successful events we had hoped for, but special thanks should go to Eugene Levy, Provost of Rice University, and Katherine B. Ensor, Chair, Statistics Department, as well as the staff, faculty, and students of the Statistics Department at Rice University. The American Statistical Association section on Nonparametric Statistics sponsored the Symposium.



Javier Rojo of Rice University (center), who wrote this article, takes a moment out to pose with Victor de la Peña (left) and Demissie Alemayehu (right)



Sir David R. Cox, Erich Lehmann, and Juliet P. Shaffer

Between the Sessions at the First Erich Lehmann Symposium



Shulamith Gross, Juliet P. Shaffer, Erich Lehmann, Ingram Olkin, and Adrian Raftery



Jef Teugels and Gabor Szekely

Below Left: Persi Diaconis, with Erich Lehmann, Juliet P. Shaffer, Nozer Singpurwalla, Gabor Szekely and Joe Gastwirth in the background. Below Right: Adrian Raftery, Peter Bickel and Kjell Doksum



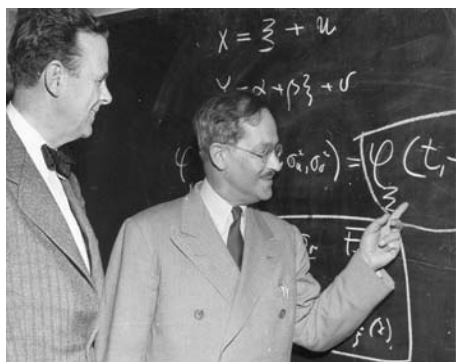
“Remember When ?”

Preparing for a Memorable Birthday

Remember 1955?

You may not have been around to remember it, but 1955 was quite a year. British Prime Minister Winston Churchill resigned his office, the Brooklyn Dodgers beat the New York Yankees in the World Series, Col. Tom Parker had just discovered a talented young singer named Elvis Presley, and a Montgomery, Alabama seamstress named Rosa Parks refused to give up her bus seat. Some made headlines, and they all made history.

When you went to the store, you could expect to pay 18¢ for a loaf of bread and 24¢ for a quart of



Why are these men smiling?

milk, while you could mail a first-class letter for 3¢ and get a gallon of gas for 23¢ at the pump. A brand-new family-sized sedan would cost you around \$1,800, and a mere \$20,000 would get you a newly-built home in 1955. Modest prices, yes, but considering the average American income was \$4,137 a year, you were still likely to buy a used car and live in rented quarters.

New Arrivals in California

It was a year of many exciting new things: School children lined up to get the first shots of the Salk vaccine that would protect them against polio, Johnny Carson debuted in a new late-night TV show, Ford introduced a pricey new set of wheels called the Thunderbird, and California, at least, saw the arrival of two thriving newborns. In Anaheim, a guy named Walt Disney was opening a new park called Disneyland, while in Berkeley — we say this modestly — a man named Jerzy Neyman was spearheading



Familiar faces?

the organization of something called the Statistics Department at the University of California. (Both newborns, we're happy to say,

reached healthy adulthoods and are still going strong as they approach their fiftieth birthdays.)

Which brings us to the point. What do *you* remember about the last 50 years — or the last 20 or 5? We'd love to see those photos you took at a department party in 1962, or that Commencement snapshot from 1979, that *Daily Californian* clipping from 1984, or just your reminiscences of “Back Then,” and your reflections on what you got from your time here. So we're asking you to gather some memories and memorabilia, copy them or stick them in an envelope, or e-mail them to us, to be shared in the next issue of the *StatistiCAL News*. You can mail them to: *StatistiCAL News*, 367 Evans Hall #3860, Berkeley, CA 94720-3860 or e-mail them to stat-news@stat.berkeley.edu.

While we can't promise to use everything you send us, we *can* promise to take extra care of it and return it to you undamaged. Even if it's old hat to you, think of how much enjoyment others will get from a glimpse of us a few years ago, and how much you'll enjoy revisiting a yesterday or two.

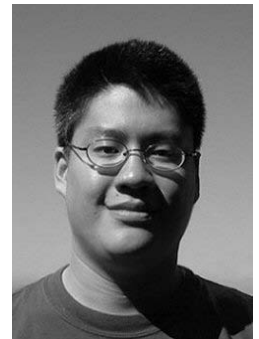
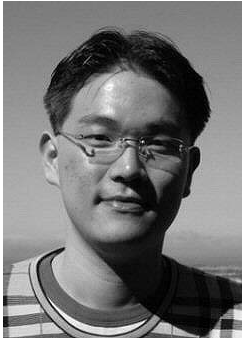
Recognize anyone in this photo?



New Faces 2004

Ph.D. Students

Left to right: Choongsoon Bae, Nate Coehlo, Robert Gibbons, Greg Hather, Richard Liang



Welcome to You All!



...And More Ph.D. Students

Left to right: Ron Peled, David Pokorny, David Purdy, Frances Tong, Vince Vu

FACULTY HONORS AND AWARDS

David Aldous:

Elected fellow of American Academy of Arts and Sciences 2004.

Peter Bickel :

Gave the Rietz Lecture at the 2004 Annual Meeting of IMS and World Congress of Bernoulli Society in Barcelona.

Steve Evans:

Has been invited to be one of the three scholars who are each giving a series of ten lectures at the 35th Saint Flour Probability Summer School in July 2005.

research methods in the social sciences, particularly in sociology, by providing a set of interrelated statistical tools that enable researchers to examine quantitative/categorical data with scientific rigor. His introduction and further development of these and related tools has led to revolutionary changes in the methods now used in social science research involving categorical data.”

- The Methodology Section of the American Sociological Association invited him to present the Inaugural Otis Dudley Duncan Lecture at their 2004 Winter/Spring Conference. This lecture inaugurates a series of annual lectures in honor of Otis Dudley Duncan.

One of the greatest assets a school can have are faculty who stand at the forefront of their disciplines — and are continually learning as well as teaching

- The Methodology Section of the American Sociological Association has established a “Leo Goodman Award” which recognizes contributions to sociological methodology or innovative uses of sociological methodology made by a scholar who is no more than ten years past receipt of the Ph.D. It is to be awarded biannually starting in 2005.

Leo Goodman:

- The University of Michigan conferred on Leo Goodman the Honorary Degree Doctor of Science at their Winter Commencement 2003 “for his major contributions to statistics and social and behavioral science, and in particular for his development of new methods for the analysis of survey data as a sophisticated branch of statistical science.” The award citation states that he “has had a profound impact on methods of statistical analysis used in the social and behavioral sciences. In particular, he has had a most important role in elevating the analysis of survey data from an art form to a sophisticated and rigorous branch of statistical science. His work has fundamentally transformed quantitative

Haiyan Huang:

Received a Junior Faculty Research Grant award, 2003-2004 and was named a UCB Presidential Chair Fellow, 2003-2004.

Michael Jordan:

Was the Institute Medallion Lecturer, Institute of Mathematical Statistics, 2004, and a Fellow, Institute of Electrical and Electronics Engineers (IEEE), 2005.

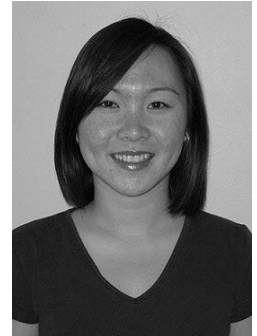
Deborah Nolan:

Received the Rhoda H. Goldman Award for Distinguished Faculty Advising of Undergraduates.

More New Faces 2004

M.A Students:

Welcome to our new Master's students (left to right): Dan Acland, Ariel Eynine, Jamie Hollander, James Park and Trinh Pham.



Faculty Honors (Continued from Page 10)

Yuval Peres:

Delivered the Hans Rademacher Lectures in Mathematics at the University of Pennsylvania in October 2004, on "Point Processes, the Stable Marriage Algorithm, and Gaussian Power Series."

Philip Stark:

Was named a UCB Presidential Chair Fellow, 2004.

Mark van der Laan:

Received the 2004 Spiegelman Award as an outstanding researcher under 40 in biostatistics/public health.

Bin Yu:

Received the Chang Jiang Chair Professorship at Peking University.

COMMENCEMENT 2004



In a very lighthearted moment, department head Deb Nolan bestows a master's hood on new M.A. Kostas Hatzitaskos

Commencement was held May 20, 2004 in Sibley Auditorium of the Bechtel Engineering Center. Department Chair Deborah A. Nolan presided over the commencement program. The commencement speaker was Professor George W. Cobb of Mt. Holyoke College. Professor Bin Yu presented the Bachelor of Arts degrees, while Professor David Brillinger presented the Master of Arts and the Doctor of Philosophy degrees. Commencement ended with concluding remarks from Professor Nolan and a reception at the Trefethen Terrace.

Departmental Citation: Given in recognition of distinguished undergraduate achievement in coursework, it was awarded to Ryohei Takahashi

Outstanding Graduate Student Instructor Award: This award give campuswide recognition to excellence in teaching by Graduate Student Instructors, and is based on overall effectiveness as an instructor as evidenced by student evaluations and faculty recommendations. It was awarded to Tao Shi.

Elizabeth Scott Memorial Award: Established in 1989, this award consists of a scientific book and a citation. To be given as warranted, but at most annually, to the M. A. student in the Statistics Department showing the greatest promise in statistical research. The recipient of the 2004 award is Chingway Lim

Erich Lehmann Citation: Established in 1999, this prize consists of a framed certificate. It is awarded for an outstanding Ph.D. dissertation in theoretical statistics (interpreted broadly). This year's award was given to Romain Neugebauer.

Evelyn Fix Prize: Established in 1968, this prize consists of a medal and a citation. It is awarded to the Ph.D. student or students on the Berkeley campus showing the greatest promise in statistical research, with preference for applications to biology and problems of health. It was awarded to Gang Liang and Annette Molinaro.

Bachelor of Arts

Sharon Chan
Ming Yin Cheung
Dana Embree
Ryan Farrelly
Matthew Johnson
Soojin Kim
Oliver Ng Kwing King
Aaron Kohn
Chang Yeop Lee
Lorretta Lok Yee Leung
Jessica Ruo Yu Liu
Pui Chi Luk
Bingying Luo
Asa Ma
Hodad Naderi*
Garett Ng
Brandon Notario*

"The other George W.," George W. Cobb of Mt. Holyoke College, combined humor and challenge in his address



Aakash Patel
 E Han Paul
 Lily Phan
 Dennis Pong
 Roxanne Pritchard
 Phillip Rescober*
 Vimi H. Shad
 Ryohei Takahashi
 Olivia Tandra
 Angela Qi Tang
 Yenny Usman
 Michael Vu
 Erica May Wong
 Wing-Yee Anna Wong
 Jinhua Zhou

*with Departmental Honors

Master of Arts

Konstantinos Hatzitaskos
 Jeffrey Holman
 Weizhao Simon Huang
 Tamar Kushnir
 Chingway Lim
 Desheng Liu
 Yu Liu
 Qing Lu

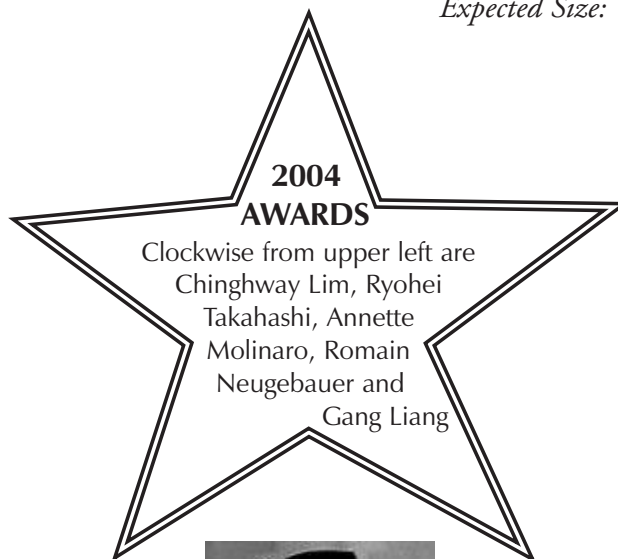
Guozhen Ren
 Jose Rodriguez-Lopez
 Mingyu Shi
 Chih-Ying Daisy Wang
 Danzhen You

Doctor of Philosophy–Biostatistics

Annette Molinaro
*Novel Approaches to Prediction of Survival in
 Cancer Research: Focus on Genomics*
 Romain Neugebauer
*Double Robust Estimation of Causal
 Parameters in Marginal Structural Model*

Doctor of Philosophy–Statistics

Aiyou Chen
*Semiparametric Inference for Independent
 Component Analysis*
 Gang Liang
Statistical Inference for Network Tomography
 Serban Nacu
*On the Simulation of Certain Random
 Systems*
 Chad Schafer
*Constructing Confidence Regions of Optimal
 Expected Size: Theory and Application to*



Heartfelt Thanks

The Department of Statistics once again extends heartfelt thanks to you, our many donors who, year in and year out, continue to offer your generous support. The continued strength, vitality and excellence of our programs, students and the department owe a great debt of gratitude to you. The following is a list of our donors since the previous issue, and the funds they support. We apologize if we have omitted anyone or incorrectly spelled a name.

Your support is vital to department programs and activities, now more than ever. For your convenience, an envelope for your contribution is attached to the center of this newsletter. Please use it or go online to <http://www.url.berkeley.edu/givetocal/>.

Again, our heartfelt thanks for your support.

Jerzy Neyman Fund

The Neyman Fund supports the long-running afternoon Neyman Seminar. This includes refreshments, dinner for the speakers, and some travel

expenses. It also covers recruitment costs for the Neyman Visiting Assistant Professor position and modest expenditures for this teaching visitor. Again, the campus does not have funds for these purposes.

Chin Long Chiang, Mark Eudey, Rose Ray, Wilhelmine von Turk and Suzanne Welsch

Erich Lehmann Fund

The Erich Lehmann Fund supports the graduate student community, initially via prizes.

Colin R. Blyth, Amy Racine-Poon, Wilhelmine von Turk

Friends of the Department Fund

This fund allows the Chair to respond to needs and opportunities as they emerge, making this fund an especially important one in times of decreasing public funding.

Anna Men, Anonymous

New Faculty: Martin J. Wainwright



One of the greatest strengths of our department has always been an outstanding faculty—something that's as true today as it was when the Statistics Department started

nearly fifty years ago. With this academic year, another new faculty member joins us, adding his enthusiasm and expertise to the mix.

Martin Wainwright received his Ph.D. in electrical engineering and computer science (EECS) from the Massachusetts Institute of Technology in 2002. His research interests include statistical signal and image processing, machine learning, graphical models and optimization, and information/coding theory, distributed signal processing, and statistical decision-making under communication constraints. He brought this broad range of interests to the MSRI

Special Semester Program in March 2005 (see page 3), as the second workshop, “Phase Transitions in Computation and Reconstruction” included his work on survey propagation.

Among his recent publications are “Random cascades on wavelet trees and their use in modeling and analyzing natural images,” with E. P. Simonelli and A. S. Willsky in *Applied Computational and Harmonic Analysis*, 11:89 (2001); and “Tree-based reparameterization framework for analysis of sum-product and related algorithms,” with T.S. Jaakkola and A.S. Willsky, in *IEEE Transactions on Information Theory*, 49:1120 (2003).

As he settles into the Bay Area, Wainwright enjoys the outdoors a great deal, especially hiking and swimming. “Of course, the Bay Area is a wonderful place for outdoor activity in general,” he notes, though he also enjoys listening to music, reading for pleasure, and any kind of traveling.

SGSA Perspective

by Victor Panaretos



The Statistics Graduate Student Association (SGSA) plays a number of roles in the Cal community, but one of the most important is its work in recruiting and welcoming new graduate students. For those of our readers who have been gone for a few (or more!) years,

we thought it would be interesting to hear how someone currently in the program sees the Department. Here is SGSA President Victor Panaretos' perspective, as recently shared with a prospective student. —Editor

Dear _____,

First off, congratulations on your acceptance to Berkeley! I bet you must know how competitive the application process is. I'd be glad to try to answer your questions to the extent that I can. Indeed, they are good questions, so I'll try to take things point-by-point.

Q: Could you share with me observations on the culture of the program, the interaction and relations between faculty and students, and the level of support from faculty?

The culture of the program is, I think, that you basically get a firm background during the first one to two years (during which the program is more structured) and then you get into research and things become much looser. The faculty interacts with the students through seminars and classes (this is the "organized interaction"), although I have found the "unorganized interaction" to be much more important: whatever door you knock at, the professor will always be willing to hear about your problem—whatever that may be, personal or scientific—and help as much as they can. This is especially important when you do research, since you have access to people with a very wide variety of research interests.

Q: How challenging is the program compared to others?

Well, I haven't been through any of the other programs, but I find it challenging. I guess that this would also be true for the other top-class programs—that's what makes them top-class programs in the first place!

Q: A comment on the website from a former student said that when he started he discovered that of 20 incoming students, only he and one other did not already have a masters in stats, and he spent 2 years just trying to keep his head above water. Is it really that tough?

First of all, let me tell you I did not hold a master's degree when I arrived here. The first year is indeed stressful, as there are coursework requirements that take up practically all of your time. It used to be especially stressful when the so-called preliminary exams existed. I was part of the last group of graduate students to take them. But these were done away with as of this year, so I think that life should feel better for the first-year students now. I think that the difficult time is during the first year (at least that's how it was with me). It always helps if you have a statistics background, but if you do not, you can make it. I suppose this should be true for all graduate statistics programs.

Q: How interdisciplinary is the program?

The program is very strong in this respect. It has very close ties with computer science, biology (genetics, biostatistics, bioinformatics) and communications. In fact, there exist "designated emphasis" programs for the former two subjects. In addition, collaboration with scientists from other fields comes individually, through your advisor. For example, I am working in a problem arising from biophysics. I know that people work on topics from various different disciplines, including the above, but also the social sciences (e.g. political science, law). This is a very strong point for Berkeley: all of its graduate programs are ranked among the top ten in the country, so that one really works with the cream when collaborating with other departments.

Q: Is Berkeley more on the theoretical side or on the applied side?

As you might probably know, Berkeley has been the powerhouse of theoretical statistics and has a very strong tradition there. However, I would not say that Berkeley is “all theory,” but I would put it a little differently: Berkeley does everything, but expects you to know your theory well. As my advisor (David Brillinger) says: *Theory becomes practice.*

I hope my reply is of some help. I think you will get a much better idea if you visit us during Visit Day, next week. It is always best to go and see first before deciding. My visit to Berkeley was crucial for my decision to join the program.

All the best, and I hope to see you during Visit Day—or some other time!

—Victor Panaretos

Ebi Kalahi Kimanani

Ebi Kalahi Kimanani died suddenly January 29, 2005, in Montreal, Canada. She had contracted malaria while visiting trial sites for a malaria clinical drug development trial in East Africa. On her return home she was diagnosed with the flu, whose symptoms can look very much like malaria, and which her youngest son then had. Her condition soon began to deteriorate, and she was rushed to the hospital, where a correct diagnosis was made. It was too late to save her.

Ebi was born in Kakamega, Kenya in 1958, one of 11 children growing up in rural Busali. Ebi was the top student in the national mathematics examinations in Kenya. At the University of Nairobi she received the Ghandi Memorial and Shell prizes for the best final year student in science, obtaining a B.Sc. in 1981 and an M.Sc. in 1983. Ebi came to Berkeley in 1984 on a Rockefeller Fellowship. As a student, Ebi charmed us all with her forthright manner and humor. The way she introduced me to her husband-to-be, Timothy Johns, was typical of her. At a department picnic she said, “David, there is someone here who I think you would enjoy meeting. He’s also from Canada.” Well, Tim and I talked and talked. When I saw Ebi a few days later, she asked, “What did you think of my fiancé?”

Here at Berkeley she made many dear friends and obtained a doctorate in 1989. On graduation, Ebi went on to pursue a career based in Montreal and to raise a family of three sons, Amiani, Mise and Mwanzi. Ebi’s professional career included work as Assistant Professor of Epidemiology and Biostatistics



(1958-2005)

at McGill University; Associate Director of Biometrics, Research and Development for Phoenix International Life Science; Principal Program Developer, International Biomedical Research in Africa and Executive Secretary of the African Health Research Forum. Ebi worked with both malaria and HIV-AIDS testing of new pharmaceuticals, and spent the last years of her life crusading for increased education and health care for victims of the HIV/AIDS, malaria and tuberculosis epidemics. A powerful and inspirational speaker, she spoke to groups about the need for education and for more resources to combat the spread of infectious diseases in Africa. Hers had become a recognized voice at major international conferences on health in Africa.

Ebi’s life and work are a powerful model for all, a remarkable example of a woman of great strength and intelligence who integrated her own life’s work with the needs of the larger world. Her life has genuinely made the world a better place, and her departure leaves a huge gap, but also a group of people dedicated to continue her efforts. Donations in Ebi’s memory may be sent to: The African Medical Research Foundation (<http://amref.org>) or The Stephen Lewis Foundation (<http://stephenlewisfoundation.org>).

—David Brillinger

The Great T-Shirt Tradition, 2004

Usually, the word “tradition” conjures up images of venerable occasions, solemn faces, and—well, generally speaking, pretty serious stuff. The Statistics Department has its share of serious stuff, of course, but not all our traditions fall into that category. And even though in California, anything you’ve done more than once qualifies as a tradition, this particular tradition really *is* venerable. The Statistics Department T-Shirt Design Competition has been an anything-but-solemn department tradition for over two decades, and it continues to be one of the most fun traditions going. Not only does some creative soul win a terrific prize (in this case, a free t-shirt sporting the winning design), but everyone else gets the fun of buying and wearing a new Departmental Fashion Statement. (In fact, t-shirt sales are an important source of income for the SGSA, so buying a t-shirt is said to make its wearer

feel virtuous as well as stylish.)

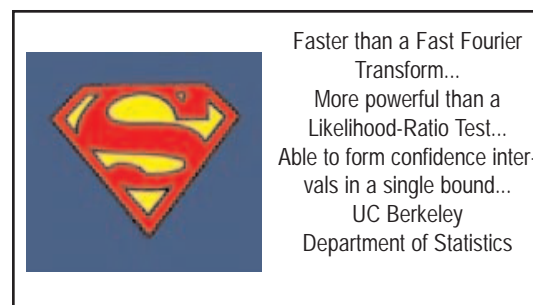
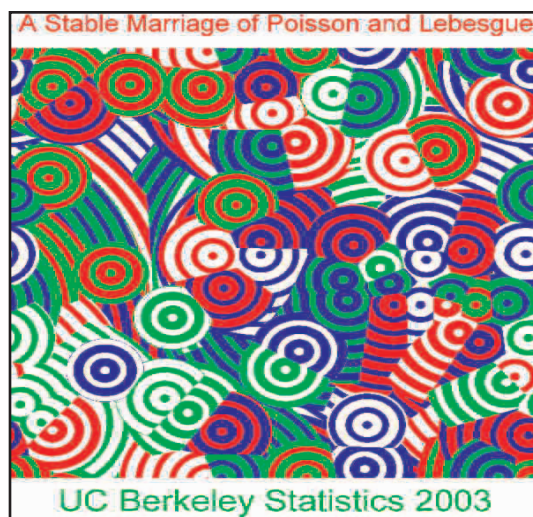
The latest chapter in the t-shirt tradition is 2004 winner Victor Panaretos’s design, which appears below.

The tradition is already busy adding a new chapter to its history for 2005. The 2005 T-Shirt Design Competition Committee consists of Dan Acland, Soyeon Ahn, and Richard Liang, who promise us that it will be another fun, exciting competition and that another memorable prize-winner will take its place among the venerable t-shirts of yore. (A few of these memorable t-shirts of yore are shown below at the right; others can be viewed and ordered at: <http://www.stat.berkeley.edu/students/tshirts/tshirts.html>.

You, too, can sport a piece of the tradition!



The 2004 T-Shirt Competition Winner



2002 Winner

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Berkeley, CA 94720-3860

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Mark Your Calendar!

Department of Statistics
Commencement
Spring 2005



Thursday, May 19, 2005—1:30 p.m.

Sibley Auditorium
Bechtel Engineering Center

Reception to follow at Trefethen Terrace