

Rocky Mountain Section of the MAA  
ColoMATYC  
1998 Annual Meeting  
April 17-18, 1998

Location (Map Included)

- Sessions in the Main Building, Arapahoe Community College, Littleton, Colorado
- Banquet at the Radisson Hotel Denver South, I-25 and Arapahoe Road

Dates

Friday, April 17, 12 - 9 PM, and Saturday, April 18, 8 AM - 12 PM

Final Program: Attached

Invited Speakers

- **1997 Distinguished Teaching Award Winner:**  
Thomas Kelley; Metropolitan State College of Denver  
Title: *Molasses, Maclaurin, and Oil: A Series of Surprising Connections*
- **Banquet Speaker:**  
Paul Zorn; Editor of *Mathematics Magazine*  
St. Olaf College; Northfield, Minnesota  
Title: *Math Mag Morsels*
- **Keynote Speaker:**  
Paul Zorn;  
Title: *The Bieberbach Conjecture: A Broad Historical View and a Close Look with Technology*

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**Rocky Mountain Section News Bits**

Election of Chair Elect

At the annual section meeting this year, for the first time under our new rules, we are going to elect a chair-elect who will have four years in one office or another. He or she is chair-elect one year, then two years as chair, followed by one year as past-chair. The section nomination committee will present two nominees: John Brown of Western State College and Marsha Driskill of Aims Community College. Additional Nominations may be made from the floor.

Other section business to be conducted will include a vote on renaming the Distinguished Teaching Award and a vote on establishing a committee on professional linkages.

If you have time, you may want to get on the Web and follow the links from our section home page to the MAA and from there to the MAA President's Task Force report on NCTM Standards. (You can get there directly by: <http://www.maa.org/past/maanctm4.html>) Issues raised in this report, as well as two previous reports from the same task force, are very important to our students, ourselves, and the profession.

Bill Briggs is to be commended for maintaining our section home page. Check it out at: <http://www-math.cudenver.edu/~maa-rm>

Submitted by Bill Ramaley, Secretary/Treasurer

**Rocky Mountain Section of the Mathematics Association of America  
and  
ColoMATYC  
1998 Annual Meeting: Summary Program**

**Friday, April 17**

- 11:00a.m.-4:00p.m. Meeting Registration, 2<sup>nd</sup> Floor Lobby, Main Building
- 11:00a.m.-12:15p.m. MAA Executive Committee Luncheon, M353
- 12:00p.m.-5:00p.m. Publishers Exhibits, M342
- 12:00p.m. - 12:30p.m. Refreshments, M260
- 12:30p.m.-12:45p.m. Welcome and Opening Remarks, M260
- 12:50p.m.-1:50p.m. **Invited Address: *Molasses, MacLaurin and Oil: A Series of Surprising Connections*, Thomas Kelley, Metropolitan State College of Denver, Recipient of the MAA Distinguished Teaching Award, 1997**
- 2:00p.m.-4:55 p.m. Submitted Talks, Special Sessions and Panel Discussions
- 2:00p.m.-5:00p.m. Hospitality Room, M342
- 5:00p.m.-5:30p.m. MAA Department Liaison Meeting, M341
- 6:00p.m.-9:00p.m. Cocktails and Banquet, Radisson Hotel Denver South, Event Center 3.
- 8:00p.m. **Banquet Talk: *Math Mag Morsels*, Paul Zorn, St. Olaf College, Northfield, Minnesota, Editor of Mathematics Magazine, Radisson Hotel Denver South, Event Center 3**

**Saturday, April 18**

- 7:00a.m. - 7:30a.m. Colorado Council of Teachers of Mathematics, Breakfast, M353
- 7:30a.m. - 10a.m. Colorado Council of Teachers of Mathematics, Business Meeting, M353
- 8:00a.m.-8:45a.m. Rocky Mountain Section of the MAA, Business Meeting, M340
- 8:50a.m.-9:50a.m. **Invited Address: *The Bieberbach Conjecture: A Broad Historical View and a Close Look with Technology*, Paul Zorn, St. Olaf College, Northfield, Minnesota, Editor of Mathematics Magazine, M260**
- 10:00a.m.-12:00p.m. Submitted Talks, Special Sessions and Panel Discussions
- 1:05p.m. Atlanta Braves vs. Colorado Rockies, Coors Field

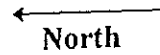
**We wish to thank the following for their generous support of this conference:**

Dr. Russ Hamm, Vice-President for Instruction, and Carla Latorraca, Dean for Health, Math and Science, Arapahoe Community College  
Alan Bricker, International Thompson Publishing; Scott Day, Prentice Hall; Ellen Derrick, Houghton Mifflin Company; Jerry Dunbar, WCB-McGraw Hill and Larry Sifford, Addison Wesley Longman









# Arapahoe Community College

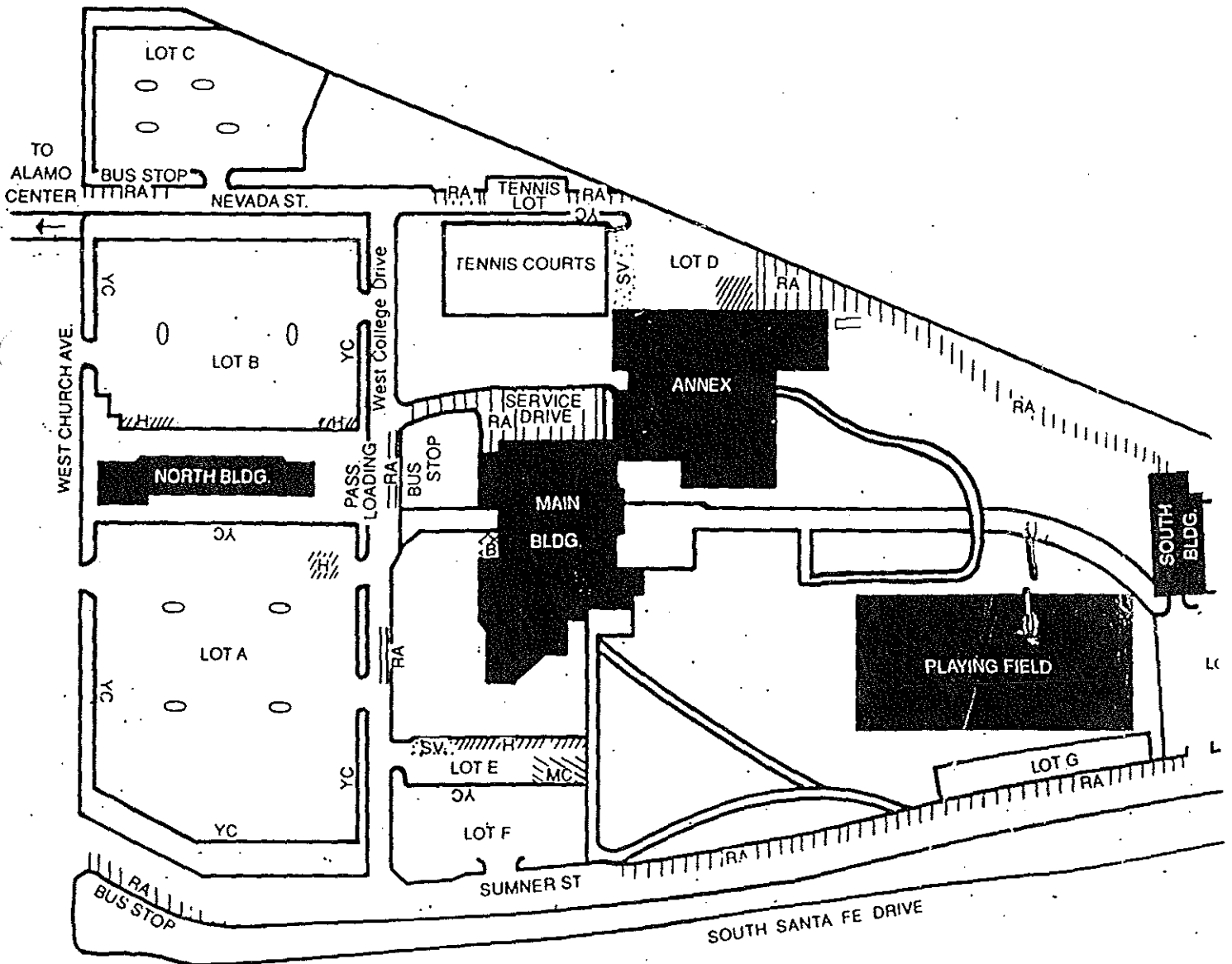
2500 West College Drive, P.O. Box 9002  
Littleton, Colorado 80160-9002



**Conference Parking:** All available campus lots are free. We suggest Lots A, B, or E. Plenty of spaces are available on Fridays and Saturdays.

The entrance to the Main Building is on the North side.

-  H HANDICAPPED PARKING
-  SV STATE VEHICLE PARKING
-  MC MOTORCYCLE PARKING
-  B BICYCLE PARKING
-  YC YELLOW CURB RESTRICTED
-  RA RESTRICTED AREA



**1998 Meeting of the Rocky Mountain Section of the MAA and ColoMATYC  
Abstracts of Invited Talks**

**Distinguished Teaching Award:** *Molasses, MacLaurin and Oil: A Series of Surprising Connections*, Professor Thomas Kelly, Metropolitan State College of Denver. **Friday, April 17, 1:50p.m.-2:50p.m.; M260**

Colin Maclaurin is usually first encountered in the context of Maclaurin Series. He is also mentioned as the author of "Treatise of Fluxions" and the acclaimed "Account of Sir Isaac Newtons Philosophical Discoveries". While working with Metro students on the Tilted-Tank Problem for Underground Storage Tanks (UST's) I chanced to attend a talk by Judith Grabiner describing Maclaurins work on measuring the volume of molasses in barrels.

This talk will examine the similarities between Maclaurin's molasses barrel problem and the present day problems with USTs. These similarities range from the direct, wherein both volumes are gauged with a stick and tables to the indirect, such as the reasons for desiring accurate volume measurements in the first place.

**Banquet Talk:** *Math Mag Morsels*, Professor Paul Zorn, St. Olaf College, Northfield, MN, Editor of Mathematics Magazine. **Friday, April 17, 8p.m.; Radisson Hotel Denver South, Event Center 3**  
Mathematics Magazine, one of three MAA journals, has 70 years of colorful history. The magazine began in 1927, an offshoot of the Louisiana-Mississippi MAA section. Over the years the Magazine has assumed various forms, had various homes and supporting institutions – and an on-again-off-again relationship with the MAA. Through all this the Magazine has built a fascinating and entertaining mathematical archive; its author list includes many of the century's most famous (or, in one case, notorious) mathematicians. I'll trace where and what the Magazine has been over the decades, illustrating the narrative with morsels chosen from the historical smorgasbord: mathematical notes, cartoons, proofs without words, tables of contents, references to some very famous names, Problems and Quickies, columns.

**Invited Address:** *The Bieberbach Conjecture: A Broad Historical View and a Close Look with Technology*, Professor Paul Zorn, St. Olaf College, Northfield, MN, Editor of Mathematics Magazine. **Saturday, April 18, 8:50-9:50a.m.; M260**  
One of the long-standing open problems of classical analysis was solved in 1984 by Louis de Branges, of Purdue University. Like Fermat's theorem, the Bieberbach conjecture is tantalizingly easy to state. It concerns power series ("infinite polynomials") of the form

$$f(z) = z + a_2z^2 + a_3z^3 + \dots$$

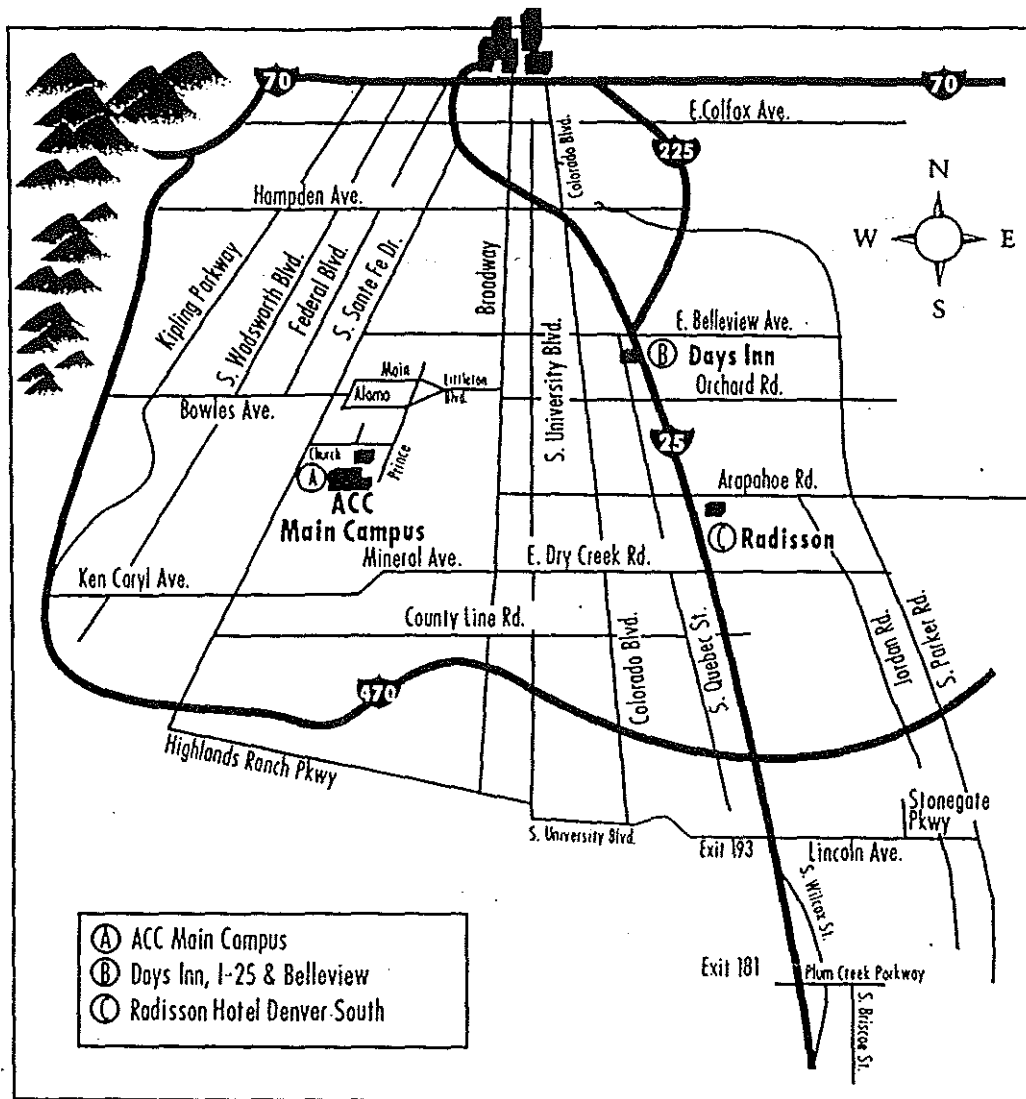
( $z$  and the  $a_n$  are complex numbers) that satisfy two additional conditions:

1. the series converges for all  $z$  with  $|z| < 1$
2. the function  $f(z)$  is one-to-one

In 1916 the German mathematician Ludwig Bieberbach informally conjectured that for every such function the  $n^{\text{th}}$  coefficient must obey  $|a_n| \leq n$  for every  $n$ . Bieberbach himself showed this only for the second coefficient. During the next 60 years, complicated proofs were found for the third through the sixth coefficients (not in that order!) The difficulty of these proofs led some experts to suspect the conjecture was false. They were wrong.

In spring 1984, de Branges announced, at last, a general proof. With the aid of a group of Russian mathematicians, de Branges soon shortened and clarified his proof. It is now only a few pages long.

The talk will focus not on the proof, but on mathematical and historical context: What does the conjecture say? Why is it reasonable? What partial results are "obvious"? What does the result mean geometrically? Some Mathematica-generated "closeups" of complex mappings will illustrate the discussion.



### Accommodations

*(Please call the hotel directly to make reservations and identify yourself with the MAA.)*

- Radisson Hotel Denver South, 7007 S. Clinton (one block East of I-25 on Arapahoe Road, turn South on Clinton), (303)-799-6200 or (800)-333-3333. Conference rates are \$69 per day (single or double occupancy). The Radisson is 10 miles from the ACC Campus and is the site for the conference banquet on Friday night.
- Days Inn, I-25 and Belleview: Denver Tech Center (one block West on Belleview, turn South on Quebec), (303)-721-1144 or (800)-DAYS-INN. Conference rates are \$62.10 per day (single) or \$71.10 per day (double). The Days Inn is also about 10 miles from the ACC Campus.
- Super 8, I-25 and Belleview (Denver Tech Center), (303)-771-8000 or (800)-800-8000. Conference rates are \$62.50 per day (double). Please identify reservation number 41-595. The Super 8 is right next to the Days Inn.

FRIDAY, APRIL 17

time	M340 Presented Papers I	M364 Presented Papers II	M341 History of Math	M354 COLOMATYC	M365 Presented Papers III	M333 Student Session
4:25 - 4:55	Roger Johnson, SDSMT "Hands-on Learning Activities & Data Collection Projects in Probability and Statistics"	Dean Allison, UNC "Differential Equations Using VisualDSolve and a Dynamical Systems Approach"	Julie Ferrara USC "The Galois Group Presents: Resolutions of a Young Radical"	Colleen Jorgenson RRCC "A Look at CCC On-Line Math"	Robert Ream, CU-Boulder "Distribution of Additive Functions(mod 1)"	Allen Lawrence MSCD "The Belousov- Zhabotinsky Reaction"

5:00-5:30 Liaisons Meeting, M341

6:00 P.M. - 9:00 P.M. - COCKTAILS AND BANQUET: Radison Hotel Denver South

8:00 P.M. - BANQUET TALK: "Math Mag Morsels," Prof. Paul Zorn, St. Olaf College, Northfield, Minnesota; Editor of Mathematics Magazine

FRIDAY, APRIL 17

<b>11 A.M. - 4 P.M. - REGISTRATION:</b> 2nd Floor Lobby, Main Building						
<b>11 A.M. - 12:15 P.M. - EXECUTIVE COMMITTEE LUNCHEON:</b> M353						
<b>12:30 - 12:45 - WELCOME:</b> Dr. James Weber, President of Arapahoe Community College, M260						
<b>12:50 - 1:50 P.M. - INVITED ADDRESS:</b> "Molasses, MacLaurin, and Oil: A Series of Surprising Connections," Professor Thomas Kelley, Metropolitan State College of Denver, Recipient of the 1997 MAA Distinguished Teaching Award, M260						
<b>12:00-5:00 P.M. Publishers Exhibits and Hospitality Room:</b> M342						
time	M340 Presented Papers I	M364 Presented Papers II	M341 History of Mathematics	M354 ColoMATYC	M365 Presented Papers III	M333 Student Session
2:00 - 2:20	Daluss Siewert CU-Denver "Multi-Image Mosaic Problem"	Steve Billups CU-Denver "Enhancing the Optical Density Range of Digital Cameras: A Mathematical Approach"	Jack Hodges CU-Boulder "Things I learned in 44 Years Teaching Mathematics with some Examples from the History of Mathematics"	Panel Discussion: Changes to the Math Core  Organizer: Patricia Hauss, ACC	Zim Olson "Mathematics and the Human Condition"	Dave Brown MSCD "Gautemions in Action"
2:25 - 2:45	Steven Leth UNC "What I Learned About The Prime Number Theorem From My Students"	Warren Kokko ACC "On Corley's Problem"	Judy Keyes USC "The Beginning of Rigor in The Calculus"	Panelists: Jim Johnston, ACC LuAnn Malik, CCA Rick Reeves, RRCC	Howard Christensen CCD "The Algebra Review Worksop at CCD"	Howard Canode & Eric Knight MSCD "Rudin Plot Ivestigation"
2:50 - 3:10	Becker Smith CU-Boulder "Teaching Mathematical Foundations in Lower-Division & Survey Courses"	George Donovan MSCD "Atlantic Menhaden: Migration & Population Estimates"	Burnett Meyer CU-Boulder "The Work of T.J. Stieltjes on Continued Fractions"	Donald Fairbairn, ACC "Transformations on The Greatest Integer Function"	Shahar Boneh MSCD "Least Squares Solutions to Problems of Property Splitting"	Henc Bouwmeester Mesa State "How Bad a Set Can Be Measured"
3:15 - 3:45	William Briggs, CU-Denver Jeffrey Bennet CU-Boulder "What About the Other Half? A Case for Quantitative Reasoning"	Igor Szczyrba, UNC "Quantum Mechanics and Thinking Processes"	George Heine Math and Maps "Finding God by Calculation: Attitudes Towards Mathematics in Medieval Islam"	ColoMATYC Business Meeting	Robert Ream CU-Boulder "Fractional Functions and Operations"	Meagen McNulty MSCD "The Heart and Chaos"
3:50 - 4:20	Wendy Hageman Smith CU-Boulder "An Internet Application in a Constructivist Mathematics Classroom"	Robert Jacobson "Influence of Astro-nautics on Plane Geometry"	Bill Ramaley Fort Lewis "History of Mathematical Induction"		William Trench Trinity University "Some Dirichlet-Like Tests for Convergence of Series"	Tessa Weinstein MSCD "Chaos in the Heavens"
						David Reckseen MSCD "Chaos and the Stock Market"
					Jason DeRose Mesa State "Topics of Fair Division"	

(OVER FOR MORE SESSIONS)

SATURDAY, APRIL 18.

8:00 - 8:45 A.M. - MAA BUSINESS MEETING, M340

8:50 - 9:50 A.M. - INVITED ADDRESS: "The Bieberbach Conjecture: A Broad Historical View and a Close Look with Technology",  
Professor Paul Zorn, St. Olaf College, Northfield, Minnesota, Editor Mathematics Magazine, M260

7:00 A.M. - 10:00 P.M. - COLORADO COUNCIL OF TEACHERS OF MATHEMATICS, BREAKFAST AND BUSINESS MEETING, M353

time	M340 Presented Papers I	M341 Presented Papers II	M342 Panel Discussions	M364 Presented Paper III	M333 Presented papers IV
10:00 - 10:20	John Starrett CU-Denver "Removing Hotspots from Aerial Photo- graphs"	Bradford Kline USAFA "Some Simple Technology for Complex Variables - A Preliminary Look"	Panel Discussion: Entry Level Competencies  Organizer: Ben Manvel, CSU Panelists: Patricia Hauss, ACC Ken Klopfenstein, CSU Matty Pollard, Colo. Dept. of Ed.	Peter Wildman Casper College & LuAnn Malik, CCA "NASA-AMAYTĈ PC: A Collaborative Project Between NASA and 20 Commnity College Instructors"	Michael J. Seery USAFA Prep "Pursuit and Regular N-gons"
10:25 - 10:45	David Fisher CU-Denver "The Expected Time for a Widely Used Min-Plus Algebra Algorithm Is Infinite				Linda Sundbye MSCD "Chaos and Fractals on the TI-85 Graphing Calculator"
10:50 - 11:10		Jodle Novak UNC "Is SAS True on a Sphere? A Question Based Approach to Teaching Geometry"	Panel Discussion: NCTM Standards  Organizer: Janet Barnet, USC Panelists: Bill Juraschek, MSCD Lora Lindgren, MSCD Jim Loats, MSCD Lisa Meple, Heatherwood Elementary, Boulder	Bill Emerson MSCD "Mathematica Animations for Linear Algebra and Partial Differential Equations"	
11:15 - 11:35	Anne Spalding CU-Denver "A Dynamic Program- ming Algorithm in Min-Plus Algebra for Finding the Domination Number for GXPn"			Jennifer Bush, UNC "Preliminary Findings Regarding What Comprises Student Understanding of the Quotient Group	Paul Thalos CU-Denver "Bishop Domination on an MxN Chessboard"
11:40 - 12:00		Jerome Quarton "A (1-1) Correspon- dence between the  Natural Numbers and the Real Numbers"			

1:05 P.M. - Atlanta Braves vs. Colorado Rockies, Coors Field (limited number of tickets available at \$12.00)