

Final Report and Budget for MAA Rocky Mountain Section Meeting Spring 1997

Summary

The spring 1997 meeting of the Rocky Mountain Section of the MAA was held April 11-12 on the Auraria campus. The meeting was held jointly with ColoMATYC. A total of 170 people registered for the meeting and an estimated 160 people actually attended. The detailed program of the meeting is attached to this report. The meeting opened with two Distinguished Teaching Award presentations by Bill Emerson (MSCD) and Zenas Hartvigson (CU-Denver). These talks were followed by four parallel sessions of contributed papers and panel discussions. The afternoon ended with an invited talk by Stan Wagon. The evening banquet was held in the Columbine Room of the Executive Tower Inn and featured an after-dinner talk by Keith Devlin. The Saturday morning session opened with an invited talk by Keith Devlin followed by four parallel sessions of contributed papers and panel discussions.

Six book publishers and ZomeTools set up exhibits at the meeting. Complimentary T-shirts were provided by MathWorks. Information about the meeting was posted on the Rocky Mountain Section home page (<http://www-math.cudenver.edu/~maa-rm>). This will be an increasingly important form of communication for future meetings and we suggest that it be used for the next meeting.

Notes for Posterity

Organizing this meeting needn't be a nightmare provided planning starts six months in advance and tasks are completed on or ahead of schedule. It's best to plan for delays and unexpected occurrences (bulk mail is always slow, computers know when to malfunction, and photocopy machines always break in the middle of an important run)! Delegation is important; don't hesitate to recruit faculty and student volunteers. The following timeline is based on an April 10-15 meeting.

October and November (previous year) – Reserve rooms for the conference, block out rooms with conference hotels. At least locate a site for the evening banquet. Commitments from invited speakers should be secured in October.

December – Start planning for meeting announcement and call for papers to be mailed in early January. This entails locating mailing lists and/or address labels. The MAA has mailing labels for section members. However there should also be a mailing to department chairs and possibly to ColoMATYC and CCTM members. Contact the Distinguished Teaching Award speaker. Set registration fees with approval of Executive Committee.

January – The first mailing should be sent no later than the middle of the month. It should include information about meeting dates and location, invited speakers, accommodations (prices and phone numbers), parking and directions to meeting. The deadline for contributed papers should be around March 20-25. Publisher representatives should be contacted with a personal letter inviting them to exhibit. Also contact Carl Schiotz at Zometools, Inc. If parking is an issue, make arrangements with institution for parking.

February – Don't expect any registrations to return immediately! Discussions with the banquet caterer should begin concerning menu and reception plans. If you expect to have a technology component to the meeting or if some speakers request either computers or internet access, then arrangements should be made well in advance. Decide on extra *freebies* for registration packets.

March – Get data base prepared for registration. Keep careful (multiple) records of incoming registrations, abstracts, and banquet requests. Exhibitors should receive receipts and letter of thanks. Prepare for a March 25-30 mailing of the preliminary program; it must give all speakers and times of talks, meeting features, information on accommodations and parking. Begin lining up volunteers (faculty, staff and students) for various meeting jobs. Assign one person to be in charge of *each of* registration, MAA book sale, and coffee breaks. Recruit faculty members to chair sessions.

April – Even in the last two weeks, there will probably be changes to the program. Therefore, prepare for printing the final program with all last minute change and a map of the rooms where the meeting will be held. Ideally the organizers should be relatively free during the meeting to handle unexpected problems or even to attend talks! Inevitably, there are a lot of jobs that can't be done until the last minute. Here is a list of some of our last minute jobs:

TO DO:

- tables (2 per publisher, 3 for registration, 2 for coffee)
- Registration packets; name tags, folders, pencils, pads, receipts, program, T-shirts
- Volunteer list; session moderators; registration desk
- Room assignments for talks
- Maps
- Student speaker certificates
- Wall posters for directions
- Enlarge schedule for each room
- Coffee breaks, breakfast: orders and setup
- Dean/VC requests
- Vitas for speakers
- Opening quiz
- Assign introduction, emcee duties, head table
- Banners
- Speaker vitas
- MAA books

At Registration desk:

- Extension cords
- Extra bulbs
- Markers, pens pads
- Cash box
- Registration list
- Duct tape!

At Banquet:

- OHP
- Mac with CD and projection panel
- Screen

Budget

Income

| | |
|--|---------------|
| Registration fees (\$0 student, \$10 regular, \$15 late) | \$1393 |
| Banquet fees (110 × \$18 each) | \$1980 |
| Exhibitor fees | \$650 |
| Institutional contributions | \$1060 |
| Total | \$5083 |

Expenses

| | |
|--------------------------------|---------------|
| Postage and copying | \$600 |
| Banquet (plus tip) | \$2272 |
| Coffee breaks and breakfast | \$615 |
| Honorarium for Stan Wagon | \$100 |
| Reception - food | \$504 |
| Reception - drinks | \$405 |
| Accomodations for Keith Devlin | \$126 |
| Box lunches | \$153 |
| Staff support | \$288 |
| Rental of microphone | \$20 |
| Total | \$5083 |

First Mailing

~ January 20

Rocky Mountain Section of the MAA

ColoMATYC

1997 Annual Meeting

Location (See map on reverse side)

- Sessions in North Classroom Building, Auraria Campus, Denver
- Banquet in Executive Tower Inn Ballroom, 1405 Curtis Street (corner of Curtis Street and 14th Street)

Dates

- Friday, April 11 12:00 PM – 9:00 PM and Saturday, April 12, 8:00 AM – 12:00 PM.

Invited Speakers

- Keith Devlin, Editor of FOCUS
- Stan Wagon, Macalester College
- Bill Emerson, Recipient of MAA Distinguished Teaching Award 1995
- Zenas Hartvigson, Recipient of MAA Distinguished Teaching Award 1996

Special Features:

- Evening banquet and after dinner talk
- Textbook displays by major publishers
- Student and faculty presentations in 15 and 30 minute formats
- Panels and special sessions
- Business/member meetings of the Rocky Mountain Section and ColoMATYC

Accommodations: Two conference hotels have been selected. *Please call hotels directly to make reservations.*

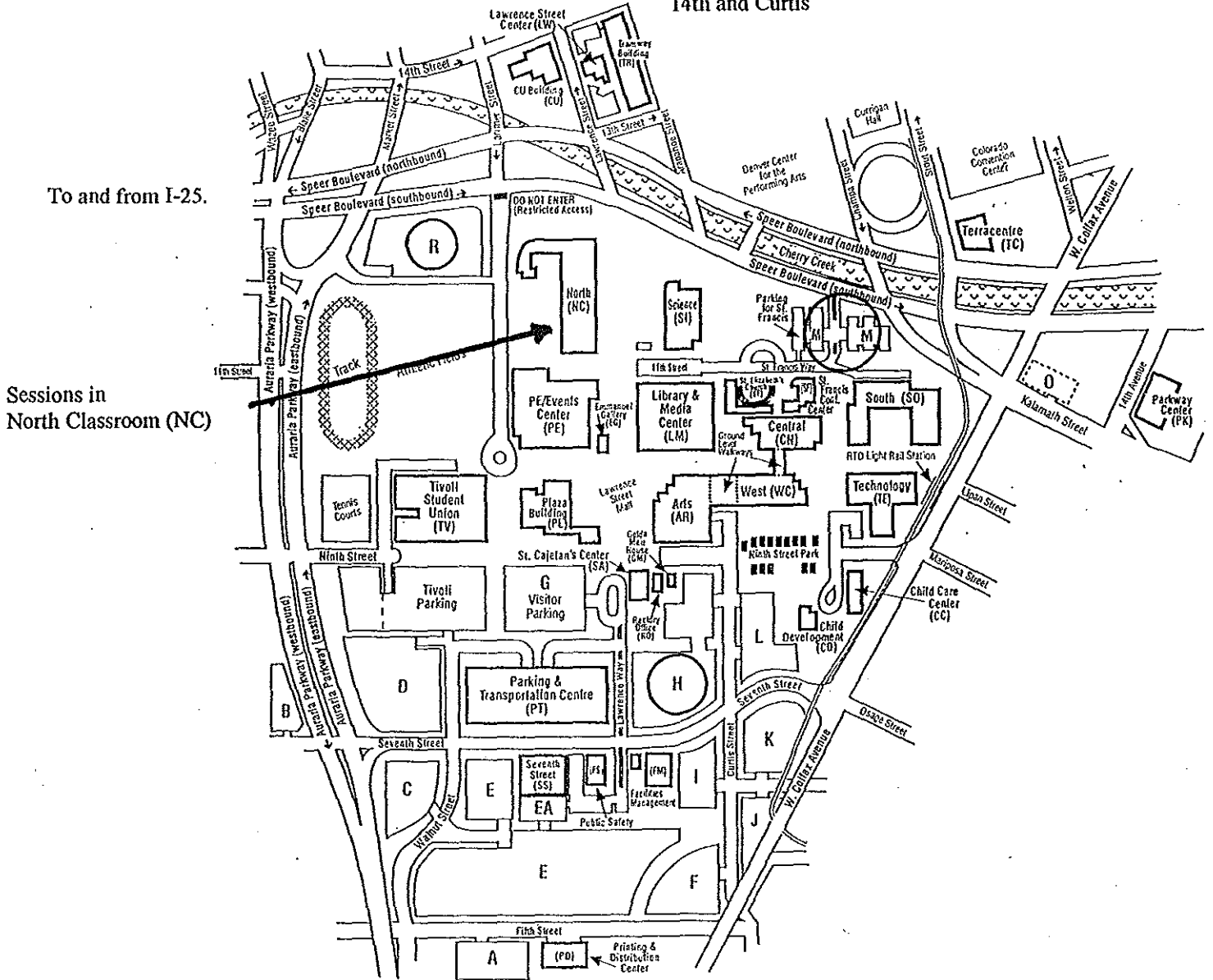
- Executive Tower Inn, 1405 Curtis Street, 1-800-525-6651 or 571-0300. Conference rates are \$75 per day, single occupancy or \$80 per day double occupancy. Conference rates will be extended for two days before and after the meeting. The Executive Tower is three blocks from the Auraria campus and will be the site of the conference banquet on Friday night, April 11.
- Downtown Denver Super 8, 2601 Zuni (Exit 212B at I-25 and Speer Boulevard North), 1-800-800-8000 or 433-6677. Conference rates are \$36 for a room with one king bed or \$42 for a room with two double beds. Reservations must be made prior to April 4 to secure conference rates. The Super 8 is about a half mile from the Auraria campus.

For additional information on Denver hotels/motels, see the Denver web page
<http://usacitylink.com//denver/denstay.html>

See reverse side for campus map and parking information.

AURARIA CAMPUS

Executive Tower Hotel
14th and Curtis



To and from I-25.

Sessions in
North Classroom (NC)

Directions to Auraria Campus

- Arriving from I-25. Take Exit 212B, Speer Blvd South. Go over viaduct and look for the Auraria Campus on the right.
- Arriving from I-70. At the intersection of I-25 and I-70, take I-25 south. Then take Exit 212B, Speer Blvd south. Go over the viaduct and look for the Auraria Campus on the right.

Parking

Friday – Free parking in the Tivoli lot if you leave your car past 6:15 PM. Otherwise, \$2 parking in Lots M and R.

Saturday – \$2 parking in Lots H, M and R.

Rocky Mountain Section of the MAA

ColoMATYC

Registration and Call for Papers – 1997 Annual Meeting

April 11-12, Auraria Campus, Denver

| | |
|-----------------|------------|
| Last Name | First Name |
| Institution | |
| Mailing address | |
| Email address | |

| Registration fees (Pre-register before April 1) | Presentations (Abstracts due March 21) |
|--|---|
| <input type="checkbox"/> MAA member? <input type="checkbox"/> ColoMATYC member? | To give a presentation, please attach a typed 100-word (maximum) abstract to this form. |
| <input type="checkbox"/> Student (\$0.00) | Preferred length of talk: <input type="checkbox"/> 15 minutes |
| <input type="checkbox"/> Other (\$10.00 before April 1, \$15.00 after) | <input type="checkbox"/> 30 minutes |
| <input type="checkbox"/> Friday night buffet banquet (\$18.00) | Preferred time: <input type="checkbox"/> Friday afternoon |
| <input type="text"/> Total enclosed | <input type="checkbox"/> Saturday morning |
| (Make checks payable to CU-Denver) | Special equipment needed: |

If you are interested in organizing a special session, workshop or panel, please call or email us.

| | |
|---|--|
| Bill Briggs Mathematics Department, Box 170 University of Colorado at Denver P.O. Box 173364 Denver, CO 80217-3364 303-556-4809 wbriggs@math.cudenver.edu | Tom Kelley Department of Math and CS, Box 038 Metropolitan State College of Denver P.O. Box 173362 Denver, CO 80217-3362 303-556-2904 kelleyt@mscd.edu |
|---|--|

For details and highlights of the meeting, see attached sheets or visit the Rocky Mountain Section web site at <http://www-math.cudenver.edu/~maa-rm>.

Rocky Mountain Section of the MAA
ColoMATYC
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**Rocky Mountain Section of the MAA – ColoMATYC
1997 Annual Meeting – Summary Program**

Friday, April 11

- 10:00 - 4:00 Meeting Registration, North Classroom Galleria
- 10:00 - 5:00 Publishers Exhibits, North Classroom Galleria
- 10:30 - 12:00 **Math Awareness Week Workshop: *Using the Web to Teach Mathematics*, Harvey Greenberg, CU-Denver, NC 2608**
- 11:00 - 12:30 ColoMATYC Lunch
- 11:00 - 12:30 MAA Executive Committee Lunch, CU-Denver Building 626
- 12:30 - 12:45 Welcome and Opening Remarks, NC 1130
- 12:45 - 1:15 *A Reformer Ruminates*, **Bill Emerson**, Recipient of MAA Distinguished Teaching Award 1995, Metropolitan State College, NC 1130
- 1:15 - 1:45 *Tales of a TechnoGeek*, **Zenas Hartvigson**, Recipient of MAA Distinguished Teaching Award 1996, CU-Denver, NC 1130
- 1:50 - 3:15 Submitted Talks, Special Sessions, and Panel Discussions
- 3:15 - 3:30 Coffee Break, East Galleria of NC
- 3:30 - 4:25 Submitted Talks, Special Sessions, and Panel Discussions, North Classroom
- 4:30 - 5:30 **Invited Lecture: *The Impact of Modern Software on Mathematical Theory and Practice*, Stan Wagon, Macalester College, NC 1130**
- 5:30 - 6:00 **MAA Department Liaison Meeting, NC 1204**
- 6:00 - 9:00 Wine and Cheese and Banquet Dinner, Executive Tower Inn, Columbine Room
- 8:00 pm **Banquet Talk: *Writing Commercial Calculus Software*, Keith Devlin, St. Mary's College of California, Executive Tower Inn, Columbine Room**

Saturday, April 12

- 8:00 - Noon Publishers Exhibits, North Classroom Galleria
- 8:00 - 8:45 MAA Business Meeting, all members, coffee and rolls, NC 1130
- 9:00 - 10:00 **Invited Lecture: *Goodbye Descartes?*, Keith Devlin, St. Mary's College of California, NC 1130**
- 10:00 - 12:25 Submitted Talks, Special Sessions, and Panel Discussions, North Classroom

We are grateful to the administrations of CU-Denver and Metropolitan State College of Denver for contributions that defrayed conference expenses.

We thank the following book publishers and developers whose exhibitor fees supported this meeting: **Addison Wesley Longman, Brooks Cole/ITP, DC Heath/Houghton Mifflin, Harcourt Brace/Saunders College, Prentice Hall, Wiley, Zometool.**

Thanks to **MathWorks** for the wonderful MATLAB T-shirts!

1997 Meeting of Rocky Mountain Section of MAA and ColoMATYC
Abstracts of Invited Talks and Workshop

Distinguished Teaching Award Talk: *Ruminations of a Reformer*, Bill Emerson, MSCD. Friday, 12:45, NC 1130

I plan to discuss calculus reform and some of its effects. I will reflect on some of the good ideas coming out of reform and how they have affected my teaching. Together, we might contemplate what the future holds for reform in calculus and other classes.

Distinguished Teaching Award Talk: *Tales of a TechnoGeek*, Professor Zenas Hartvigson, CU-Denver. Friday, 1:15, NC 1130

Invited Talk: *The Impact of Modern Software on Mathematical Theory and Practice*, Stan Wagon, Macalester College. Friday, 4:30, NC 1130

Once one learns to harness the tremendous power of Mathematica it is possible to carry out very complicated projects. And using computers to investigate familiar material often leads to new insights. I will present several illustrations, such as:

- How to automate what Escher did painstakingly by hand
- New ways to visualize solutions of differential equations
- A new view of the most famous false proof in history (Kempe's "proof" of the four-color theorem)
- Finding new formulas for pi
- Using space-filling curves to (almost) solve the traveling salesman problem.

Banquet Talk: *Writing Commercial Calculus Software*, Keith Devlin, Saint Mary's College of California. Friday, 8:00 pm, Executive Tower Inn, Columbine Room

Electronic Companion to Calculus is a commercially produced educational package comprising a CD ROM and an accompanying workbook. It is designed to be used with any textbook (though it's more suited to "non reform" calculus, and a reform version will come later). *Electronic Companion* was developed from scratch by a large, professional team with many years experience in the production of educational software and the publication of mathematics texts. What were the challenges involved in putting calculus onto a CD ROM that would have to make its own way on the market, and what particular challenges did I face as author working with a large team of developers with widely varying areas of expertise?

Invited Talk: *Goodbye Descartes?*, Keith Devlin, Saint Mary's College of California. Saturday, 9:00, NC 1130

Attempts to develop a mathematics of thought and language began with Aristotle and Zeno in ancient Greece and progressed through the work of Leibniz and then Boole to the mathematical logic and the mathematical linguistics of the twentieth century. After a rapid tour of this two thousand year development, I'll ask the question, "What will the twenty-first century bring by way of new developments in this area?"

Workshop: *Teaching Operations Research on the World Wide Web*, Harvey J. Greenberg, CU-Denver. Friday, 10:30, NC 2608

This is an introduction to the entitled subject, with no assumed knowledge about the World Wide Web. The workshop will begin with some browsing to show what is out there and some basic places for you to start on your own. This will include showing where to obtain guides for what you need to develop your own teaching materials. We shall examine the use of simple materials that offer nice explanations of certain mathematical concepts. From there, we look at animation, and beyond. One of the key pages for you to examine before the workshop is the <http://forum.swarthmore.edu>. You will find a wealth of materials there plus links to other places we shall visit. Near the conclusion of the workshop I shall demonstrate with an introduction to linear programming how we can selectively use web materials prepared by others to build a course students can take from their home.

**1997 Meeting of Rocky Mountain Section of MAA and ColoMATYC
Final Program of Invited Talks, Contributed Talks and Special Sessions**

Saturday, April 12 (NC = North Classroom Building)

| | | | | |
|---------------|---|---|--|---|
| 8:00 - 8:55 | MAA Business Meeting , coffee and rolls, NC 1130 | | | |
| 9:00 - 9:55 | Invited Lecture: <i>Goodbye Descartes?</i> , Keith Devlin, St. Mary's College of California, NC 1130 | | | |
| | Session A - NC 1204 Steve Billups, Chair | Session B - NC 1324 Special Student Session: Algebraic Combinatorics , Bill Cherowitzo, Chair | Session C - NC 1515 Gail Gliner, Chair | Session D - NC 1326 George Donovan, Shahar Boneh, Chairs |
| 10:00 - 10:15 | <i>Quantitative Reasoning and Mathematical Skills</i> , John Martin, CU-Boulder | <i>Life Without Triangles: Constructing the Payne GQ</i> , Mark Miller, CU-Denver | <i>A New Approach to Business Math: Calculating to Help Students Get into Business</i> , Tom Kelley, MSCD | <i>Creative Mathematics</i> , Zim Olson |
| 10:20 - 10:35 | | | <i>The Use of the TI-83 Graphing Calculator in Business Calculus</i> , Linda Sundbye, MSCD | |
| 10:40 - 10:55 | <i>A Mathematical Model for the Closed Loop of Bacterial Gene Regulation</i> , Jihad Qaddour, MSC | <i>An Introduction to Difference Sets or How to Factor a Prime Number With Finite Geometry</i> , Ann Cushman, CSU | <i>A Characterization of Infima for Finite Dimensional Hilbert Space Effects</i> , Tim Moreland, DU | <i>Knotty Mathematics</i> , Jennie O'Rourke, USC |
| 11:00 - 11:25 | Panel Discussion: CCHE's College Entry Competencies Panelists: Darel Hardy, CSU, Glenn Bruckhart, CSU Organizer: Jim Loats, MSCD | <i>On Generalized Orthogonal Arrays</i> , Mike Adams, University of Wyoming | Panel Discussion: Experience in Using New Materials for Teaching Calculus Panelists: Nancy Baggs, UCCS, Rick Ball, DU, Brad Kline, USAFA, Organizer: Joan Hundhausen, CSM | <i>Platonic Polyhedra Are Prodigiously Perfect Playful Polygons</i> , Emily Borrego, USC |
| 11:30 - 11:55 | | <i>An Alternative Approach to the "Names-in-the-Hat" Technique</i> , Leanne Holder, CU-Denver | | <i>A Mathematica Implementation of an Algorithm for Unconstrained Minimization</i> , Jerry Shultz, MSCD |
| Noon - 12:25 | | | | <i>Mathematics Versus Intuition in Gambling</i> , Shahar Boneh, MSCD |

CSM = Colorado School of Mines, CSU = Colorado State University, DU = University of Denver, MSCD = Metropolitan State College of Denver, SDSMT = South Dakota School of Mining and Technology, UCCS = University of Colorado at Colorado Springs, UNC = University of Northern Colorado, USAFA = U.S. Air Force Academy, USC = University of Southern Colorado

1997 Meeting of Rocky Mountain Section of MAA and ColoMATYC
Final Program of Invited Talks, Contributed Talks and Special Sessions

Friday, April 11 (NC = North Classroom Building)

| | | | | |
|---------------|---|--|--|--|
| 10:30 - 12:00 | Math Awareness Week Workshop: <i>Using the Web to Teach Mathematics</i>, Harvey Greenberg, CU-Denver, NC 2608 | | | |
| 12:30 - 12:45 | Welcome and Opening Remarks, NC 1130 | | | |
| 12:45 - 1:15 | <i>A Reformer Ruminates</i>, Bill Emerson, MAA Distinguished Teaching Award 1995, MSCD, NC 1130 | | | |
| 1:15 - 1:45 | <i>Tales of a TechnoGeek</i>, Zenas Hartvigson, MAA Distinguished Teaching Award 1996, CU-Denver, NC 1130 | | | |
| | Session A - NC 1204 Panel Discussion | Session B - NC 1525 Special Session: History of Mathematics, Nancy Thompson, MSCD, chair and co-organizer | Session C - NC 1321 Discrete Mathematics, Guillermo Jimenez, Chair | Session D - NC 1326 Mathematics Education, Linda Sundbye, Chair |
| 1:50 - 2:15 | Liberal Arts Mathematics – Is There a Common (Transferable) Course? | <i>Set Theoretical Forcing: A Brief History</i> , Janet Heine Barnett, USC | <i>The Independence Numbers of Circulant Graphs</i> , Robin Ramirez, CU-Denver | <i>Mathematical Vocabulary: From Semantics to Classroom Practice</i> , Jeff D. Farmer, UNC |
| 2:20 - 2:45 | Panelists: Paul Beale, CU-Boulder, Marsha Driskill, Aims CC, Pat Enright, Arapahoe CC, Dave Wilson, CU- Boulder | <i>Genealogy Charts of Mathematicians</i> , Harry B. Coonce, Mankato State University | <i>Repetition in the Min-Plus Algebra</i> , Anne Spalding (speaker), Dave Fisher, CU-Denver | <i>Reading, wRiting, and 3-D peRception</i> , Igor Szczyrba, UNC |
| 2:50 - 3:15 | Organizer: Bill Briggs, CU-Denver | <i>The Problem of the Points Before and With Pascal</i> , Ruth Rebekka Struik, CU-Boulder | <i>Domination Problems on Rectangular Chessboards</i> , Dave Fisher, CU-Denver | <i>One Model Which Works: The MSCD Mathematics Group Learning Program</i> , Charlotte Murphy and Connie Novicoff, MSCD |
| 3:15 - 3:30 | Coffee Break, East GALLERIA of NC | | | |
| | Session A - NC 1204 Ingrid Fotino, Chair | Session B - NC 1525 Dave Fisher, Chair | Session C - NC 1321 Bill Cherowitzo, Chair | Session D - NC 1326 Jon Plachy, Chair |
| 3:30 - 3:55 | <i>Integrating MAPLE, Spreadsheets, and Writing into Algebra and Introductory Statistics</i> , Linda Duchrow, Regis Univ | <i>Marginal Analysis of the Analytic Center Solution</i> , Allen Holder, CU-Denver | <i>The Domination- Compliance Graph of a Tournament</i> , Guillermo Jimenez (speaker), Richard Lundgren, CU-Denver | <i>Uncovering a Problem in Underground Storage Tanks</i> , Aref Nammari, MSCD |
| 4:00 - 4:25 | <i>MATLAB and Laboratory Explorations in ODE Classes</i> , Janet Burgoyne, SDSMT | <i>Teaching a Neural network to Back up a Trailer</i> , Douglas Hundley, CSU | <i>Using Mathwright in a College Algebra Course</i> , Robin Cruz, USC | <i>Vectors, Vodka, and Visualization</i> , Patricia Haus, Jeffrey Berg, Arapahoe CC |
| 4:30 - 5:30 | Invited Lecture: <i>The Impact of Modern Software on Mathematical Theory and Practice</i>, Stan Wagon, Macalester College, NC 1130 | | | |
| 5:30 - 6:00 | MAA Department Liaison Meeting, NC 1204 | | | |
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Rocky Mountain Section of the MAA – ColoMATYC

North Classroom Building

First Floor

All contributed talks are held in shaded rooms

