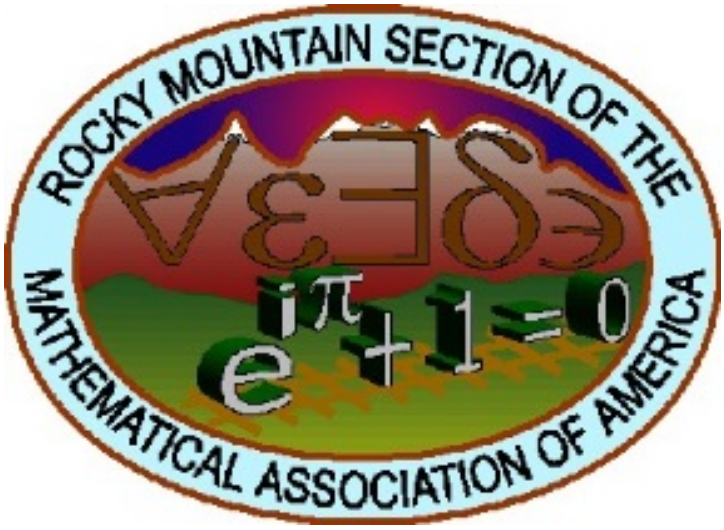
www.MAA.ORG



FALL 2015 NEWSLETTER

Section Website: http://sections.maa.org/rockymt

Fall 2015 Newsletter in PDF Format for Printing

Click on the following link for PDF document that is formatted for printing.

http://sections.maa.org/rockymt/newsletters/fall2015news.pdf

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2015 - 2016 Section Officers and Committee Members

Section Website http://sections.maa.org/rockymt

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Janet Barnett of Colorado State University - Pueblo named 2015 Distinguished Teacher

The often heard refrain, "You know, there will be door prizes raffled off in the book sale room, but you have to be there to win!" identifies for most of us one of the most stalwart members of our section and a staple of our annual meetings. However, there is much more to this book seller *par excellence* and recipient of the 2015 Burton W. Jones Distinguished Teaching Award.

In 1991, the MAA Board of Governors established Section Awards for Distinguished College or University Teaching to recognize excellence in mathematics teaching at the post-secondary level. The Rocky Mountain Section Award is named in honor of Burton W. Jones, a lifelong advocate of excellence in teaching and supporter of the members and programs of the MAA. In addition to receiving a certificate and a check, award recipients deliver the opening address at the following year's spring meeting and become eligible to be the Section Nominee for the Deborah and Franklin Haimo Awards for Distinguished College or University Teaching of Mathematics (a national MAA award).

Criteria for the award require far more than effective teaching. Awardees are expected to be outstanding teachers, widely recognized both within and beyond their institution for extraordinary success in teaching mathematics. Professor Barnett easily satisfies these criteria.

Professor Janet Heine Barnett is one the most distinguished teaching faculty members at Colorado State University – Pueblo. She won the university-wide Faculty Excellence Award in Teaching for *the second time* in the spring of 2013.

Documentation for her excellent teaching was provided in letters of recommendation from her current and former students, many of whom she motivated to become K-12 teachers.

Professor Barnett working closely with Janet Nichols, a former DTA Winner, are the Principal Investigators of the CSU-Pueblo Noyce Scholarship Grant. They use that grant to fund projects that have a broad impact on the teaching of mathematics in southeastern Colorado. In particular:

Professors Barnett and Nichols developed the Noyce Summer Internship Program to expose college freshmen and sophomores to the art of teaching mathematics by having them act as instructors for the Noyce Summer Math Camp for middle school students. They bring in local master teachers as well as Noyce scholarship recipients to coordinate the two-week summer camp and expose all of them to current pedagogical practices in mathematics education.

Their Noyce Induction program provides professional development for CSU-Pueblo's recent graduates and local area in-service secondary teachers, as well as building community between the different educational entities involved: secondary schools, community colleges, the University.

These grants are producing an ever increasing number of highly-qualified secondary teachers of mathematics to serve in high-needs school districts in southeastern Colorado.

In summary, Janet Barnett is an extraordinary individual whose contributions as a teacher of post-secondary mathematics and lifelong advocacy of excellence in teaching fully deserve the recognition of the Burton W. Jones Teaching Excellence Award. And we should all pay our respect by visiting the MAA book sale booth at the next annual meeting.

Our special thanks go to **Frank Zizza** (CSU-Pueblo) for the time and effort he put into preparing the dossier for Professor Barnett upon which we have heavily relied in preparing this report.

Bill Cherowitzo
Chair, Awards Committee of the RMS-MAA

2016 Distinguished Teaching Award Call for Nominations

Each year, the section recognizes one outstanding teacher of collegiate mathematics with an award named in honor of Burton W. Jones, a lifelong advocate of excellence in teaching at all levels. In addition to an honorarium, a certificate and an invitation to deliver the opening lecture at the next Section Meeting, the recipient is eligible to be the section's nominee for the Deborah and Franklin Haimo Awards for Distinguished College or University Teaching of Mathematics. These

national awardees (at most three) are honored at the MAA winter meeting with a certificate and $100*e check. All nominators also receive a certificate of in recognition of their efforts to support the section mission of promoting excellence in teaching; nominators and nominees both receive free meeting registration at the next section meeting. To begin the nomination process for an outstanding teacher that you know, simply submit the **one-page nomination form** (available at our website: http://sections.maa.org/rockymt and in this newsletter) by **15 December 2015**. **Complete nomination materials** (described on the website) are due **15 January 2016**.

Past Burton W. Jones DTA Recipients

1992 John H. "Jack" Hodges
University of Colorado at Boulder
1993 Gerald Diaz
United States Air Force Academy
1994 A. Duane Porter
University of Wyoming
1995 William D. Emerson
Metropolitan State University of Denver
1996 Zenas Hartvigson
University of Colorado Denver
1997 Thomas Kelley
Metropolitan State University of Denver
1998 Monte Zerger
Adams State College
1999 Bill Briggs
University of Colorado Denver
2000 Barbara Bath
Colorado School of Mines
2001 Jim Loats
Metropolitan State University of Denver
2002 Gene Abrams
University of Colorado at Colorado Springs
2003 Hugh King
Colorado School of Mines
2004 Don Teets
South Dakota School of Mines and Technology
2005 Bryan Shader
University of Wyoming
2006 Barbara Moskal
Colorado School of Mines
2007 Lynne Ipiña
University of Wyoming
2008 Steven Janke
Colorado College
2009 Richard Grassl
University of Northern Colorado
2010 Eric Stade
University of Colorado at Boulder
2011 Rich Bogdanovich
Community College of Aurora
2012 Janet Nichols
Colorado State University – Pueblo
2013 Marlow Anderson
Colorado College
2014 Anne Dougherty
University of Colorado at Boulder
2015 Janet Barnett
Colorado State University - Pueblo

Seeking Nominations for New Section Early Career Teaching Award

The Rocky Mountain Section of the MAA recently approved a new teaching award for faculty early in their career. The award was inspired by the Henry Adler Award, which has been active at the national level since 2004. We hope to use this section program as an opportunity for recognition for faculty members that are early in their career and this program makes a wonderful companion to the section Distinguished Teaching Award. To be eligible the candidate must:

- Hold a doctorate degree
- Be college or university teachers who have held a full-time faculty appointment in a college department of mathematical sciences in the Rocky Mountain Section for at least two, but not more than seven, years since receiving the doctorate. A nominee who has just started the eighth year of teaching at the time of the application is still eligible for the award. If a nominee has held his or her doctorate for more than seven years then the nominator must indicate on the nomination form the times that the nominee was not teaching. Common exceptions to the 7-year limit are maternity, paternity, family, or medical leaves. Sabbaticals and postdoctoral fellowships are exceptions only if they

involved no teaching and the application does not include accomplishments made during these times.

- Hold membership in the Mathematical Association of America

Nominees should be recognized for excellence in teaching at the undergraduate level and have a demonstrated influence outside their own classrooms. The award includes a small cash prize and a plaque, plus the person will also be recognized at the next section meeting. This is an excellent opportunity for you to get recognition for the excellent teachers in your department and also for the mathematics community to recognize the teaching contributions people can make early in their career.

Complete nomination guidelines and the one-page nomination form are included in this newsletter. The one-page nomination form is due December 15 and the complete nomination packet is due January 15. All materials should be sent electronically to Heidi Keck,

hkeck@western.edu.

I hope you are able to nominate someone this year.

Respectfully,

Kyle Riley, SDSMT

Chair, Rocky Mountain Section

Chair's Report

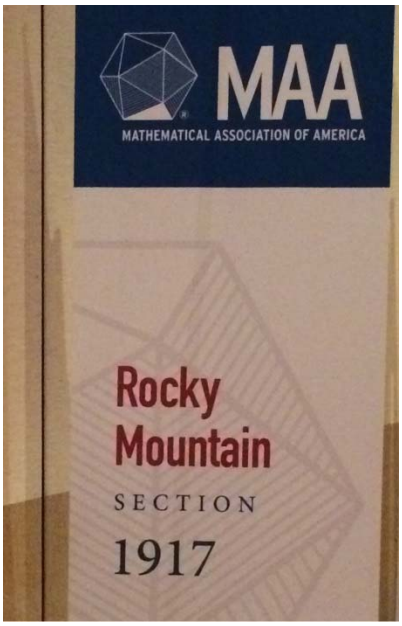
Greetings Section Members!

I hope that you are doing well and enjoying the fall semester. I had the opportunity to attend the Mathfest in Washington DC and had a great time attending talks and meeting people. I also want to give **Michael Jacobson** special thanks for the opportunity to attend the Rockies game Friday night at the Nationals stadium. The Rockies managed to hang onto a win 5 to 4 and I was lucky enough to be with the three people in the stadium that were excited about that outcome. We also had a fireworks show after the game and that was very nice.

Mathfest 2015

The Rocky Mountain Section has several exciting things going on this year and I would like to highlight a few in my report. One important item is that the revision of the section bylaws has been officially approved by the MAA Board of Governors. The next section meeting is a joint meeting with the Intermountain Section located on the campus of Colorado Mesa University in Grand Junction, CO. **Tracii Friedman** and her team at Mesa are doing a wonderful job planning this event for April 8-9, 2016. I hope you are planning to attend and can bring others from your college to join us. We have plenty of outstanding elements of this meeting planned and I hope you have a chance to read the article in this newsletter to learn more about the upcoming meeting.

The section has always counted on our outstanding members, but it is nice to have some of them recognized for their outstanding contributions to the profession. **Mike Brilleslyper** and **Beth Schaubroeck** were awarded the **George Pólya Award** for their article: "Locating Unimodular Roots" in the College Mathematics Journal. The Pólya award was established in 1976 to honor expository excellence in the College Mathematics Journal and there are two awards every year. It is an accomplishment to get published in the CMJ, but it is truly an honor to earn a Pólya award and the authors were honored in a special ceremony at MathFest.



New Section Banner

The section also approved a new early career teaching award and we will be reviewing nominations this year. We should have details on the award and a nomination form included in this newsletter. We hope you have an outstanding early career faculty member that you would like to nominate for the early career award. We hope to gather nominations this year and start putting the awards committee to work reviewing the nominations. We are also working to identify a proper name for this award and hope to survey the section membership to narrow our choices and get the section to vote on this item at our business meeting next April. Another big action item is the proposal to move our annual meeting to the fall. The chairs and liaisons meeting at our last section meeting generated a proposal of moving the section meeting to October. The spring meeting in April does provide an opportune time to finish the semester and deliver research results from the academic year along with the chance to network with people after a long and busy year. However, the April meeting often presents a conflict with many other meetings that take place in the spring and guarantees the chance of bad weather. A move of the annual section meeting to October would greatly increase the chances of good weather and it would remove the meeting from the traditional conflicts we have experienced with other meetings. An October meeting does present a potential conflict with local sports since football games that reside on campus could conflict with the ease of parking we tend to enjoy on Saturday. We plan to survey the section membership this fall and discuss the issue more fully in the next section business meeting. For me, the crucial question centers on this being a net benefit to the section members and increases the number of section members attending the meeting. If we can determine the move that is a net gain in terms of section membership then that would motivate the need to change in my mind. The earliest we could possibly make a switch is for the 2018 section meeting, but we first need to be convinced that this is truly the best move for the section.

To learn more about what is going on please check out our recently renovated section website at http://sections.maa.org/rockymt/ and of course the national website http://www.maa.org/ . For me, the largest asset the MAA has to offer is the grassroots involvement opportunities that reside in the sections. If you would like to get involved in some of section activities then please do not hesitate to contact me. I hope you have a great fall semester and look forward to seeing you at the section meeting in Grand Junction.

Respectfully Submitted,

Kyle Riley, SDSMT

Chair, Rocky Mountain Section

Governor's Report

This will not be my last Governor's Report but I may be the last Governor of the Rocky Mountain Section of the MAA. The Governance Task Force Final Report was presented by **Jennifer Quinn** to the Board of Governors meeting at the MathFest in August. The task force (**Jennifer Quinn, James Epperson, Rick Gillman, Michael Pearson** and **Karen Saxe**) noted that there is increased competition for MAA services and products accompanied by an ongoing decline in membership and revenues. The task force believes that the MAA needs to make informed, mission-driven decisions on a timescale that is not supported by the current governance structure. They proposed three models for the restructuring the Board. The following is a very brief summary of the models, I'll be glad to provide more detail to anyone who asks (emersonb@msudenver.edu).

Model I: Small board with 15 voting members, no larger advisory body.

Model II: Small board with 8 voting members, and a larger advisory body (an Assembly) drawn primarily on ex officio basis from the volunteer leadership of SIGMAAs, Council chairs, chair of the Committee on Sections, regional representatives and other identified constituencies.

Model III: Small board with 12 voting members, and a larger advisory body (an Assembly) elected by Sections, one for each section.

The Board of Governors voted to exclude Model I; Models II or III will be selected to be implemented at JMM 2016. Once the model is agreed upon, new bylaws will be created which will eventually be voted upon by the entire membership, probably within the next year.

For comparison purposes, the American Mathematical Society is governed by a Board of Trustees consisting of eight members, the Society of Industrial and Applied Mathematics is governed by a Board of Trustees consisting of nine elected Trustees, and the American Statistical Association has a 16 member Board of Directors.

I am strongly in support of a smaller nimbler governing body and am leaning towards Model III, but I would be happy to hear from anyone in the section about these upcoming changes.

Respectfully submitted,

Bill Emerson, MSU Denver

Governor, Rocky Mountain Section

20th Annual Colorado Mathematics Awards Ceremony/Reception

The 20th annual Colorado Mathematics Awards (CMA) Reception/Ceremony was held on Tuesday, May 12 at the Grant-Humphreys Mansion in Denver. Organized by Dick Gibbs, Emeritus Professor of Mathematics at Fort Lewis College, and David Carlson of the Colorado Department of Agriculture (retired), this event recognized Colorado students and teachers from junior and senior high schools, and colleges and universities in Colorado for outstanding performances on six national mathematics competitions: MATHCOUNTS, the American Mathematics Contests 8, 10 and 12, the William Lowell Putnam Mathematical Competition, and the Mathematical Contest in Modeling.

The AMC 8, AMC 10, AMC 12, and Putnam Competitions are sponsored programs of the national MAA, which also provides support for the other two competitions.

The Rocky Mountain Section of the MAA is an educational sponsor of the Colorado Mathematics Awards. Section Governor, Professor **Bill Emerson** was on hand to assist in handing out the collegiate awards. Special thanks to **Silva Chang** from Boulder for maintaining CMA information on her website: **cma.coloradomath.org**. Pictures of this year's event (and of prior years) can be found there.

Colorado students teams excelled in this year's Mathematical Contest in Modeling. Of the 7,636 teams participating in this contest, only ten received the top "Outstanding" designation, and three of them were from Colorado!! Sixteen teams from eight Colorado colleges and universities participated. The outstanding teams were:

Jordan Deitsch, **Matthew Hurst**, and **Nathan Yeo** from CU-Boulder, coached by Professors **Bengt Fornberg** and **Anne Dougherty.**

Christine Reilly, **Derek Gorthy**, and **Marc Thomson** (an all freshman team!) from CU-Boulder coached by Professors **Bengt Fornberg** and **Anne Dougherty**,

Eleanore Campbell, **Melissa Jay**, and **Nate Mankovich** from Colorado College coached by Professor **Andrea Bruder.**

There is also an Interdisciplinary Contest in Modeling. Of the 2137 teams participating worldwide, only 9 received the Outstanding designation and 21 received the Finalist designation. One of the Finalist teams was from Colorado:

Anna Johnsen, **Brent Moran**, and **Michael Murphy** from CU-Denver coached by Professor **Gary Olson**.

Students from 11 Colorado colleges and universities participated in the William Lowell Putnam Mathematical Competition. There were two Colorado students among the top 500 scorers:

Noah Blach from the U.S. Air Force Academy coached by Professor **Kurt Herzinger** and **Carson Kent** from the Colorado School of Mines coached by Professors **Rebecca Swanson** and **Steve Pankavich**.

Also recognized at the ceremony was Professor **Janet Barnett** from CSU-Pueblo as the recipient of the 2015 Burton W. Jones

Distinguished Teaching Award.

Special thanks to the CMA Steering Committee for identifying and recognizing these outstanding young mathematicians and faculty. And thanks to the MAA Rocky Mountain Section for supporting the Colorado Mathematics Awards these many years.

Plans are already under way for the 21st Colorado Mathematics Awards Reception and Ceremony to be held again at the Grant-Humphreys Mansion on Tuesday, May 10, 2015.

Dick Gibbs
Emeritus Professor of Mathematics
Fort Lewis College

2015 George Pólya Award for Mike Brilleslyper and Beth Schaubroeck

The George Pólya Award was established in 1976. Two awards are given yearly for articles of expository excellence published in *The College Mathematics Journal.*

Mike Brilleslyper and **Beth Schaubroeck** from the United States Air Force Academy were recipients of the 2015 George Pólya Award for their article "Locating Unimodular Roots," *The College Mathematics Journal,* Vol. 45, No. 3, May 2014, p. 162-168.

MAA members can access this award winning article online by logging into their account at http://www.maa.org. Go to "My Profile" at the top right, then "My Subscriptions" on the left side bar.

Congratulations to Mike and Beth!

13th Annual PPRUMC Colorado State University – Pueblo Saturday, February 27, 2016

Mark your calendars now for the next PPRUMC! The focus of this one-day conference is to give undergraduate mathematics students an opportunity to present their work in a professional, supportive setting. It is also an occasion for students to become acquainted with other students from the region, and to learn more about the mathematics profession, including graduate school and career opportunities.

The conference program will feature talks by students, a keynote speaker, and a panel discussion on careers and graduate school. Based on recent attendance, we expect several dozen student presenters and over one hundred attendees from Colorado, Wyoming and other neighboring states.

Pending funding, there will again no registration or lunch fees for the conference; financial reimbursement for student travel expenses may also be available. *However, the NSF grant to the MAA which previously provided the majority of funding for PPRUMC has officially ended.* The PPRUMC Steering Committee, together with the Rocky Mountain Executive Committee, is therefore exploring a variety of fund-raising options to support this wonderful student opportunity. **If you have suggestions regarding potential financial contributors – or if you would like to personally make a donation in support of PPRUMC – please contact janet.barnett@csupueblo.edu.**

In the meantime, please begin now to encourage your students both to attend and to make a presentation! Presentation topics could include the results of classroom or independent study, as well as REU or other research projects. Both research and expository topics are welcome. Each student presenter will give a 20-minute talk**. The deadline for submitting an abstract will be approximately February 1, 2016.**

Section News

Black Hills State University

This has been an eventful time at BHSU. Our new Sanford Math and Science Education Center opened this fall. The old science building that housed math, physics, geology, and biology labs was completely remodeled over the past 15 months thanks in part to a generous donation from **Denny Sanford**. The new space gives us new state-of-the-art active learning classrooms and labs, numerous inviting student collaboration and study areas, and faculty offices. Included in the new space is large common area that will showcase BHSU's connection to research being conducted at the Sanford Underground Research Facility and BHSU's new underground classroom at this deep-underground lab just minutes from our Spearfish campus.

BHSU also has a new location in Rapid City. The University Center Rapid City was a recently opened Board of Regents facility where all state institutions could offer classes. This facility is now a branch campus of BHSU and has been renamed Black Hills State University – Rapid City. Over 1100 BHSU students are taking classes at this facility this semester.

Dr. **Dan May** recently taught at the Summer Program in Mathematical Problem Solving (SPMPS). The SPMPS is a residential summer math program for rising 8th graders who live in New York City and attend a public school where at least 75% of the students receive free lunch. Entrance into the program is competitive gives underserved students with a talent in math the opportunity to learn about sophisticated topics like projective planes, topology, group theory and combinatorics at a young age. Dr. **Parthasarathi Nag** was recently named the BHSU Campus Research Coordinator. Dr. **Dan Swenson** was granted tenure and promoted to associate professor. **Jill Trimble** again spent part of the summer teaching pre-college algebra and algebra at a faculty-in-residence summer program at the Indian University of North America at the Crazy Horse Monument in Custer, South Dakota.

Last, but certainly not least, we have two new instructors at Black Hills State University. **Jeffrey Winter** who was a temporary instructor last year, has now been hired as a full-time instructor. Jeff has an M.S. in Mathematics from the University of Idaho. **Douglas Heltibridle** was hired as a mathematics instructor to teach primarily at our Rapid City location. Douglas has an M.S. in Mathematics from the University of Nebraska at Lincoln. We are very pleased to have these new colleagues join our department and we expect they will soon become actively involved in the Rocky Mountain Section of the MAA.

Colorado Mesa University

We are pleased to announce one new hire this academic year, Dr. **Eric Miles**. Eric received is PhD at Colorado State University under the direction of **Renzo Cavalieri**. His thesis discussed the Bridgeland stability of line bundles on surfaces, and a paper based on this work has recently been accepted by the Journal of Pure and Applied Algebra. Upon graduation, he accepted a visiting position at the University of Minnesota, Morris, and one year later is happy to be back at his alma mater, Colorado Mesa University, as an assistant professor.

Colorado School of Mines

Professor **Willy Hereman** continues as Head of the Department of Applied Mathematics and Statistics. Professor **Barbara Moskal** (Director of the Trefny Institute for Educational Innovation) continues as liaison with the MAA.

This fall, the department welcomes one new faculty member which brings the department to a total of 21 faculty members.

Dr. Mike Mikucki

Dr. Mike Mikucki joined the department as a Teaching Associate Professor. He received his PhD from Colorado State University in 2015. Mike's research interests are in computational modeling for biophysics problems, but what he finds most rewarding is teaching mathematics. A long-time Colorado resident, Mike loves to spend time in the mountains with his family when he gets the chance.

2015 Awards

- **OUTSTANDING GRADUATE TEACHER AWARD** Statistics PhD student **Brian Zaharatos** received the 2015 Outstanding Graduate Teacher Award.

Brian Zaharatos

Eric Jones and Dr. Willy Hereman

- **OUTSTANDING GRADUATING SENIOR AWARD** This award is presented by each degree-granting department to its outstanding graduating senior. **Abby Branch** was presented this award in fall of 2015, and to **Eric Jones** and **Carson Kent** in spring of 2015.

Abby Branch and Dr. Willy Hereman

Carson Kent

- **RYAN SAYERS MEMORIAL AWARD** – This award was presented to **Eric Jones** for his significant undergraduate research as well as his outstanding academic achievements as a graduating senior, earning a BS degree in Physics as well as Applied Mathematics and Statistics.
- **MAA Janet L. Anderson Award** - Given to **Eric Jones** and **Paul Diaz** for undergraduate research in Mathematical or Computational Biology at the MAA's 2015 MathFest. Their talk, "A Modified SEIR Model for the Spread of Ebola in Western Africa and Metrics for Resource Allocation", was based on their group project from their MATH 484 Capstone course taught by Stephen Pankavich in spring 2015. **Chelsea Sandridge** and **Kelsey Kalmbach** also participated in the research group but were unable to attend the presentation.

PAUL DIAZ

- **OUTSTANDING FACULTY AWARD** – Assistant Professor **Stephen Pankavich** was awarded the AMS Outstanding Faculty Award.

DR. STEPHEN PANKAVICH

- **WALTMAN AWARD** – **Abby Branch** and **Eric Jones** were presented the Waltman Award for their nearly perfect conduct and scholarship as well as their actions as an American Gentleman and Lady during their collegiate career.
- **PROFESSOR EVERETT AWARD** – This award is given to graduating seniors with mathematics who demonstrate scholarship, leadership, community service and potential for the innovative application of mathematics to engineering. **Sean Lopp** and **Sarah Verros** were presented the Professor Everett Award.

Sean Lopp

Sarah Verros

Distinguished Faculty

Dr. Mike Nicholas was awarded the Distinguished Faculty Award by Blue Key, Order of Omega, and Tau Beta Pi Honor Societies for his ceaseless dedication to the students of CSM.

Dr. Mike Nicholas

NSF Graduate Research Fellowships

Five students from Mines received the National Science Foundation Graduate Research Fellowship which provides support for three years of graduate education for each student. **Carson Kent** received the fellowship for his research proposal on "Quantum Error Correction in the Field of Computational and Mathematical Engineering."

Ranked #2 in USA Today

As part of a College Factual Survey of USA Today, the Department of Applied Mathematics and Statistics at Mines was ranked number two in the top ten universities in the nation for a major in mathematics. The full article is available at http://college.usatoday.com/2014/10/08/top-10-colleges-for-a-major-in-math/

Colorado State University - Pueblo

Bruce Lundberg began a three-year term as department chair this past May. We are grateful to our outgoing chair, **Frank Zizza**, for his six years of service.

The program is also pleased to welcome **Tracey Blanco** to campus as our new Math Learning Center Director. Tracey is also completing her doctoral dissertation in mathematics education at another RMS institution, the University of Wyoming. CSU-Pueblo alum **James Garcia** also began his first term as a lecturer at CSU-Pueblo this fall.

Igor Melnykov is back on campus after his second year of helping to design and implement a math and statistics graduate program at Nazarbayev University, an autonomous research university, founded in 2010 in the capital city Astana, Kazakhstan.

Darren Funk-Neubauer is currently on sabbatical leave; we look forward to learning of his adventures in mathematics and climbing when he returns to campus in January.

Our **Noyce Scholars Program** is starting its fifth year of providing significant scholarships, stipends, and academic programs for qualified individuals to earn a teaching credential and commit to teaching in high-need K-12 school districts with funding from the NSF. Since spring 2012, a total of 23 individuals have received Noyce support; of these, 12 have graduated and are now teaching in a high needs school district. Additionally, 22 freshmen and sophomore mathematics & science students (from CSU-Pueblo, PCC and PPCC) have completed our "Explore Teaching" Summer Internship Program, and four Noyce scholars who previously served as interns have also completed a "junior mentorship" through the summer program. In addition to receiving intensive training on teaching techniques for secondary mathematics, junior mentors and interns worked under the supervision of faculty mentors to co-teach classes for secondary students enrolled in the concurrent **Noyce Scholars Summer Math Academy**. Approximately 2500 students from grades 6 – 10 have now participated in the eight-day Summer Math Academy. Noyce grant PIs are **Janet Barnett, Janet Nichols** and **Frank Zizza**.

Janet Barnett also received an NSF-IUSE grant to support the *Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources* (TRIUMPHS) project; more information about this five-year, seven-university collaborative effort to develop, test, and publish innovative historically-based materials for teaching undergraduate mathematics appears elsewhere in this newsletter.

On the physics side of our department, **Caixia Gao** has joined us as a lecturer this semester; Caixia holds a Ph.D. in General Relativity and Cosmology from the University of Mississippi. We also encourage you to listen to "Dark Skies – Turn Out the Lights," an NPR *Pulse of the Planet* Radio Interview with our very own **William Brown**, which re-aired on May 7 (http://www.pulseplanet.com/dailyprogram/dailies.php?POP=6049).

Metropolitan State University of Denver

John Ethier was tenured and promoted to associate professor. **Lou Talman** retired this past year.

Regis University

On the math faculty front, **Tim Trenary** continues as our department chair. We asked Dr. **Sally Duvall**, who had been repeatedly occupying a 1-year term position, to accept a 3 year visiting assistant professor position, which she accepted. Sally Duvall completed her PhD in math education at the University of Northern Colorado. She is enjoying teaching a wider variety of courses than just four sections of Stats for the Life Sciences for us every semester. Tim Trenary's joint paper with Dr. **Cath Kleier** (Regis University), "Size Class Structure, Growth Rates, and Orientation of the Central Andean Cushion Azorella Compacta," was accepted for publication by Peerj. **Bethany Springer's** paper with Dr. **Patrick Shipman** (CSU) and Dr. **Francis Motta** (CSU), "Optimally topologically transitive orbits in discrete dynamical systems," has been accepted for publication in the American Mathematical Monthly to appear in 2016.

We had several students participate in research and internships over the summer. Mayra Coronado attended an REU on Public Health in Nebraska. **Amorette Sanchez-Valdenegro** attended an REU at Dowell Lab at CU Boulder and worked with a graduate student, **Joey Azofeifa**, to model the distribution of Polymerase II along a gene during the transcription process. **Bridget O'Mara** worked on an REU at CU Boulder with **Mark Miesch**, **Nick Featherstone**, and **Kyle Auguston,** studying solar convection in the sun in order to predict the occurrence CMEs, which cause power outages and loss of GPS signal. **Alexandra Crook** did research in chemistry in Nebraska. **Edward Diamond** assisted Dr. **Fred Gray** with research in physics at Regis. **Katherine Hardy** passed her second summer in a row in a financial analyst internship with Wells Fargo, who then offered her a job when she graduates. Regis Alumnus **Anne Ho** completed her PhD at Colorado State University and accepted an assistant professorship at Coastal Carolina University. We are happy to report that all of our graduates of

spring 2015 who were either seeking a job or to attend graduate school either found a job or landed in a graduate program.

South Dakota School of Mines and Technology

We have several happy news items to share this fall. The department has a couple of new faces on staff with Dr. **Paul Hinker** returning to campus to teach Computer Science after a successful career in the private sector. His experience and perspective are great additions to our department and will greatly benefit the program. We also have the benefit of successfully recruiting his wife, **Roben Rudy-Hinker**. Roben has been successfully teaching developmental mathematics at Front Range Community College and her expertise and experience will be another great benefit to our campus. Dr. **Travis Kowalski** recently earned promotion to full Professor and is currently chair of our Mathematics Curriculum Committee. We are also very proud of our Putnam team from last year, which was ranked in the top 150 teams in the competition last year. The most astounding detail regarding our Putnam team is the fact that all six students we had participate in the contest had a non-zero score. No one can recall a better showing with so many students doing well. Dr. **Kyle Caudle** has recently earned a funded grant proposal from a Navy program that employed a couple of faculty members and a student over the summer. We are so happy with so much success over the past year and look forward to another exciting school year.

University of Colorado at Boulder

Changes this year in Boulder:

1) **Don Monk** retired.

2) Hiring this year in Differential Geometry and Topology.

3) Hired Universal Algebraist **Peter Mayr**, and two postdocs: **Jakub Bulin** (Universal Algebra), and **Jordan Watts** (Geometry).

4) Colleague **Markus Pflaum** ran a new course in topological chemistry.

University of Colorado – Colorado Springs

The UCCS Mathematics Department is welcoming new faculty member **Oksana Bihun**, who will start teaching this fall. Originally from the Ukraine, Oksana completed her Ph.D. at the University of Missouri in 2009. Since then she has been teaching at Concordia College. Oksana's research interests include numerical methods for solving differential equations, calculus of variations, and other aspects of geometric analysis. She was selected from a group of about 500 applicants!

In other news, the Mathematics Department is acquiring a computer-equipped classroom. Until now, our classes that mixed lectures with computer labs were forced to borrow classroom space from cooperating engineering departments. The new computer classroom will not only give us our own space for existing computer-intensive courses, but will enable us to integrate computing into a broader segment of the mathematics curriculum.

University of Wyoming

Rocky Mountain Mathematics Consortium

The 2015 RMMC on "Structure and Classification of C* Algebras" co-organized by **Zhuang Niu** and **Farhad Jafari** attracted 47 participants from the Rocky Mountain region, nationally and internationally. **George Elliot** (University of Toronto), a leading figure in classification theory, gave the opening remarks. For the first time, since 1973, when Mary Ellen Rudin was the keynote speaker, this year's conference featured **Huaxin Lin** (University of Oregon) as the keynote CBMS speaker. Please see http://www.uwyo.edu/zniu (please check the exact link to the RMMC website) for additional details on this conference, copies of talks and so on.

The planning for the 2016 RMMC conference is underway. This year's conference will be co-organized by **Victor Ginting, Ekaterina Smirnova** and **Farhad Jafari** and will be on "Functional analytic methods in error prediction and their applications." Speakers both from mathematics and statistics departments have already been confirmed. We are in the process of applying for NSF funds for this conference. A website with additional details will be soon forthcoming.

Rocky Mountain-Great Plains Graduate Research Workshop in Combinatorics

In the summer of 2016, the University of Wyoming will be hosting the Rocky Mountain-Great Plains Graduate Research Workshop in Combinatorics (GRWC). The tentative dates are

July 18 — July 29, 2016. The local organizer is **Tyrrell McAllister** (tmcallis@uwyo.edu). The GRWC is a multi-institutional program of annual workshops and continuation activities co-organized by Iowa State University, the University of Colorado Denver, the University of Denver, the University of Nebraska–Lincoln, and the University of Wyoming. The goal of the GRWC is to provide an intensive collaborative research environment for graduate students in combinatorics and related fields, giving students an opportunity to enhance their research skills and to build a professional network that will advance with them throughout their careers. Please visit sites.google.com/site/rmgpgrwc/ for details and updates.

Professor Zhuang Niu receives 2015 Halperin Prize

University of Wyoming Assistant Professor **Zhuang Niu** was selected as the co-winner of the 2015 Israel Halperin prize. The prize is awarded once every five years for outstanding work in operator theory or operator algebras who is within ten years of receipt of their doctorate. The prize was founded in 1979 in honor of Israel Halperin, a leader in the Canadian mathematical community and the only student of John von Neumann.

Is news from your school missing?

Send your news to your department liaison now with a request to forward it to the Linda Sundbye, Newsletter Editor for inclusion in the next issue. sundbyel@msudenver.edu

Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources - TRIUMPHS

RMS members invited to make (use of) history with *TRIUMPHS*.

As mathematics instructors, it seems natural for us to try to provide students with clear and precise presentations, both in our teaching and in the textbooks we select. But just as water filtration, intended to remove impurities, can remove healthy minerals and interesting tastes, efforts to remove potential impediments to learning can strip a subject of its context, motivation and direction. One means of restoring these ingredients is to go back to the source from which the subject originally sprang …. precisely what the *Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources* (TRIUMPHS) project aims to do!

A national, seven-university collaboration, TRIUMPHS has been awarded funding from the NSF to develop, test, and evaluate classroom materials based on primary sources for teaching undergraduate mathematics courses ranging from pre-calculus and elementary statistics to abstract algebra, analysis and topology.

These materials will allow instructors to replace standard classroom lectures on core topics with "primary source projects" (PSPs) that directly engage students with the mathematics they are studying. Each PSP will focus on a particular mathematical concept or procedure as it was developed by a historic mathematician. Students read source documents by the original author, and through a series of exercises that are woven throughout the project, develop a fuller understanding of the mathematics they are studying as they react to the historical source, organize their thoughts about the mathematical ideas in the source, and rediscover groundbreaking ideas for themselves.

With two of the team's PIs residing in our section - **Janet Barnett** (CSU-Pueblo) and **Diana White** (CU Denver) - RMS faculty are especially well-placed to participate in the site-testing opportunities that the grant will provide. Additionally, **Dave Ruch** (Metro) will be developing and testing several Analysis projects an external author for TRIUMPHS. The TRIUMPHS team also plans to offer two of its four training workshops for faculty and graduate students in Denver.

Other members of the TRIUMPHS PI team teach at Central Washington University, Florida State University, New Mexico State University, Ursinus College in Pennsylvania, and Xavier University in Ohio. The team received a total of $1.25 million from the NSF, most of which will be used for the project's evaluation-with-research and faculty training components.

Mathematics instructors at all RMS universities and colleges are cordially invited to collaborate with the TRIUMPHS team by site-testing projects developed by its authors in your own classrooms, or by working with a grant team member to develop a project of

your own. Site tester support available now through the end of the grant in August 2020 includes a small stipend, as well as travel funds for a consultation visit to one of the PI sites, or to have a grant team member visit your home institution.

PSPs developed with prior NSF support are available at

http://www.cs.nmsu.edu/historical-projects/ .

For more information, please contact janet.barnett@csupueblo.edu or Diana.White@ucdenver.edu.

Section Nominating Committee Report

The nominating committee is seeking strong leaders with a desire to serve the MAA to run for Vice-Chair of the Rocky Mountain Section. The position of Vice-Chair is vital to the organization and operation of the Rocky Mountain Section. The Vice-Chair serves a two year term and is expected to (i) act as a contact with two-year and community colleges, (ii) attend all Executive Committee Meetings, (iii) serve on the Program Committee and arrange for programs for two-year and community college faculty, (iv) serve on the Distinguished Teaching Award Committee, and (v) Serve on the Committee on Profession Linkages, or designate a representative of two-year colleges.

The Vice Chair should either be on the faculty of a two-year or community college or have a strong tie to one of these institutions. If you have an interest in running for Vice-Chair or would like to nominate a colleague who would be an outstanding candidate, please contact any member of the nominating committee:

- Gus Greivel, Chair (CSM) ggreivel@mines.edu
- Mike Brilleslyper (USAFA) mike.brilleslyper@usafa.edu
- Mary Pilgrim (CSU) pilgrim@math.colostate.edu

Elections will be held during the business meeting at the MAA Rocky Mountain Section annual meeting to be held at Colorado Mesa University, April 8-9, 2016. Note: Elected officers of the section must be members of the MAA.

With Gratitude,
The Nominating Committee

Postscript:

2017 will be a very big year for elections for leadership positions in the Rocky Mountain Section. We will be seeking nominees for Chair Elect, Governor and Secretary/ Treasurer. For details about the duties associated with these positions, please visit

http://sections.maa.org/rockymt/Duties.php

and let us know if you are interested in being considered or if you have a quality nominee in mind for any of these positions.

Colorado Council of Teachers of Mathematics (CCTM) News

The 2015 Annual Conference of Colorado Council of Teachers of Mathematics (CCTM) will be held at the Denver Mart, on September 24-25, 2015. The theme of this year's conference is *Putting the Pieces Together*. This year's keynote speaker is **Steve Leinwand**, one of the authors of NCTM's 2014 the *Principles to Actions* document. The conference sessions will start on Friday morning at 8am.

There are pre-conference sessions for school and district leaders and in-service teachers on Thursday, September 24, 2015. **Matt Larson**, NCTM President-elect, and **Phil Daro** will facilitate these pre-sessions.

For full conference program and registration information visit the CCTM website:

http://www.cctmath.org.

Also, the fall 2015 issue of Colorado Mathematics Teacher (CMT) Journal is also available at the CCTM website.

Gulden Karakok, UNC
CCTM Representative

Colorado Mesa University to Host the Joint Meeting of the Rocky Mountain and Intermountain Sections April 8-9, 2016

Colorado Mesa University is excited to host the 2016 Joint Meeting of the Rocky Mountain and Intermountain Sections of the Mathematics Association of America. This will be the 3rd Decennial Joint Meeting of the two sections to take place in Grand Junction, CO. The conference will be held **April 8-9, 2016 on the CMU campus.** The schedule is jam-packed with engaging speakers, a workshop, parallel sessions, student activities, and more. The conference will feature something for everyone so register online, book your hotel, and start planning your trip because it will surely be worth the drive!

Plenary Speakers

- Section visitor **Dr. Bob Devaney**, Professor of Mathematics at Boston University and immediate past-president of the MAA.
- **Dr. Janet Heine Barnett,** Professor of Mathematics at Colorado State University-Pueblo and Rocky Mountain Section's 2015 Burton W. Jones Distinguished Teaching Award winner.
- **Dr. Robin Wilson,** Emeritus Professor at Open University in the United Kingdom.
- **Dr. Bob Palais**, Associate Professor and Associate Chair at Utah Valley University.

Pre-Conference Workshop

- Hands-on introduction to nonlinear dynamical systems providing an interactive experience that can be adapted for use in the undergraduate classroom.
- Led by **Joshua Garland** who will receive his Ph.D. in Computer Science (May 2016) under the direction of Dr. Liz Bradley at the University of Colorado at Boulder. Joshua is also a Lab Instructor at the Santa Fe Institute and recipient of the Intelligent Data Analysis 2013 Frontier Prize.

Other (Tentative) Happenings

- Panel on obtaining funding for STEM education and research.
- BIG SIGMAA (Business, Industry, Government) session.
- Friday evening reception and banquet with door prizes from generous vendors.
- Special networking opportunities.
- DON'T LEAVE YET! Saturday afternoon social events: may include hiking, cycling, climbing, tour of local wineries, etc.

Student Activities

- Social events including a free Friday Lunch and Jeopardy!
- Parallel sessions for student talks.

Parallel Sessions: Call for Papers

- Have an idea for an appealing parallel session or panel session? Submit a proposal to Tracii Friedman at tfriedma@coloradomesa.edu.
- Want to give a talk in a contributed papers session?
    - Deadline for abstracts: **Monday, March 14, 2016** (reward yourself with some pie for submitting by π Day!).
    - Submit online at **coloradomesa.edu/maa** or send to Shawn Robinson at sharobin@coloradomesa.edu.

For more details and updated information, and to register online, please visit **coloradomesa.edu/maa** or contact Tracii Friedman at tfriedma@coloradomesa.edu.

Student Activities

Students and Advisors: Attending the section meeting is a great way to meet students from other schools (including at free student lunch on the first day of the conference), attend talks where you may learn some new and interesting mathematics, and even present the results of your own research!

Start thinking now about a presentation topic for the April 2016 conference.

Feel free to contact Beth (beth.schaubroeck@usafa.edu) or Carl (lienert_c@fortlewis.edu) with any questions.

2015 Section Meeting Report

The 2015 meeting of the Rocky Mountain Section of the MAA took place on April 17 and 18. The meeting was held in Colorado Springs, Colorado on the campus of The Colorado College.

The meeting featured three plenary speakers. The opening talk was the keynote presentation from the 2014 Burton W. Jones Distinguished Teaching Award Winner, **Anne Dougherty** from the University of Colorado. Dr. Dougherty's talk was entitled "Assessment is Key!"

In addition, the section was treated to a George Polya Lecture by **William Dunham**, retired from Muhlenberg College, and presently a visiting faculty member at Penn. Dr. Dunham spoke on "Two (more) morsels from Euler."

The banquet talk was given by Dr. **Karen Saxe** of Macalester College. She was our national MAA officer in attendance at the meeting. Dr. Saxe spoke on "A mathematical adventure through the Census, Reapportionment and Re-districting."

The meeting featured 16 parallel sessions on Friday afternoon and Saturday morning and almost 70 speakers, including undergraduates, graduate students and faculty from all across the section.

Contributed Papers - 2015 Section Meeting

Innovations in the Classroom

Russ Howell, Westmont
Dealing with Blanks in Reviews and Exams

Kyle Riley, South Dakota School of Mines and Technology
There and Back Again: A Journey through Mathematics Placement

Bradley Warner, United States Air Force Academy
The Hybrid Classroom and Moving to Education 3.0, Students as Creators of Knowledge

Rebecca Swanson, Colorado School of Mines
A Team-Based Approach to a Partially Flipped Linear Algebra Class

Beth Schaubroeck, United States Air Force Academy
Increasing Student Options in a Discrete Mathematics Project

Oscar Levin, University of Northern Colorado
Using Proofs to Introduce Logic

Mona Mocanasu, Metropolitan State University of Denver
Keep Your First Year Students Engaged!

Jeremy Thompson, United States Air Force Academy
Designing Projects for Engineering Math Students

Marshall Whittlesey, California State University - San Marcos
A Couse in Spherical Geometry for Undergraduates

Mathematics Education

Russ Howell, Westmont
Revitalizing Complex Analysis

David Grant, University of Colorado at Boulder
Plans and Practice in the UCB Mathematics Department

Jim Loats, Metropolitan State University of Denver
How are the CCSS Impacting the Mathematics Content Courses for Future Teachers at Your Institution?
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Rakissa Cribari, University of Colorado Denver
A Pedagogical Framework for Distinguishing Mathematical Definitions in the Classroom

Mary Pilgrim, Colorado State University
Engaged Learning through Writing: A Faculty Development Project

Travis Kowalski, South Dakota School of Mines and Technology
Assessment as Learning: An Experiment with Abilities-Based Grading, Part 2

Spencer Bagley, University of Northern Colorado
Best Practices for the Inverted (Flipped) Classroom

Colin Garnett, Black Hills State University
Using the Game of Spot It! to Introduce Sophisticated Topics in Combinatorics

Numerical Algebraic Geometry

Chris Peterson, Colorado State University
Numerics and Exact Computations

Jesse Drendel, Colorado State University
Real Algebraic Geometry Applied to Evolutionary Biology

Elizabeth Gross, San Jose
Model Selection using Numerical Algebraic Geometry in Systems Biology

Tim Hodges, Colorado State University
Choosing Good Paths for Homotopy Continuation

Dan Brake, Notre Dame
Applications of Real Algebraic Varieties to Tropical Geometry

Alan Liddell, Notre Dame
A Hybrid Symbolic-Numeric Approach to Exceptional Sets of Generically Zero-Dimensional Systems

Justin Marks, Bowdoin College
When Matrix Manifold means Need a NAG Lifeline

Brent Davis, Colorado State University
Numeric Algebraic Geometry for Analysis of Phylogenetic Trees

Jeb Collins, West Texas A&M University
A Survey of a Posteriori Error Estimation and Possible Uses in NAG

Francesco Pancaldi, Notre Dame
A Method for Quantifying Uncertainty of Reaction Rates in Predicting Thrombin Production

Jon Hauenstein, Notre Dame
Center-Focus Problem and Algebraic Geometry

Mathematics History

Bill Cherowitzo, University of Colorado Denver
The Devil is in the Details

Shahar Boneh, Metropolitan State University of Denver
Some Cool Gambling Questions from the Early Days of Probability

Don Teets, South Dakota School of Mines and Technology
FFT? FGT!

Dan Swenson, Black Hills State University
A Tour of Check-Digit Algorithms

Janet Barnett, Colorado State University - Pueblo
Three American Mathematical Associates: E.V. Huntington, G.A. Miller and J.W. Young

Steve Janke, Colorado College
Cajori at Colorado College: All in for Mathematics

Jeff V. Berg, Arapahoe Community College
George Heine, Math and Maps
Vignettes from the History of the Rocky Mountain Section

General Contributed Papers

Jeremy Thompson, United States Air Force Academy
The Froebenius Number of Balanced Numerical Semigroups

Beth Malmskog, Villanova
Picard Curves with Good Reduction away from p=3

Li Feng, Albany State University
Multiplicative Groups in the Zero Divisors ZD(Z/10^n))

Eric Packard, Colorado Mesa University
An Elementary Proof Regarding Quartics

Travis Kowalski, South Dakota School of Mines and Technology
Stargazing: Looking at Stars through Art and Math

Gerald Harnett, University of Northern Colorado
The Natural Relation of Add Here, Multiply There

Shawn Robinson, Colorado Mesa University
Schubert and Hulsurkar Polynomials

Petr Vojtechovsky, University of Denver
Automated Deduction in Research Mathematics

Joseph May and Cody Griffith, Metropolitan State University of Denver
Stochastic Analysis of a Duel Capacity Queue

Jamie Principato, Arapahoe Community College
Geometric Algebras

Michelle Osborne, University of Colorado – Colorado Springs
Numerical Studies of the KP Line Solitons

Dale Peterson, United States Air Force Academy
Disorder Permutations

Dan May, Black Hills State University
Sestinas and their Generalization

Mike Brilleslyper, United States Air Force Academy
Racing to Infinity: Which Sequence Wins?

Marti Garlick, South Dakota School of Mines and Technology
Using Homogenization to Estimate Random-Walk Motility from GPS Collar Data in Variable Landscapes

Rachel Jennings, University of Wyoming
An Advection and Age-Structured Approach to Modeling Bird Migration and Indirect Transmission of Avian Influenza

Andy Keck, Western State Colorado University
Butterflies, MRIs and Lassos

Bruce Lundberg, Colorado State University - Pueblo
Estimating Orbital element Probabilities from a State Vector

Student Papers

Katy Martinez, Colorado College
Epidemiological Methods for Examining Bullying

Courtney Brown, Albany State University
Formalization and generalization of the Pythagorean Means

Ahmad Alyoubi, Colorado School of Mines
Parallel Simulation of Fractional Single-Phase Flow Models

Marcus Denseth, Fort Lewis College
Centrality in Network Flow Theory

Karen Kazor, Colorado School of Mines
A Markov-Switching Vector Autoregressive Stochastic Wind Generator for Multiple Spatial and Temporal Scales

Charles Morgenstern, Colorado School of Mines
An Efficient Non-Standard FEM and iterative Method for Acoustic Wave Propagation

Ryan Sandee, Pikes Peak Community College
Taylor Polynomial of the Natural Log Function

Hayoung Choi, University of Wyoming
Positive Definite Hankel Matrix Completions and Hamburger Moment Completions

Cassandra Seaney, Fort Lewis College
Digraph of Rings

Melody Dodd, Colorado State University
The Mathematics of Electrical Impedance Tomography and the D-Bar Algorithm

Elizabeth Thomas, Fort Lewis College
Modeling Slackline Parks with Graphs

Kirill Golubnichiy, University of North Carolina - Charlotte
About One Theorem for the Nonlinear Transport Equation

Alexander Charlesworth, Colorado School of Mines
Analysis for a Class of Discrete Approximations for Electro-Magnetic Dynamics in the Time Domain

Bradley Dworzak, Colorado School of Mines
Parameter Estimation for Acoustic Obstacles from a Single Incident Field

Taylor McMillan, University of Northern Colorado
On Combustible Embeddings

Dalton Baker, Black Hills State University
Permanental Spectrum and Permanentally Spectrally Arbitrary Patterns

Panel Discussion

Colorado Math Pathways Task Force Panel Discussion

Dean Allison, University of Northern Colorado
Ian Macgillivray, Colorado Department of Higher Education
Alexsis Venter, Arapahoe Community College
Dave Ruch, Metropolitan State University of Denver
Shelly Ray Parsons, Aims Community College

2015 Business Meeting Minutes
Saturday, April 18, 2015

Minutes: MAA Rocky Mountain Section Annual Business Meeting
Date: Saturday, April 18, 2015 at 8:00 am – 8:50 am
Location: Tutt Science 122; Colorado College, Colorado Springs, Colorado

1. Kyle Riley called the meeting to order at 8:00am. Minutes from the 2014 meeting and current agenda were approved.
2. Mike Brilleslyper announced Mike Jacobson as the single candidate for Chair-Elect and offered him the chance to speak. Mike Jacobson thanked the section for the opportunity to serve and encouraged others to run for offices. Mike Brilleslyper asked for a motion to elect Mike J by acclamation. A motion was made and seconded. All present approved.
3. Reports:
    a) Heidi Keck gave the financial report. She encouraged people to apply for activity grants. The fund balance of nearly $13,000 is quite high, but others suggested it was also nice to have money on hand.
    b) Kyle Riley gave the Chair's report. The section paid for the Chairs and Liaisons Lunch this year to encourage people to attend. There were 160 people preregistered for the conference, with 105 of them attending the banquet. There is interest in investigating moving the meeting to fall. A short survey will be sent out asking people in the section for feedback on the idea.
    c) Karen Saxe gave the report from the Association. She commended the section on a "fabulous meeting." MathFest is coming up, and April is Math Awareness Month. There is now a new departmental membership category that allows unlimited numbers of student memberships. The cost is based on the size of the institution, not the size of the department. CUPM has drafted a new curriculum guide in 2015. Project NExT has new leadership. The Association is looking at a possible overhaul of its governance structure. A committee is looking for commonality among AMS, SIAM, AMATYC, ASA, and MAA recommendations for first two years of collegiate mathematics.
    d) Bill Emerson gave the Governor's report. This is the 100th Anniversary MathFest. It's a 4-day conference for $329. The new CUPM curriculum guide has more emphasis on applied mathematics than in past years, which is not without controversy.
    e) Beth Schaubroeck spoke about student activities. It is difficult to predict how much food to order, but consensus that the Friday lunch is a good social activity for undergraduates. Next year the Intermountain section will lead a Jeopardy game. We plan to "watch and learn" and maybe add it to our usual student activities. PPRUMC has lost a major source of funding (MAA is no longer giving grants.) Challenge on how to make up this funding.
    f) Dick Gibbs reported on student competitions in the Colorado. Local Students always do well on the AMC exams. This year we had a spectacular showing on the Mathematical Contest in Modeling. Both CU Boulder and Colorado College had teams placing in the top 1%. Putnam and AMI are still waiting for results. Dick thanked the section for the financial support, as they, too, are losing some major donors.
4. Announcements:
    a) Bill Cherowitzo announced Janet Barnett from CSU-Pueblo as the 2015 DTA winner. There were many highly qualified nominees.
    b) Various upcoming meetings were listed in the agenda, and people were referred to the list.
5. New Bylaws. Thanks to the committee of Bill Cherowitzo, Mike Brilleslyper, and Erica Hastert for their work on this task. Changes made include: clarify committee roles, duties, and membership; follow Association template for By Laws; allow for electronic voting of the executive committee; allow as much

flexibility as possible in the way the section is run. Kyle Riley called for a vote to approve the new By Laws. A unanimous 24 out of 24 people voted to approve.

6. Early Career Teaching Award. A handout of the proposed Early Career Teaching Award was an attachment to the agenda. It is based on the Association's Adler award, but more flexible. The section's award will allow any person with a doctorate in mathematics or a related field who teaches mathematics at least half time and is within the first seven years after completing a degree to be nominated. If the person also meets the criteria for the Adler award, the awards committee could recommend that the materials be submitted for the further award. A motion was made to approve the award was made, seconded, and approved unanimously. An additional motion was made to attach a financial prize to the award. Discussion ensued as to the amount of the award, and whether the section was making too many financial commitments in the By Laws. The motion was amended to make the financial award match that of the DTA ($100e) and to add language that the prize money was subject to availability. The amended motion was passed unanimously.
7. George Heine announced that we will be using an online registration system next year. This will also allow for voluntary dues contributions. Members were reminded that money can be given for a specific purpose as well as added to the general fund.
8. Kyle Riley thanked Marlow Anderson and Andrea Bruder for hosting such a well run meeting. Tracii Friedman and Cathy Bonan-Hamada are program chairs for the joint meeting next spring with the Intermountain Section.
9. Meeting was adjourned at 8:50.

Respectfully submitted,
Heidi Keck, Western State Colorado University
Secretary/Treasurer of the MAA Rocky Mountain Section

2015 Executive Committee Meeting Minutes
Thursday, April 16, 2015

Minutes: MAA Rocky Mountain Section Executive Committee Meeting
Date & Time: Thursday, April 16, 2015, 7:30—9:55 pm
Location: Saigon Café, 20 E. Colorado Avenue; Colorado Springs, CO
Attendance: Kyle Riley, Erica Hastert, Bill Emerson, Bill Cherowitzo, Heidi Keck, Marlow Anderson, Andrea Bruder, Tracii Friedman, Lisa Driskell, Janett Barnett, George Heine

1. Kyle Riley called the meeting to order at 8:20 pm. Minutes from the 2014 meeting and current agenda were approved. Agendas for banquet and business meeting were confirmed. Specific tasks were reviewed and order of events confirmed. Events to celebrate the MAA Centennial were highlighted from the program. Discussion of an official end to the meeting indicated a need to balance people's desire to "get on the road" and final ceremony to encourage attendance a late talks and officially pass the banner to the next host institution. Asking the speaker from national MAA to give a second plenary talk to end the conference was suggested.
2. Reports
   a) Heidi Keck gave the financial report. The section has about $13,000 on hand. Book sales have been strong, which boosts our revenue. Activity grants and sponsored graduate student speakers have been fewer, which limits our expenses. Discussion of whether these need to be increased or better advertised to increase participation.
   b) Kyle Riley summarized the nominating committee's activities. There is one nominee for chair-elect, Mike Jacobson. Next year we will need to elect a Vice Chair. Again discussion centered on how to better communicate with members to alert them to these issues.
   c) There were only two section activity grants awarded in fall 2014. The Colorado Math Circle received $500 and the PPRUMC was awarded $750, but only spent $118.23 because of weather related attendance problems.
   d) Funding Requests:
      i. Colorado Math Awards (Dick Gibbs) was awarded $250 (Bill E motion, Bill C second, unanimous approval)
      ii. Books for door prizes (Janet Barnett) was awarded $140 (Bill E motion, Bill C second, unanimous approval)
      iii. Since there were only 22 people signed up for the chair and liaison lunch, a motion was made to cover the entire cost of $220. (Heidi motion, Bill E second, unanimous approval).
      iv. The national funding for regional undergraduate math conferences has ended. The organizers of PPRUMC were encouraged to convene their steering committee to make a decision before approaching the RMS MAA for funding.
3. Representative for MathFest are Kyle Riley and Bill Emerson. Our representative at the Joint Meeting will also be Bill Emerson.
4. Future Section Meetings: General discussion about moving location for ease of majority of members with recognition that no location will be convenient for everyone. Reminder that before agreeing to host, the prospective program chair must ask about local usage fees. It is now very common for institutions to charge for rooms and IT services.
   a) 2016: Tracii Friedman is the program chair and coordinating with the Intermountain region program chair. We anticipate using online registration and further researching how to handle online payment.
   b) 2017 CSU-Pueblo is confirmed. Janet Barnett will be program chair.
   c) 2018 Greeley, Kyle will confirm.
5. George Heine presented research into web registration for 2016. We can easily use the MAA web page registration. This will allow us to collect and analyze data about the meeting. Some decisions will have

to be made soon about what the registration form should look like and what data we want to collect. Online payment is more difficult. Commercial vendors will necessarily charge a fee, which all felt was reasonable and worth paying for. Our nonprofit status may allow us to get lower rates. Periodic changes to the treasurer position (and subsequent changes to banking) require investigation on how to allow one account that can be modified. Tracii Friedman was given permission to investigate and do what she can for next year, knowing that a wide variety of solutions are acceptable.

6. Some minor editorial changes were made to the draft Bylaws. Thank you to Bill Cherowitzo and his committee of Erica Hastert and Mike Brilleslyper for working on these.
7. The Early Career Distinguished Teaching Award was discussed. Bill E was able to add some background on the national Adler award and why it so specifically requires a PhD. There was consensus that we did not need to mirror this award exactly, and could forward nominations when our winner also met the national criteria. The draft language was modified to require a doctorate in mathematics or a closely related field and a teaching appointment that was at least half time in mathematics. People felt that counting the seven year limit would be impossible to determine if the degree requirement was Master's degree, although all acknowledged outstanding teachers without a doctorate exist at our institutions. Loosening the PhD requirement to any doctorate related to math would expand the eligibility.
8. There was support in theory for Section NExT, but no one willing to take leadership. Several people volunteered to help who are unable to attend the meeting. Tracii will contact them to see if there is any interest for the 2016 meeting.

Respectfully submitted,
Heidi Keck, Western State Colorado University
Secretary/Treasurer of the MAA Rocky Mountain Section

Financial Report

The Rocky Mountain Section remains in strong financial shape. We started the year with $12,500 in reserves. The usual sources of revenue are subvention (a portion of your MAA dues comes back to the section) of $750 and book sales (a portion of the proceeds from books sold during the meeting month come back to the section) of $200. This year Colorado College ran a very frugal meeting and we made $1400 from vendors and registrations. Our expenses are minimal. The largest is Activity Grants, on which we spent $1000 this year. Other expenses include the Distinguished Teaching Award of $350 and student programming and door prizes at the meetings of $350. Postage and other secretarial expenses are about $200. This leaves us with $13,300 to start a new cycle.

Respectfully submitted,
Heidi Keck, Western State Colorado University
Secretary/Treasurer of the MAA Rocky Mountain Section

MAA Rocky Mountain Section
Suggestions for Speakers

The Rocky Mountain Section would like to offer the following suggestions, especially to first-time speakers, regarding preparation of a talk at the conference.

1. The standard talk length is 20 minutes, (with longer times available upon request, subject to the limitations of the program). Thus, you should prepare your presentation to fit the time allotted. If possible, plan to leave a few minutes at the end of your presentation for questions.
2. A moderator will be assigned to facilitate each session of presentations. The moderator will introduce the speaker, assist in distribution of any handouts, signal the end of the presentation, and ask for questions from the audience.
3. If handouts are to be provided, give them to the moderator prior to the beginning of the session including your talk. Plan to bring about 35 handouts and be prepared to give attendees your e-mail address in case the supply runs out. It may also be possible to arrange for posting of electronic materials from your talk on the section website. Check with program organizers concerning this possibility.
4. Do not include too much detailed technical material in your presentation. Focus on providing the audience with insight into your topic and its key notions. Remember that most members of the audience will not be experts in the field you are discussing, and that the audience is likely to include students.
5. All session rooms will be equipped with a projector and a laptop hook up. Accordingly, you can present your talk using Power Point slides, PDF, or similar, which will greatly enhance the pace of a presentation. However, make sure that notes on the slides or transparencies are typed in a font big enough and with spacing adequate to be seen clearly 50 to 100 feet away.

Grants Available

Section Activity Grants Available

The purpose of the Section Activity Grants program is to assist Section members in funding projects in support of Section Mission. These projects must be clearly tied to one or more of the Rocky Mountain Section Mission Goals and the project director must be a member of MAA. Grants will not exceed $750 per project. Matching funds from host institution are preferred, but not required. To apply for a Section Activity Grant, submit the following to the Section Secretary/Treasurer:

(a) Description of project (no more than one page);
(b) Statement of how project supports Mission Goals (no more than one page);
(c) Estimated budget;
(d) Description of matching funds available, if any;
(e) Vitae of project director(s).

If funded, a report on the project will be filed by the Project Director upon completion (no more than one page) and a report will be made at the next meeting of the Section. Complete details on the selection process and application guidelines are posted on the section website. Grants will be reviewed once a year. All application materials are due November 1st of each year.

Student Recognition Grants Available

The establishment of a Student Recognition Grant Program was approved by the section membership at the 2003 Annual Business Meeting. In support of this program, the Section will set aside $500 every calendar year. From these monies, the Section will make grants for the purpose of recognizing superior achievement in mathematics on the part of (1) students enrolled in post-secondary institutions within the geographic region served by the Section and (2) high school students whose school districts, or other appropriate political subdivisions, substantially intersect the geographic region served by the Section.

Proposals for such grants must

1. Originate from a member of the Rocky Mountain Section of the Mathematical Association of America on behalf of an agency, institution, or organization whose stated purposes are consistent with recognizing or encouraging superior academic achievement at the high school level;
2. Be in the hands of the Chair of the Rocky Mountain Section no later than March 15 of the year in which the proposed recognition is to be made;
3. Include the criteria under which superior achievement in mathematics is to be recognized, together with the time and the manner of such recognition;
4. Report, insofar as possible at the time of the proposal, other potential sources of support together with proposals or requests made or intended; and
5. Be limited to a maximum amount of $250.

The Executive Committee will review all proposals for grants under this policy and will make such grants as, in its sole judgment, it deems proper. In keeping with the section mission, funding priority will be given to grants that include recognition of undergraduate students. Funding decisions will be announced no later than the Annual Business Meeting of the Section. Monies not expended during any particular year shall revert to the Section's general fund.

About Our Logo

The logo for the Rocky Mountain Section of the Mathematical Association of America was created in by Mark Petersen in 2001. A graduate student in the Applied Mathematics Department at the University of Colorado at Boulder at that time, Mark says of his design:

"The mountain symbols were chosen because analysis is the foundation for all of mathematics. The equation $e^{i\pi} + 1 = 0$ must rank among the most beautiful formulas in mathematics. It connects the five most important constants of mathematics with the three most important operations - addition, multiplication, and exponentiation. These five constants symbolize the four major branches of classical mathematics: arithmetic, represented by 0 and 1; algebra, by *i*; geometry, by π; and analysis, by *e*. (Quoted from Eli Maor's *e, The Story of a Number*). I chose to portray this equation as a train because rail has historically been the life blood of the American West, and trains are complementary to any mountain scene."

Meetings Calendar

Joint Mathematics Meetings; Seattle, WA
January 6-9, 2016
ICTCM 2016; Atlanta, GA; March 10-13, 2016
NCTM annual meeting; San Francisco, CA
April 13-16, 2016
MAA Rocky Mountain Section Meeting;
Colorado Mesa University
Grand Junction, April 8-9, 2016
Joint meeting with the Intermountain Section
MAA MathFest; Columbus, OH;
August 3-6, 2016

Joint Mathematics Meetings; Atlanta, GA
January 4-7, 2017
NCTM annual meeting; San Antonio, TX
April 5-8, 2017
MAA Rocky Mountain Section Meeting;
Colorado State University - Pueblo
Grand Junction, April 21-22, 2017
MAA MathFest; Chicago, IL; July 26-29, 2017

Joint Mathematics Meetings; San Diego, CA
January 10-13, 2018
NCTM annual meeting; Washington DC
April 25-28, 2018
MAA MathFest; Denver, CO; August 1-4, 2018

Joint Mathematics Meetings; Baltimore, MD
January 16-19, 2019
NCTM annual meeting; San Diego, CA
April 6-9, 2019
MAA MathFest; Cincinnati, OH;
July 31-August 3, 2019

Joint Mathematics Meetings; Denver, CO
January 15-18, 2020

Joint Mathematics Meetings; Washington DC
January 6-9, 2021

The Rocky Mountain Section of
The Mathematical Association of America

Burton W. Jones Award
for Distinguished College or University Teaching of Mathematics

Burton W. Jones Award Nomination Form

Name of Nominee _____
(First name first)

Email Address _____

College or University Affiliation _____

College or University Address _____

City _____ State _____ Zip _____

Is the nominee a member of the MAA? _____

Number of years of teaching experience in a mathematical science _____

Has the nominee taught at least half time in a mathematical science
for the past three years (not counting a sabbatical period)? _____

On a separate page, briefly describe the unusual or extraordinary personal and professional qualities of the nominee that contribute to her or his extraordinary teaching success.

Name of Nominator) _____
(First name first)

Address of Nominator _____

_____

Email Address _____

Telephone: Work _____ Home _____ Fax _____

Nominator's Signature _____

Nomination forms should reach Section Secretary by December 15 of each year.
Complete nomination materials should reach Section Secretary by January 15 of each year.

Section Secretary: Heidi Keck, hkeck@western.edu
Western State Colorado University; Hurst Hall; Gunnison, CO 81231.

Please consult the Section webpage (http://sections.maa.org/rockymt) for complete guidelines.

The Rocky Mountain Section of
The Mathematical Association of America

Early Career Teaching Award
for Excellence in Teaching in the Mathematical Sciences

Early Career Teaching Award Nomination Form

Name of Nominee _____
(First name first)

Email Address _____

College or University Affiliation _____

College or University Address _____

City _____ State _____ Zip _____

Is the nominee a member of the MAA? _____

Has the nominee taught at least half time in a mathematical science
for at least two but not more than seven years? _____

On a separate page, briefly describe the unusual or extraordinary personal and professional qualities of the nominee that contribute to her or his extraordinary teaching success.

Name of Nominator) _____
(First name first)

Address of Nominator _____

_____

Email Address _____

Telephone: Work _____ Home _____ Fax _____

Nominator's Signature _____

Nomination forms should reach Section Secretary by December 15 of each year.
Complete nomination materials should reach Section Secretary by January 15 of each year.

Section Secretary: Heidi Keck, hkeck@western.edu
Western State Colorado University; Hurst Hall; Gunnison, CO 81231.

Please consult the Section webpage (http://sections.maa.org/rockymt) for complete guidelines.

Early Career Teaching Award Guidelines

Part of the core mission for the Rocky Mountain Section is to provide recognition for quality mathematics teaching. The Early Career Teaching Award was established to recognized excellence in teaching in the mathematical sciences for faculty that are early in their career.

Eligibility
Nominees must:

- Hold a doctorate degree
- Be college or university teachers who have held a full-time faculty appointment in a college department of mathematical sciences in the Rocky Mountain Section for at least two, but not more than seven, years since receiving the doctorate. A nominee who has just started the eighth year of teaching at the time of the application is still eligible for the award. If a nominee has held his or her doctorate for more than 7 years then the nominator must indicate on the nomination form the times that the nominee was not teaching. Common exceptions to the 7-year limit are maternity, paternity, family, or medical leaves. Sabbaticals and postdoctoral fellowships are exceptions only if they involved no teaching and the application does not include accomplishments made during these times.
- Hold membership in the Mathematical Association of America

Guidelines for nomination
Nominees for the award may be made by any member of the Rocky Mountain Section of the MAA.
Nominees should:

- Be recognized as extraordinarily successful in their teaching
- Have effectiveness in teaching undergraduate mathematics that can be documented
- Have had influence in their teaching beyond their own classrooms
- Foster curiosity and generate excitement about mathematics

Nomination form is due December 15
Complete nomination packet is due January 15

Nomination Packet
A complete nomination packet should consist of the following documentation as it is described below.

1. **Nomination Form *and One-Page Summary*** - Describe the unusual and personal and professional qualities of the nominee that contribute to his or her extraordinary teaching success, and attach to this completed nomination form.

2. **Narrative (Up to 2 pages)** - Describe the nominee's extraordinary success in teaching by providing a narrative of the nominee's background, experience, teaching style, special contributions, other teaching awards, and any additional evidence of the nominee's unusual achievement in teaching. Note especially effectiveness in teaching undergraduate mathematics and influence beyond the nominee's own classrooms. The narrative should not exceed two single-spaced pages.

3. **Additional Documentation (Up to 2 pages)** - Submit no more than two pages of further evidence to document the nominee's extraordinary teaching success. This documentation will vary greatly from institution to institution, but may include summaries of peer or student evaluations, comments on teaching, possible increases in numbers of majors in mathematics (with clear evidence of the nominee's substantial responsibility for them), possible student success in mathematics competitions (with clear evidence of the nominee's substantial responsibility for them), success in research in mathematics conducted by undergraduate students under the direction of the nominee, production of superior quality honors theses by undergraduate students under the direction of the

nominee, development of curricular materials successfully used by colleagues, adoption of the nominee's teaching methods or techniques by experienced colleagues, service as a respected adviser for a student group, etc.

Nominators should bear in mind that the selection committee for the award might view a nomination more positively if it is accompanied not just by carefully chosen testimonials from a few selected students and faculty, but also reports comments and criticism which is representative of the whole spectrum of opinion among students and faculty on the nominee's teaching.

4. **Letters of Recommendation (Each letter is one page. Maximum of 5 letters.)**
    - Two letters from the nominee's present or former students.
    - One letter from the nominee's colleagues (could be the department chair).
    - At most two additional letters from anyone qualified to comment on the nominee's extraordinary teaching success, including additional students and/or colleagues.

Voluntary Section Dues

Many thanks to those members who have made a voluntary dues contribution to the section along with their Spring Meeting Registration!

Although the section has found itself in good financial health in recent years, additional funds are always needed in order to pursue special initiatives suggested by the membership. The successful John Fauvel Memorial Conference and William Dunham Special Lecture, both supported in part by the Section Activity Grant program, provide excellent examples of what can be done with even a small amount of funding to support our section mission and goals.

A voluntary section dues contribution from you now can help build up funds in support of similar initiatives!

To submit your dues, simply return the coupon below with a check for any amount you wish - every little bit will help, and all contributors will receive a letter acknowledging the contribution for their financial records.

MAA Rocky Mountain Section Voluntary Dues Contribution Form

Name _____

Address _____

_____ **ZIP** _____

Please indicate in the space provided how you would like your dues to be used:

_____ Undergraduate Student Initiatives
_____ Graduate Student Initiatives
_____ Burton W. Jones DTA Fund
_____ Section Activity Grant Program
_____ Wherever needed most
_____ Other: _____
_____ **TOTAL DUES PAID ($10 recommended)**

Please make check payable to: **MAA Rocky Mountain Section** and return to: Heidi Keck, MAA Rocky Mountain Section Treasurer/Secretary: Western State Colorado University, Hurst Hall; Gunnison, CO 81231

MAA Rocky Mountain Section
Mission Statement

**To promote excellence in mathematics education,
especially at the collegiate level.**

Mission Related Goals

1. To foster scholarship, professional development, and professional cooperation among the various constituencies of the mathematical community within the region.

2. To foster the implementation and study of recent research recommendations for the teaching, learning and assessment of collegiate mathematics.

3. To support the implementation of effective mathematics preparation programs of prospective teachers at all levels.

4. To enhance the interests, talents and achievements of all individuals in mathematics, especially of members of underrepresented groups.

5. To provide recognition of the importance of mathematics, mathematical research and quality mathematics teaching, and promote public understanding of the same.

6. To provide regional leadership in the promotion of systemic change in mathematics education, and in the enhancement of public understanding about the needs and importance of mathematical research and education.