IOWA SECTION MAA

NEWSLETTER

VOLUME VII No. 2 Edited by Luz M. DeAlba March 1991

GOVERNOR'S REPORT

The Board of Governors met January 15, 1991 in San Francisco, CA. The following is a brief summary of some of the items discussed.

FUTURE MEETINGS: Sites and dates are:

August 8-11, 1991	Orono, Maine
January 8-11, 1992	Baltimore, Maryland
January 13-16, 1993	San Antonio, Texas
August 15-19, 1993	Vancouver, British Columbia

There will be no summer AMS-MAA meeting in 1992; instead all MAA members are encouraged to attend the International Congress for Mathematics Education (ICME-7) which will be meeting in Quebec August 16-23 that summer. The Board of Governors will meet just prior to the ICME-7 in Quebec.

TEACHING AWARDS: Each year the MAA participates in the ceremonies in Washington, D.C. to honor the Presidential Award winning Mathematics Teachers, both at the elementary and secondary levels. So far, there has been no award for outstanding teaching at the post-secondary level. Now there will be. The Board of Governors approved a proposal on MAA Awards for Distinguished College or University Teaching. The specific criteria have not yet been published, but tentative procedures follow. At the beginning of the academic year, each Section shall select one of its members for a yearly Section Award for Distinguished College or University Teaching of Mathematics, and shall honor that person at a Section meeting during that academic year. The names of the Section Award winners, together with appropriate documentation, will be submitted to a standing committee of the Association. This committee will select, no later than the following summer, the MAA award winners from those named by the sections, with the provision that one of the winners may be selected from another source. There will be a maximum of three awards each year, each award is to consist of $1,000 and a certificate, and the awards will be presented at the annual meeting of the Association. So, we in the Iowa Section will need to identify an existing group or committee, or form a new one, to decide on our Section's recipient as soon as guidelines are provided.

SPEAKING OF AWARDS: A.M. Fink (Iowa State University) was presented with a Certificate of Meritorious Service at the Annual Business Meeting.

CAREER INFORMATION: The pamphlet "Careers in the Mathematical Sciences" first appeared at the August meeting in 1990, and more than 10,000 copies have been distributed since then. A new brochure called "Mathematical Scientists at Work" is also now available. It contains the career profiles of 14 mathematical scientists and should provide some interesting material for students wondering what they can do with a mathematics major.

COMMITTEES: A modification in the committee structure of the MAA is taking place. Each committee is assigned to one of six Areas: Awards, Competitions, Education, Human Resources, Meetings, Publications. Each Area is to have a Coordinating Council and hopefully this will allow for more exchange of information between committees involved in similar work and eliminate duplication of efforts. An attempt is being made to bring "new blood" into the committees, so if you have any interest in serving the mathematical community by working on an MAA committee, let someone know. I will be glad to pass your name on to the Committee on Committees, or you may simply indicate your interests when you send in your annual dues payment.

MATHEMATICS AWARENESS WEEK is April 21-27, 1991. What can YOU do?

1. Put a banner over the door of your department.
2. Sponsor a public forum to discuss mathematics education in your community.
3. Be (or offer a colleague as) a guest speaker at a local elementary, junior high or senior high school.
4. Submit an editorial to your local newspaper.

TREASURER'S REPORT - 1990

Balance 12/31/89: $862.66

Receipts:		Disbursements:	
Meeting registrations	390.00	MAA-book cash sales[1]	296.00
MAA Assessment	180.00	IA-ASA-mtg.registrations	39.00
Interest	48.68	Spring newsletter	301.97
Total receipts[2]:	914.68	Printing	157.13
		Postage	125.94
		Extra copies	18.90
		Total disbursements[3]	636.97

Balance on hand 12/31/90 $1140.37

[1]Total book sales of $440 included $144 of credit card sales

[2]Book incentive payment of $44.00 has not yet been received.

[3]Fall newsletter costs of $197.01 were paid after the first of the year.

This gives an adjusted balance of $987.37

David Oakland, Secretary-treasurer

ANNOUNCEMENTS

The nominating committee has nominated Marvin C. Papenfuss from Loras College and Ron Smith from Graceland College for the position of Chairman-Elect. Biographical sketches follow.

Marvin C. Papenfuss, Professor of Mathematics and Computer Science, Loras College, received his B.S. in mathematics from Winona State College, his M.S. from Kansas State University, and his Ph.D. in applied mathematics from Iowa State University. He has been a faculty member at Loras since 1972. Marv has also taught at the University of Alaska-Fairbanks during the 1986-87 academic year as well as the summers of 1987 and 1989. His research interests include local existence/non-existence results for

certain classes of nonlinear two-point boundary value problems and computational methods for solving certain classes of two-point boundary value problems using successive Green's functions. He has also taught mathematical modeling and is coach for the Loras College Modeling Contest Team.

Ron Smith graduated with a B.S. in mathematics from Graceland College in 1974. Following a year of volunteer work with his church, he enrolled at Iowa State University. In 1978, he received his M.S. from ISU and was hired at Graceland, where he has been teaching mathematics until the present. He finished his Ph.D. in 1981 under Dr. Irvin Hentzel. Activities of the last two years outside the usual classroom instruction and faculty committees include: sponsoring the mathematics club, the mathematics modeling team, and the intercultural club from Graceland; attending SIGGRAPH '89 as an educational grant recipient; teaching HyperCard to elementary school teachers; chairing the nominations committee for the Iowa MAA; and rediscovering the excitement of fractals. Ron just returned from sponsoring a cultural exchange with a sister school in Taiwan. In addition, Ron was a delegate to the last world conference of his church, and he directed Sr. High camps for the last two years. Ron enjoys algebra, computers, singing, and playing the guitar.

"Ancient Greek Mathematics" Summer Course Offered in Greece

This summer the course "Ancient Greek Mathematics" will be given in Greece. Lectures will cover the development of mathematics from its legendary beginnings with Thales and Pythagoras through the work of Euclid, Archimedes, the Diophantus, all viewed in the context of Greek culture and history. The lectures will be given in Athens and on the island of Samos, with a trip also included to Miletus and some other important early Greek cities in Asia Minor. Three graduate or undergraduate credits are available for completing this three-week course, July 6-27. Professionals who take the course may find that their expenses are deductible or that they will be defrayed by an employer.

The cost of the program is about $2000, including round-trip airfare from New York, lodging, transportation within Europe, and several tours. Most meals are not included, nor is tuition. For further information, write to the instructor - Professor Paul Wolfson, Department of Mathematics and Computer Science, West Chester University, West Chester, Pennsylvania 19383 - or call him at (215) 436-1081.

Joint Meetings of the Iowa Sections of MAA, ASA, AMATYC

Drake University, April 5-6, 1991

FRIDAY, APRIL 5

2:00pm-	Registration	Meredith Hall, South lobby
2:30-5:00pm	Student Paper Session I (Concurrent Session)	103 Meredith Hall
2:30-3:30pm	Student Paper Session II (Concurrent Session)	106 Meredith Hall
3:30-5:00pm	Student Data Analysis Competition	106 Meredith Hall
5:00-6:00pm	The Mathematical Modeling Competition - Panel Discussion	101 Meredith Hall
6:00-8:00pm	Dinner on own	
8:00-8:45pm	"Life After the Bachelors Degree" Wayne Woodworth, The Principal Company Jennifer Rowley, University of Nebraska	Quad Creek Faculty House
8:00-10:00pm	Informal Reception	Quad Creek Faculty House

SATURDAY, APRIL 6

8:00am-	Registration	Meredith Hall, South lobby
8:30-9:30am	W. Robert Stephenson Iowa State University "The Statistics' Experience Versus Experiencing Statistics"	101 Meredith Hall
9:45-10:45am	A. Wayne Roberts Macalester College "The Current State of Calculus Reform"	101 Meredith Hall
11:00-11:30am	Business meeting and Student Awards	101 Meredith Hall
11:30-1:00pm		lunch on own
11:30-1:30pm	AMATYC Luncheon John Wheeler Iowa Department of Education	to be announced
1:00-4:30pm	concurrent sessions	Meredith Hall

STUDENT PAPERS

Session I - Meredith 103

2:00-2:25	Xiaorong Shen	ISU	Quadratic Forms and Ternary Algebras
2:30-2:55	Michael Yanacheak	Drake	Codes: Black and White
3:00-3:25	Paul Shimura	MIU	Tiling Groups for the Regular and Semiregular Tilings
3:30-3:55	Kevin Dennis	Luther	Fractal Geometry
4:00-4:25	Robin Taylor	Drake	Power in the British Parliament
4:30-4:55	Jon Phillips	ISU	The Superiority of Lebesgue Integration: An Example

Session II - Meredith 101

2:00-2:25	C Joseph Lu William Q Meeker, Jr	ISU ISU	Using Degradation Measures to Estimate a Time-to-Failure Distribution
2:30-2:55	Morgan C. Wang	ISU	Self-validating Computations of Probabilities for Central and Noncentral Chi-square Distributions

3:15-4:55	Student Data Analysis Competition	
5:00-5:45	Panel Discussion The Mathematical Modelling Competition Marvin Papenfuss, Loras Tony Brantzeg, Drake Siddharatha Agarwal, Grinnell Alex Kleiner (moderator), Drake	101 Meredith Hall

SATURDAY AFTERNOON SESSION

SESSION I 103 Meredith Hall

1:00-1:25	Michael Millar	UNI	Episodes from Islamic Mathematics
1:30-1:55	Reginald Laursen Steven Schlicker	Luther Luther	True Basic Software for Calculus Instruction
2:00-2:25	Sherry L Meier West Des Moines Community Schools **NOTE 125 Meredith**		An Application to the TI-81 Graphics Calculators: Implications for Pre-calculus and Calculus Courses
2:30-2:55	Elgin Johnston	ISU	The MAA Mathematics Competitions
3:00-3:25	Patsy Fagan Jerold Mathews	Drake ISU	Curriculum and Evaluation Standards for School Mathematics
3:30-3:55	Anita Solow	Grinnell	Writing Calculus Labs

SESSION II 102 Meredith Hall

1:00-1:25	K. B. Athreya	ISU	On Measures of Nondegeneracy
1:30-1:55	A. Rahulji Parsa	Drake	Correspondence Analysis
2:00-2:25	Jennifer Rowley	UNL	to be announced
2:30-2:55	Milan N Lukic	MIU	A Note on Hermite Polynomials of a Gaussian Random Process
3:00-3:25	Li Luoluo	Zhongshan	Results on Inequalities of Matrix Product
3:30-3:55	Valery A Kholodnyi	MIU	Reduction of the Dirichlet Problem for Helmholtz' Equation in the Plane to the Cauchy Problem for a Sequence of Ordinary Differential Equations on the Boundary
4:00-4:25	James Wilson	ISU	New Proofs of Mean Comparison Inequalities

SESSION III 101 Meredith Hall

1:00-1:25	M. Anne Dow	MIU	Effects of Maharishi Mahesh Yogi's Transcendental Meditation Program on Factors Affecting Success in Mathematics
1:30-1:55	A. M. Fink	ISU	An Integral that Arises in the Search for Jesse James' Gold
2:00-2:25	H K Krishnapriyan	Drake	Yet Another Method of Counting Triangles
2:30-2:55	Catherine A. Gorini	MIU	Tiling Groups for Non-uniform Tilings
3:00-3:25	Milan Randic' David Oakland	Drake Drake	On Unique Number Labels for Graphs
3:30-3:55	Arnold Adelberg	Grinnell	A New Approach to Bernoulli Polynomials
4:00-4:25	Dan Ashlock	ISU	Compositional Attractors: A Unifying Idea for Permutation Polynomials

SESSION IV 106 Meredith Hall

1:00-4:00 Dynamic Systems, Chaos and Fractal Videos

STUDENT PAPERS

QUADRATIC FORMS AND TERNARY ALGEBRAS

Xiaorong Shen
Iowa State University

We have investigated a new class of algebras, the so-called comtrans algebras, that have recently arisen from the solution to a problem in differential geometry. We have developed some structure and representation theory of comtrans algebras, and have classified the low-dimensional cases of these algebras. Also, we have found some interesting connection between Lie algebras an a particular class of comtrans algebras.

CODES: BLACK AND WHITE

Michael Yanacheak
Drake University (student)

We will briefly review various mathematical codes for objects like graphs and polyhedra. Some criteria will be outlined which allow evaluation of codes and allow one to qualify them as bad (black) and good (white), permitting characterizations of some codes as intermediate (grey). Among codes and questions considered will be the question is a Gray code grey or not? We will end with novel codes for selected mathematical objects.

TILING GROUPS FOR THE REGULAR AND SEMIREGULAR TILINGS

Paul Shimura
Maharishi International University

Groups can be represented as Cayley graphs and some of these graphs become uniform periodic tilings, i.e., the three regular and the eight semiregular tilings. This talk will present these groups and will

analyze relationships between the transitivity classes of the vertices, edges, and tiles of the tilings and the corresponding Cayley graph.

FRACTAL GEOMETRY

Kevin Dennis
Luther College

The goal of the presentation is to generalize the notion of the Sierpinski triangle and apply this to a regular n-gon to form a Sierpinski n-gon. Also to be discussed are the conditions that are required for this generalization.

POWER IN THE BRITISH PARLIAMENT: WILL REFORM BE MORE "DEMOCRATIC"?

Robin Taylor
Drake University

Currently there are proposals for electoral reform in the United Kingdom. The "First past the post" system gives the party in power a disproportionately favorable number of seats over the popular vote. At the same time, lesser parties suffer, being underrepresented in seat distribution. Using the Shapley-Schubik and Banzhaff power index measurements, we will look at how the proposed reform may alter the power structure. Further directions of research will be explored.

THE SUPERIORITY OF LEBESGUE INTEGRATION OVER RIEMANN INTEGRATION: AN EXAMPLE

Jon Phillips
Iowa State University

We will show that for the purpose of recovering a function from its derivative, Lebesgue integration is superior to Riemann integration. This will be accomplished by producing an everywhere differentiable absolutely continuous function whose derivative is not Riemann integrable, but whose derivative is Lebesgue integrable. In fact, the Lebesgue integral of the derivative recovers the function everywhere (and not almost everywhere as could have been expected)!

USING DEGRADATION MEASURES TO ESTIMATE A TIME-TO-FAILURE DISTRIBUTION

C. Joseph Lu and William Q. Meeker, Jr.
Iowa State University

Some life tests result in few or no failures. In such cases, it is difficult to assess reliability with traditional life tests that record only time-to-failure. For some components, it is possible to obtain degradation measurements over time and these measurements may contain useful information about product reliability. By defining component failure in terms of a specified level of degradation, we can study the distribution of time of the first crossing for the degradation measures. This defines a time-to failure distribution. If the degradation model has one of several simple forms, it is possible to obtain a closed form expression for this distribution and standard statistical methods apply. The purpose of this work is to develop more general statistical methods for using degradation measures to estimate a time-to failure distribution. These methods employ Monte Carlo simulation to obtain point estimates and confidence intervals for reliability assessment and these can be used with a much more general and practical class of degradation models.

SELF-VALIDATING COMPUTATIONS OF PROBABILITIES AND PERCENTILES FOR CENTRAL AND NONCENTRAL CHI-SQUARE DISTRIBUTIONS

Morgan Wang
Iowa State University

Self-validating computational methods provide a scalar approximation to the desired value and a guaranteed error bound. Such methods are especially useful whenever computed results must satisfy given accuracy requirements. This paper gives methods for obtaining self-validating results when computing probabilities and percentiles of univariate continuous distributions. Probability functions

dealt explicitly in the paper are Central and Non-central Chi-square. Sel-validating is achieved through use of internal arithmetic computations.

ABSTRACTS

THE STATISTICS' EXPERIENCE VERSUS EXPERIENCING STATISTICS

W. Robert Stephenson
Iowa State University

For many years the statistics' experience has been approached with fear and loathing by many students. Statistics and mathematics anxiety, coupled with rumors of dull and seemingly incomprehensible material, have contributed to a less than enthusiastic perception of statistics courses. Improvements in texts and the use of computers have led to some improvements. Still, students often fail to appreciate the usefulness of statistics. This talk will review what has been done to improve the statistics' experience. Changes in texts, especially the advent of exploratory data analysis and real world problems, will be highlighted. The use of computers and video will also be discussed. In addition, suggestions will be made for ways to have students actually experience statistics as part of a statistics course.

EPISODES FROM ISLAMIC MATHEMATICS

Michael H. Millar
University of Northern Iowa

From the 7th to the 16th century A.D., Islamic mathematicians made a significant number of little known but highly original contributions to mathematics. Examples of this work will be considered from geometry, algebra, and number theory.

TRUE BASIC SOFTWARE FOR CALCULUS INSTRUCTION

Reginald Laursen and Steven Schlicker
Luther College

To assist students in their understanding of mathematical concepts, the Mathematics Department of Luther College is building a computer laboratory to aid in mathematics instruction. Members of the department have been writing computer programs, using the True BASIC language, to be utilized in this laboratory. Our goal is to use the laboratory to allow our students to experiment with and explore mathematical concepts, to search for patterns and make conjectures, and to utilize the graphics capabilities of the True BASIC language to enhance their abilities to visualize mathematics. We will discuss a number of True BASIC programs, developed at Luther College, along with accompanying laboratory assignments that we use in first semester calculus.

AN INTRODUCTION TO THE TI-81 GRAPHICS CALCULATORS: IMPLICATIONS FOR PRE-CALCULUS AND CALCULUS COURSES

Sherry L. Meier
West Des Moines Community Schools

This session is designed to give people a short introduction to the TI-81 Graphics Calculator and begin discussion of its possible uses in pre-Calculus and Calculus courses. Discourse on the implications its use may have on the content and instruction in college classrooms will also be encouraged. A set of 30 calculators will be available for hands-on experimentation and exploration.

THE MAA MATHEMATICS COMPETITIONS

Elgin Johnston
Iowa State University

Every year the MAA sponsors four exams of varying difficulties for students in grades 7-12. We will give an overview of these exams, talk about objectives of the exam program, and look at some sample problems from each exam.

CURRICULUM AND EVALUATION STANDARDS FOR SCHOOL MATHEMATICS

Patsy Fagan, Drake University
Jerold Mathews, Iowa State University

The NCTM Curriculum and Evaluation Standards for School Mathematics are impacting the K-12 mathematics curriculum. It is expedient, therefore, that instructors of post-secondary mathematics classes not only be aware of the content and philosophy of the Standards but also of the impact the reform has on the teaching of undergraduate courses. This session will discuss the Standards and present applications to post-secondary mathematics.

WRITING CALCULUS LABS

Anita Solow
Grinnell College

Calculus labs are becoming more common. As part of an NSF-funded calculus project, I have been collecting, editing and writing labs. This talk will focus on how labs are written. In particular, I will discuss the goals of the lab experience, the decision that we made to make our labs software independent, and the problems we have had writing and using the labs.

ON MEASURES OF NONDEGENERACY

K. B. Athreya
Iowa State University

If ϕ is a convex function and X a random variable, then (by Jensen's inequality) $\psi_\phi(X) = E_\phi(X) - \phi(EX)$ is nonnegative and zero iff either ϕ is linear in the range of X or X is degenerate. So if ϕ is not linear then $\psi_\phi(X)$ is a measure of nondegeneracy of the random variable X. For $\phi(x) = x^2$, $\psi_\phi(X)$ is simply the variance V(X) which is additive in the sense that $V(X + Y) = V(X) + V(Y)$ if X and Y are uncorrelated. In this note it is shown that if $\phi''(\bullet)$ is monotone increasing then ψ_ϕ is sub-additive for all (X, Y) such that $EX \geq 0$, $P(Y \geq 0) = 1$ and $E(X|Y) = EX$ w.p.1. and is additive essentially only if ϕ is quadratic and (X, Y) is degenerate. Thus, it confirms the unique role of variance as a measure of nondegeneracy. An application to branching process is also given.

CORRESPONDENCE ANALYSIS

A. Rahulji Parsa
Drake University

Correspondence Analysis (CA) is a technique for displaying rows and columns of a Contingency Table as points in lower dimensional space. That is, for a given I x J contingency table with non-zero cell counts, CA considers the I rows as points in J dimensional space and J columns as points in I dimensional space and obtain a display of rows and columns in an "optimal" lower dimensional vector space. The purpose of this display is to study the relationship between rows and between columns. Appropriate formulae will be derived to obtain the display. Also, an example will be considered to introduce the concepts, style of the analysis and interpretation of the results.

A NOTE ON HERMITE POLYNOMIALS OF A GAUSSIAN RANDOM PROCESS

Milan N. Lukic
Maharishi International University

A formula for computing the expectation of a product of an arbitrary (finite) number of hermitian polynomials of a Gaussian random process will be considered. This result gives rise to a method for computing some integrals involving hermitian polynomials of a nonrandom variable.

RESULTS ON INEQUALITIES OF MATRIX PRODUCT

Li Luoluo
Zhongshan University

Motivated by results of Komaroff and of Luoluo, we present a set of inequalities for the eigenvalues of the set of nxn Hermitian matricies.

REDUCTION OF THE DIRICHLET PROBLEM FOR HELMHOLTZ'S EQUATION IN THE PLANE TO THE CAUCHY PROBLEM FOR A SEQUENCE OF ORDINARY DIFFERENTIAL EQUATIONS ON THE BOUNDARY

Valery A. Kholodnyi
Maharishi International University

The Dirichlet boundary value problem (inside and outside) for Helmholtz's equation in the plane with arbitrary smooth closed boundary will be considered. A method which allows reduction of this problem to the Cauchy problem for a sequence of ordinary differential equations will be presented. This sequence defines approximate source functions on the boundary, and converges weakly to an exact source function in Sobolev spaces. The weak convergence is enough for most applications, and at the same time it allows us to avoid the usual instability difficulties that arise in computer applications.

NEW PROOFS OF MEANS COMPARISON INEQUALITIES

James Wilson
Iowa State University

We give another simple inductive proof of the arithmetic-geometric means inequality. The proof generalizes to give the inequality comparing means M_ϕ and M_ψ where $\psi \circ \phi^{-1}$ is convex.

EFFECTS OF MAHARISHI MAHESH YOGI'S TRANSCENDENTAL MEDITATION PROGRAM ON FACTORS AFFECTING SUCCESS IN MATHEMATICS

M. Anne Dow
Maharishi International University

This talk presents an overview of research indicating improvement in factors affecting success in mathematics in students practicing Maharishi's Transcendental Meditation and TM Sidhi program. The focus will be on studies carried out at college and university level. The talk includes a theoretical model for the creative process involved in learning and doing mathematics that helps explain why TM should produce these effects.

AN INTEGRAL THAT ARISES IN THE SEARCH FOR JESSE JAMES' GOLD

A.M. Fink
Iowa State University

I have formulated an optimal search problem for (the missing) gold from a bank robbery. I am led to an integral for the probability density of finding the gold at a specific site. This integral has some interesting features, some of which the program Mathematica did not discover. Analysis of the integral leads to some surprising results.

YET ANOTHER METHOD OF COUNTING TRIANGLES

H. K. Krishnapriyan
Drake University

In "The Eternal Triangle-A History of a counting Problem", College Mathematics Journal, November 1989, Mogens Esrom Larsen surveys the many different ways of finding the general formula for the number of triangles in an equilateral triangle with side n units tiled with unit equilateral triangles. He remarks "...[the different ways of obtaining the formula] cover most of the methods in a textbook on combinatorics. ...a teacher presenting the problem in a class may very well encounter a student with a completely new line of attack." While he is not presenting the result in class, and I have moved a certain distance away from being a student in class, a different method of solving the problem did occur to me as I was reading his article. The purpose of this talk is to present this method and its pedagogic uses.

TILING GROUPS FOR NON-UNIFORM TILINGS

Catherine A. Gorini
Maharishi International University

Uniform tilings can be represented as the Cayley graph of a finitely generated group. This paper investigates the possibility of using groups to represent non-uniforms tilings.

ON UNIQUE PRIME NUMBER LABELS FOR GRAPHS

Milan Randic and David O. Oakland
Drake University

We will outline a scheme in which a prime number is assigned to each edge in a graph. The assignment is done in a canonical manner that ensures that each graph is represented by a unique integer. We will illustrate graphs (with loops, with multiple connections and disconnected) associated with such a procedure. The outline of the algorithm that gives the canonical representation will illustrate the approach. Some properties of the proposed labeling of edges will be discussed, such as the identification of common subgraphs.

A NEW APPROACH TO BERNOULLI POLYNOMIALS

Arnold Adelberg
Grinnell College

Starting with finite difference considerations involving binomial coefficients, a class of multivariable polynomials is developed, which are closely related to the "degenerate weighted Bernoulli and Stirling polynomials". They come with a natural combinatorial interpretation. Many of the classical results are generalized and some new binomial identities and factorization results are established.

COMPOSITIONAL ATTRACTORS: A UNIFYING IDEA FOR PERMUTATION POLYNOMIALS

Dan Ashlock
Iowa State University

Compositional attractors are ideal in a polynomial ring that are not only closed under addition and attractors under multiplication but attractors under polynomial composition as well. Several different results on the membership and order of groups of permutation polynomials are all special cases of a single result that follows from the study of computational attractors. This talk presents this result and establishes the connections to existing results.

A Note on Campus Locations and Parking

Most of the meetings and activities will take place in Meredith Hall which is in the center of the Drake campus. The Friday evening presentation and reception will be in the Quad Creek Faculty House which is in the lower level of the north end of Hubbell Dining Hall (enter from the north end of the building). The most convenient parking lot is the Meredith/Olmsted lot which is on the north side of University Avenue with an entrance from University. This is a paid lot with charges based on the length of stay (although there is no charge on Saturday). Directly across University from this lot is a free lot with entrances on both 28th and 29th streets. In addition there is a visitors' lot near the corner of 31st and University (entrance from Brattleboro) one block south of University. There are several activities scheduled on campus for the same weekend as our meetings but these three lots are scheduled to be open for the general public. Other lots shown on the campus map may be closed that weekend.