

# STATISTICAL SCIENCE

**a review journal of the institute of mathematical statistics**

**Volume 9**

**Number 2**

**May 1994**

## **STATISTICS AND PHYSICAL OCEANOGRAPHY**

A Report from the BOARD ON MATHEMATICAL  
SCIENCES of the National Research Council

## **DNA FINGERPRINTING: A REVIEW OF THE CONTROVERSY**

by Kathryn Roeder

## **A LEWIS CARROLL PILLOW PROBLEM: PROBABILITY OF AN OBTUSE TRIANGLE**

by Stephen Portnoy

**and A Conversation with WILLIAM KRUSKAL**

---

**EXECUTIVE EDITOR**

Robert E. Kass  
*Carnegie Mellon University*

**EDITORIAL ASSISTANT**

Heidi Rhodes

**EDITORS**

George Casella  
*Cornell University*

Leon Jay Gleser  
*University of Pittsburgh*

Ramanathan Gnanadesikan  
*Rutgers University*

David Griffieath  
*University of Wisconsin*

Nancy Reid  
*University of Toronto*

Terry Speed  
*University of California, Berkeley*

Michael Titterington  
*University of Glasgow*

**MANAGING EDITOR**

John R. Collins  
*University of Calgary*

**PRODUCTION EDITOR**

Patrick Kelly

**PAST EXECUTIVE EDITORS**

Morris H. DeGroot, 1986–1988      Carl N. Morris, 1989–1991

---

The aim of *Statistical Science* is to present the full range of contemporary statistical thought at a technical level accessible to the broad community of practitioners, teachers, researchers and students of statistics and probability.

The journal will publish discussions of methodological and theoretical topics of current interest and importance, surveys of substantive research areas with promising statistical applications, comprehensive book reviews, discussions of classic articles from the statistical literature and interviews with distinguished statisticians and probabilists.

**SUBMISSION POLICY**

*Statistical Science* welcomes the submission of expository, review and survey papers in all areas of the theory, methodology and applications of statistics and probability. Articles that synthesize research that has been published in diverse sources or that has been developed from diverse points of view are especially valuable. Please see the editorial in the February 1992 issue (vol. 7, no. 1) for additional description of the goals of *Statistical Science*.

Authors should submit four nonreturnable copies of any manuscript to be considered for publication in *Statistical Science*. The manuscript should be typed on  $8\frac{1}{2} \times 11$ -inch white paper, on one side only, and double-spaced throughout, including the references, with margins of at least  $1\frac{1}{2}$  inches on all four sides. Pages should be numbered consecutively. The manuscript should contain an abstract of 200 or fewer words, followed by approximately 5 or 6 key words or phrases. A short author's note providing the name, address, present position or rank and affiliation of each author should also be included. Copies should be mailed, first class, to:

Robert E. Kass  
Executive Editor, *Statistical Science*  
Department of Statistics  
Carnegie Mellon University  
Pittsburgh, PA 15213-3890

**In addition**, if possible, a  $\text{\LaTeX}$  input file should be sent by electronic mail to [statsci@stat.cmu.edu](mailto:statsci@stat.cmu.edu). If electronic mail is not feasible, a standard floppy disk may be submitted by first-class mail. Manuscripts submitted in the  $\text{\LaTeX}$  format should use the "article" style and should not use any special macros.

A condition of submission is that the manuscript has not previously been published and is not simultaneously being considered for publication elsewhere. All authors must transfer copyright to the Institute prior to publication. Page charges are \$45 per printed page. Payment of some or all of the estimated page charges associated with articles is strongly encouraged. The editorial review of articles and administration of page charges are completely separate activities. Manuscripts are reviewed and accepted prior to determining whether page charges will be paid. Corresponding authors receive 25 gratis offprints. Offprints of discussion articles include the main article(s), discussion(s) and rejoinder(s) as a package. Corresponding authors of main articles receive 25 gratis offprints; corresponding discussants receive 10 gratis offprints. Additional offprints may be purchased by using the IMS Offprint Purchase Order Form accompanying the galley. Copyright transfer, page charges and offprints are the responsibility of the IMS Business Manager.



## IMS CORPORATE MEMBERS

AT&T BELL LABORATORIES  
Murray Hill, New Jersey

BELL COMMUNICATIONS RESEARCH  
Morristown, New Jersey

GENERAL MOTORS CORPORATION  
Research Laboratories  
Warren, Michigan

INTERNATIONAL BUSINESS MACHINES CORP.  
Thomas J. Watson Research Center  
Yorktown Heights, New York

## IMS INSTITUTIONAL MEMBERS

ACADEMIA SINICA  
Inst. of Statistical Science  
Taipei, Taiwan

AMERICAN UNIVERSITY  
Dept. of Mathematics and Statistics  
Washington, D.C.

ARIZONA STATE UNIVERSITY  
Committee on Statistics  
Dept. of Mathematics and Dept.  
of Decision and Information Systems  
Tempe, Arizona

AUSTRALIAN NATIONAL UNIVERSITY  
Canberra, ACT, Australia

BOWLING GREEN STATE UNIVERSITY  
Dept. of Mathematics and Statistics  
Bowling Green, Ohio

CALIFORNIA STATE UNIVERSITY AT FULLERTON  
Dept. of Mathematics  
Fullerton, California

CASE WESTERN RESERVE UNIVERSITY  
Dept. of Mathematics and Statistics  
Cleveland, Ohio

CHINESE UNIVERSITY OF HONG KONG  
Statistical Unit  
Shatin, Hong Kong

CORNELL UNIVERSITY  
Dept. of Mathematics  
Ithaca, New York

DALHOUSIE UNIVERSITY  
Killam Memorial Library  
Halifax, Nova Scotia, Canada

DUKE UNIVERSITY  
Mathematics and Physics Library  
Durham, North Carolina

FLORIDA STATE UNIVERSITY  
Dept. of Statistics  
Tallahassee, Florida

GEORGE WASHINGTON UNIVERSITY  
Dept. of Statistics  
Washington, D.C.

HARVARD UNIVERSITY  
Cabot Science Library  
Cambridge, Massachusetts

HARVARD UNIVERSITY  
Dept. of Biostatistics  
Boston, Massachusetts

HARVARD UNIVERSITY  
Dept. of Statistics  
Cambridge, Massachusetts

INDIANA UNIVERSITY  
Dept. of Mathematics  
Bloomington, Indiana

INSTITUTE FOR DEFENSE ANALYSIS  
Center for Communications Research  
La Jolla, California

IOWA STATE UNIVERSITY  
Dept. of Statistics and Statistical Laboratory  
Ames, Iowa

JOHNS HOPKINS UNIVERSITY  
Dept. of Biostatistics and  
Dept. of Mathematical Sciences  
Baltimore, Maryland

KANSAS STATE UNIVERSITY  
Dept. of Statistics  
Manhattan, Kansas

MARA INSTITUTE OF TECHNOLOGY  
Selangor, Malaysia

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
Dept. of Mathematics  
Cambridge, Massachusetts

MCGILL UNIVERSITY  
Dept. of Mathematics and Statistics  
Montreal, Quebec, Canada

MEDICAL COLLEGE OF WISCONSIN  
Biostatistics Division  
Milwaukee, Wisconsin

MEMORIAL SLOAN-KETTERING CANCER CENTER  
Biostatistics Service  
New York, New York

MIAMI UNIVERSITY LIBRARY  
Oxford, Ohio

MICHIGAN STATE UNIVERSITY  
Dept. of Statistics and Probability  
East Lansing, Michigan

NATIONAL SECURITY AGENCY  
Fort George G. Meade, Maryland

NEW MEXICO STATE UNIVERSITY  
Dept. of Mathematical Sciences  
Las Cruces, New Mexico

NORTH CAROLINA STATE UNIVERSITY  
Dept. of Statistics  
Raleigh, North Carolina

NORTH DAKOTA STATE UNIVERSITY LIBRARY  
Fargo, North Dakota

NORTHERN ILLINOIS UNIVERSITY  
Div. of Statistics  
DeKalb, Illinois

OHIO STATE UNIVERSITY  
Dept. of Statistics  
Columbus, Ohio

OREGON STATE UNIVERSITY  
Dept. of Statistics  
Corvallis, Oregon

PENNSYLVANIA STATE UNIVERSITY  
Dept. of Statistics  
University Park, Pennsylvania

PRINCETON UNIVERSITY LIBRARY  
Princeton, New Jersey

PURDUE UNIVERSITY LIBRARY  
West Lafayette, Indiana

QUEEN'S UNIVERSITY  
Dept. of Mathematics and Statistics  
Kingston, Ontario, Canada

RICE UNIVERSITY LIBRARY  
Houston, Texas

THE ROCKEFELLER UNIVERSITY LIBRARY  
New York, New York

SOUTHERN ILLINOIS UNIVERSITY  
Dept. of Mathematics and Statistics  
Edwardsville, Illinois

STANFORD UNIVERSITY  
Dept. of Statistics  
Stanford, California

STOCKHOLM UNIVERSITY  
Institute of Actuarial Mathematics  
and Mathematical Statistics  
Stockholm, Sweden

SYRACUSE UNIVERSITY  
Dept. of Mathematics  
Syracuse, New York

TECHNISCHE UNIVERSITÄT  
Inst. für Math Stochastik  
Braunschweig, Germany

TEXAS TECH UNIVERSITY  
Dept. of Mathematics  
Lubbock, Texas

UNIVERSITÄTSBIBLIOTHEK DORTMUND  
Bereichsbibliothek Statistik  
Dortmund, Germany

UNIVERSITY OF ALBERTA  
Dept. of Statistics and Applied Probability  
Edmonton, Alberta, Canada

UNIVERSITY OF ARIZONA  
Dept. of Mathematics  
Tucson, Arizona

UNIVERSITY OF BATH  
Library  
Bath, United Kingdom

UNIVERSITY OF BRISTOL  
Queen's Library  
Bristol, United Kingdom

UNIVERSITY OF BRITISH COLUMBIA  
Dept. of Statistics  
Vancouver, British Columbia, Canada

UNIVERSITY OF CALGARY  
Dept. of Mathematics and Statistics  
Calgary, Alberta, Canada

UNIVERSITY OF CALIFORNIA, BERKELEY  
Dept. of Statistics  
Berkeley, California

UNIVERSITY OF CALIFORNIA, DAVIS  
Div. of Statistics  
Davis, California

UNIVERSITY OF CALIFORNIA, IRVINE  
Main Library  
Irvine, California

UNIVERSITY OF CONNECTICUT  
Dept. of Statistics  
Storrs, Connecticut

UNIVERSITY OF FLORIDA  
Dept. of Statistics  
Gainesville, Florida

UNIVERSITY OF GEORGIA  
Dept. of Statistics  
Athens, Georgia

UNIVERSITY OF ILLINOIS  
Dept. of Statistics  
Champaign, Illinois

UNIVERSITY OF ILLINOIS AT CHICAGO  
Dept. of Mathematics, Statistics  
and Computer Science  
Chicago, Illinois

UNIVERSITY OF IOWA  
Dept. of Statistics and Actuarial Science  
Iowa City, Iowa

UNIVERSITY OF MARYLAND  
Dept. of Mathematics  
College Park, Maryland

UNIVERSITY OF MASSACHUSETTS  
Dept. of Mathematics and Statistics  
Amherst, Massachusetts

UNIVERSITY OF MINNESOTA  
School of Statistics  
Minneapolis, Minnesota

UNIVERSITY OF MINNESOTA  
Twin Cities Campus Libraries  
Minneapolis, Minnesota

UNIVERSITY OF MISSOURI  
Ellis Library  
Columbia, Missouri

UNIVERSITY OF MONTREAL  
Dept. of Mathematics  
Montreal, Quebec, Canada

UNIVERSITY OF NEBRASKA  
Dept. of Mathematics and Statistics  
Lincoln, Nebraska

UNIVERSITY OF NEW BRUNSWICK LIBRARY  
Fredericton, New Brunswick, Canada

UNIVERSITY OF NEW MEXICO  
Dept. of Mathematics and Statistics  
Albuquerque, New Mexico

UNIVERSITY OF NORTH CAROLINA  
Dept. of Statistics  
Chapel Hill, North Carolina

UNIVERSITY OF OREGON  
Dept. of Mathematics  
Eugene, Oregon

UNIVERSITY OF PENNSYLVANIA  
Dept. of Statistics  
Philadelphia, Pennsylvania

UNIVERSITY OF THE PHILIPPINES AT LOS BAÑOS LIBRARY  
Laguna, Philippines

UNIVERSITY OF PITTSBURGH  
Mathematics Library  
Pittsburgh, Pennsylvania

UNIVERSITY OF SOUTH CAROLINA  
Dept. of Statistics  
Columbia, South Carolina

UNIVERSITY OF TEXAS AT AUSTIN  
Dept. of Mathematics  
Austin, Texas

UNIVERSITY OF TEXAS AT DALLAS  
Program in Mathematical Sciences  
Richardson, Texas

UNIVERSITY OF VICTORIA  
Dept. of Mathematics  
Victoria, British Columbia, Canada

UNIVERSITY OF VIRGINIA  
Dept. of Mathematics  
Charlottesville, Virginia

UNIVERSITY OF WASHINGTON  
Dept. of Statistics  
Seattle, Washington

UNIVERSITY OF WATERLOO  
Dept. of Statistics and Actuarial Sciences  
Waterloo, Ontario, Canada

US DEPT. OF AGRICULTURE  
Forest Service  
New Orleans, Louisiana

US DEPT. OF THE AIR FORCE  
Air Weather Service Technical Library  
Scott AFB, Illinois

VIRGINIA COMMONWEALTH UNIVERSITY  
Dept. of Mathematical Sciences  
Richmond, Virginia

VIRGINIA POLYTECHNIC INSTITUTE  
AND STATE UNIVERSITY  
Dept. of Statistics  
Blacksburg, Virginia

WAKE FOREST UNIVERSITY  
Z. Smith Reynolds Library  
Winston-Salem, North Carolina

WAYNE STATE UNIVERSITY  
Dept. of Mathematics  
Detroit, Michigan

YORK UNIVERSITY  
Dept. of Mathematics  
Downsview, Ontario, Canada