# IOWA SECTION MAA
# NEWSLETTER

## IOWA SECTION MEETING

The spring meeting of the MAA jointly with the Iowa Sections of SIAM and ASA is scheduled for April 24 and 25. The tentative schedule is for Friday, April 24; 12-5 p.m. student papers; 5:15-6:30 informal mixer; 8-10:30 films. For Saturday April 25; 8-12 registration, lecture and panel, business meetings and student awards; 1-5 concurrent sessions. One panel topic possible is the directions that the teaching of calculus should take.

## NSF FELLOWSHIPS

NSF fellowships for mathematics graduate students are available. Urge all your seniors to apply. The number actually granted to mathematics students is roughly a linear function of the number of applications. Some universities are giving incentives for students to apply. Michigan University does. Iowa State will supplement the $11,000 annual stipend from NSF with an additional $2,400 plus travel to professional meetings. Other universities may do similar things. Also see Lynn Steen's comments in the September Focus.

## GOVERNOR'S REPORT

I attended the Governor's business meeting in Berkeley in August. It all seemed routine. I was able to personally recommend Basil Gillam for the certificate of meritorious service. It will be officially bestowed at the San Antonio meeting. Some effert is being made to raise the public's awareness of Mathematics, especially around the Olympiad results.


## MAA LECTURE PROGRAM

The MAA Lecture program lists 6 people in Iowa (the geographical list given on page 8 of the booklet is not complete).

A. M. FINK - Professor of Mathematics
              Iowa State University
    How to have your cake and Edith Too. (Fair division)-E, How large a city can an insecure police force patrol? (Helly's theorem on convex sets)-EA, The spherical dipstick-IA, Roundheads have higher IQ's than squares. (On isoperimetric quotients)-E, Rigid motions of the plane (uses notion of group)-A, Games and Grundy functions-EIA, How to find a needle in a linear haystack-IA, A liver kinetics control problem-A, Sturmian sequences-A.

RICHARD A. GROENEVELD - Professor of Statistics
                         Iowa State University
    Maximal Errors in Finite Population Estimation-IA, Probabilistic and Statistical Properties in a Best of 2n-1 Game Series-A, The Mode, Median, Mean Inequality-I, Measurement of Skewness and Kurtosis-IA.

STUART A. KLUGMAN - Bankers Life Chair and Associate Professor
                     Department of Statistics and Actuarial Science
                     University of Iowa
    The Mathematics of Life Insurance and Pensions-E, How Many Games Should be Played in a World Series?-EI, Probability Models for Insurance-IA, Shrinkage Estimation with Actuarial Applications-A.

ROBERT J. LAMBERT - Professor of Mathematics
                     Iowa State University
    Solving an Integral Equation with Cubic Splines-IA, An Overview of Multi-step Methods for Solving Differential Equations-IA, Discussion of the Algorithms for Solving the Matrix Eigenvalue Problem-A, The Analyst and the Computer in Business and Industry: The University Role-E, Can You Convince Others That Your Matrix Eigenvalues Are Correct?-A.

HOWARD A. LEVINE - Professor of Mathematics
                    Iowa State University
    Uniqueness theorems in partial differential equations-EI, What is a well posed problem?-EI, Theorems suggested by the computer-EI, Inequalities between Dirichlet and Neumann eigenvalues-IA, A strange flow on the surface of a droplet-IA, Blow up theorems in partial differential equations-EIA.

KEITH D. STROYAN - Professor of Mathematics
                    University of Iowa
       Geometry and Microcomputers:  An Elementary Synthesis of Geometry and Graphics-EI,  Infinitesimal Analysis Then and Now:  Some History of Calculus from the Point of View of Modern Infinitesimals-EIA,  Uniform Derivatives and the Infinitesimal Microscope-IA,  Computer Laboratories for Calculus and Linear Algebra-EIA,  Brownian Motion and Infinitesimal Random Walk-A.

       E = Elementary, I = Intermediate, A = Advanced.

       For further lectures see volumes 1 and 2 of this newsletter.


IOWA STATE UNIVERSITY
DEPARTMENT OF STATISTICS

       The Department of Statistics began its 40th year as a separate academic department at Iowa State University in 1986.  The Department and ISU Statistical Laboratory has risen to a faculty numbering 34, nine of whom hold joint departments with departments in disciplines including genetics, industrial engineering, mathematics, psychology, sociology and political science.  Professor Dean Isaacson was appointed Head of the Department of Statistics and Director of the Statistical Laboratory on July 1, 1986 after serving two years in an acting capacity in these two positions.

       At the beginning of the Fall Semester 1986 there were 88 graduate students in statistics at ISU.  About one half of these students are from the United States and one half are from countries around the world.  Countries represented include Argentina, Belgium, China (People's Republic and Republic of China), the Dominican Republic, India, Indonesia, Japan Lebanon, Malaysia, South Korea, Uruguay and West Germany.  A number of these graduate students are supported by their governments and return to positions in government or in universities in their countries upon completion of their degrees.  This diversity of backgrounds indicates the international nature of statistics and of the Department.

       During the period from July 1, 1985 to June 30, 1986 there were eleven Ph.D. and 34 M.S. degrees completed in the Department of Statistics.  Many of the M.S. graduates have taken positions as applied statisticians in diverse industries including automotive production, communications, computation, health care product manufacturing, heavy manufacturing and pharmaceutical production.  Statisticians with background in quality control and reliability are in particularly strong demand.  Other M.S. graduates are continuing their education to the Ph.D. level at ISU or at other universities.  Of the eleven Ph.D. graduates, seven are employed in the private sector as statisticians and four have accepted academic positions.

       Notable outside speakers during the Fall Semester have been Professor Robert Bechhofer from the School of Operations Research and Industrial Engineering at Cornell University and Professor James O. Berger of the Statistics Department at Purdue University.  Professor Bechhofer spoke on "An Optimal Closed Adaptive Sequential Procedure for Selecting the Bernoulli Population which has the largest Probability" on September 12, 1986.  Professor Berger presented the George Zyskind Lecture, "Bayesian Analysis:  Myths and Reality," on October 7, 1986.

UNIVERSITY OF IOWA
DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE

The University of Iowa has approved a new M.S. program in Quality Management and Productivity. It is a joint program among three departments in three colleges: Statistics and Actuarial Science (Liberal Arts), Industrial and Management Engineering (Engineering), and Management Science (Business Administration). The prerequisites are a B.A. or B.S. with a program including calculus and linear algebra and a G.P.A. of at least 3.00 (on a 4.00 basis) as well as good communication skills. While the program has yet to be approved by the Board of Regents, it is expected to be in place for 1987. The participating departments have agreed to supply a number of teaching assistantships to be awarded to qualified applicants.

Bob Hogg is the President-Elect of the American Statistical Association.

The book Loss Distributions by Bob Hogg and Stuart Klugman received the Clarence Kulp award from the American Risk and Insurance Association for being the outstanding insurance book published in 1984.

Stuart Klugman (Hierarchical Bayes methods for classification ratemaking) and Glenn Meyers (Insurer solvency models) received research grants from the Actuarial Education and Research Fund.

Tim Robertson (Statistical inference under order restrictions), Dick Dykstra (Iterative methods for constrained optimization in mathematical statistics), and Johannes Ledolter (Leverage, influence, and outliers in time series models), have research grants from the Office of Naval Research.

Joe Sedransk (Properties of imputation methods) has a grant from the Census Bureau.

George Woodworth (Mapping the recreation opportunity spectrum into user choices: Applying discrete choice models to a Chicago area recreation management problem) has a grant from the Forest Service.

Jon Cryer has recently published Time Series Analysis, a text for students who have had calculus and an introductory course in mathematical statistics. It is published by Duxbury.

Dick Dykstra, Tim Robertson and Tim Wright (University of Missouri, Rolla) are the editors of Advances in Order Restricted Statistical Inference, to be published by Springer-Verlag. It is a collection of papers presented at a conference held in Iowa City in September 1985.

Dykstra, Robertson, and Wright are also preparing Order Restricted Statistical Inference, a research monograph to be published by Wiley in 1987.

Bob Hogg and Johannes Lodolter are nearly finished writing Engineering Statistics a textbook for a one or two semester introductory course for students with calculus. It will be published in early 1987 by Macmillan.

Stuart Klugman and George Woodworth are members of the American Statistical Association's Visiting Lecturers Program.

Dale Zimmerman, who is completing a Ph.D. in Statistics from Iowa State University has joined our faculty as a tenure-track Assistant Professor. His main area of interest is spatial statistics.

There are four visiting professors this year:

1. Aryeh Reiter (Ph.D., Hebrew University) - Categorical Data, Sample Surveys.
2. Tom Ryan (Georgia Tech) - Quality and Productivity.
3. A. R. Padmanabhan (Monash University) - Nonparametric, Robust, and Adaptive Procedures.
4. Ming Yang (Ph.D., Florida) - Decision Theory.

There will definitely be some visiting positions available. It is possible that a tenure-track position will also be open.

## SIMPSON COLLEGE

Professor Van Wyk is on leave of absence from Simpson this year. He is now employed by Pioneer Data Systems in Des Moines, working with microcomputers.

Mark E. Hall has joined the faculty, as Instructor in Mathematics. Mark is completing his doctoral dissertation in Lie algebras at the University of Wisconsin, Madison, under the direction of Professor Georgia Benkart. He has previously taught at the University of Nebraska, Lincoln.

Herman Trivilino has also joined the faculty, as Instructor in Mathematics and Physics. Herman received his M.S. from Sam Houston State University, and has previously taught there.

## UNIVERSITY OF NORTHERN IOWA

Min Lee was appointed Assistant Professor at UNI Fall 1986. He received his Ph.D. in Algebraic Geometry and Number Theory from State University of New York at Stony Brook in August, 1983. Lee was at Rutgers University from 1983 to Summer 1986.

Dong-Sun Shin has a one year appointment as Distinguished Research Scholar at UNI. He is on leave from Ewha Womans University in Seoul, Korea.

Professor Hyo Myung has been honored by UNI with a Graduate College Distinguished Scholar appointment for 1986-87.

## LORAS COLLEGE

Dr. Steve Mosiman has returned to teach Computer Science and Mathematics after two years working at I.B.M. Company at Rochester, Minnesota.

Dr. Tan C. Tran, who recently finished the Ph.D. in Mathematics at the University of Missouri, Kansas City, has joined the staff.

Dr. Marvin Papenfuss is spending the year at the University of Alaska at Fairbanks, on sabbatical leave.

Sr. Kathleen Sullivan is on leave this '85-'86 year to pursue a Master's degree in Computer Science at the University of Iowa.

Dr. Don Marxen attended the August 1986 International Congress of Mathematics in Berkeley, California. He presented a paper entitled, "Free Uniform Groups and Embeddability of Topological Semigroups."

ST. AMBROSE COLLEGE

Jim Van Speybroeck is the new chairperson of mathematical sciences at St. Ambrose College. At St. Ambrose the mathematics department and computer science department are combined into Mathematical Sciences.

WARTBURG COLLEGE

Dr. Chris Schmidt completed his second summer in the two-summer program of the Institute for Retraining in Computer Science on the Kent State University Campus. He has now completed what he feels was a valuable program.

John M. Zelle joined our staff as an assistant professor of computer science this fall after completing his masters at I.S.U this past summer.

The department is offering a new course this fall entitled: Automata, Computability and Formal Languages". A new course entitled "Foundations of Analysis" is scheduled for Winter Term.

The Department reviewed and made changes in all three of its majors (MA, CS, CIS) during 1985-86.

In our weekly department seminars we are concentrating on the theory of computations.

Dr. Bill Waltmann was given a Wartburg Alumni Citation in recognition of the quality of his teaching.

Josef Breutzmann was promoted to associate professor and granted tenure.

Gregory J. Diercks accepted a position with Digital Electronics Corporation in Chicago.

There were 25 graduates with Computer Science or CIS Major and 22 graduates with Mathematics Major.

LUTHER COLLEGE

Robert Jacobsen retired at the end of the 1985-86 academic year.

Luther College will confer an Honorary Doctorate on MAA President Lynn Steen at its Fall Homecoming. Also at that time, Distinguished Service Awards will be given to two alumni: High School Teacher Karen Dotseth and Paul Hoel, Professor Emeritus at UCLA.

We have an open position in mathematics beginning in the Fall, 1987. Its a tenure-eligible position and the qualifications are a Ph.D or ABD in mathematics.

MAHARISHI INTERNATIONAL UNIVERSITY

Michael Weinless and Cathy Gorini spent one month in India this summer studying Vedic Science with Maharishi Mahesh Yogi, the founder of MIU.

Cathy Gorini will be teaching for one month at MIU-Norway in Oslo this fall.

Franz Harpain of Vancouver Community College in Vancouver, British Columbia, will be visiting faculty from September 24 until December 1, 1986.

Birney Titus of Georgia Tech was visiting faculty in June, 1986.

Anne Dow, formerly lecturer at University of Queensland, Australia, has been appointed associate professor. Anne's areas of interest are statistics and partial differential equations.

Phil Boyland, formerly assistant professor at Boston University, has been appointed assistant professor. Phil received his Ph.D. from the University of Iowa and will be attending the Special Session on Twist Maps at the Mathematics Institute of the University of Warwick in March and April, 1987.

Eric Hart, currently finishing his Ph.D. in Mathematics Education at the University of Iowa, has been appointed assistant professor of mathematics.

Maxwell Rainforth is now the director of MIU's Math Lab. Maxwell has a BSc(Honours) in Mathematics from the University of Canterbury, New Zealand, and an MA in Education from MIU.

CENTRAL COLLEGE NEWS

Agnes Andreassian returned this fall after spending a year's leave of absence at the University of Washington, Seattle, Washington, where she completed all requirements for the M.S. degree in computer science.

Leland Graber has returned from a year's leave of absence to Bitburg, Germany. While he was there he taught computer science courses to Americans abroad for the University of Maryland - European Division.

Twenty Iowa teachers of grades 6-12 participated in an eight week summer institute for mathematics teachers at Central College entitled "Discrete Methods in Mathematics." The institute was held from June 9 to August 1, 1986, and was supported by monies resulting from the Iowa Title II Education for Economic Security Act which is administered by the Iowa State Board of Regents. Of the twenty participants, fourteen teach primarily in grades 9-12 and six have responsibilities in grades 6-8. Each participant enrolled in two courses, a discrete mathematics course and a Pascal programming course.

This fall Central is experimenting with a series of mini-courses for providing computer skills to the incoming freshman. These courses run from 2 to 4 weeks and cover such topics as Word Processing, Spread Sheets, Data Management, Statistical Packages and Elementary BASIC Programming. The courses are independent of one another and are offered at various times throughout the term. The courses are being taught on microcomputers as opposed to the academic time sharing system. A new microcomputer lab was installed over the summer. The new mini-courses are being taught by faculty from various departments other than Math/Computer Science. The faculty training and the software for this project were supported by a grant from the Northwest Area Foundation.

Also in place for use this fall is a new computer lab for advanced courses in computer science. This lab houses student terminals to a new AT&T 3B2/400 UNIX based machine. This system will be used for student projects and for new courses in operating systems and database management systems being offered this year. Faculty offices are equipped with terminals which can access either the UNIX system or the main academic system. The equipment for this lab was purchased with the support of an NSF Science Instrumentation Grant.

## IOWA STATE UNIVERSITY
## MATHEMATICS DEPARTMENT

On leave are Jim Cornette for a second year at NIH, Don Pigozzi at University of Chicago and elsewhere, Stuart Nelson at University of Connecticut for the fall. Roger Alexander and Tsu-Fen Chen are at the Mathematics Institute in Minneapolis, for the fall semester, and John Goldwasser is in Zimbabwe. Visitors for the year include: Anna Romanowska, Jose Marasigan, Federico Marchetti, Luiz Peresi, and Ahmid Ocal. New faculty are: Noemi Wolanski and Ricardo Duran who are also at the Mathematics Institute for the fall and Ananda Weerasinghe. The department expects to hire three to four new faculty this year. Robert Meany retired this year. Paik Kim died suddenly this summer.

The new Master of School Mathematics program got off to a good start with 15 students enrolling, some of them with fellowships supplied by a grant from the Board of Regents. These new students push the mathematics graduate enrollment over the 100 mark for the first time ever. Our department will probably grant 31 graduate degrees (MS and Ph.D) in the next 12 months, about 2/3 of these are in applied mathematics.

Mathematician makes good. President Gordon Eaton of ISU has an undergraduate major in mathematics (and a Ph.D. in geology).

## JOINT SEMINARS

Last year the functional analysis groups from the University of Iowa and Iowa State met periodically at Grinnell for joint seminars. The PDE groups and the Numerical Analysis groups are intending to do the same in the spring semester. Anyone else interested get in touch. Their meetings are on Saturday.


## THE GRAND ROUNDOFF RESULT

Given a matrix X with real entires, there exists a matrix Y, with integer entries such that

$$|x_{ij} - y_{ij}| < 1, \quad \left|\sum_i (x_{ij} - y_{ij})\right| < 1 \text{ each } j,$$

$$\left|\sum_j (x_{ij} - y_{ij})\right| < 1 \text{ each } i, \text{ and } \left|\sum_{ij} (x_{ij} - y_{ij})\right| < 1.$$


## GOVERNOR'S PRIZE

A prize will be offered for the best explanation of why every number in the set $\{5, 6, 8, 10, 21, 25\}$ is interesting. To claim the prize you must attend the Section Meeting.


Editor's Comments: Please keep the information coming and let me know what kind of things you would like in the Newsletter.