MONDAY, SEPTEMBER 7--Labor Day Holiday, all offices closed.

TUESDAY, SEPTEMBER 8

Algebra 241 AH 2:00 pm
Professor Jürgen Ritter, University of Heidelberg, Orthogonal characters.

Algebraic Number Theory 241 AH 3:00 pm
Professor Leon McCulloh, Stickelberger and Galois module structures.

Classical Analysis 245 AH 1:00 pm
Professor Lee Rubel, A topic in joint approximation.

Differential Geometry 245 AH 3:00 pm
Professor Ernst Ruh, University of Bonn and Institute for Advanced Study, Almost flat manifolds

Felix Klein 243 AH 3:00 pm
Seminar to begin on 9/29/81.

Functional Analysis 257 AH 3:00 pm
Professor M. M. Day, Left thick to left lumpy - a guided tour.

Geometric Potpourri 243 AH 2:00 pm
Organizational meeting.

Logic 247 AH 2:00 pm
See Thursday listing this week.

Syzygy Street 247 AH 3:00 pm
Professor Matt Miller, University of Tennessee, $K[t_6, t_7, t_8, t_9, t_{10}]$.

Number Theory 247 AH 1:00 pm
Professor P. T. Bateman, Application of theorems on the distribution of primes to obtain results on the coefficients of the cyclotomic polynomial.

WEDNESDAY, SEPTEMBER 9

Computer Science Colloquium 237-9 DCL 3:00 pm
Mr. Ehud Y. Shapiro, Yale University, Algorithmic program debugging.

Combinatorial Algorithms 237 DCL 4:00 pm
Professor Yuri Gurevich, Ben-Gurion University and Bowling Green State University, Trees, automata, and games.
### THURSDAY, SEPTEMBER 10

**Mathematics Colloquium**

Professor Ernst Ruh, University of Bonn and Institute for Advanced Study, Almost symmetric spaces.

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<td>3:15 pm</td>
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<td>Coffee &amp; Tea</td>
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**ABSTRACT:** Symmetric spaces serve as models in Geometry and Physics and are extensively studied. What can be said if a space is almost symmetric in the sense that the curvature of the space is close to the curvature of a model? In 1950 Rauch started this line of investigation and proved: A simply connected space with curvature close to one is homeomorphic to a sphere. In my talk, I will discuss this question for all Riemannian symmetric spaces as models.

**Algebraic Number Theory**

Professor Richard Mollin, Queen's University, Kingston, Class numbers of algebraic number fields.

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**Applied Math**

No meeting this week.

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**Deformation Theory**

Dr. Barbara Peskin, Introduction to deformation theory.

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**Dynamical Systems & Strange Attractors**

Professor Felix Albrecht, On strange attractors, I

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**Group Theory**

Organizational meeting.

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**Logic-Special Seminar**

Professor Yuri Gurevich, Ben Gurion University & Bowling Green State University, The monadic quantifier.

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**Number Theory**

Professor H. E. Richert, Visiting from University of Ulm, On the Iwaniec Sieve.

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### FRIDAY, SEPTEMBER 11
MATHMATICAL TIMETABLE

MONDAY, SEPTEMBER 14

**Illinois Series in Mathematics Education**
261 IUB
4:00 pm
Professor Thomas C. O'Brien, SIU at Edwardsville, The teachers' center project -- a novel approach to improving mathematics in schools.

Coffee & Tea
261 IUB
3:30 pm

**Survey of Geometric Structures** (Math 438)
261 AH
11:00 am
Professor Ph. Tondeur, Foliations II. This is the beginning of a new section of the course. There will be 5 lectures on foliations. The sections of the course are largely independent and we invite people to attend the sections according to their interests.

TUESDAY, SEPTEMBER 15

**Algebra**
261 AH
2:00 pm
Professor Jürgen Lutter, University of Heidelberg, Orthogonal groups, II.

**Algebraic Number Theory**
261 AH
3:00 pm
Professor I. N. MacDonald, Stickelberger and Galois module structures, II.

**Classical Analysis: 'Join' with Logic**
345 AH
1:00 pm
Professor B. L. van der Waerden, Applications of Modern Algebra to Mathematical Logic.

**Differential Geometry**
245 AH
3:00 pm
No meeting this week.

**Felix Klein Seminar**
243 AH
3:00 pm
Seminar to begin on 9/29/81.

**Functional Analysis**
347 AH
3:00 pm
Professor R. I. Dunlop, The background of almost periodicity and amenability in topological semigroups.

**Geometric Puzzles**
243 AH
2:00 pm
Professor John Natzel, A problem of Fourier on 17 lines.

**Logic**
247 AH
2:00 pm
See Classical Analysis This Week.

**Max Newman**
243 AH
11:00 am
Professor M. R. Hamstrom will continue speaking on the Amoebotrus monster.

**Number Theory**
347 AH
1:00 pm
Professor Hans-Ulrich Kiepert, visiting from the University of Ulm, The Iwaniec Sieve, II.

**Szego's lecture**
247 AH
3:00 pm
Professor E. Graham Evans, Paul Roberts Intersection Theorems.
Mathematical Timetable

WEDNESDAY, SEPTEMBER 16

Mathematics Department Faculty Meeting 314 AH 4:00 pm
For all members of the regular faculty. Professor Halberstam, Chair. Dean Prokasy will be present to make a statement about the financial problems facing the College and Campus, and to answer questions.

Coffee & Tea 321 AH 3:30 pm

Computer Science Colloquium 237 DCL 3:00 pm
Dr. L. C. W. Dixon, Hatfield Polytechnic, England; The place of parallel computation in numerical optimization.

Combinatorial Algorithms 237 DCL 4:00 pm
Professor Franco Preparata, EE Department, Shortest path problem for Euclidean plane with obstacles.

Survey of Geometrical Structures (Math 429) 241 AH 11:00 am
Professor Ph. Tondeur, Prolations, Ill.

THURSDAY, SEPTEMBER 17

Mathematics Colloquium 314 AH 4:00 pm
Dr. Peter Webb, Cambridge University visiting UIUC, Quivers and group representations.

Coffee & Tea 321 AH 3:15 pm

ABSTRACT: The talk is about the way Auslander-Preiten sequences may be applied to give results in the representation theory of finite groups. The implications of this general theory include an extension of the usual orthogonality relations for characters, and a technique for computing certain cohomology groups. We describe the structure of the Auslander-Preiten quiver of a group ring.

Algebraic Number Theory 241 AH 2:00 pm
Professor A. Fröhlich, Galois module structure and the embedding problem (work of Brinkhuis).

Applied Math 314 AH 1:00 pm
Professor Dick Bishop, Computer analysis of building energy consumption.

Deformation Theory 247 AH 3:00 pm
Dr. Barbara Neskin, Introduction to deformation theory, II.

Dynamical Systems & Strange Attractors 245 AH 2:00 pm
Professor Felix Albrecht, On strange attractors, II.

Group Theory 243 AH 1:00 pm
Professor Derek Robinson, Some finitely presented soluble groups, I.

Number Theory 247 AH 1:00 pm
Professor Carlos Moreno, The Chowla-Selberg Formula, I.

FRIDAY, SEPTEMBER 18

Survey of Geometrical Structures (Math 429) 241 AH 11:00 am
Professor Ph. Tondeur, Prolations, Ill.
ABSTRACT: There are complex computer programs to simulate the energy flow in buildings. CERL's BLAST (Building Loads Analysis and Systems Thermodynamics) is one such and the National Bureau of Standards has another. The kinds of factors which are taken into account will be presented briefly. A more detailed account will be given of how the one-dimensional heat equation for multilayered walls is solved and in what form that solution is used. The interlacing of zeros of solutions of ordinary second-order differential equations leads to a nice refinement of previous techniques.
## University of Illinois at Urbana-Champaign

**DEPARTMENT OF MATHEMATICS · 273 ALTGELD HALL · 1409 WEST GREEN STREET · URBANA, ILLINOIS 61801 · (217) 333-3350**

**MATHEMATICAL TIMETABLE**

**SEPTEMBER 21 - 25, 1981**

### MONDAY, SEPTEMBER 21

**Arthur B. Coble Memorial Lecture**
Dr. Ron L. Graham, Bell Laboratories, Bin packing: A paradigm in the analysis of algorithms.

**Coffee & Tea**

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**Computer Science Colloquium**
Dr. Ross Quinlan, Rand Corporation, Understanding simulation traces.

**Probability & Statistics**
Professor Adam Martinsek, Sequential estimation with relative squared error loss.

**NOTE TIME CHANGE!**

**Survey of Geometrical Structures (Math 428)**
Professor Ph. Tondeur, Foliations, IV.

### TUESDAY, SEPTEMBER 22

**Arthur B. Coble Memorial Lecture**
Dr. Ron L. Graham, Bell Laboratories, Combinatorial number theory

**Coffee & Tea**

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**Algebraic Number Theory**
Dr. Martin Taylor, Rings of algebraic integers as hermitian Galois modules.

**Classical Analysis**
No meeting this week.

**Differential Geometry**
No meeting this week.

**Felix Klein**
Seminar to begin on 9/29/81.

**Functional Analysis**
Professor R. G. Bartle, The history of functional analysis (Part I of II)

**Geometric Potpourri**
No meeting this week.

**Logic**
Professor Ward Henson, High school algebra.

Max Newman
Professor M.-E. Hamstrom, The Armentrout monster.

**Number Theory**
Professor Carlos J. Moreno, The Chowla-Selberg formula, II

**Syzygy Street**
Professor E. Graham Evans, Paul Roberts intersection theorems, II
Mathematical Timetable

WEDNESDAY, SEPTEMBER 23

Arthur B. Coble Memorial Lecture 314 AH 5:00 pm
Dr. Ron L. Graham, Bell Laboratories, Euclidean Ramsey theory.

Coffee & Tea 321 AH 4:15 pm

Combinatorial Algorithms 237 DCL 4:00 pm
No meeting this week.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor Ph. Tondeur, Foliations, V

THURSDAY, SEPTEMBER 24

Algebraic K-Theory 241 AH 2:00 pm
Professor Bruce Magurn, University of Oklahoma, Unit representation of Whitehead groups.

Applied Math 314 AH 1:00 pm
Professor Lynn McLinden, Convergent sequences of nonconvex minimization problems.

Deformation Theory 247 AH 3:00 pm
Dr. Barbara Peskin, Introduction to deformation theory, III

Dynamical Systems & Strange Attractors 245 AH 2:00 pm
Professor Felix Albrecht, On strange attractors, III

Group Theory 243 AH 1:00 pm
Professor Derek Robinson, Some finitely presented soluble groups

Number Theory 247 AH 1:00 pm
Mr. U. Zannier, On recurrent sequences modulo p.

FRIDAY, SEPTEMBER 25

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor H. Osborn, Vector bundles, I
CONVERGENT SEQUENCES OF NONCONVEX MINIMIZATION PROBLEMS

Professor Lynn McLinden
Department of Mathematics, UIUC

ABSTRACT: In a normed space we consider a sequence of minimization problems $P_n$ which "converge" (in a geometrically natural sense) to some limit problem $P$. The situation provides a framework for considering, for example, a large number of iterative numerical schemes for solving $P$. Weak sufficient conditions are given, for not necessarily convex problems, to ensure that any sequence $x_n$ of $\varepsilon_n$-approximate solutions to the $P_n$'s must cluster about some exact solution to $P$ as $0 < \varepsilon_n \longrightarrow 0$. In the convex case a strong necessary condition is also given, which all exact solutions of $P$ must satisfy in terms of limiting behavior of solutions to the $P_n$'s. Since explicit linear perturbation terms are included throughout, the results relate to linear stability theory as well as successive approximation.

September 24, 1931

1 pm
thursday

314
altgeld hall
MATHEMATICAL TIMETABLE

MONDAY, SEPTEMBER 28

Probability & Statistics
Topic, time and room to be announced.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor H. Osborn, Vector bundles, II

TUESDAY, SEPTEMBER 29

Mathematics Colloquium 314 AH 4:00 pm
Professor Hassler Whitney, Institute for Advanced Study, Letting research come naturally.

Algebraic Number Theory 241 AH 2:00 pm
Dr. Martin Taylor, Rings of algebraic integers as hermitian Galois modules, II

Professor Jürgen Ritter, Informal lecture of Koch's theory of wild representations of skewfields, I

Classical Analysis 245 AH 1:00 pm
Dr. Michael Cranston, The Martin boundary for two-dimensional Ornstein-Uhlenbeck processes.

Differential Geometry 245 AH 3:00 pm

Felix Klein 243 AH 3:00 pm
Mr. Stephen Gray, Graphics systems; an overview of the hardware and software involved.

Functional Analysis 347 AH 3:00 pm
Professor R. G. Bartle, The history of functional analysis, II

Geometric Potpourri 243 AH 2:00 pm
Professor Dick Bishop, Interlacing of zeros of transfer functions.

Logic 247 AH 2:00 pm
Dr. Michael von Rimscha, Non-founded set theory, I

Max Newman 243 AH 11:00 am
Professor M.-E. Hamstrom, The Armentrout monster.

Number Theory 247 AH 1:00 pm
Dr. R. Balasubramanian, Some omega theorems.

Syzygy Street 247 AH 3:00 pm
Professor Robert Fossum, The representation ring of one dimensional formal group laws.
WEDNESDAY, SEPTEMBER 30

Combinatorial Algorithms 237 DCL 4:00 pm
No meeting this week.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor H. Osborn, Vector bundles, III

THURSDAY, OCTOBER 1

Computer Science Colloquium 115 DCL 4:00 pm
Prof. Dr. P. Deuflhard, University of Heidelberg, Recent advances in multiple shooting techniques.

Algebraic Number Theory 241 AH 2:00 pm
Professor Jürgen Ritter, Informal lecture on Koch's theory of wild representations of skewfields, II

Applied Math 314 AH 1:00 pm
Professor Jay Mittenthal, Department of Anatomical Sciences, UIUC, A model: The shapes of arthropod body parts minimizing a mechanical energy functional.

Decision Problems 243 AH 2:00 pm
Mr. Carl Weaver, Markov properties of time systems, II

Deformation Theory 247 AH 3:00 pm
Dr. Barbara Peskin, Introduction to deformation theory, IV

Dynamical Systems & Strange Attractors 245 AH 2:00 pm
Professor Felix Albrecht, On strange attractors, IV

Group Theory 243 AH 1:00 pm
Dr. Ursula Webb, Automorphisms of graphs and of infinite and finite nilpotent groups.

Number Theory 247 AH 1:00 pm
Professor Paul Bateman, How many Permat and Mersenne primes are there?

FRIDAY, OCTOBER 2

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor H. Osborn, Vector bundles, IV
A MODEL: THE SHAPES OF ARTHROPOD BODY PARTS MINIMIZING A MECHANICAL ENERGY FUNCTIONAL

Professor Jay Mittenthal
Department of Anatomical Sciences, UIUC

ABSTRACT: With R. M. Mazo (Institute for Theoretical Science, Eugene, Oregon) I have developed a model for the shaping of body parts in arthropods, such as insects and crustaceans. In these animals the external form is produced by a sheet of cells which secretes the surface cuticle. Experiments suggest that the sheet consists of cells with different adhesive affinities; similar cells are grouped together in a block, and the blocks form a quilt pattern. Rearrangement of cells within each block can adjust the shape of the sheet by changing the shapes of the blocks. By means of such rearrangements the sheet develops that shape which minimizes an energy functional, the difference between energy of mechanical strain due to bending of the epithelium and the work of adhesion among cells.

We have obtained and solved the Euler-Lagrange differential equations for the shape of the surface, for two surfaces treated as figures of revolution. These solutions correctly predict several biological phenomena. The formalism offers opportunities for extension to other problems of experimental interest.

In the seminar I will discuss the solutions obtained so far, and some of the outstanding problems.
MATHMmaticAL TIMETABLE

MONDAY, OCTOBER 5

Special Lecture

Professor Paul Erdős, Hungarian Academy of Sciences, Topic to be announced.

Survey of Geometrical Structures (Math 428)

Professor H. Osborn, Vector bundles, IV

TUESDAY, OCTOBER 6

Algebraic K-Theory

Professor R. Keith Dennis, Cornell University, $K_1$ of integral group rings.

Algebraic Number Theory

Professor Jürgen Ritter, Informal lecture of Koch's theory of wild representations of skewfields, III

Classical Analysis

Dr. Michael Cranston, The Martin boundary for two-dimensional Ornstein-Uhlenbeck processes, II

Differential Geometry

Professor Philippe Tondeur, The index of harmonic foliations on spheres.

Functional Analysis

Professor R. G. Bartle, The history of functional analysis, III

Geometric Potpourri

Professor Bruce Reznick, Lattice points in triangles.

Logic

Dr. Michael von Rimscba, Non-founded set theory, II

Max Newman

Professor M.-E. Hamstrom, The Armentrout monster.

Number Theory

Professor David Leep, University of Chicago, Elementary proofs of some theorems on systems of quadratic forms.

Syzygy Street

Professor Robert Fossum, The representation ring of one dimensional formal group laws, II

WEDNESDAY, OCTOBER 7

Combinatorial Algorithms

Professor Donna Brown, A lower bound for channel width in VLSI.

Felix Klein

Mr. Stephen Gray, Graphics; an overview of the hardware and software involved, II
Mathematical Timetable

WEDNESDAY, OCTOBER 7 (continued)

Probability-Statistics 314 AH 3:00 pm
Mr. Atul Jain, a discussion of L. H. Chen's paper, "Martingale transform and random Abel-Dini series."

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor H. Osborn, Vector bundles, V.

THURSDAY, OCTOBER 8

Mathematics Colloquium 314 AH 4:00 pm
Professor John Walsh, University of British Columbia, Sample paths and their Markov processes: the Chacom-Jamison theorem.

Computer Science Colloquium 115 DCL 4:00 pm
Prof. Dr. P. Deuflhard, University of Heidelberg, Recent advances in multiple shooting techniques.

Algebraic Number Theory 241 AH 2:00 pm
No meeting today.

Applied Math 314 AH 1:00 pm
Professor R. P. Futrelle, Department of Genetics & Development, The mathematical model meets godzilla (=slime mold data)

Decision Problems 243 AH 2:00 pm
Mr. Peter Lindsay, Embeddings into semigroups with only a few defining relations.

Deformation Theory 247 AH 3:00 pm
Dr. Barbara Peskin, Introduction to deformation theory, V

Dynamical Systems & Strange Attractors 245 AH 2:00 pm
Professor Felix Albrecht, On strange attractors, V.

Group Theory 243 AH 1:00 pm
Dr. Ursula Webb, Automorphisms of graphs and of infinite and finite nilpotent groups, II

Number Theory 247 AH 1:00 pm
Professor Paul Erdős, Hungarian Academy of Sciences, Topic to be announced.

FRIDAY, OCTOBER 9

Mathematics Colloquium 241 AH 5:00 pm
Professor John Coates, Princeton University, On the arithmetic of elliptic curves.

Survey of Geometrical Structures 241 AH 11:00 am
Professor H. Osborn, Vector bundles, VI
MONDAY, OCTOBER 6

**Computer Science Colloquium** 115 DCL 4:00 pm
Prof. Gerhard Zimmermann, University of Kiel, Germany; The MIMOLA Design System: A Computer Architecture Synthesis Tool.

**Joint Seminar-CERL, Educational Psychology and Computer Science** 351 ERL 3:00 pm
Prof. Charles van der Mast, Delft University of Technology; A Modular Cai System.

**Representations of p-adic Groups** 241 AH 4:00 pm
Prof. Ranga Rao, The Weil representation, III

TUESDAY, OCTOBER 7

**Arthur B. Coble Memorial Lecture** 314 AH 4:00 pm
Prof. S.-S. Chern, University of California, Berkeley; Introduction to Exterior Differential Systems.

**Coffee and Tea** 321 AH 3:15 pm

**Algebraic Geometry** 243 AH 3:00 pm
Ms. Catherine Meadows, Linear systems cut out on curves by hypersurfaces, II

**Combinatorics & Optimization** 243 AH 11:00 am
Prof. Paul Weichsel, Distance-regular graphs.

**Differential Geometry** 241 AH 3:00 pm
Prof. F. W. Kamber, Harmonic foliations, IV

**Functional Analysis** 245 AH 1:00 pm
Dr. J. Kupka, visiting from Monash, Measurable cross section, I

**Geometric Potpourri** 247 AH 2:00 pm
Prof. R. Alexander, When Crofton's formula fails.

**Group Theory** 245 AH 3:00 pm
Prof. J. Rotman, Mathieu Groups, IV

**Logic** 241 AH 2:00 pm
Prof. Paul Schupp, The theory of ends, pushdown automata, and second-order logic, II

**Number Theory** 247 AH 1:00 pm
Prof. H. Halberstam, Introduction to sieves, III
WEDNESDAY, OCTOBER 8

Arthur B. Coble Memorial Lecture 314 AH 5:00 pm
Prof. S.-S. Chern, University of California, Berkeley; Applications of Exterior Differential Systems.

Coffee and Tea 321 AH 4:15 pm

Combinatorial Algorithms 237 DCL 4:00 pm
To be announced.

Probability and Statistics 241 AH 4:00 pm
Prof. N. Ninomiya, Osaka University, A notion of the potential taken with respect to generalized kernels: existence theorems.

Riemann 243 AH 4:00 pm
No meeting.

THURSDAY, OCTOBER 9

Arthur B. Coble Memorial Lecture 151 EEB 11:00 am
Prof. S.-S. Chern, University of California, Berkeley, Web geometry.
NOTE TIME, ROOM, AND TITLE CHANGE!

Algebra 245 AH 2:00 pm
Prof. B. Reznick, How to write a polynomial as a sum of squares: notes toward a combinatorial theory.

Applied Math 314 AH 1:00 pm
Prof. Eric Jakobsson, Department of Physiology and Biophysics and Program in Bioengineering, UIUC, Mathematical models of electrical excitation and signal propagation in muscle and nerve.

Classical Analysis 243 AH 2:00 pm
No meeting.

Functional Analysis 245 AH 1:00 pm
Dr. J. Kupka, Measurable cross section, II

Number Theory 247 AH 1:00 pm
Dr. H. Daboussi, Mean values of multiplicative functions, II

Pro-Seminar
New time, room, speaker and title to be announced on blackboard.

FRIDAY, OCTOBER 10

Professor Gianna Stefani from the University of Florence (Control Theory) will be here until October 20. Her office for that period of time will be 317 AH, 3-3414.
MONDAY, OCTOBER 12

Computer Science Colloquium 115 DCL 4:00 pm
Professor Clyde P. Kruskal, New York University's general-purpose parallel processor.

Illinois Series in Mathematics Education 261 IUB 4:00 pm
Professor John Dossey, Illinois State University, Normal: The professional development of mathematics teachers: intention and reality.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor H. Osborn, Vector Bundles, VII

TUESDAY, OCTOBER 13

Algebraic Number Theory 241 AH 2:00 pm
Dr. Jürgen Ritter, Wild representations of skewfields and induced representations of absolute Galois groups.

Classical Analysis 245 AH 1:00 pm
Professor Donald Burkholder, Boundedness of singular integral operators on Lebesgue-Bochner spaces.

Combinatorics 145 AH 3:00 pm
Professor E. T. Parker, Some permanents.

Differential Geometry 245 AH 3:00 pm

Functional Analysis 347 AH 3:00 pm
Professor H. P. Lotz, Quasi-compact positive operators on $L^\infty$ and $L^1$.

Geometric Potpourri 243 AH 2:00 pm
Professor Bruce Reznick, Lattice points in triangles, II.

Logic 247 AH 2:00 pm
See Thursday's Colloquium.

Max Newman 243 AH 11:00 am
Professor M.-E. Hamstrom, The Armentrout monster.

Number Theory 247 AH 1:00 pm
Dr. David Richman, Su una interessante curiosità numerica (The talk will be in English).

Syzzygy Street 247 AH 3:00 pm
Dr. Craig Huneke, Primary tokens of authority (8-6).

WEDNESDAY, OCTOBER 14

Combinatorial Algorithms 237 DCL 4:00 pm
Professor Michael Loui, CSL, Minimizing access pointers into trees and arrays.
### Wednesday, October 14 (Con't)

**Felix Klein**

155 AH  
4:00 pm  
Profesor George Francis, The kind of graphics system I wish I had access to. (Progress report on PLATO lesson-riemann-).

**Probability-Statistics**

314 AH  
4:00 pm  
To be announced.

**Survey of Geometrical Structures (Math 428)**

241 AH  
11:00 am  
Professor Felix Albrecht, Singularities, I

### Thursday, October 15

**Mathematics Colloquium**

314 AH  
4:00 pm  
Professor A. K. Lachlan, Simon Fraser University visiting University of Chicago; Finite homogeneous structures.

**Coffee & Tea**

321 AH  
3:15 pm  

**Abstract:** Let \( L \) be a finite relational language. Call an \( L \)-structure \( M \) homogeneous if any isomorphism between finite substructures can be extended to an automorphism of \( M \). An \( L \)-structure is stable if it is either finite or stable in the sense of Shelah. Let \( H(L) \) denote the class of finite homogeneous \( L \)-structures. Notions of rank, dimension, and shrinking for homogeneous \( L \)-structures are introduced. The following conjecture will be discussed: For every \( L \) there exists a finite class \( A \) of countable stable homogeneous \( L \)-structures such that every \( M \in H(L) \) is either in \( A \) or obtainable by shrinking a member of \( A \).

**Algebraic Number Theory**

241 AH  
2:00 pm  
Professor Engineer, Geotory, Institute for Advanced Study, Princeton, NY; Some problems in Iwabusa theory.

**Applied Math**

314 AH  
1:00 pm  
No meeting this week.

**Chess Match**

245 AH  
1:00 pm  
Dr. Simon Fitzpatrick, The Karpov-Korchnoi Match.

**Decision Problems**

243 AH  
2:00 pm  
Mr. F. Lindsay, Embeddings into semigroups with only a few defining relations, II

**Deformation Theory**

247 AH  
3:00 pm  
Professor Graham Evans, Herzog's work on deformations.

**Dynamical Systems & Strange Attractors**

245 AH  
2:00 pm  
Professor Robert Hunicaster, On Levinson's paper, I.

**Group Theory**

243 AH  
1:00 pm  
Dr. Ursula Webb, Automorphisms of graphs and of infinite and finite nilpotent groups, II

**Number Theory**

247 AH  
1:00 pm  
Professor Heini Halberstam, The Greaves sieve.

### Friday, October 16

**Survey of Geometrical Structures (Math 428)**

241 AH  
11:00 am  
Professor Felix Albrecht, Singularities, II
MATHEMATICAL TIMETABLE

MONDAY, OCTOBER 19

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor Felix Albrecht, Singularities, III

TUESDAY, OCTOBER 20

Computer Science Colloquium 115 DCL 4:00 pm
Dr. L. A. Hageman, Westinghouse Electric Corporation, A family of iterative procedures for solving the semi-implicit Navier-Stokes difference equations: preliminary results.

Algebraic Number Theory 241 AH 2:00 pm
Professor David Goss, Brandeis University, Introduction to the arithmetic of function fields.

Dr. Colin Bushnell, Tame division algebras and root numbers, I

Classical Analysis 245 AH 1:00 pm
Professor Robert Kaufman, Singular integrals, linear functionals, and special analytic functions (work of Uy).

Differential Geometry 245 AH 3:00 pm
To be announced.

Donald B. Gillies Memorial Lecture 141 Loomis 8:00 pm
Professor James H. Wilkinson, Stanford University, Rounding error analysis without tears.

Functional Analysis 347 AH 3:00 pm
Professor H. P. Lotz, Quasi-compact positive operators on $L^\infty$ and $L^1$, II

Geometric Potpourri 243 AH 2:00 pm
Professor George Francis, What the foliation of the figure-B knot complement really looks like: a visualization exercise in low dimensional topology.

Logic 247 AH 2:00 pm
To be announced.

Max Newman 243 AH 11:00 am
Professor M.-E. Hamstrom, The Armentrout monster.

Number Theory 247 AH 1:00 pm
Professor Heini Halberstam, The Greaves Sieve, II

Syzygy Street 247 AH 3:00 pm
Professor Chester Chen, The complex and real Bezout theorem.

WEDNESDAY, OCTOBER 21

Combinatorial Algorithms 237 DCL 4:00 pm
No meeting this week.
WEDNESDAY, OCTOBER 21 (Continued)

Donald B. Gillies Memorial Lecture
Professor James H. Wilkinson, Stanford University, Backward and forward error analysis and judicious mixtures.

Felix Klein
Professor George Francis, PLATO lesson-riemann-: a general purpose surface plotting editor.

Probability-Statistics
Professor Robert Kaufmann, Brownian motion and absolutely convergent Fourier series (Kahane, Katznelson, and Hruscèv).

Survey of Geometrical Structures (Math 428)
Professor Felix Albrecht, Singularities, IV

THURSDAY, OCTOBER 22

Algebra
Professor Frank DeMeyer, Saltman’s generic Galois extensions.

Applied Math
Professor Robert G. Muncaster, A spectral problem in transport theory.

Chess Seminar
Dr. Simon Fitzpatrick, The Karpov-Korchnoi Match (continued)

Decision Problems
Mr. P. Lindsay, Embeddings into semigroups with only a few defining relations, III

Deformation Theory
Professor E. G. Evans, Herzog’s work on deformations. (Postponed from last week)

Donald B. Gillies Memorial Lecture
Professor James H. Wilkinson, Stanford University, Kronecker’s canonical form via linear differential systems.

Dynamical Systems and Strange Attractors
Professor Robert Muncaster, On Levinson’s Paper, II

Group Theory
To be announced.

Number Theory
Professor Kenneth S. Williams, Carleton University, Class numbers and biquadratic reciprocity

FRIDAY, OCTOBER 23

Mathematics Colloquium
Professor James H. Wilkinson, Stanford University, The numerical analyst’s ε

Coffee & Tea
Professor Stanley Wasserman, University of Minnesota, Sensitivity of estimates of Markov transition matrices to perturbations and sampling errors.

Survey of Geometrical Structures (Math 428)
Professor Dick Bishop, Symplectic geometry, I
A SPECTRAL PROBLEM IN TRANSPORT THEORY

Professor Robert G. Muncaster
Department of Mathematics, UIUC

ABSTRACT: A simple linear integro-differential equation arising in transport theory for gases will be examined. The associated operator has continuous spectrum, and it will be shown that the general solution of the equation can be found by constructing a transform, thorough use of eigendistributions, which diagonalizes the operator. Implications for gas dynamics will be discussed briefly.

October 22, 1981

1 pm
thursday
314
altgeld hall
MONDAY, OCTOBER 26

**Computer Science Colloquia** 237-9 DCL 3:00 pm
Mr. John Bourgoin, Advanced Micro Devices Corp.; Advanced Bipolar LSI at AMD.

115 DCL 4:00 pm
Dr. P. Marwedel, University of Kiel; Retargetable microcode generation.

**Survey of Geometrical Structures (Math 420)** 241 AH 11:00 am
Professor Dick Bishop, Symplectic Geometry, II

TUESDAY, OCTOBER 27

**Algebraic Number Theory** 241 AH 2:00 pm
Professor Stephen Chase, Cornell University, Galois module structure in wild extensions.

241 AH 3:00 pm
Dr. Colin Bushnell, Tame division algebras and root numbers, II.

**Classical Analysis** 245 AH 1:00 pm
Professor John D'Angelo, Geometry and subellipticity for $\Omega$.

**Differential Geometry** 245 AH 3:00 pm
Dr. P. Lecomte, University de Liège; On the automorphisms of a vector bundle.

**Functional Analysis** 347 AH 3:00 pm
Professor H. P. Lotz, Quasi-compact positive operators on $L^\infty$ and $L^1$, III.

**Geometric Potpourri** 243 AH 2:00 pm
No meeting this week.

**Logic** 247 AH 2:00 pm
See Thursday's listing.

**Max Newman** 243 AH 11:00 am
Professor M.-E. Hamstrom, The Armentrout monster.

**Number Theory** 247 AH 1:00 pm
Professor Kenneth B. Stolarsky, Problems about roots of algebraic equations.

**Syzygy Street** 247 AH 3:00 pm
Dr. Barbara Peskin, Finite linear groups whose rings of invariants are complete intersections.

WEDNESDAY, OCTOBER 28

**Combinatorial Algorithms** 237 DCL 4:00 pm
No meeting this week.

**Felix Klein** 314 AH 4:00 pm
Dr. Michele Emmer, Rome University, will present 4 films from his ART & MATHEMATICS sequence: "Soap Bubbles," "Platonic Solids," "The Möbius Strip," "Symmetry and Tessellations."
Wednesday, October 28 (Con't)

Survey of Geometrical Structures 241 AH 11:00 am
Professor Dick Bishop, Symplectic Geometry, III

Thursday, October 29

Mathematics Colloquium 314 AH 4:00 pm
Professor Robert L. Devaney, Boston University, Blowing up singularities in classical dynamical systems.

Coffee & Tea 321 AH 3:15 pm

Algebra 241 AH 2:00 pm
To be announced.

Applied Math 314 AH 1:00 pm
Professor Jon Wright, Physics Department, Bifurcation phenomena in maps with two critical points.

Chess Seminar 245 AH 1:00 pm
Dr. Simon Fitzpatrick, The Karpov-Korchnoi Match (continued)

Decision Problems 243 AH 2:00 pm
Mr. Peter Lindsay, Embeddings into semigroups, IV

Deformation Theory 247 AH 3:00 pm
Professor E. G. Evans, Herzog's work on deformations, II

Dynamical Systems & Strange Attractors 245 AH 2:00 pm
Professor Robert G. Muncaster, On Levinson's paper, III

Group Theory 243 AH 1:00 pm
Professor Paul Weichsel, Higher commutators in free groups - a new result of Rips.

Logic 257 AH 3:00 pm
Dr. S. S. Wainer, University of Leeds, The slow growing hierarchy of recursive functions.

Number Theory 247 AH 1:00 pm
Dr. J. Brian Conrey, New proofs of some old theorems on the Riemann zeta function.

Probability & Statistics 220 COM WEST 3:00 pm
(Joint with Economics) Professor Mary-Ellen Bock, Purdue and Stanford Universities, Making use of probable inequality restrictions for normal mean vector estimation. (NOTE ROOM CHANGE!)

Professor Moshe Shaked, University of Arizona, Partial ordering of exchangeable distributions by position dependence

Friday, October 30

Functional Analysis-Special 241 AH 4:00 pm
Professor R. Alastair Gillespie, University of Edinburgh; Factorization in Banach function spaces.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor Dick Bishop, Symplectic Geometry, IV
BIFURCATION PHENOMENA IN MAPS WITH TWO CRITICAL POINTS

Professor Jon Wright
Department of Physics, UIUC

ABSTRACT: General properties of two parameter maps of the form \( x_{n+1} = f(a,b,x_n) \) are studied. Maps with one critical point have been studied in considerable detail in recent years, particularly with regard to some universal scaling properties of bifurcations. We have generalized to maps with two critical points and find a very rich scaling structure.

The motivation for the work comes from studying solutions to many ordinary differential equations that have scaling behavior predicted by one dimensional maps.
MONDAY, NOVEMBER 2

Computer Science Colloquium 115 DCL 4:00 pm
Professor Maarten Van Emde, University of Waterloo, A runnable specification in logic for AVL-tree insertion.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor Dick Bishop, Symplectic geometry, V.

TUESDAY, NOVEMBER 3

Mathematics Colloquium 314 AH 4:00 pm
Professor Ronald J. Evans, University of California, San Diego; Character sums.

Coffee & Tea 321 AH 3:15 pm

ABSTRACT: This talk, for a general audience, begins with a brief introduction to the theory of character sums over finite fields, such as Gauss, Jacobi, and Kloosterman sums. These sums are the counterparts of the Gamma, Beta, and Bessel functions of classical analysis. In order to develop the theory analytically, a notion of differentiation of complex functions on finite fields is introduced.

Algebraic Number Theory 241 AH 2:00 pm
Dr. Colin Bushnell, Tame division algebras and root numbers, II

Classical Analysis 245 AH 1:00 pm
Professor Lee Rubel, Non-redundancy in systems of algebraic differential equations.

Differential Geometry 245 AH 3:00 pm
Professor K. T. Chen, Degeneracy indices and Chern classes, I

Functional Analysis 347 AH 3:00 pm
Professor N. T. Peck, L0-valued vector measures.

Geometric Potpourri 243 AH 2:00 pm
The joint Potpourri-Klein seminar at CERL has been postponed one week.

Logic 247 AH 2:00 pm
Professor Gaisi Takeuti, Fuzzy logic and fuzzy set theory.

Max Newman Topology 243 AH 11:00 am
Professor M.-E. Hamstrom, The Armentrout monster.

Number Theory 247 AH 1:00 pm
Professor Ronald J. Evans, University of California, San Diego, Coefficients in expansions of certain rational functions.

Probability & Statistics 156 ADMIN 3:00 pm
Professor Stanley Wasserman, University of Minnesota, Sensitivity of estimates of Markov transition matrices to perturbation and sampling errors. (Note: Professor Wasserman is being considered for a joint appointment in the Mathematics & Psychology Departments.)

Syzygy Street 247 AH 3:00 pm
Mr. Joe Brennan, T-T2 reciprocity laws on the affine line.
<table>
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<tr>
<th>Day</th>
<th>Meeting</th>
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<tbody>
<tr>
<td><strong>WEDNESDAY, NOVEMBER 4</strong></td>
<td>Combinatorial Algorithms</td>
<td>237 DCL</td>
<td>4:00 pm</td>
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<td></td>
<td>Professor E. M. Reingold, How I spent my summer vacation.</td>
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<td></td>
<td><strong>Felix Klein</strong></td>
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<td>The joint Potpourri-Klein seminar at CERL has been postponed one week.</td>
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<td><strong>Survey of Geometrical Structures (Math 428)</strong></td>
<td>241 AH</td>
<td>11:00 am</td>
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<td>Professor John Wetzel, Some results about distances between points in the plane.</td>
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<td><strong>THURSDAY, NOVEMBER 5</strong></td>
<td><strong>Algebra</strong></td>
<td>241 AH</td>
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<td><strong>Applied Math</strong></td>
<td>314 AH</td>
<td>1:00 pm</td>
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<td>Professor M. Lowengrub, Indiana University, Mixed boundary value problems in elasticity.</td>
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<td><strong>Chess Seminar</strong></td>
<td>245 AH</td>
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<td><strong>Decision Problems</strong></td>
<td>243 AH</td>
<td>2:00 pm</td>
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<td>Mr. Phil Merkey, The Adian-Rabin theorem.</td>
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<td><strong>Deformation Theory</strong></td>
<td>247 AH</td>
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<td>Dr. Craig Huneke, Deformation and liason, I.</td>
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<td><strong>Dynamical Systems &amp; Strange Attractors</strong></td>
<td>245 AH</td>
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<td>Professor Robert G. Muncaster, On Levinson's paper, IV.</td>
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<td><strong>Group Theory</strong></td>
<td>243 AH</td>
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<td></td>
<td>Professor Derek Robinson, Automorphisms of groups with finite conjugacy classes, I</td>
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<td><strong>Number Theory</strong></td>
<td>247 AH</td>
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<td><strong>Student Statistics</strong></td>
<td>243 AH</td>
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<td>Mr. Daniel Naiman, Tautness for collections of linear inequalities, and simultaneous confidence bounds in multilinear regression with intercept.</td>
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<td><strong>FRIDAY, NOVEMBER 6</strong></td>
<td><strong>Survey of Geometrical Structures (Math 428)</strong></td>
<td>241 AH</td>
<td>11:00 am</td>
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<td>Professor John Wetzel, Sylvester's problem and some related questions.</td>
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MIXED BOUNDARY VALUE PROBLEMS IN ELASTICITY

Professor M. Lowengrub
Department of Mathematics, Indiana University

ABSTRACT: We shall consider certain mixed boundary value problems arising in the theory of elastostatics with particular emphasis on fracture mechanics. Existence and uniqueness theorems will be discussed as well as practical applications to specific problems involving composite media. Particular attention will be paid to the nature of the singularities common to this class of problems.

November 3, 1981
MATHENTICAL TIMETABLE

MONDAY, NOVEMBER 9

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor John Wetzel, On arrangements in the plane and space, I

TUESDAY, NOVEMBER 10

Algebra Meeting 241 AH 2:00 pm
Professor R. Fossum. Meeting of the (Algebra) Faculty to discuss the algebra program for the Fall 1982. Agenda: Fall 1982 algebra program, Algebra Brochure, other business. (Requests for courses may be submitted to above prior to the meeting.)

Algebraic Number Theory 241 AH 3:00 pm
Professor Carlos Moreno, A modular criterion for the vanishing of certain Dedekind zeta functions at $s = 1/2$.

243 AH (Note room change) 4:00 pm
Dr. Colin Bushnell, Tame division algebras and root numbers, III

Classical Analysis 245 AH 1:00 pm
Professor J. Miles, An unfortunate entire function.

Differential Geometry 245 AH 3:00 pm
Professor K. T. Chen, Degeneracy indices and Chern classes, II

Functional Analysis 347 AH 3:00 pm
Professor N. T. Peck, $L_0$-valued vector measures, II

Geometric Potpourri 243 AH 2:00 pm
Seminar will meet at Core of Engineering Research Laboratory. Contact G. Francis or R. Bishop to arrange for rides.

Logic 247 AH 2:00 pm
Professor Y. Kakuda, Kobe University visiting Penn State University; Set theory with the additional quantifier "almost all".

Max Newman Topology 243 AH 11:00 am
Professor M.-E. Hamstrom, The Armentrout monster.

Number Theory 247 AH 1:00 pm
Professor Bruce Reznick, An elementary diophantine problem arising from lattice-point simplices.

Probability & Statistics 314 AH 4:00 pm
Professor Michael Stoline, Western Michigan University, The status of multiple comparisons--simultaneous estimation of all pairwise comparisons in the one-way anova design.

Coffee & Tea 321 AH 3:15 pm

Syzygy Street 247 AH 3:00 pm
No meeting today.
WEDNESDAY, NOVEMBER 11

Combinatorial Algorithms 237 DCL 4:00 pm
Mr. J. L. Lewandowski, Extraterrestrial communications.

Felix Klein 155 AH 4:00 pm
See Tuesday's Potpourri announcement.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor John Wetzel, On arrangements in the plane and space, II

THURSDAY, NOVEMBER 12

Mathematics Colloquium 314 AH 4:00 pm
Professor Andrew Glass, Bowling Green University, The word problem for lattice ordered groups.

Coffee & Tea 321 AH 3:15 pm
ABSTRACT: A proof will be outlined of the Theorem: There exists a finitely presented lattice ordered group with insoluble word problem.

Algebraic K-Theory 241 AH 2:00 pm
Professor James Arnold, University of Wisconsin (Milwaukee), Homological algebra based on permutation modules.

Applied Mathematics 314 AH 1:00 pm
Professor Robert D. Skeel, Department of Computer Science, A very fast method for solving discretized P.D.E.'s.

Chess Seminar 245 AH 1:00 pm
Dr. S. Fitzpatrick, The Karpov-Korchnoi match, continued.

Decision Problems 243 AH 2:00 pm
Mr. Phil Merkey, The Adian-Rabin theorem, II

Deformation Theory 247 AH 3:00 pm
Dr. Craig Huneke, Deformation and liaison, II

Dynamical Systems & Strange Attractors 245 AH 2:00 pm
Professor A. Jackson, Physics Department, The Lorentz model.

Group Theory 243 AH 1:00 pm
Professor Derek Robinson, Automorphisms of groups with finite conjugacy classes, II

Number Theory 247 AH 1:00 pm
Professor Paul Bateman, Are there infinitely many primes p congruent to 3 modulo 4 such that 2p+1 is prime and (2p-1)/(2p+1) is prime?

Student Statistics 243 AH 3:00 pm
Professor R. Wijsman, A general theory of simultaneous confidence sets with applications.

FRIDAY, NOVEMBER 13

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor G. Francis, Drawing pictures, I
A VERY FAST METHOD FOR SOLVING DISCRETIZED P.D.E.'s

Professor Robert D. Skeel, Department of Computer Science, UIUC

ABSTRACT: Perhaps the most exciting development in numerical analysis in the past decade is the multigrid method. It is an optimally efficient method for "solving" discretized nonlinear P.D.E.s in the sense that it requires only $O(n)$ operations to determine $n$ unknowns, and it promises to be "orders-of-magnitude" more effective for solving P.D.E.'s than other existing methods. In this talk, I will illustrate the multigrid method with a very simple example, at the same time explaining why it works.

November 12, 1981

1 pm
thursday
314 altgeld hall
Mathematical Timetable

Monday, November 16

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor G. Francis, Drawing Pictures II: A zoo of elementary shapes.

Tuesday, November 17

Algebraic Number Theory 241 AH 3:00 pm
No be announced.

Classical Analysis 245 AH 1:00 pm
Professor Lee Rubel, What is a "solution" of an algebraic differential equation?

Differential Geometry 245 AH 3:00 pm
Meeting of the geometry and topology faculty and students to discuss the course offerings for Fall 1982.

Functional Analysis 347 AH 3:00 pm
Professor N. T. Peck, $L^p$-valued vector measures, III

Geometric Potpourri 243 AH 2:00 pm
To be announced.

Logic 247 AH 2:00 pm
See Thursday's listing.

Max Newman Topology 243 AH 11:00 am
Robert Craggs, Algebraic and geometric deformations.

Number Theory 247 AH 1:00 pm
Professor Bruce Berndt, The quarterly reports of Srinivasa Ramanujan, I

Probability and Statistics 243 AH 4:00 pm
Meeting of interested faculty and students to discuss the course offerings for Fall 1982.

Syzygy Street 247 AH 3:00 pm
Dr. Craig Huneke, Multiplicities in characteristic $p$.

Wednesday, November 18

Mathematics Colloquium 314 AH 4:00 pm
Dr. Vera Sós, Bell Labs and University of Budapest, Uniform distribution of sequences and diophantine approximation.

Coffee & Tea 321 AH 3:15 pm

Combinatorial Algorithms 237 DCL 4:00 pm
Professor G. Bilardi, Average case analysis for a planar point location technique.

Felix Klein 155 AH 4:00 pm
To be announced.
WEDNESDAY, NOVEMBER 18 (continued)

Functional Analysis-Special Seminar
Dr. S. Kantorovitz, Temple University, Some results in spectral theory.

Survey of Geometrical Structures (Math 428)
Professor G. Francis, Drawing Pictures III: How to tell picture stories.

THURSDAY, NOVEMBER 19

Mathematics Colloquium
Professor Jon Alperin, University of Chicago, Representations, varieties, and projective resolutions.

Coffee & Tea

ABSTRACT: The lecture introduces a homological invariant in the theory of representations of finite groups, and discusses applications of this invariant.

Computer Science Colloquium
Dr. John M. Rushby, University of Newcastle upon Tyne, Design and Verification of Secure Systems.

Algebraic K-Theory
To be announced.

Applied Math
Professor R. McEliece, Communications in the presence of unpleasant interference.

Chess Seminar
Dr. Simon Fitzpatrick, The Karpov-Korchnoi Match (continued)

Decision Problems
Ms. Susan Swagert, Embeddability of finitely generated semigroups in finitely presented semigroups.

Deformation Theory
Ms. Sae-ja Kim, Some examples of deformations.

Dynamical Systems & Strange Attractors
Professor A. Jackson, Physics Department, The Lorentz model, II

Group Theory
Dr. U. Webb, Outer automorphisms of finitely generated nilpotent groups.

Logic
Netting to discuss logic courses for Fall, 1982. If you cannot attend but are interested in teaching a logic course, please leave a note for Carl Jockusch.

Number Theory
Professor Bruce Berndt, The quarterly reports of Srinivasa Ramanujan, II

Student Statistics
To be announced.

FRIDAY, NOVEMBER 20

Survey of Geometrical Structures (Math 428)
Professor Ralph Alexander, Integral Geometry I: Problems from the 18th and 19th centuries.
MATHMATICAL TIMETABLE

MONDAY, NOVEMBER 23

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor R. Alexander, Integral geometry II: Integral curvatures.

TUESDAY, NOVEMBER 24

Algebraic Number Theory 241 AH 10:00 am
Dr. Martin Taylor, On Fröhlich's conjecture, II (Note time change!)

Classical Analysis 245 AH 1:00 pm
Professor Robert Kaufman, BMO and removable sets for analytic functions.

Differential Geometry 245 AH 3:00 pm
Professor Howard Osborn, The singature ring.

Functional Analysis 347 AH 3:00 pm
No meeting this week.

Geometric Potpourri 243 AH 2:00 pm
No meeting this week.

Logic 247 AH 2:00 pm
Mr. Shih-Ping Tung, Nonstandard models of Peano arithmetic and the work of Kochen and Kripke

Max Newman Topology 243 AH 11:00 am
Robert Craggs, Algebraic and geometric deformations, II

Number Theory 247 AH 1:00 pm
Professor Bruce Berndt, The quarterly reports of Srinivasa Ramanujan, III

Syzygy Street 247 AH 3:00 pm
Professor Frank DeMeyer, The Brauer group of the function field of a surface, I

WEDNESDAY, NOVEMBER 23

Combinatorial Algorithms 237 DCL 4:00 pm
No meeting this week.

Felix Klein 155 AH 4:00 pm
No meeting this week.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
To be announced.

Probability & Statistics-no meeting this week. 4:00 pm

THURSDAY & FRIDAY, NOVEMBER 26 & 27 - Thanksgiving Holiday Break. All University Offices closed!
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<th>Date</th>
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<tr>
<td>Monday, November 30</td>
<td>Survey of Geometrical Structures (Math 428)</td>
<td>241 AH</td>
<td>11:00 am</td>
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<tr>
<td></td>
<td>Professor R. Alexander, Integral geometry III: Integral curvatures</td>
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<td>Tuesday, December 1</td>
<td>Mathematics Colloquium</td>
<td>314 AH</td>
<td>4:00 pm</td>
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<td>Professors Charles F. Miller, University of Melbourne, Groups, Homology and some Logic.</td>
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<td>Coffee &amp; Tea</td>
<td>321 AH</td>
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<td></td>
<td>Algebraic Number Theory</td>
<td>241 AH</td>
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<td>Professor Andrew Matchett, Texas A &amp; M University, Projective class group of the symmetric group.</td>
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<td>Classical Analysis</td>
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<td>No meeting this week</td>
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<td></td>
<td>Differential Geometry</td>
<td>245 AH</td>
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<td>Professor Izu Vaisman, Haifa University, Locally conformal Kaehler manifolds.</td>
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<td>Functional Analysis</td>
<td>347 AH</td>
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<td>Professor I. D. Berg, Almost commuting shifts.</td>
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<td>Geometric Potpourri</td>
<td>243 AH</td>
<td>2:00 pm</td>
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<td>Logic</td>
<td>47 AH</td>
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<td>Mr. Shih-Ping Tung, Nonstandard models of Peano arithmetic and the work of Kochen and Kripke</td>
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<td>Max Newman Topology</td>
<td>243 AH</td>
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<td></td>
<td>Robert Craggs, Algebraic and geometric deformations, III</td>
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<td>Number Theory</td>
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<td>Survey of Geometrical Structures</td>
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<td>Professor J. Palmore, Morse theory, I</td>
<td></td>
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<tr>
<td></td>
<td>Syzygy Street</td>
<td>247 AH</td>
<td>3:00 pm</td>
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<tr>
<td></td>
<td>Professor Frank DeMeyer, The Brauer group of the function field of a surface, II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wednesday, December 2</td>
<td>Combinatorial Algorithms</td>
<td>237 DCL</td>
<td>4:00 pm</td>
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<tr>
<td></td>
<td>To be announced</td>
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<tr>
<td></td>
<td>Felix Klein</td>
<td>155 AH</td>
<td>4:00 pm</td>
</tr>
<tr>
<td></td>
<td>No meeting this week</td>
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</tr>
</tbody>
</table>
### WEDNESDAY, NOVEMBER 2 (continued)

<table>
<thead>
<tr>
<th>Course</th>
<th>Location</th>
<th>Time</th>
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<tbody>
<tr>
<td>Survey of Geometrical Structures (Math 428)</td>
<td>241 AH</td>
<td>11:00 am</td>
</tr>
<tr>
<td>Professor R. Alexander, Integral geometry IV: Integral curvatures</td>
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<td></td>
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</tbody>
</table>

### THURSDAY, DECEMBER 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Colloquium</td>
<td>314 AH</td>
<td>4:00 pm</td>
</tr>
<tr>
<td>Professor Philip Kutzko, University of Iowa, Supercuspidal representations of $GL_n$ of a local field.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coffee &amp; Tea</td>
<td>321 AH</td>
<td>3:15 pm</td>
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</tbody>
</table>

**ABSTRACT:** We give a complete construction of the supercuspidal representations of $GL_n$ of a local field when $n$ is prime, and describe a method of computing their characters. We also indicate how to treat the case where $n$ is composite.

<table>
<thead>
<tr>
<th>Course</th>
<th>Location</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Applied Math</td>
<td>314 AH</td>
<td>4:00 pm</td>
</tr>
<tr>
<td>No meeting this week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision Problems</td>
<td>243 AH</td>
<td>2:00 pm</td>
</tr>
<tr>
<td>No meeting this week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deformation Theory</td>
<td>241 AH</td>
<td>3:00 pm</td>
</tr>
<tr>
<td>Professor Robert Fossum, Deformations of algebraic varieties with $\mathbb{F}_m$ -action (selected topics, d’après Pinkham), I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamical Systems &amp; Strange Attractors</td>
<td>245 AH</td>
<td>2:00 pm</td>
</tr>
<tr>
<td>No meeting this week.</td>
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<tr>
<td>Group Theory</td>
<td>243 AH</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>To be announced.</td>
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<td></td>
</tr>
<tr>
<td>Student Number Theory</td>
<td>247 AH</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>Mr. Michael Seyfried, On the gaps between the integers expressible as a sum of two squares.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Statistics</td>
<td>243 AH</td>
<td>3:00 pm</td>
</tr>
<tr>
<td>Professor Adam Martinsek, Confidence sequences and tests of power one, I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey of Geometrical Structures (Math 428)</td>
<td>247 AH</td>
<td>11:00 am</td>
</tr>
<tr>
<td>Professor J. Palmore, Morse theory, II</td>
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</tbody>
</table>

**FRIDAY, DECEMBER 4

<table>
<thead>
<tr>
<th>Course</th>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability &amp; Statistics</td>
<td>241 AH</td>
<td>4:00 pm</td>
</tr>
<tr>
<td>To be announced.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey of Geometrical Structures (Math 428)</td>
<td>241 AH</td>
<td>11:00 am</td>
</tr>
<tr>
<td>No meeting today.</td>
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</tbody>
</table>

### COMING ATTRACTIONS

**Monday, December 7, Mathematics Club**

<table>
<thead>
<tr>
<th>Course</th>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor Robert McEliece, From Saturn with parity: an introduction to interplanetary</td>
<td>314 AH</td>
<td>7:00 pm</td>
</tr>
</tbody>
</table>
MONDAY, DECEMBER 7

Math Club Lecture 314 AH 7:30 pm
Professor Robert McEliece, From Saturn with Parity: An Introduction to Interplanetary Coding Theory

ABSTRACT: In this talk, intended for nonspecialists, I will describe how the use of an error-correcting code enabled Voyagers 1 and 2 to return almost four times as many photographs to earth than would have been possible otherwise. I will focus mainly on the mathematical fundamentals, but I will also discuss the important mathematics/engineering interface.

Survey of Geometrical Structures (Math 428) 241 AH 11:00 am
Professor R. Alexander, Integral Geometry IV: The mathematics of CATSCAN X-ray devices.

TUESDAY, DECEMBER 8

Algebraic Number Theory 241 AH 2:00 pm
Professor Steve Galovich, Carleton College, Arithmetic in cyclotomic function fields.

Classical Analysis 245 AH 1:00 pm
No meeting this week.

Differential Geometry 245 AH 3:00 pm
Professor Isu Vaisman, Haifa University, Locally conformal Kaehler manifolds, II

Functional Analysis 347 AH 3:00 pm
No meeting this week.

Geometric Potpourri 243 AH 2:00 pm
No meeting this week.

Logic 247 AH 2:00 pm
No meeting this week.

Max Newman Topology 243 AH 11:00 am
Robert Craggs, Algebraic and geometric deformations, IV

Student Number Theory 247 AH 1:00 pm
Mr. Michael Seyfried, On the gaps between the integers expressible as a sum of two squares.

Survey of Geometrical Structures 247 AH 11:00 am
Professor J. Falmore, Morse theory, III

Syzygy Street 247 AH 3:00 pm
Professor Frank DeMeyer, The Brauer group of the function field of a surface, III

WEDNESDAY, DECEMBER 9

Combinatorial Algorithms 237 DCL 4:00 pm
No meeting this week.

Felix Klein 155 AH 4:00 pm
Mr. Kevin Jeffay, Writing interactive graphics software.
WEDNESDAY, DECEMBER 9 - Continued

Probability-Statistics
Professor Arthur Getis, Department of Geography, A second moment approach to point pattern analysis.

THURSDAY, DECEMBER 10

Mathematics Colloquium
Professor Dan Barbasch, Rutgers University, Representations of the symmetry group and harmonic analysis on $GL_n$.

Coffee & Tea

Abstract: It has been known for a long time that the representations of the symmetry group are parametrized by partitions of $n$. On the other hand the Jordan canonical forms of a nilpotent element are also given by a partition of $n$. A connection between these two objects is discussed using the infinite dimensional representations of $GL_n$.

Applied Math
Professor Takashi Sasamore, Laboratory for Atmospheric Research, Hydrodynamic stability of the planetary circulation of the earth.

Decision Problems
Professor Robert Fossum, Laboratory for Atmospheric Research, Decision Problems.

Deformation Theory
Professor Robert Fossum, Deformations of algebraic varieties with $E_m$-action (selected topics, d'apres Pinkham), II.

Dynamical Systems & Strange Attractors
Professor George Francis, Pictures of strange attractors.

Group Theory
No meeting this week.

Number Theory
Professor Heini Halberstam, The twin problem for sums of two squares.

Student Statistics
Professor Adam Martinsek, Confidence sequences and tests of power one, II.

Survey of Geometrical Structures (Math 428)
Professor Julian Palmore, Morse theory, IV.

FRIDAY, DECEMBER 11

Reminder

Mathematics Department Holiday Party, Friday, December 11, 6:30 pm at the Rec-Arena.

Purchase tickets from Pat Coombs by 5:00 pm on Tuesday, December 8.
HYDRODYNAMIC STABILITY OF THE PLANETARY CIRCULATION OF THE EARTH

Takashi Sasamori
Laboratory for Atmospheric Research, UIUC

ABSTRACT: The large-scale atmospheric circulation on the planet earth is characterized by the closed mean meridional circulation in the tropics and the zonal westerly jet in midlatitudes with the planetary waves superimposed. The balance of these two different circulations and their dynamical interplay will be discussed based on the physical laws governing the planetary motions.
MATHMATICL TIMETABLE

MONDAY, JANUARY 17

TUESDAY, JANUARY 18

Trjitzinsky Lecture 314 AH 4:00 pm
Professor Gene Golub, Stanford University; The singular value decomposition:
applications and computation.
Coffee & Tea 321 AH 3:15 pm

Classical Analysis 245 AH 1:00 pm
Professor Robert Kaufman, A sketch of the Leray-Schauder degree and an elementary
application.

Commutative Algebra 247 AH 3:00 pm
Organizational meeting.

Differential Geometry 245 AH 3:00 pm
No meeting this week.

Geometric Potpourri 243 AH 2:00 pm
Organizational meeting.

Max Newman Topology 245 AH 11:00 am
To be announced.

PASCAL: An Introduction to Use of in Mathematics 243 AH 3:00 pm
Professor Ken Appel, An organizational meeting.

Probability & Statistics 241 AH 11:00 am
No meeting this week.

Number Theory 247 AH 1:00 pm
Professor Harold Diamond, Differences of consecutive numbers relatively prime to a
given modulus, I.

WEDNESDAY, JANUARY 19

Trjitzinsky Lecture 314 AH 314 AH
Professor Gene Golub, Stanford University; Iterative methods for solving sparse
systems of equations arising from elliptic p.d.e.'s.
Coffee & Tea 321 AH 3:15 pm
Mathematical Timetable

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>THURSDAY, JANUARY 20</td>
<td></td>
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</tr>
<tr>
<td>Triitzinsky Lecture</td>
<td>314 AH</td>
<td>4:00 pm  Professor Gene Golub, Stanford University; Inverse eigenvalue problems.</td>
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<tr>
<td></td>
<td>321 AH</td>
<td>3:15 pm  Coffee &amp; Tea</td>
</tr>
<tr>
<td>Algebra &amp; Algebraic Number Theory</td>
<td>241 AH</td>
<td>2:00 pm  Organizational meeting.</td>
</tr>
<tr>
<td>Combinatorics or Optimization</td>
<td>245 AH</td>
<td>2:00 pm  Organizational meeting.</td>
</tr>
<tr>
<td>Commutative Algebra</td>
<td>247 AH</td>
<td>3:00 pm  Professor Robert Fossum, Representations of $SL_2(k)$, I.</td>
</tr>
<tr>
<td>Number Theory</td>
<td>247 AH</td>
<td>1:00 pm  Professor Harold Diamond, Differences of consecutive numbers relatively prime to a given modulus, II</td>
</tr>
<tr>
<td>FRIDAY, JANUARY 21</td>
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</tr>
<tr>
<td>Combinatorial Optimization &amp; Matroids</td>
<td>TO BE ANNOUNCED</td>
<td>3:00 pm  Professor Bruce Hajek, $NP$ completeness of 3-matroid intersection, or Professor Douglas West, Duality in matroids.</td>
</tr>
</tbody>
</table>
# Mathematical Timetable

**January 25 - 29, 1932**

## Monday, January 25

**Algebra**

241 AH  
1:00 pm

To be announced.

## Tuesday, January 26

**Algebra**

243 AH  
1:00 pm

Classical analysis will meet at the same time, if there are no objections. Please let me know if you want to speak next semester.— R. Kaufman

**Classical Analysis**

243 AH  
1:00 pm

Professor F. W. Kamber, Duality theorems for harmonic Riemannian foliations, I

**Differential Geometry**

243 AH  
3:00 pm

Professor F. W. Kamber, Duality theorems for harmonic Riemannian foliations, I

**Geometric Potpourri**

241 AH  
2:00 pm

Organizational meeting.

**Max Newman Topology**

243 AH  
11:00 am

Mr. Richard Brown, Group presentations, formal deformations and free crossed modules (continued from last semester), I

**Number Theory**

247 AH  
1:00 pm

Dr. R. Balasubramanian, Iwanciec's improvement of the Bombieri-Vinogradov Theorem, III

**Stochastic Integration**

245 AH  
11:00 am

Professor Ditlev Monrad, A review of discrete parameter martingales.

**Syzygy Street**

245 AH  
3:00 pm

To be announced.

## Wednesday, January 27

**Combinatorial Algorithms**

237 DCL  
4:00 pm

Professor Clyde Kruskal, Results in parallel merging and sorting.

**Probability & Statistics**

343 AH  
4:00 pm

To be announced.

## Thursday, January 28

**Mathematics Colloquium**

314 AH  
4:00 pm

Professor T. Jozefiak, visiting University of Michigan, Syzygies of determinantal ideals.

Coffee & Tea  
321 AH  
3:15 pm

**Abstract:** Determinantal varieties (ideals) occur in a natural way in many algebraic and geometric problems, e.g. in invariant theory coordinate rings of determinantal varieties appear as rings of fixed elements under specific actions of some classical groups. The goal of the talk is to report on some recent attempts to construct explicitly minimal free resolutions of determinantal ideals.
THURSDAY, JANUARY 27 - Continued

Algebra
To be announced.

Dynamical Systems & Strange Attractors
Professor Yoshi Oono, Physics Department, Chaos in 1-dimensional endomorphisms.

Functional Analysis
Dr. Simon Fitzpatrick & Professor Bruce Reznick, Skewness in Banach spaces.

Number Theory
Dr. R. Balasubramanian, Iwancie's improvement of the Bombieri-Vinogradov Theorem, IV

Ring Theory
To be announced.

Stochastic Integration
Professor Ditlev Monrad, Continuous parameter martingales.

Student Statistics
Reading in Tong Probability Inequalities, speaker to be announced.

FRIDAY, JANUARY 28

Special Category Theory Seminar
Professor Ross Street, McQuairie University, Australia; Topic to be announced.

RE M I N D E R

All seminar notices are due in Pat's office by 5:00 pm on Thursday. Otherwise, it will automatically be listed as "To be announced"!
MONDAY, FEBRUARY 1

Mathematics Club Lecture 314 AH 7:30 pm
Professor Roy Axford, Nuclear Engineering Department, Nuclear Energy's Mathematics

TUESDAY, FEBRUARY 2

Department Meeting 314 AH 4:00 pm
Professor H. Halberstam, presiding
Coffee & Tea 321 AH 3:30 pm

Algebraic Number Theory 245 AH 3:00 pm
Mr. Kurt Foster, Equidistribution of Steinitz classes of quadratic extensions.

Classics by Request (formerly Classical Analysis) 243 AH 1:00 pm
Professor J. L. Doob, Martin boundaries for Laplace's equation and the heat equation.

Differential Geometry 243 AH 3:00 pm
Professor F. W. Kamber, Duality theorems for harmonic Riemannian foliations, II

Geometric Potpourri 241 AH 2:00 pm
Professor R. Alexander, Equireflective Surfaces

Max Newman Topology 243 AH 11:00 am
Mr. Richard Brown, Group presentations, formal deformations and free crossed modules, II

Number Theory 247 AH 1:00 pm
Dr. R. Balasubramanian, Iwanciec's improvement of the Bombieri-Vinogradov Theorem, IV

Stochastic Integration 245 AH 11:00 am
Professor Ditlev Monrad, Stopping times, I

Syzygy Street 247 AH 3:00 pm
Professor F. DeMeyer, The Brauer group of normal surfaces.

WEDNESDAY, FEBRUARY 3

Combinatorial Algorithms 237 DCL 4:00 pm
Professor M. C. Loui, CSL, Optimal dynamic embedding of trees into arrays

Probability-Statistics 343 AH 4:00 pm
Dr. Michael Cranston, Exit times for symmetric stable processes - joint work with Richard Bass.
THURSDAY, FEBRUARY 4

Algebraic K-Theory 245 AH
Professor Remi Kuku, Equivariant higher algebraic K-theory, II
2:00 pm

Applied Mathematics 314 AH
No meeting this week.
1:00 pm

Dynamical Systems & Strange Attractors 241 AH
Professor F. Albrecht, Strange attractors on a 2-dimensional torus.
2:30 pm

Functional Analysis 243 AH
Mr. Raouf Eldeeb, On subspaces of $\ell_p$, $p < 1$
1:00 pm

Hodge-Podge 247 AH
Dr. C. Huneke, Introduction to algebras with straightening laws, I
3:00 pm

Number Theory 247 AH
Dr. R. Balasubramanian, Iwanciecz's improvement of the Bombieri-Vinogradov Theorem, VI
1:00 pm

Stochastic integration 245 AH
Professor Ditlev Monrad, Stopping times, II
11:00 am

Student Statistics 245 AH
Mr. Tom Grzesiak, Inequalities in Probability and Statistics, II
3:00 pm

FRIDAY, FEBRUARY 5

Error-Correcting Codes 245 AH
3:00 pm

REMINDER

All seminar notices are due in Pat's office by 5:00 pm on Thursday. Otherwise it will automatically be listed as "to be announced"!
MONDAY, FEBRUARY 8

Mathematics Club Lecture 314 AH 7:30 pm
Professor Roy Axford, Nuclear Engineering Department, Nuclear Energy's Mathematics

Harmonic Analysis 141 AH 4:00 pm
Professor Audrey Terras, University of California, San Diego; Non-euclidean harmonic analysis (Elementary discussion of harmonic analysis on the upper half plane with applications to PDE's, probability and number theory.)

TUESDAY, FEBRUARY 9

Mathematics Colloquium 314 AH 4:00 pm
Professor Harold Stark, University of California, San Diego; Values of L-series at interesting points.

Coffee & Tea 321 AH 3:15 pm

Algebraic Number Theory 245 AH 2:00 pm
Professor Audrey Terras, University of California, San Diego; Selberg's trace formula and units in number fields (asymptotics of units in number fields)

Classics by Request 243 AH 1:00 pm
Professor J. L. Doob, Martin boundaries for Laplace's equation and the heat equation, II

Differential Geometry 243 AH 3:00 pm
Professor F. W. Kamber, Duality theorems for harmonic Riemannian foliations, III

Geometric Potpourri
No meeting this week.

Logic (joint with Algebra) 243 AH 2:00 pm
Mr. Peter Lindsay, On recognizing cyclic modules effectively, I

Max New Man Topology 243 AH 11:00 am
Mr. Richard Brown, Group presentations, formal deformations and free crossed modules, III

Number Theory 247 AH 1:00 pm
Dr. R. Balasubramanian, Iwancie's improvement of the Bombieri-Vinogradov Theorem, VII

Stochastic Integration 245 AH 11:00 am
Professor Ditlev Monrad, Optional processes and predictable processes.

Syzygy Street 247 AH 3:00 pm
Professor Robert Fossum, K-theory of complexes (if older Foxby), I

WEDNESDAY, FEBRUARY 10

Algebraic Number Theory 141 AH 4:00 pm
Professor Harold Stark, University of California, San Diego; Coates-Wiles revisited.
Wednesday, February 10 - Continued

Combinatorial Algorithms
Mr. Jieh Hsiang, Mechanical theorem proving using term rewriting systems.

Probability-Statistics
Dr. Jurgen Bliedtner, Goethe University, Frankfurt, West Germany; Analytic description of penetrating times, I

Thursday, February 11

Mathematics Colloquium
Dr. John C. Lennox, University College, Cardiff, Wales; Joins of subnormal subgroups.

Coffee & Tea

ABSTRACT: The problem: when is the join of two subnormal subgroups subnormal? is a subtle one which has received much attention in the last 15 years. A survey of recent work in the area will be given.

Algebraic K-Theory
Professor Jacques Queyrut, S-Grothendieck groups, I

Applied Mathematics
Professor D. Muller, Tiling problems on various types of universes.

Dynamical Systems & Strange Attractors
Professor Yoshi Oono, Physics Department, Towards statistical mechanics of 1-dimensional chaos

Functional Analysis
Mr. Raouf Eldeeb, On subspaces of $\ell^p$, $p < 1$

Hodge Podge
Dr. C. Huneke, Introduction to algebras with straightening laws, II

Number Theory
Dr. R. Balasubramanian, Iwanciecz's improvement of the Bombieri-Vinogradov Theorem, VIII

Stochastic Integration
Professor Ditlev Monrad, Capacities. The Section Theorem.

Student Statistics
Speaker and topic to be announced.

Friday, February 12

Mathematics Colloquium
*Professor Bruce Sagan, University of Michigan, Congruences derived from group actions

Error Correcting Codes
Mr. H. L. Janwa, Hadamard matrix constructions. (Note time and room change)
ABSTRACT: In a classical tiling problem one seeks a way of covering the infinite plane with tiles which are unit squares. The tiles must be chosen from a finite number of types of tiles and placed in accordance with certain rules which govern which types may be placed next to each other both vertically and horizontally. Such problems were originally called domino problems and were studied because of their applicability to logic. It was shown to be recursively undecidable whether a general tiling problem on the infinite plane has a solution. The underlying universe, in this case, may be regarded as a graph whose vertices lie at lattice points on an infinite square lattice.

The same kind of problem may be similarly phrased using another type of graph as the underlying universe. Cases in which this graph is a chain or a tree have already been considered in the guise of automata. We shall look at a general class of graphs for which tiling problems are decidable and shall discuss possible applications of such systems.
### MONDAY, FEBRUARY 15

#### Mathematics Colloquium
314 AH 1:00 pm
*Professor Douglas West, Princeton University, The interval number of a planar graph; three intervals suffice.*

#### Algebraic K-Theory
245 AH 2:00 pm
*Professor Jacques Queyrut, S-Grothendieck groups, II*

#### Classics by Request
243 AH 1:00 pm
No meeting this week.

#### Curriculum Committee
314 AH 4:00 pm
Open meeting to discuss the calculus sequence.

#### Differential Geometry
243 AH 3:00 pm
No meeting this week.

#### Geometric Potpourri
241 AH 2:00 pm
No meeting this week.

#### Logic (joint with Algebra)
243 AH 2:00 pm
Mr. Peter Lindsay, On recognizing cyclic modules effectively, II

#### Max Newman Topology
243 AH 11:00 am
Mr. Richard Brown, Group presentations, formal deformations and free crossed modules, IV
Professor Robert Craggs, Report on the Japan Topology Conference.

#### Number Theory
247 AH 1:00 pm
Dr. R. Balasubramanian, Iwanciec's improvement of the Bombieri-Vinogradov Theorem, IX

#### Stochastic Integration
245 AH 11:00 am
Professor Ditliv Monrad, Capacities and analytic sets.

#### Syzygy Street
347 AH 3:00 pm
Professor Robert Fossum, K-theory of complexes (if§lge Foxby), II

### TUESDAY, FEBRUARY 16

#### Mathematics Colloquium
1:00 pm

#### Algebraic K-Theory
245 AH 2:00 pm
*Professor Jacques Queyrut, S-Grothendieck groups, II*

#### Classics by Request
243 AH 1:00 pm
No meeting this week.

#### Curriculum Committee
314 AH 4:00 pm
Open meeting to discuss the calculus sequence.

#### Differential Geometry
243 AH 3:00 pm
No meeting this week.

#### Geometric Potpourri
241 AH 2:00 pm
No meeting this week.

#### Logic (joint with Algebra)
243 AH 2:00 pm
Mr. Peter Lindsay, On recognizing cyclic modules effectively, II

#### Max Newman Topology
243 AH 11:00 am
Mr. Richard Brown, Group presentations, formal deformations and free crossed modules, IV
Professor Robert Craggs, Report on the Japan Topology Conference.

#### Number Theory
247 AH 1:00 pm
Dr. R. Balasubramanian, Iwanciec's improvement of the Bombieri-Vinogradov Theorem, IX

#### Stochastic Integration
245 AH 11:00 am
Professor Ditliv Monrad, Capacities and analytic sets.

#### Syzygy Street
347 AH 3:00 pm
Professor Robert Fossum, K-theory of complexes (if§lge Foxby), II

### WEDNESDAY, FEBRUARY 17

#### Computer Science Colloquium
115 DCL 3:00 pm
Mr. Paul K. Harter, Jr., SUNY at Stony Brook, Verification of real-time programs with temporal logic.

#### Combinatorial Algorithms
237 DCL 4:00 pm
No meeting this week.

#### Probability-Statistics
343 AH 4:00 pm
Dr. Jurgen Bliedtner, Goethe Universitä, Frankfurt, West Germany; Analytic description of penetrating times, II
THURSDAY, FEBRUARY 18

Algebraic Number Theory 245 AH 2:00 pm
Dr. Donald Maurer, The Stickelberger criterion and normal integral bases of prime degree.

Applied Mathematics 314 AH 1:00 pm
Professor E. N. Kuznetsov, Department of General Engineering, Static nets

Combinatorics 347 AH ** 3:00 pm
Professor Paul Weichsel, Products of highly symmetric graphs.

Dynamical Systems & Strange Attractors 241 AH 2:30 pm
Professor F. Albrecht, Some definitions of strange attractors.

Functional Analysis 243 AH 1:00 pm
Professor Jurgen Bliedtner, visiting from Frankfurt, A potential-theoretic characterization of Riemann surfaces.

Hodge Podge 247 AH 3:00 pm
Dr. C. Huneke, Introduction to algebras with straightening laws, III

Number Theory 247 AH 1:00 pm
Dr. R. Balasubramanian, Iwanciec's improvement of the Bombieri-Vinogradov Theorem, X

Stochastic Integration 245 AH 11:00 am
Professor Ditlev Monrad, Section theorems.

Student Statistics 245 AH 3:00 pm
Professor Saul Blumenthal, An elementary exposition of series system reliability.

FRIDAY, FEBRUARY 19

Mathematics Colloquium 314 AH 5:00 pm
Professor Marshall Stone, visiting University of Chicago, Sheaf representations of algebras.

Coffee & Tea 321 AH 4:15 pm

Error-Correcting Codes 445 AH ** 2:00 pm
Ms. Li-Fung Chang, The Nordstrom-Robinson code and its relatives.

** At the time of printing, these rooms had not been officially approved. Please watch the blackboard for a potential change of room!
STATIC NETS

Professor E. N. Kuznetsov, Department of General Engineering, UIUC

ABSTRACT: Two one-parametric arrays of lines on a surface form a net. Due to variability of the net angle the mobility of a net normally goes beyond the surface bending. Yet, there exist exceptional nets which, being fixed at the contour, completely lack kinetic mobility. A necessary and sufficient invariant criterion of this class of nets (called static) has been developed and used to identify numerous particular types of these nets. In a certain sense, this represents a generalization of the classic Plateau problem in differential geometry.
MONDAY, FEBRUARY 22

TUESDAY, FEBRUARY 23

Trijitzinsky Lecture
Professor Hugh Montgomery, University of Michigan, Uniform distribution and harmonic analysis.

Coffee & Tea

Pi Mu Epsilon Lecture
Professor Hugh Montgomery, Pegboard Solitaire

Algebra
Professor Gerald Cliff, University of Alberta, Projective modules for infinite groups

Classics by Request
Dr. Terry McConnell, Lusin's area integral and functions subharmonic in a half space

Differential Geometry
No meeting this week.

Geometric Potpourri
No meeting this week.

Logic (joint with Algebra)
Mr. Peter Lindsay, On recognizing cyclic modules effectively, III

Max Newman Topology
Professor Robert Craggs, Report on the Japan Topology Conference, II

Number Theory
Professor D. R. Heath-Brown, Oxford University; Prime twins for Siegel zeros

Stochastic Integration
Professor Ditlev Monrad, Section theorems, II

Syzygy Street
To be announced.

WEDNESDAY, FEBRUARY 24

Trijitzinsky Lecture
Professor Hugh Montgomery, An introduction to Turan's method

Coffee & Tea

Combinatorial Algorithms
Professor Ahmed Sameh, A brief survey of parallel algorithms in numerical linear algebra

Probability & Statistics
*Dr. Dennis Jennings, University of Minnesota, Inference and diagnostics for logistic regression
Mathematical Timetable

THURSDAY, FEBRUARY 25

Trjitzinsky Lecture 314 AH 4:00 pm
Professor Hugh Montgomery, The statistical behaviour of partitions

Coffee & Tea 321 AH 3:15 pm

Algebraic Number Theory 245 AH 2:00 pm
No meeting this week.

Applied Mathematics 314 AH 1:00 pm
No meeting this week.

Combinatorics 347 AH 3:00 pm
Professor Paul Weichsel, Products of highly symmetric graphs, II

Dynamical Systems & Strange Attractors 241 AH 2:30 pm
Professor F. Albrecht, Sensitivity with respect to initial conditions

Functional Analysis 243 AH 1:00 pm
Professor I. D. Berg, The view from Mt. Urbana

Hodge Podge 247 AH 3:00 pm
Professor Graham Evans, Introduction to algebras with straightening laws, IV

Number Theory 247 AH 1:00 pm
Dr. Brian Conrey, On the curves $\Re \zeta(s) = 0$ and $\Im \zeta(s) = 0$

Stochastic Integration 245 AH 11:00 am
Professor Ditlev Monrad, The optional and the predictable projections.

Student Statistics 245 AH 3:00 pm
Professor Saul Blumenthal, An elementary exposition of series system reliability

FRIDAY, FEBRUARY 26

Error-Correcting Codes 445 AH 3:00 pm
Mr. Phil Merkey, Justesen Codes
MATHENATICAL TIMETABLE

MARCH 1-5, 1982

MONDAY, MARCH 1

Computer Science Colloquium 115 DCL 4:00 pm
Dr. Vincent Newson, Delco Electronics, GMC; Designing integrated circuits at Delco Electronics

TUESDAY, MARCH 2

Algebraic Number Theory 245 AH 2:00 pm
Professor Jacques Queyrul, S-Grothendieck groups, III

Classics by Request 243 AH 1:00 pm
Professor J. Milen, On a theorem of Valiron and Polya.

Combinatorics 347 AH 3:00 pm
Mr. Paul Terwilliger, Distance regular graphs with girth 3 and 4.

Differential Geometry 243 AH 3:00 pm
Professor Philippe Tondeur, Curvature and harmonic foliations.

Geometric Potpourri 241 AH 2:00 pm
No meeting this week.

Logic (Joint with Probability) 243 AH 2:00 pm
Dr. Michael von Rimscha, A logical approach to qualitative probability, I.

Max Newman Topology 243 AH 11:00 am
Professor Robert Craggs, Report on the Japan Topology Conference, III and Collapsing $K \times I$, I.

Number Theory 247 AH 1:00 pm
Professor George Greaves, Cardiff, Weighted sieves.

Stochastic Integration 245 AH 11:00 am
Professor Ditlen Monrad, Increasing processes, I

Syzygy Street 247 AH 3:00 pm
Professor Graham Evans, Algebras with straightening laws, V

WEDNESDAY, MARCH 3

Combinatorial Algorithms 237 DCL 4:00 pm
Professor C. L. Liu, A job assignment problem.

Probability & Statistics 245 AH 3:00 pm
*Mr. Yasuo Amemiya, Iowa State University; Analysis of multivariate linear errors in variables model.

Coffee & Tea 321 AH 2:30 pm
## Mathematical Timetable

### THURSDAY, MARCH 4

<table>
<thead>
<tr>
<th>Event</th>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Colloquium</td>
<td>314 AH</td>
<td>4:00 pm</td>
</tr>
<tr>
<td>Professor Hyman Bass, Columbia University; On the Jacobian conjecture</td>
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</tr>
<tr>
<td>Coffee &amp; Tea</td>
<td>321 AH</td>
<td>3:15 pm</td>
</tr>
<tr>
<td>Algebraic Number Theory</td>
<td>245 AH</td>
<td>2:00 pm</td>
</tr>
<tr>
<td>Professor S. Ullom, Congruences for class numbers of quadratic fields.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysts Meeting</td>
<td>243 AH</td>
<td>2:00 pm</td>
</tr>
<tr>
<td>See J. Uhl for information concerning agenda items.</td>
<td></td>
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</tr>
<tr>
<td>Applied Mathematics</td>
<td>314 AH</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>No meeting this week.</td>
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<td></td>
</tr>
<tr>
<td>Dynamical Systems &amp; Strange Attractors</td>
<td>241 AH</td>
<td>2:30 pm</td>
</tr>
<tr>
<td>No meeting this week.</td>
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</tr>
<tr>
<td>Functional Analysis</td>
<td>243 AH</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>Dr. A. Korszeniowski, On Banach distance between symmetric spaces.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hodge Podge</td>
<td>247 AH</td>
<td>3:00 pm</td>
</tr>
<tr>
<td>See Syzygy Street-Tuesday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number Theory</td>
<td>247 AH</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>Professor D. R. Heath-Brown, Oxford University; The least square free number is an arithmetic progression.</td>
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</tr>
<tr>
<td>Stochastic Integration</td>
<td>245 AH</td>
<td>11:00 am</td>
</tr>
<tr>
<td>Dr. Catherine Doléans-Dade, Increasing processes, II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Statistics</td>
<td>245 AH</td>
<td>3:00 pm</td>
</tr>
<tr>
<td>Mr. Kenton Juhlin, Introduction to survival analysis.</td>
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</table>

### FRIDAY, MARCH 5

<table>
<thead>
<tr>
<th>Event</th>
<th>Location</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Error-Correcting Codes</td>
<td>445 AH</td>
<td>3:00 pm</td>
</tr>
<tr>
<td>Mr. Eric Price, Some NP-complete coding problems.</td>
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</tr>
</tbody>
</table>
MONDAY, MARCH 8

MILLERCOM LECTURE 314 AH 5:00 pm
Professor J. L. Lions, College de France; Optimal control of distributed systems

Math Club Lecture 321 AH 4:15 pm
Coffee & Tea

Math Club Lecture 141 EEB 7:30 pm
Professor S. J. Chang, Physics Department; Iterative maps and their phase transitions

Computer Science Colloquium 115 DCL 4:00 pm
Mr. Kenneth Whitebread, University of Wisconsin; Some problems in the development of a model of default reasoning.

Algebraic Number Theory 141 AH 4:00 pm
Professor Olga Taussky-Todd, CalTech; Some matrix methods in algebraic number theory.

TUESDAY, MARCH 9

MILLERCOM LECTURE 314 AH 4:00 pm
Professor J. L. Lions, College de France; Optimal control of distributed systems

Coffee & Tea 321 AH 3:15 pm

Algebraic Number Theory 245 AH 2:00 pm
Professor Jacques Queyrut; S-Grothendieck groups, IV

Classics by Request 243 AH 1:00 pm
Professor D. L. Burkholder; An extremal problem that arises in martingale theory.

Combinatorics 347 AH 3:00 pm
Professor Paul Weichsel, Graphs like Petersen's

Differential Geometry 243 AH 3:00 pm
Professor Philippe Tondeur, Curvature and harmonic foliations, II

Geometric Potpourri 241 AH 2:00 pm
Professor S. Alexander, Local uniqueness of shortest paths on manifolds with convex boundary: an application of singularity theory, I

Logic (joint with Probability) 243 AH 2:00 pm
Dr. Michael von Rimscha, A logical approach to qualitative probability, II

Max Newman Topology 243 AH 11:00 am
Professor Robert Craggs, Collapsing K × I, II

Number Theory 247 AH 1:00 pm
Dr. Amit Ghosh, Institute for Advanced Study; Topic to be announced

Stochastic Integration 245 AH 11:00 am
Dr. Catherine Doléans-Dade, The Doob-decomposition.

Syzygy Street 247 AH 3:00 pm
Dr. Barbara Peskin, On a theorem of Boutot.
Mathematical Timetable -2- 3/8-12/82

WEDNESDAY, MARCH 10

Combinatorial Algorithms 237 DCL 4:00 pm
Mr. Robert K. Montoye, A practical algorithm for the solution of triangular systems on a parallel processing system.

Probability & Statistics 245 AH 3:00 pm
No meeting this week.

THURSDAY, MARCH 11

Algebra 245 AH 2:00 pm
Professor Leonard Scott, University of Virginia; On the isomorphism problem for integral group rings.

Applied Mathematics 314 AH 1:00 pm
Professor Scott Stuart, A solution to a moving boundary problem in combustion theory.

Dynamical Systems & Strange Attractors 241 AH 2:30 pm
No meeting this week.

Functional Analysis 243 AH 1:00 pm
Professor I. D. Berg, The view from Mt. Urbana, II

Hodge Podge 247 AH 3:00 pm
See Syzygy Street-Tuesday

Number Theory 247 AH 1:00 pm
Dr. David Richman, Topic to be announced.

Stochastic Integration 245 AH 11:00 am
Dr. Catherine Doléans-Dade, The martingale decomposition.

Student Statistics 245 AH 3:00 pm
Mr. Robin Shealy, Anderson's theorem and extensions.

FRIDAY, MARCH 12

Error-Correcting Codes 445 AH 2:00 pm
Mr. Louis Blair, The Griesmer bound and anticodes.

REMINDER

The week of March 15 - 19 is Spring Break. Friday, March 19 is an all-campus holiday and all offices and libraries will be closed.
A SOLUTION TO A MOVING BOUNDARY PROBLEM IN COMBUSTION THEORY

by

Professor Scott Stuart
Department of Theoretical and Applied Mechanics, UIUC

ABSTRACT: In order to describe how flames accelerate, we examine a model problem that has been derived asymptotically from the one-dimensional equations of a reacting gas. In the model, the flame forms a moving boundary that imposes certain conditions on the solution. The problem thus posed is a moving boundary problem; the solution and the location of the flame are to be found simultaneously.

March 11, 1982
MONDAY, MARCH 22

Computer Science Colloquium
Professor John Todd, California Institute of Technology; The Problems of Zolotareff.

Algebraic Number Theory
Professor Olga Taussky-Todd, CalTech; Some matrix methods in algebraic number theory.

TUESDAY, MARCH 23

Algebraic Number Theory
Professor Irving Reiner, The prime ideal theorem in non-commutative arithmetic.

Classics by Request
Professor Steven Bank, Solutions of periodic linear DE's in the complex domain (DEFLP).

Combinatorics
To be announced.

Differential Geometry
Professor Philippe Tondeur, Curvature and harmonic foliations, III.

Geometric Potpourri
Professor S. Alexander, Local uniqueness of shortest paths on manifolds with convex boundary: An application of singularity theory, II

Logic
To be announced.

Max Newman Topology
Professor Robert Craggs, Collapsing K x I, III.

Number theory
Dr. David Richman, A new proof of Lech's theorem about linear recurrence sequences, II

Stochastic Integration
Professor Ditlev Monrad, The Brownian motion.

Syzygy Street
Ms. Sae-ja Kim, Some theorems on formal functions (Faltings).

WEDNESDAY, MARCH 24

Combinatorial Algorithms
Dr. Andrew Ozlyzko, Bell Laboratory, Murray Hill, NJ; On set partitions.

Probability & Statistics
To be announced.
THURSDAY, MARCH 25

<table>
<thead>
<tr>
<th>Mathematics Colloquium</th>
<th>314 AH</th>
<th>4:00 pm</th>
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<tbody>
<tr>
<td>Dr. Andrew Ozlyzko, Bell Laboratory, Murray Hill, NJ; On the zeros of the Riemann zeta function.</td>
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<table>
<thead>
<tr>
<th>Coffee &amp; Tea</th>
<th>321 AH</th>
<th>3:15 pm</th>
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<table>
<thead>
<tr>
<th>Computer Science Colloquium</th>
<th>115 DCL</th>
<th>4:00 pm</th>
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<tbody>
<tr>
<td>Mr. Kye S. Hedlund, Purdue University; Wafer scale integration of parallel processors.</td>
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<table>
<thead>
<tr>
<th>Applied Mathematics</th>
<th>314 AH</th>
<th>1:00 pm</th>
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<tbody>
<tr>
<td>Dr. Georges A. Deschamps, EE UIUC; Applications of exterior differential forms to electromagnetics.</td>
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</table>

<table>
<thead>
<tr>
<th>Dynamical Systems &amp; Strange Attractors</th>
<th>241 AH</th>
<th>2:30 pm</th>
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<tbody>
<tr>
<td>No meeting this week.</td>
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<thead>
<tr>
<th>Functional Analysis</th>
<th>243 AH</th>
<th>1:00 pm</th>
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<tbody>
<tr>
<td>Professor J. J. Uhl, A sermon on subsets of $L_\infty$.</td>
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<table>
<thead>
<tr>
<th>Hodge Podge</th>
<th>247 AH</th>
<th>3:00 pm</th>
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<tbody>
<tr>
<td>Dr. Barbara Peskin, A criterion for rational singularities on graded rings (Watanabe).</td>
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<thead>
<tr>
<th>Number Theory</th>
<th>247 AH</th>
<th>1:00 pm</th>
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<tr>
<td>To be announced</td>
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<tr>
<th>Stochastic Integration</th>
<th>245 AH</th>
<th>11:00 am</th>
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<tbody>
<tr>
<td>No meeting this week.</td>
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<thead>
<tr>
<th>Student Statistics</th>
<th>245 AH</th>
<th>3:00 pm</th>
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<tbody>
<tr>
<td>Mr. Robin Shealey, Anderson's theorem: Related results.</td>
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FRIDAY, MARCH 26

<table>
<thead>
<tr>
<th>Error-Correcting Codes</th>
<th>445 AH</th>
<th>2:00 pm</th>
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<tbody>
<tr>
<td>No meeting this week.</td>
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</tbody>
</table>
APPLICATIONS OF EXTERIOR DIFFERENTIAL FORMS TO ELECTROMAGNETICS

Georges A. Deschamps
Department of Electrical Engineering
University of Illinois

Abstract

Differential forms provide a most natural and convenient representation of electromagnetic quantities. The exterior differential calculus (Cartan's calculus) which deals with these forms is now widely used in differential geometry, and is beginning to be appreciated by physicists working with classical mechanics, geometrical optics, and gauge theories. Its application to electromagnetics will be discussed. This calculus is simpler, more general and more versatile than the conventional vector calculus: a single operator "d", the exterior derivative, replaces curl, grad, div; fewer formulas have to be memorized; the transition from differential to integral formulations results from the single Stokes theorem valid in spaces or manifold of any dimension. A brief review of the principal rules of Cartan's calculus will be presented.

Electromagnetic quantities are represented by differential forms and their relations can be displayed as flow diagrams. The equations separate into two sets (Maxwell-Faraday and Maxwell-Ampere), each of which involves only the exterior derivative. Consequently, they have the same expression in any system of coordinates. This "covariance" property, which is not apparent in vector calculus is, of course, convenient when working with curvilinear coordinates. The relation between the two sets of equations, however, does involve a metric. Its expression through Hodge's star operator depends on the coordinate system being used and on the medium properties (\(\varepsilon, \mu\)). The space-time formulation is particularly concise and the two sets of equations are then invariant under any change of coordinates involving both space and time. However, relations between the two sets, also represented by a star operator, are invariant only under the Lorentz transformations. All quantities in each set of equations have the same physical dimension. They can be expressed respectively in Coulombs and Webers or in multiples of electric charge (e) and magnetic pole (g).

Time permitting, a few selected applications will be described to reciprocity, Huygens' principle, and Kirchhoff's approximation to the diffraction through an aperture.
MATHMATICAL TIMETABLE

MONDAY MARCH 29

Computer Science Colloquium
Professor Walter F. Tichy, Purdue University; A data model for programming support environments and its application.

Algebraic K-Theory
Dr. Robert Oliver, University of Aarhus; K-theory of integral group rings.

TUESDAY, MARCH 30

Mathematics Colloquium
Professor Kenneth Ribet, University of California, Berkeley; Mod p Hecke algebras.

Classics By Request
Professor Robert Kaufman, More Zeroes!! Or, Riccati equations and the Bessel differential equation. A theorem of C. L. Siegel.

Combinatorics
To be announced.

Differential Geometry
Professor K. T. Chen, A secondary Bezout theorem.

Geometric Potpourri
No meeting this week.

Logic
Professor C. Jockusch, Generalizations of Friedberg's jump theorem (work with R. Shore).

Max Newman Topology
Professor Robert Craggs, Collapsing K × I, IV

Number Theory
Professor Robert A. Rankin, University of Glasgow; On the zeros of certain Poincare series.

Stochastic Integration
Professor Ditlev Monrad, The Itô-integral.

Syzygy Street
Ms. Sae-ja Kim, Some theorems on formal functions (Faltings), II

WEDNESDAY, MARCH 31

Algebraic Number Theory
Professor Moshe Jarden, Tel Aviv University; The Tchebotarev density theorem for function fields.
WEDNESDAY, MARCH 31 - CONTINUED

Combinatorial Algorithms 237 DCL 4:00 pm
Mr. Dana Richards, IUPUI, Two problems in combinatorics.

Probability & Statistics 343 AH 4:00 pm
Professor Frank Knight, A post-predictive view of Gaussian processes, I

THURSDAY, APRIL 1

Mathematics Colloquium 314 AH 4:00 pm
Professor K. Ramanathan, Institute for Advanced Study, On some aspects of Ramanujan's work.

Coffee & Tea 321 AH 3:15 pm

Computer Science Colloquium 115 DCL 4:00 pm
Professor Janice E. Cuny, Purdue University; Conversion from data-flow to synchronous execution in loop programs.

Algebraic Number Theory 245 AH 2:00 pm
Professor Kenneth Ribet, University of California, Berkeley; Mod p Hecke algebras.
(Continuation of colloquium lecture)

Applied Mathematics 314 AH 1:00 pm
Professor Julian Palmore, Dynamical systems and differential geometry.

Dynamical Systems & Strange Attractors 241 AH 2:30 pm
No meeting this week.

Functional Analysis 243 AH 1:00 pm
Mr. L. Hollister Riddle, The Baire facts on weak Radon-Nikodym sets.

Group Theory 243 AH 3:00 pm
Professor John Walter, Automorphisms of the unitary groups, I

Hodge Podge 247 AH 3:00 pm
Professor Robert Fossum, Shubert varieties have only rational singularities, I

Number Theory 247 AH 1:00 pm
Professor Kenneth Stolarsky, Gaussian binomial coefficients and total positivity (an area of analysis in which partition generating functions arise).

Stochastic Integration 245 AH 11:00 am
Professor Ditlev Monrad, Stochastic differential equations.

Student Statistics 245 AH 3:00 pm
Mr. Robin Shealey, Anderson's theorem: related results, II

FRIDAY, APRIL 2

Error-Correcting Codes 445 AH 2:00 pm
Mr. Rob Beezer, The capacity of the Schlöfli graph.

Ph.D. Final Examinations 449 AH 4:00 pm
Mr. Lawrence Riddle; Professor J. J. Uhl, Director of Dissertation

Mr. Paul Terwilliger; Professor Paul Weichsel, Director of Dissertation
DYNAMICAL SYSTEMS AND DIFFERENTIAL GEOMETRY

Professor Julian Palmore
Department of Mathematics, UIUC

ABSTRACT: Several classical dynamical systems arising in mechanics and electrodynamics will be used to illustrate the application to orbit theory of techniques of differential geometry.

April 1, 1982

1 pm
thursday
314
altgeld hall
# Mathematical Timetable

## Monday, April 5

**Algebra**
- 245 AH
- **2:00 pm**
- Professor Irving Reiner, The prime ideal theorem in non-commutative arithmetic, II

**Classics by Request**
- 243 AH
- **1:00 pm**
- Professor Lee Rubel, Solution of algebraic differentiation equations, I

**Combinatorics**
- 347 AH
- **3:00 pm**
- Professor Bruce Reznick, Sums of fractional parts of multiples.

**Differential Geometry**
- 243 AH
- **3:00 pm**
- Mr. Mark A. Thomas, Reducing the group of a first-order geometric structure, I

**Geometric Potpourri**
- 241 AH
- **2:00 pm**
- Professor G. Francis, Seifert surfaces, knot complements, orbifolds and other fauna in Thurston’s zoo, I

**Logic**
- 243 AH
- **2:00 pm**
- Professor Gert Müller, University of Heidelberg, Choice and partitions.

**Max Newman Topology**
- 243 AH
- **11:00 am**
- Professor Mary-Elizabeth Hamstrom, Any spline of the cube is 2-collapsible Edwards-Gilman

**Number Theory**
- 247 AH
- **1:00 pm**
- Professor Robert A. Rankin, University of Glasgow, The Fourier coefficients of certain Eisenstein series.

**Stochastic Integration**
- 245 AH
- **11:00 am**
- Professor Ditlev Monrad, Brownian motion in a force field.

**Syzygy Street**
- 247 AH
- **3:00 pm**
- Professor B. Ulrich, Purdue University, Deformation and liaison

## Tuesday, April 6

**Combinatorial Algorithms**
- 237 DCL
- **4:00 pm**
- Professor Franco Preparata, A mesh-connected area-time optimal VLSI integer multiplier

**Probability & Statistics**
- 343 AH
- **4:00 pm**
- Professor Frank Knight, a post-predictive view of Gaussian processes, II

## Wednesday, April 7

**Combinatorial Algorithms**
- 237 DCL
- **4:00 pm**
- Professor Franco Preparata, A mesh-connected area-time optimal VLSI integer multiplier
### THURSDAY, APRIL 8

<table>
<thead>
<tr>
<th>Event</th>
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<th>Location</th>
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<tbody>
<tr>
<td><strong>Mathematics Colloquium</strong></td>
<td>4:00 pm</td>
<td>314 AH</td>
</tr>
<tr>
<td>Professor Benjamin Halpern, Indiana University, Winding numbers and branch covers</td>
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<td></td>
</tr>
<tr>
<td>Coffee &amp; Tea</td>
<td>3:15 pm</td>
<td>321 AH</td>
</tr>
<tr>
<td><strong>Computer Science Colloquium</strong></td>
<td>4:00 pm</td>
<td>115 DCL</td>
</tr>
<tr>
<td>Professor William Gragg, University of Kentucky, The unitary eigenvalue problem and singular values of complex symmetric matrices.</td>
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</tr>
<tr>
<td><strong>Applied Mathematics</strong></td>
<td>1:00 pm</td>
<td>314 AH</td>
</tr>
<tr>
<td>Professor Ramer Basar, EE &amp; CSL, Stochastic control of interconnected systems under decentralized information.</td>
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<tr>
<td><strong>Dynamical Systems &amp; Strange Attractors</strong></td>
<td>2:30 pm</td>
<td>241 AH</td>
</tr>
<tr>
<td>No meeting this week.</td>
<td></td>
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<tr>
<td><strong>Functional Analysis</strong></td>
<td>1:00 pm</td>
<td>243 AH</td>
</tr>
<tr>
<td>Dr. Larry Riddle, The Baire facts on weak Radon-Nicodym sets, II</td>
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</tr>
<tr>
<td><strong>Group Theory</strong></td>
<td>3:00 pm</td>
<td>243 AH</td>
</tr>
<tr>
<td>Professor John Walter, Automorphisms of the unitary groups, II</td>
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<tr>
<td><strong>Hodge Podge</strong></td>
<td>3:00 pm</td>
<td>247 AH</td>
</tr>
<tr>
<td>Mr. Michael Stillman, Harvard University, Nonunirationality of moduli space of abelian varieties</td>
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<tr>
<td><strong>Mathematics Club</strong></td>
<td>7:30 pm</td>
<td>124 BURRILL</td>
</tr>
<tr>
<td>Professor Benjamin Halpern, Indiana University, Beyond Rubik's Cube</td>
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<tr>
<td><strong>Number Theory</strong></td>
<td>1:00 pm</td>
<td>247 AH</td>
</tr>
<tr>
<td>Professor Carlos J. Moreno, Kloostermann sums: report on recent progress by Iwanic, Zarnck, etc.</td>
<td></td>
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<tr>
<td><strong>Stochastic Integration</strong></td>
<td>11:00 am</td>
<td>245 AH</td>
</tr>
<tr>
<td>Professor Ditlev Monrad, Stochastic differential equations, II</td>
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<tr>
<td><strong>Student Statistics</strong></td>
<td>3:00 pm</td>
<td>245 AH</td>
</tr>
<tr>
<td>Mr. Daniel Naiman, Reflections on graduate study from beginning to end.</td>
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### FRIDAY, APRIL 9

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<thead>
<tr>
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<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td><strong>Error-Correcting Codes</strong></td>
<td>2:00 pm</td>
<td>445 AH</td>
</tr>
<tr>
<td>Mr. H. L. Janwa, M&quot;obius inversion on partially ordered sets</td>
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STOCHASTIC CONTROL OF INTERCONNECTED
SYSTEMS UNDER DECENTRALIZED INFORMATION

Tamer Basar
Department of Electrical Engineering and
Coordinated Science Laboratory
University of Illinois

In this talk, we will discuss, in the general framework of team decision theory, some salient aspects of the optimum control of interconnected stochastic systems under imperfect decentralized measurements. Particular emphasis will be placed on the interplay between information and control in these dynamic nonclassical stochastic optimization problems, and a general theory will be presented whereby optimum solutions of a subclass of such problems (defined in both discrete and continuous time) with "partially nested" information patterns can be obtained through the solutions of a sequence of static stochastic team problems. Two prototypes of such problems (one in discrete-time and the other one in continuous-time) will be identified, and derivation of their solutions under some structural restrictions will be discussed. The talk will conclude by elucidating the mathematical difficulties inherent in the derivation of optimum team solutions under other (than partially nested) types of decentralized information patterns.

April 8, 1982
## Mathematical Timetable

**Monday, April 12**

Daniel Q. Naiman's Final Examination

**Tuesday, April 13**

<table>
<thead>
<tr>
<th>Course</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Algebra</td>
<td>2:00 pm</td>
<td>245 AH</td>
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<tr>
<td>Dr. David Richman, A result about exponential polynomials in characteristic P.</td>
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<tr>
<td>Classics by Request</td>
<td>1:00 pm</td>
<td>243 AH</td>
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<tr>
<td>Professor Lee Rubel, Solution of algebraic differentiation equations, II</td>
<td></td>
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<tr>
<td>Differential Geometry</td>
<td>3:00 pm</td>
<td>243 AH</td>
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<tr>
<td>Mr. Mark A. Thomas, Reducing the group of a first-order geometric structure, II</td>
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<tr>
<td>Geometric Potpourri &amp; Combinatorics</td>
<td>2:00 pm</td>
<td>241 AH</td>
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<tr>
<td>Professor Bruce Reznick, The waltz of the toroids.</td>
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<td></td>
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<tr>
<td>Logic</td>
<td>2:00 pm</td>
<td>243 AH</td>
</tr>
<tr>
<td>Professor Peter Loeb, A Daniell integral method of obtaining standard measure spaces in nonstandard models.</td>
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<td></td>
</tr>
<tr>
<td>Max Newman Topology</td>
<td>11:00 am</td>
<td>243 AH</td>
</tr>
<tr>
<td>Professor Mary-Elizabeth Hamstrom, Any spine of the cube is 2-collapsible Edwards-Gillman, II</td>
<td></td>
<td></td>
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<tr>
<td>Number Theory</td>
<td>1:00 pm</td>
<td>247 AH</td>
</tr>
<tr>
<td>Professor Robert A. Rankin, Univ. of Glasgow, The distribution of the Fourier coefficients of a certain family of multiplicative functions.</td>
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<tr>
<td>Stochastic Integration</td>
<td>11:00 am</td>
<td>245 AH</td>
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<tr>
<td>Professor Ditlev Monrad, Stochastic differential equations, III.</td>
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<td></td>
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<tr>
<td>Syzygy Street</td>
<td>3:00 pm</td>
<td>247 AH</td>
</tr>
<tr>
<td>To be announced</td>
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**Wednesday, April 14**

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Mathematics Colloquium</td>
<td>5:00 pm</td>
<td>314 AH</td>
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<tr>
<td>Dr. Menachem Magidor, Ben Gurion University and UCLA (visiting), On the singular cardinal problem; a progress report.</td>
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<tr>
<td>Coffee and Tea</td>
<td>4:15 pm</td>
<td>321 AH</td>
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<tr>
<td>Computer Science Colloquium</td>
<td>4:00 pm</td>
<td>115 DCL</td>
</tr>
<tr>
<td>Professor Richard G. Hamlet, Univ. of Maryland, Testing vs. proving: machines and people.</td>
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</table>
WEDNESDAY, APRIL 14 (cont.)

**Combinatorial Algorithms**  
No meeting this week

**Probability & Statistics**  
No meeting this week

THURSDAY, APRIL 15

**Mathematics Colloquium**  
Professor B. Sz. Nagy, Indiana Univ. (visiting), *Diagonalization of Matrices over $H^\infty$*.  
314 AH  1:00 pm

**Mathematics Colloquium**  
Professor C. Foias, Indiana University, *Nonlinear spectral theory related to the Navier-Stokes equations*.  
314 AH  4:00 pm

**Coffee and Tea**  
321 AH  3:15 pm

**Computer Science Colloquium**  
Mr. Paul G. Spirakis, Harvard University, *Speed variability in distributed systems*.  
115 DCL  4:00 pm

**Algebra Area Meeting**  
To discuss course offering for Spring 1983.  
245 AH  1:00 pm

**Applied Mathematics**  
No meeting this week.

**Dynamical Systems & Strange Attractors**  
No meeting this week.

**Functional Analysis**  
Mr. Jon Snader, Bishop's condition ($\beta$) and decomposable operators.  
243 AH  1:00 pm

**Group Theory**  
Mr. Jay Zimmerman, *Automorphism groups of infinite groups only, I*.  
243 AH  3:00 pm

**Hodge Podge**  
To be announced

**Number Theory**  
No meeting this week.

**Stochastic Integration**  
Professor Ditlev Monrad, *Quadratic variation: Ito's formula*.  
245 AH  11:00 am

**Student Statistics**  
No meeting this week.

FRIDAY, APRIL 16

**Error-Correcting Codes**  
Mr. H.-F. Chen, *Berlekamp's algorithm for factoring polynomials*.  
445 AH  2:00 pm
MONDAY, APRIL 19

Computer Science Colloquium 198 CSL 4:00 pm
Dr. Neil Berglund, INTEL Corporation; The evolution of MOS process technology.

Algebraic Number Theory 141 AH 4:00 pm
Professor Gary Cornell, University of Connecticut; Genus theory and the class group.

TUESDAY, APRIL 20

Pi Mu Epsilon 314 AH 4:00 pm
Professor Heini Halberstam, The vibrating string controversy.

Coffee & Tea 321 AH 3:00 pm

Computer Science Colloquium 237-9 DCL 4:00 PM
Mr. Ran Ginosar, Princeton University; MP/C: A multiprocessor/computer architecture.

Algebraic Number Theory 245 AH 2:00 pm
Professor H. Kisilvesky, Concordia University; Semisimplicity of certain Iwasawa modules.

Algebraic Number Theory 245 AH 4:00 pm
Professor Michael Rosen, Brown University; Stickelberger's theorem in function fields.

Classics by Request 243 AH 1:00 pm
Professor Jang-Mei Wu, Paths for subharmonic functions—by B. Davis and J. Lewis.

Combinatorics 347 AH 3:00 pm
Dr. David Richman, A result of deBruijn on bases of integers.

Differential Geometry 243 AH 3:00 pm
No meeting—see notice about Geometry-Topology Area Meeting.

Geometric Potpourri 241 AH 2:00 pm
Professor George Francis, From catastrophes to chaos: a very elementary introduction.

Logic 243 AH 2:00 pm
Professor Peter Loeb, A Daniell integral method of obtaining standard measure spaces in nonstandard models, II

Logic Area Meeting 341 AH 3:00 pm
Logic area meeting to schedule courses for Spring 1983. (Leave a note in C. Jockusch's box if you are interested but unable to attend.)

Max Newman Topology 243 AH 11:00 am
Professor Mary-Elizabeth Hamstrom, Any spine of the cube is 2-collapsible Edwards-Gillman, II

Number Theory 247 AH 1:00 pm
Professor Carlos Moreno, Kloosterman sums: report on recent progress by Iwanic, Zarnak, etc., II
TUESDAY, APRIL 20—CONTINUED

**Stochastic Integration**
245 AH 11:00 am
Dr. Catherine Doléans-Dade, Ito's formula.

**Syzygy Street**
247 AH 3:00 pm
Professor Graham Evans, The new program for computing syzygies: the algorithm and its implementation.

WEDNESDAY, APRIL 21

**Algebraic Number Theory**
141 AH 4:00 pm
Professor Jack Sonn, Technion University; Direct summands of class groups.

**Combinatorial Algorithms**
237 DCL 4:00 pm
Professor Charles Blair, Further results about stable marriages.

**Probability-Statistics**
343 AH 4:00 pm
Professor William Stout, Moment and probability bounds for maximum of partial sums of dependent random variables.

THURSDAY, APRIL 22

**Applied Mathematics**
314 AH 1:00 pm
Professor John Kogut, Physics Department, UIUC; To be announced.

**Dynamical Systems & Strange Attractors**
241 AH 2:30 pm
No meeting this week.

**Functional Analysis**
243 AH 1:00 pm
Mr. Jon Snader, Bishop's condition (β) and decomposable operators.

**Group Theory**
243 AH 3:00 pm
Mr. Jay Zimmerman, Automorphism groups of infinite groups only, II

**Hodge-Podge**
347 AH 3:00 pm
Dr. Craig Huneke, Schubert subvarieties of the flag variety and representations of SL(n), I

**Number Theory**
247 AH 1:00 pm
Professor Bruce Berndt, Ramanujan's analogues of the gamma functions.

**Probability-Statistics-JOINT WITH PURDUE**
245 AH 4:00 pm
Professor David Moore, Purdue University; Effect of dependence on chi-square tests.

**Coffee & Tea**
321 AH 3:30 pm

**Stochastic Integration**
245 AH 11:00 am
Dr. Catherine Doléans-Dade, Representation of martingales on the fields of Brownian motion.

**Student Statistics**
245 AH 3:00 pm
Mr. Kenton Juhlin, Survival analysis: the 2-sample problem.
FRIDAY, APRIL 23

Instructional Awards Ceremony 314 AH 3:00 pm
Presentation of the instructional awards to the outstanding teaching assistants of 1981-82. There will be a reception immediately following the ceremony in room 321 Altgeld Hall.

Error-Correcting Codes 445 AH 2:00 pm
No meeting this week.
LATTICE GUAGE THEORY: NEARING THE SOLUTION OF STRONG INTERACTIONS

Professor J. Kogut, Department of Physics, UIUC

ABSTRACT: Replacing space-time by a grid is a standard, but pedestrian, aid in the solution of partial differential equations. A similar approach to Quantum Field Theory, Lattice Guage Theory, however, has led to great progress in both our fundamental and practical understanding of theories of elementary particles. The basic notions, both mathematical and physical, and the direction of basic research in this field will be discussed.
MONDAY, APRIL 26

TUESDAY, APRIL 27

Algebraic Number Theory
No meeting today.

Classics by Request
Professor Jan-Mei Wu, Paths for subharmonic functions by B. Davis and J. Lewis, II

Combinatorics
Dr. David Richman, A result of duBruijn on bases of integers, II

Differential Geometry
To be announced.

Geometric Potpourri
Professor George Francis, Linear and aerial perspective for mathematicians.

Logic
Dr. Leonard Lipschitz, Purdue University; Diophantine theory of addition and divisibility.

Number Theory
Professor Carlos Moreno, Kloosterman sums: report on recent progress by Iwaniec, Zarnak, etc., III

Stochastic Integration
Dr. Catherine Doleans-Dade, Integration with respect to square-integrable martingales, I

Syzygy Street
Professor Frank DeMeyer, Fields invariant under the action of a finite group and retract rationality.

WEDNESDAY, APRIL 28

Combinatorial Algorithms
Mr. Tommaso Bolognesi, Channel routing in the "knocked-knee" model.

Probability-Statistics
Professor Marcus Felson, Sociology Department; Monthly crime modeling: an interesting case of negative autocorrelation.
THURSDAY, APRIL 29

Computer Science Colloquium
Professor T. L. Freeman, visiting University of Cincinnati from Manchester; The use of projections in quasi-Newton minimisation algorithms.

Algebra
Professor Alex Hahn, Notre Dame; Maximal orders and their linear groups.

Applied Mathematics
No meeting this week.

Dynamical Systems & Strange Attractors
No meeting this week.

Functional Analysis
Mr. Jon Snader, Bishop's condition (B) and decomposable operators, II

Hodge-Podge
Dr. Craig Huneke, Schubert subvarieties of the flag variety and representations of SL(n), II

Number Theory - SEE FRIDAY ALSO
Professor Carlos Moreno, Kloosterman sums: report on recent progress by Iwanic, Zarnak, etc., IV

Stochastic Integration
Dr. Catherine Doleans-Dade, Integration with respect to square-integrable martingales, II

Student Statistics
Mr. Kenton Juhlin, Survival analysis: the 2-sample problem.

FRIDAY, APRIL 30

Mathematics Colloquium
Professor U. Dieter, visiting Stanford University; Roulette as a ruin game: optimal strategies for gambling.

Algebraic Number Theory
Professor Robert Gold, Ohio State University; Rational Coates-Wiles series.

Error Correcting Codes
To be announced.

Number Theory
Professor U. Dieter, visiting Stanford University; Dedekind sums: generalizations and applications.
MATHEMATICAL TIMETABLE

MAY 3 - 7, 1982

SPECIAL NOTICE: Since this is the last timetable of the semester, any seminar which listed "no meeting" has just been deleted.

MONDAY, MAY 3

Computer Science Colloquium 115 DCL 4:00 pm
Professor Clyde Kruskal, The structure of interconnection networks for parallel processors.

TUESDAY, MAY 4

Mathematics Colloquium 314 AH 4:00 pm
Professor Madan Puri, Indiana University; Some asymptotic results for simple linear rank statistics.

Coffee & Tea 321 AH 3:15 pm

Computer Science Colloquium 237-9 DCL 4:00 pm
Dr. Tom Manteuffel, Los Alamos National Laboratory, Dynamic acceleration of nonlinear iteration.

Algebra 245 AH 2:00 pm
Dr. David Richman, A result about orthogonal matrices in characteristic two.

Classics by Request 243 AH 1:00 pm

Combinatorics 347 AH 3:00 pm
Mr. David Youngerman, Addition problems.

Geometric Potpourri 241 AH 2:00 pm
Professor George Francis, Linear and aerial perspective for mathematicians, II.

Number Theory 247 AH 1:00 pm
Dr. R. Balasubramanian, Waring's problem.

Stochastic Integration 245 AH 11:00 am
Dr. Catherine Doléans-Dade, Integration with respect to square-integrable martingales, III

Syzygy Street 247 AH 3:00 pm
Mr. Joseph Brennan, The Littlewood-Richardson rule.

WEDNESDAY, MAY 5

THURSDAY, MAY 6

Mathematics Colloquium 314 AH 4:00 pm
Professor Guido Weiss, Washington University; On spaces generated by blocks.

Coffee & Tea 321 AH 3:15 pm
THURSDAY, MAY 6 - CONTINUED

Applied Mathematics
No meeting today, but watch for special announcement for May 17.

Hodge Podge
Dr. Craig Huneke, Schubert subvarieties of the flag variety and representations of $SL(n)$, III
247 AH 3:00 pm

Number Theory
Professor Bruce Berndt, Ramanujan's analogues of the gamma functions.
247 AH 1:00 pm

Stochastic Integration
Dr. Catherine Doléans-Dade, Integration with respect to square-integrable martingales, IV
245 AH 11:00 am

FRIDAY, MAY 7 - Reading Day; No Classes
SPECIAL LECTURE

DYNAMIC BIFURCATION IN THE PLANE

Professor J. Carr, Heriot-Watt, University, Scotland

Abstract. In this lecture we consider a dynamic bifurcation problem in the plane with two parameters:

\[ \dot{x} = f(x, \lambda), \quad x \in \mathbb{R}^2, \lambda \in \mathbb{R}^2. \]  

when \( \lambda = 0 \) the linearized equation is assumed to be

\[ \dot{x} = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} x. \]

Under generic conditions on \( f \) we describe the general behaviour of solutions of (\#). Some applications to partial differential equations will also be described.

Monday, May 17, 1982