MATHEMATICAL ASSOCIATION OF AMERICA
ROCKY MOUNTAIN SECTION GENERAL MEETING
MESA STATE COLLEGE
GRAND JUNCTION, COLORADO

SATURDAY, APRIL 20, 1996
8:15 a.m. - Liff Auditorium

REPORTS AND ANNOUNCEMENTS

1)   Election of new officers: Gail Gliner

2)   Approval of minutes: Bill Ramaley

3)   Treasurer's Report: Bill Ramaley

4)   Governor's Report: Tino Mendez
         Department Representatives Network Update

5)   Announcement of Awards (presented at Banquet): Bill Ramaley

      -DTA recipient: *Lena Hartvigson*
      -Student Presenters (1-year memberships):
      -25-year members:

6)   Announcement of 1997 meeting site

7)   1998 meeting site to be selected

Business

1)   Review of Section Activities Grants Fund
         a)   application and review process draft
         b)   funding mechanism proposal

2)   Other

Financial Statement April 19, 1996
Rocky Mountain Section Mathematical Association of America

Savings Account

March 31, 1995 Balance	4179.58
Interest paid Ap 1, 1995 to Mar 31, 1996	138.95
March 31, 1996 Balance	4318.53

(note: Included here is a $1500 fund which can be loaned for expenses in connection with a summer short course offered in the section)

Checking Account

April 22, 1995 Balance		414.23

Income
Subvention from national MAA (annual support)		500.00
additional support (to bring total up to last years allocation)		200.00
Exxon Grant for student activity on Internet		750.00
	Total	1450.00

Expenses paid
Student Internet-	Metro State	160.00
	UNC	40.00
	FLC	54.39
	subtotal	254.39
Newsletter mailing from FLC		333.18
	Total	587.57

Net Change in Checking Account	862.43
Balance April 19, 1996	1276.66

Notes:
1) Actually checks #170 ($7.38) and #172 ($160.00) have not been presented for payment so that the Credit Union shows a balance of $1444.04 in our checking account.
2) The Exxon student grant of $750 has had only $254.39 spent, leaving $495.61 encumbered. Tom Kelly expects that to be spent in a fall student Internet activity.

These accounts are held in the Southwest Colorado Federal Credit Union,
Durango, Colorado, 81301

Respectively submitted,

William C. Ramaley,
Secretary/Treasurer
Rocky Mountain Section, MAA

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Agenda Items for Executive Committee, 1996 MAA, Rocky Mountain Section

1) Secretary/Treasurer's Report (Bill Ramaley)

.Finance report and minutes of 1995 meetings of section and of the executive committee

As background on finance to the executive committee-

-The totals of both savings and checking accounts are, at meeting time:

1991 -- 3957.88

1992 -- 4107.84

1993 -- 4490.81

1994 -- 3799.45

1995 -- 4593.81

1996 -- 5595.19   (see finance report--$495.61 of this is encumbered for student Internet)

2) One-year memberships for students who present papers at meeting —

3) Distinguished Teaching Award Committee (Ed Hawkins, A. Duane Porter, Bob Gaines)

4) Award for Distinguished College or University Teaching of Mathematics

Zenas Hartvigson, University of Colorado at Denver

5) American High School Mathematics Examination; recognition of students whose scores are_____

(Tino Mendez)

6) EXXON Education Foundation Grant. Internet activity report (Tom Kelley) . Note that the letter informing the section of the grant did not restrict the grant to Internet, but said only that, "Your section was awarded a mini-grant to develop and promote student activites within your Section."

(See attached list of questions the students sought answers to on the Internet)

7) Nomination Committee (Gail Gliner)

8) Announcement of Janet Barnett being elected Rocky Mountain Section Governor

9) Section Handbook (Bill Ramaley)

November 10, 1995

William C. Ramaley
Department of Mathematics
Fort Lewis College
Durango, CO 81301

Dear William,

This is the first notice of the Joint Spring MAA meeting of the Rocky Mountain Section and the Intermountain Section to be held at Mesa State College, Grand Junction, Colorado on April 19-20, 1996. Kappa Mu Epsilon, the Mathematic Honorary Society, will be jointly meeting with us also on these dates. KME students will be presenting papers and this would be an opportunity for us all to learn more about the activities of KME.

A workshop on the new Texas Instruments Calculator, the TI-92, is in the planning stages for April 19, 1996 from 9:00 a.m. to 11:30 a.m. The enrollment for this workshop will be by preregistration only and probably with a small additional fee. More information will be provided as more details are determined.

This letter should serve as the first notice for the call for papers to be presented at the meeting by faculty as well as students. We are tentatively planning for 20 minute sessions for paper presentations. We're thrilled to announce that a guest speaker will be Dr. Donald Ross of the University of Oregon and the current President of MAA.

The Friday evening buffet banquet will be at the Holiday Inn 7:00 p.m. with a reception at 6:00 p.m. also at the Holiday Inn. The registration, business meetings, sessions, and invited speakers sessions will be in the Student Center on the campus of Mesa State College.

Anyone wishing to present a paper should have the request and abstract to us by **April 1, 1996.** There are only a limited number of time slots available for the paper presentations so let's not procrastinate. Preregistrations for the meeting and banquet will be accepted until **April 10, 1996** and checks should be made out to MAA Joint Meeting.

Campus Parking instructions for the joint meeting and other concerns will be included with the second mailing.

William Ramaley, Secretary of the Rocky Mountain Section, would like the following information sent to him: (ph.970-247-7268, email is Ramaley_w@fortlewis.edu)
> 1. Information about departmental events or individual members,
> 2. Requests for nomination forms for the MAA Fifth Annual Distinguished
>   Teaching Award.

He also requests that any nominations for the Rocky Mountain Section Governor to Dr. Gail Gliner, at Metropolitan State College.

Respectfully Submitted,

Carl Kerns & Clifford Britton, Program Co-Chairs
970-248-1702, 970-248-1859
fax: 970-248-1324, email address: cbritton@mesa5.mesa.colorado.edu

Donations:

Friday Banquet   (tax and tip included) $15.00 per person

    (3 entrees, Roast beef, baked cod, teriyaki chicken, 7 salads,
       whipped potatoes, green beans, NY style cheesecake,
         coffee, tea or milk).

Faculty registration $10.00 per person

Student registration $ 3.00 per student

Motels with government rates: (be sure to ask for government rates for MAA meeting
    when making your reservations)   (all of these motels are located on Horizon Drize,
    I-70 Exit 31, the airport exit with easy access to Mesa State College, 2.5 miles)

Holiday Inn 1-970-243-6790 $53.00 for a room with 1-4 people

Hilton   1-970-241-8888 $60.00 double

Howard Johnson 1-970-243-5150 $32 single w/queen, $34 double w/2 double beds

Best Value Inn 1-970-243-5080 $29.95 single, $34.95 for 2, $35.95 for 3, $36.95 for 4
                             (all with queen size beds)

Super 8   1-970-248-8080 $39.88 single, $44.88 for 2, $49.88 for 3

Ramada Inn 1-970- 241-8411 $45.00 single, $52.00 double

Days Inn   1-970-245-7200 $38.00 plus tax for single or double

Budget Host Inn 1-970-243-6050 $33.00 single, $37.00 double

Friday April 19, 1996 8:15-9:30 a.m. and 11:30-3:30   Registration Table in South Lobby of Student Center

8:30-12:00 noon Combinatorics via Functional Equations, Donald Snow, Brigham Young University **Krey Room, Student Center
9:00-11:30 a.m. TI-92 Workshop, Richard Tebbs, Southern Utah University, **Zeigel Room, Student Center
11:00a.m. Rocky Mountain Executive Officers Meeting - Cafeteria -Student Center
1:00-1:45 p.m. Liff Auditorium of Student Center

MESA STATE COLLEGE

Kickoff Address: "Secrets & Geometry" Dr. Gustavus Simmons, Rothschild Professor of Math at Cambridge and Visiting Fellow at Trinity College.Retired Director of National Security Studies, Sandia National Labs   Liff Auditorium in Student Center

Friday April 19	Liff Auditorium	Boettcher Room	Bacon Room	Zeigel Room	Krey Room	FletcherRoom
1:50-2:10 p.m.	Book Display 11:30 a.m. - 4:00 p.m.	Eric Packard, MSC Perfect Card Shuffling	Jihad Qaddour, MSC A Math Model of Bacterial Gene Regulation.	Karen Whitehead, SDSMT Gauss and the Computation of Planetary Orbits	Robert Heal, USU Ripping A Text To Bytes	Melissa MacDonell MSC Galois Representation Attached to Elliptic Curves
2:15-2:35 p.m.	Book Display 11:30 a.m. - 4:00 p.m.	Mendez/ Cisneros,MSCD	J. Douthett & R. Krantz, AlbuquerqueCC&MSCD Maximally Even Sets in Magnetic Ordering	Don Teets, SDSMT Gauss and the Comput-ation of Planetary Orbits continued	Jay Huber, ISU Some Observation on the Integers Mod (pq)	Robin O'Connor MSC Nagell-Lutz Theorem
2:40-3:00 p.m.	Book Display 11:30 a.m. - 4:00 p.m.	Jim Loats, MSCD Using Rubrics in the College Math Classroom	R.Krantz & J. Douthett, MSCD & AlbuquerqueCC Self-Similarity in Magnetic Phase Diagrams	Harold Davenport, Mesa Fermat's Last Theorem-A Marvelous Proof	Van Bain, MSC An Inductive Algorithm for Producing Graph of N-cubes	Matthew Isom, UNC Writing in Mathematics
3:05-3:25 p.m	Book Display 11:30 a.m. - 4:00 p.m.	Hortensia Soto-Johnson, USC Technological vs Traditional Approach in Conceptual Understanding of Series	Michele Intermont, MSC Towards a Construction of theA-Cellular Approximation of a Space.	Gary DeYoung, Mesa Exploring Reflections: Uni-form Illumination of Proximal Objects using Spectral Reflector	Domenica Donovan DU Roller Coaster Design	Jessica Tams, USU Two Tree Mountain Pine Beetle Model
3:30-3:50 p.m.	Book Display 11:30 a.m. - 4:00 p.m.	James E. Daly, UCCS Elementary Use of Wavelets to Choose the Optimal Bin Width of a Histogram	Jeffrey Berg/Pat Hauss,ACC College Algebra Concept Learning Enhanced with Graphing Calculator	Jason Knight Belnap, USU Geršgorin and Beyond	Robert J. Fisher, ISU Demonstration of the Geometer's Sketchpad Software	Colin O'Donnell, MSCD Parabolic Primality Testing
3:55-4:15 p.m.		William Briggs, CUD Classroom Case Studies in Liberal Arts Mathematics	Scott Searcy, Idaho St Horner's Algorithm,Base Conversion, Remainder Theorem, etc.	Ann Marie Harris, USU The Games People Play	Don Snow, BYU Table Algorithm Takesthe HardWork Out of Finding Series Solutions to DE's	Troy McVay, SDSMT A Mathematical Model of an Oscillating Chemical Reaction

4:20-5:00 p.m. Invited Address: Fred Adler, Professor of Mathematical Biology, University of Utah
        Liff Auditorium   "Equalization andOptimization by Colonies of Foraging Ants"
6:00 p.m. No Host Reception -----------------Holiday Inn
7:00 p.m. Banquet Buffet and Speaker, Kenneth Ross, President of MAA------Holiday Inn

Saturday April 20, 1996

7:00 a.m. Rocky Mountain Department Representative Breakfast Meeting--Good Pastures at Friendship Inn 733 Horizon Drive

8:15-8:55 a.m. Rocky Mountain Business Meeting- Liff Auditorium- Student Center

9:00-9:45 a.m. Liff Auditorium of Student Center

Keynote Speaker: Marty Golubitsky
Cullen Distinguished Professor of Mathematics
University of Houston
"Patterns, Symmetry & Chaos"

Saturday April 20, 1996	Liff Aud	Boettcher Room	Bacon Room	Zeigel Room	Krey Room	Fletcher Room
9:50-10:10 a.m.	David Fisher, UCD Squaring a Tournament: A Proof of Dean's Conjecture	George Donovan, MSCD A Computerized Mathematical Exploration	Lawrence Ford, ISU Voting Procedures which can be Determined by Pairwise Elections between Alternatives	Jerome Bennett, USU Bootstrap and Delta Estimators	Rick Trujillo, CUD The 'Calculus for Kids" Project.	Shannon Flowers, WestColl Math and Bungee Jumping
10:15-10:35 a.m.	Jerry Shultz, MSCD A Symbolic Manipulation Program for Learning Algebra	Patrick Lang, ISU Cyclic Subspaces, Invariant Polynomials, and Regression	Igor Szczyrba, UNC Computers and 3-D Cognition	Amanda Brown, USU The History of Fermat's Last Theorem.	Mohammad Omran, BYU The Real Positive Semidefinite Completion Problem for Nonchordal Graphs: Revisited	Asim Jalis, USU The Axiom of Choice
10:40-11:00 a.m.	Bill Emerson, MSCD Teaching Differential Equations with Mathematica	Vencil Skarda, BYU Romberg Integration, Rearranged.	T. H. Steele, Weber SU Stability Properties for the Collection of a Function's Attractive Sets.	Derek Hein, USU The Gambler's Ruin	Dick Walker, FLC Solutions to $\Delta f/\Delta x = f$	Cindy Wyels, WSU The Exponent Set of a Primitive Matrix with a Primitive Submatrix.
11:05-11:25 a.m.	Anne Spalding, UCD Knights Domination of a k x n Chessboard	Larry Johnson, MSCD Effects of School Reform on Math Departments.	Paul Talaga, Weber SU A Nonlocal Problem in Shear Banding.	Shahar Boneh, MSCD Waiting for Change at the Box Office: A Fun Combinatorial Problem.	Lee Badger, WSU How Dense will We get?	Kay Litchfield, GTE/UU Easy Continued Fraction Convergents
11:30-11:50 a.m.	Aesoo Chung, UCD Queen's Domination of M x N Chessboards	Jim Wolper, ISU Fractions in Finite Rings	Robin Cruz, USC Examples of Noncommutative Algebraic Geometry	Christine Collier, UNC Counting Parallelograms in a triangulated equilateral triangle	Brian Traver, WSU Population Model Applied to Easter Island Data	Darel Hardy, CSU Teaching Calculus using Scientific WorkPlace
11:55-12:15 p.m.	Barry Barof, CC Knights Tours and Magic Squares	Jason Stetton, CC The Dilemma of a Prisoner Named C3PO	Craig Pringle, ISU Smoothing Splines - Current Status and New Developments	J. Farmer/S. Leth,UNC An Asymptotic Formula for Powers of Binomial Coefficients and about Inductive Reasoning	Greg Wheeler, USU The Pipeline Problem: A Multimedia Approach	Tracy Hall, BYU Bounded Principal Minor Ratios of Positive Semidefinite Matrices

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7:00 p.m. Banquet Buffet and Speaker, Kenneth Ross, President of MAA, Holiday Inn, "Factorization in L^1 and other places"

Friday Nite Banquet Agenda: Ed Hawkins ---Master of Ceremonies

7:00p.m. (if food is in Valley Rooms with seating) Seat Everybody!!
Welcome------Have Head table lead-off to serving line first then other tables.
(if food is in Holidome, gather head table people to front of line-proceed with food to seating)

After Eating:
Introduce Head-Table members
  Harriet Hawkins
  Carolyn Tucker--Governor of Intermountain Section
  Tino Mendez -- Governor of Rocky Mountain Section
  Don Snow ---   Chair of Intermountain Section
  Ed Hawkins --- Chair of Rocky Mountain Section
  Bill Ramaley --- Secretary of Rocky Mountain Section
  Linda Hill   ---   National Chair of Committee of Sections
  Kenneth Ross   ---President of MAA, Speaker
  Mrs. Ross

Introduce Bob Kribel, Dean of School of Natural Sciences & Mathematics,
        for a few words of Welcome!

Presentation of 25 Year Awards for membership in MAA,
                Intermountain Section --Don Snow *Tino Mendz*
                Rocky Mountain Section--Bill Ramaley

Presentation of Distinguished Teaching Award
                Intermountain Section   -- Don Snow
                Rocky Mountain Section--Bill Ramaley *Tinos Hartvigson*

Recognition of Student presenters of papers.
                Intermountain Section -- Don Snow
                Rocky Mountain Section--Bill Ramaley

Any other Recognitions, Introduction, or business from
                Intermountain Section
                Rocky Mountain Section

Introduction of our Banquet Speaker:
                President of MAA, Kenneth Ross
                University of Oregon
                Topic: Factorization in L^1 and other places

Students Presenting Papers

Rocky Mountain Section

William Van Bain	Mesa	
Barry Bolof	CC	
Aesoo Chung	UCD	
Christine Collier	UNC	
Donenica Donovan	DU	
Matthew Isom	UNC	???
Melissa MacDonell	Mesa	
Troy McVay	SDSMT	
Robin O'Connor	Mesa	
Colin O'Donnell	Metro	
Anne Spalding	UCD	
Jason Stetton	CC	
Rick Trujillo	UCD	

Short Descriptions of Presentations at MAA Joint Meeting

.ller, Fred   University of Utah , Invited Address
> Title: Equalization and Optimization by Colonies of Foraging Ants
> Description: Among its many tasks, a colony of foraging ants seeks to maximize the amount of food the workers bring home. I will compare an optimal solution with a more feasible "equalization" technique. In addition to providing insight into the workings of an ant colony, the problem illustrates some basic principles of ecology and calculus.

Badger, Lee   Weber State University
> Title: How Dense Will We Get?
> Description: A global model of the interaction of humans with natural resources is hypothesized, solved and fit to existing data to yield predictions of future world population and resource-levels.

Bain, Van   Mesa State College   Student
> Title: An Inductive Algorithm for Producing Graph of N-cubes.
> Description: This algorithm will produce a graph isomorphic to an n-cube, inductively. While the graph has no squares in it, as previous models attempted to maintain, neither does it possess curved edges or dashed (hidden) edges. Furthermore, the Hamiltonian cycle traces through the peripheral edges generating a Gray code sequence. (Computer demonstration/animation to accompany presentation.)

Belnap, Jason Knight   Utah State University   Student
> Title: Geršgorin and Beyond ...
> Description: A look into the proof of Geršgorin's Disk Theorem and insight into results that followed.

Bennett, Jerome   Utah State University   Student
> Title: Bootstrap and Delta Estimators
> Description: A Statistical simulation of the difference between bootstraping and delta estimators.

Berg, Jeffrey   Arapahoe Community College
> Title: College Algebra Concept Learning Enhanced with Graphing Calculator
> Description:: Student learning of College Algebra concepts including functions, transformations, inverse functions, zeros of polynomials, non-linear systems, sequences, and series can be enhanced using a graphing calculator. This presentation will discuss several techniques to meet this goal.

Boneh, Shahar   Metro State College - Denver
> Title: Waiting for Change at the Box Office: A Fun Combinatorial Problem.
> Description: We illustrate a problem of lattice path counting, and an application of it to a queueing model in which customers are lined up to buy a movie ticket, and some of them might need to wait for change. We will show how this problem can be solved by graphical methods, and present some extensions and variations of it, which can make excellent student projects.

Briggs, William   Colorado University - Denver
> Title: Classroom Case Studies in Liberal Arts Mathematics
> Description: In this talk I will briefly describe a liberal arts mathematics course that was developed at the University of Colorado. I will then present several classroom topics and activities that have proven to be very successful.

Donovan, George   Metro State College - Denver
   Title: A Computerized Mathematical Exploration
   Description: Graphing a relation on a computer leads to another question.

Douthett J.   Albuquerque Community College
   Title: Maximally Even Sets in Magnetic Ordering
   Description: The zero field ground state spin configuration of the 1-dimensional, antiferromagnetic spin-1/2
      Ising model is investigated using the formalism of Maximally Even Sets.

Emerson, Bill   Metro State College - Denver
   Title: Teaching Differential Equations using Mathematica
   Description: Using the graphical and symbolic properties of Mathematica allows students to explore
      differential equations via graphics and data.

Fisher, David   University of Colorado - Denver
   Title: Squaring a Tournament: A proof of Dean's Conjecture
   Description: Team A sort-of-beats Team C if A beats C or if A beats a Team B which beats C. In any
      round-robin tournament, we show that some team sort-of beats at least twice as many teams as it
      beats.

Flowers, Shannon   Westminster College   Student
   Title: Math and Bungee Jumping
   Description: Mathematically modeling a bungee jump off of a bridge.

Ford, Lawrence   Idaho State University
   Title: Common Voting Procedures which can be determined by Pairwise Elections between Alternatives.
   Description: Given n alternatives, A_1, ..., A_n and V voters, each of whom has a strict preference ordering on
      the alternatives, the problem of determining a winner or consensus ranking has a long history with
      many solutions proposed over the years. Arrow's Impossibility Theorem proved that no optimal
      solution exists. Two popular procedures, Borda Voting and the Kemeny Median, seem to require
      complete knowledge of each voter's preference list. We prove that these procedures can be
      completely determined by knowing the results of pairwise elections between each pair of alternatives.

Hall, Tracy   Brigham Young University   Student
   Title: Bounded Principal Minor Ratios of Positive Semidefinite Matrices
   Description: All known bounded product ratios of the principal minors of positive semidefinite matrices have
      one as their bound. A previously unclassified ratio will be shown to have and upper bound greater
      than one.

Hardy, Daryl   Colorado State University
   Title: Teaching Calculus using Scientific WorkPlace
   Description: A pilot section of Calculus at CSU uses software that recognizes standard mathematical
      notation and produces LaTex output. I will show samples of student work that includes complete
      sentences and beautiful graphics.

Harris, Ann Marie   Utah State University   Student
   Title: The Games People Play
   Description: "How do I use this in real life?" Here are some games designed to help students develope their
      skills in modeling using predator/prey, species competition, and disease propagation scenarios.

Litchfield, Kay GTE Government Systems Corp. and University of Utah
    Title: Easy Continued Fraction Convergents
    Description: Continued fraction convergents are easy to generate sequentially. Generalizing beyond simple continued fractions gives benefits. A type of problem admirably handled by them is presented.

Loats, Jim Metro State College - Denver
    Title: Using Rubrics in the College Math Classroom
    Description: In this talk you will hear about how I use rubrics to communicate to my students what I expect of them and to assess their work.

MacDonell, Melissa Mesa State College Student
    Title: Galois Representation Attached to Elliptic Curves
    Description: Consider the elliptic Curse E: $y = x^3 + ax^2 + bx + c$. Let E[n] be the points on the curve with finite order dividing n. From E[n] we obtain a group Gal(Q(E[n])/Q) and a representation of this group in GL(2, Z/nZ).

McVay, Troy South Dakota School of Mining and Technology Student
    Title: A Mathematical Model of an Oscillating Chemical Reaction
    Description: A brief history of the Belousov-Zhabotinski oscillating chemical reactions. From the chemical reaction equations a system of kinetic, and thus differential equations, a model can be derived using the Runge-Kutta Order-Four algorithm. The results of the approximation clearly show periodic behavior, and were verified using Mathematica.

O'Connor, Robin Mesa State College Student
    Title: Nagell-Lutz Theorem
    Description: The Nagell-Lutz Theorem and its application to finding rational points of finite order on elliptic curves.

O'Donnell, Colin Metro State College - Denver Student
    Title: Parabolic Primality Testing
    Description: A method of factoring has been developed using the relationships between the integers which allows a reduction of 1/3 to 2/3 the trials of Fermat's method.

Packard, Erik Mesa State College
    Title: Perfect Card Shuffling
    Description: The notion of a perfect shuffle and its extension to how a k-armed person might perfectly shuffle is given. How many of these perfect k-shuffles are needed to bring the deck back to its original configuration (order of the shuffle)? When is this order large or small relative to deck size? What if the deck has cards not all distinct such as a deck {0,1,0,1,0,1,...} or {0,1,2,0,12,0....}?

Pringle, Craig Idaho State University Student
    Title: Smoothing Splines - Current Status and New Developments
    Description: The current status is that these ss's are uniquely determined bor "constant weight throughout the domain of construction", as done separately and independently by I. J. Schoenberg and C. H. Reinsch about thirty years ago. We, Dr. Ken Bosworth and myself, are currently looking at applying the, now classical Hilbert space techniques to uniquely determine the ss for a given "continuous piecewise-linear" spline to represent the smoothing weight. We will look at cross-validation based optimization algorithms to select this weight function. Multivariate extensions of this data will follow.

Stetten, Jason   Colorado College   Student
   Title: The Dilemma of a Prisoner Named C3PO
   Description: Results of computerized tournaments between various Prisoner's Dilemma strategies both
      confirm famous conclusions and raise new possibilities.

Szczyrba, Igor   University of Northern Colorado
   Title: Computers and 3-D Cognition
   Description: Advantages and disadvantages of using computers for developing students comprehension of
      3-D objects by means of 2-D projections will be discussed in the setting of modern cognitive theories

Talaga, Paul   Weber State University
   Title: A Nonlocal Problem in Shear Banding
   Description: Some recent results about the solutions of $U_t = \Delta U + 3e^U / \int_r e^U dx$ and its steady state, a
      model for shear bandes in material in stabilities.

Tams, Jessica   Utah State University   Student
   Title: Two Tree Mountain Pine Beetle Model
   Description: A model relating the effects of a trees' infestation of Mountain Pine Beetles on a neighboring
      tree.

Teets, Don   South Dakota School of Mining and Technology
   Title: Gauss and the Computation of Planetary Orbits--Part II
   Description: This talk based on Dr. Karen Whitehead's translation of Gauss's 1809 paper, "Summary Survey
      of the Methods Applied in the Determination of the Orbits of Both New Planets," presents the
      mathematical method invented by Gauss to compute the orbit of Ceres (or any planet) from three
      observations. The talk will include the actual computation of Ceres' orbit from the original data
      presented to Gauss, as well as commentary on reading this work of Gauss.

Traver, Brian   Weber State University   Student
   Title: Population Model Applied to Easter Island Data
   Description: A genetic algorithm is used to estimate the parameters of a human population - natural resource
      interaction model. The model is applied to estimates of forest resources on Easter Island.

Trujillo, Rick   University of Colorado - Denver   Student
   Title: The 'Calculus for Kids' Project
   Description: Elementary school children learned Calculus in a computer-based course offered at CU-Denver.
      Our final project, "How to beat Michael Jordan" -- a basketball simulation, is discussed.

Walker, Dick   Fort Lewis College
   Title: Solutions to $\Delta f / \Delta x = f$
   Description: If, in the equation $f' = f$, we replace f' with a difference quotient, how does the solution depend
      on Δx and placement of x in the Δx-interval?

Wheeler, Greg   Utah State University   Student
   Title: The Pipeline Problem: A Multimedia Approach
   Description: The classic pipeline problem is used to introduce precalculus students to the applied problem
      solving process with the aid of interactive computer instruction, video, and sound.

What: **MAA Joint Meeting** of Rocky Mountain & Intermountain Sections

Where: **Mesa State College,** Student Center, Grand Junction Colorado

When: **April 19-20, 1996**

Features:

Workshop on new TI-92 given be Richard Tebbs of Southern Utah University at 9:00a.m. on Friday, April 19 by preregistration.

Mini-Course on Combinatorics via Functional Equations given by Don Snow of Brigham Young University at 8:30a.m-noon on Friday, April 19 by preregistration.

Meeting of Rocky Mountain Section Officers at 11:30 a.m Friday

KickOff Speaker: 1:00 p.m. Friday "Some Pretty Results of Geometry with Logic and Combinatorics", Dr. Gustavus Simmons, Rothschild Professor of Mathematics at Cambridge University and Visiting Fellow of Trinity College, Retired Director for National Security Studies, Sandia Labs

Invited Address: 4:20 p.m. Friday, A Mathematical Biology Topic, Fred Adler, Professor of Mathematical Biology, University of Utah

Banquet at 7:00 p.m. following Social Hour beginning at 6:00 p.m. at Holiday Inn

Banquet Speaker: President of MAA, Dr. Kenneth Ross, University of Oregon "A Gossipy Historical Story about Factorization in L^1 and other places"

Keynote Address: 9:00 a.m. Saturday "Patterns, Symmetry, and Chaos", Dr. Martin Golubitsky, Cullen Distinguished Professor of Mathematics, University of Houston.

and Contributed Papers

So send in your preregistration and check now!

The deadlines are: for contributed papers, **April 1, 1996**
for preregistrations, **April 10, 1996**

Program Co-Chairs: Clifford Britton & Carl Kerns
email: cbritton@mesa5.Mesa.Colorado.EDU ; Ph: 970-248-1702

(See back of this page for more details on Workshop, Minicourse, etc.)

Workshop on new TI-92 by Prof. Richard Tebbs, Southern Utah State University.

This will be an introduction to the menus, built-in functions and power of the TI-92. Many will refer to the TI-92 as a true computer for a suggested retail of $250. The built-in software includes five graphing packages (functions, parametric, polar, sequential and 3D), computer interactive geometry co-developed with the authors of CABRI II Geometry, powerful computer algebra system co-developed with the authors of DERIVE as well as advanced programming software. It has a QWERTY keyboard and a larger screen display. Learn how easy the TI-92 is to use!

Mini-course on Combinatorics via Functional Equations, by Prof. Don Snow, Brigham Young University and will also present at AMS/MAA Meeting in San Diego, CA.

Many combinatorial functions can be obtained, studied, and unified by using a simple functional equations approach. These functions include combinations and permutations with various repetitions or restrictions, the formulas for the sums of the powers of the integers, and many generalizations of these and other functions and number sequences such as the Fibonacci and Catalan numbers. This approach starts by finding a simple functional equation that the combinatorial function satisfies by noting what it describes. Then this functional equation is solved using appropriate initial conditions to get the function itself. This gives a method of obtaining the functions, studying their properties, obtaining generating functions, showing how all these functions are related, and giving new results. This approach yields generalizations of the Pascal property and hence generalizations of Pascal's Triangle. This will be illustrated with computer spreadsheet programs and printouts. Each of the attendees will receive printed notes, journal articles, and a computer diskette containing the spreadsheet templates. The small background needed in functional equations will be developed in the minicourse, so only a knowledge of calculus will be assumed.

Contributed Papers (as of now):

Dr. Eric Packard, Mesa State College, Card Shuffling
Dr. Jihad Qaddour, Mesa State College, A Math Model of Bacterial Gene Regulation
Dr. Harold Davenport, Mesa State College, Fermat's Last Theorem - A Marvelous Proof
Dr. Gary DeYoung, Mesa State College, Exploring Reflections: Uniform Illumination of Proximal Objects using a
                              Spectral Reflector
Dr. Don Teets, South Dakota State Univ. Gauss and the Computation of Planetary Orbits
Dr. Karen Whitehead, South Dakota State Univ., Gauss and the Computation Continued
Grad. Student Matthew Isom, Univ. of Northern Colorado, Writing in Mathematics
UnderGrad Student Domenica Donovan, Denver University, Roller Coaster Design
UnderGrad Student Robin O'Connor, Mesa State College, Nagell-Lutz Theorem
UnderGrad Student Melissa MacDonell, Mesa State College, Galois Representation Attached to Elliptic Curves

Section Meetings:

Rocky Mountain Section Meeting @ 8:15 a.m. Saturday
Intermountain Section Meeting @ 12:00 noon Saturday

Please Make your own Motel/Hotel reservations!
Motels with government rates: (be sure to ask for government rates for MAA Meeting) (These motels are located on Horizon Drize, I-70 Exit 31, the airport exit with easy access to Mesa State College, 2.5 miles)

Holiday Inn 1-970-243-6790 53.00 for a room with 1-4 people	Hilton 1-970-241-8888 $60.00 double
Howard Johnson 1-970-243-5150 $32 single w/queen,$34 double w/2 double beds	Best Value Inn 1-970-243-5080 $29.95 single, $34.95 for 2, $35.95 for 3, $36.95 for 4 (all with queen size beds)
Super 8 1-970-248-8080 $39.88 single, $44.88 for 2, $49.88 for 3	Ramada Inn 1-970- 241-8411 $45.00 single, $52.00 double
Days Inn 1-970-245-7200 $38.00 plus tax for single or double	Budget Host Inn 1-970-243-6050 $33.00 single, $37.00 double

Parking on campus!!

Parking on Mesa State College's campus is always a challenge and even for those of us that buy a permit it generally is only a license to hunt for a parking space.

Car-Pooling to the campus will definitely be a help on Friday. We will reserve parking space next to the Student Center, mainly for the Friday Morning Workshop and Mini-Course participants, and even this will be a limited number of spaces. Parking will be allowed in the big parking lot next to Saunders Field House and Recreation nter which will entail a 2 block walk to the Student Center. Do Not Park in Reserved Numbered Spots, anywhere! Saturday's parking will not be a problem.

MAIN CAMPUS:

1. Houston Hall (business, social sciences)
2. Library
3. Wubben Hall (math, sciences)
4. Walter Walker Fine Arts Center (art, speech, theatre, music)
5. Lowell Heiny Hall (administrative/faculty offices)
6. Madesy Vocational-Technical Center
7. Campbell College Center
8. Elm Hall
9. Student Health Center
10. Student Life Center (counseling, career choices)
11. Audio-Tutorial Lab
12. Early Childhood Ed Center
13. Mary Rait Hall (residence hall)
14. Purchasing/Service/Physical Plant Offices
15. Tolman Hall (residence hall)
16. Pinon Hall (residence hall)
17. Walnut Ridge Apartment complex
18. Saunders Fieldhouse (physical education)
19. Bergman Practice Field

Mesa college
GRAND JUNCTION, COLORADO 11502

ADMISSIONS OFFICE - Lowell Heiny Hall
CONTINUING EDUCATION OFFICE - Elm Hall
LIFE AUDITORIUM - Campbell College Center