



FALL 2017 NEWSLETTER

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

Fall 2017 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/fall2017news.pdf>

Table of Contents

Fall 2017 Newsletter in PDF Format for Printing	1
Table of Contents	2
2017 - 2018 Section Officers and Committee Members	4
Diane Davis of Metropolitan State University of Denver named 2017 Distinguished Teacher	6
Mary Pilgrim of Colorado State University awarded 2017 Early Career Teaching Award	6
2018 Distinguished Teaching Award Call for Nominations	7
2018 Early Career Teaching Award Call for Nominations	7
Past Burton W. Jones DTA Recipients	8
Past Early Career Teaching Award Recipients	8
Editor's Note: Postcards to be Discontinued	8
Chair's Report	9
MAA National Representative's Report	9
22nd Annual Colorado Mathematics Awards Ceremony/Reception	10
Heidi Keck receives the Rocky Mountain Section Certificate of Meritorious Service Award	11
The MAA 2017 Rocky Mountain Section Certificate of Meritorious Service Award Nominees	11
15th Annual PPRUMC University of Colorado Colorado Springs Saturday, February 24, 2018	12
Section News	12
Colorado School of Mines	12
Colorado State University	14
Colorado State University - Pueblo	15
Community College of Aurora	15
Metropolitan State University of Denver	16
Regis University	16
South Dakota School of Mines and Technology	16
University of Northern Colorado	17
RMS Members invited to Site-Test with TRIUMPHS	17
Section Nominating Committee Report	18
Section NEXt News	18
University of Northern Colorado to host the annual Rocky Mountain Section Meeting April 13 - 14, 2018	19
Student Activities	20
2017 Section Meeting Report	21
Section Officer and Volunteer Recognition	23
Contributed Papers - 2017 Section Meeting	25
A Tribute to MAA-RMS in its First 100 Years: A Panel Reflecting on Events and Experiences in the Rocky Mountain Section	25
Teaching Statistical Thinking	25
Elementary Math Specialists State Endorsement	25
General Mathematics	26

History of Mathematics and its Associations	26
IBL Methods and More	27
Interesting Ideas in Math	27
Mathematics Education, Featuring Highlights from ICME and its Satellite Meetings	28
Mathematics in K-12 Teacher Preparation	29
Undergraduate Student Paper Session	29
2017 Business Meeting Minutes Saturday, April 22, 2017	31
2017 Executive Committee Meeting Minutes Thursday, April 20, 2017	33
2016 Financial Report	35
MAA Rocky Mountain Section Suggestions for Speakers	36
Grants Available	37
Section Activity Grants Available	37
Student Recognition Grants Available	37
About Our Logo	38
Meetings Calendar	38
Burton W. Jones Award Nomination Form	39
Early Career Teaching Award Nomination Form	40
Early Career Teaching Award Guidelines	41
Voluntary Section Dues	43
MAA Rocky Mountain Section Voluntary Dues Contribution Form	43
MAA Rocky Mountain Section Mission Statement	44

2017 - 2018 Section Officers and Committee Members

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

Current term of service in parentheses; The Chair serves for 3 years – one as Chair Elect, one as Chair, one as Past Chair; All other positions are 1 year terms

Section Executive Committee Officers for 2017 – 2018

Chair Elect (2017 - 2020)	Alexander Hulpke Colorado State University Fort Collins, CO 80523	alexander.hulpke@colostate.edu 970-491-4288
Chair (2016-2019)	Mike Jacobson University of Colorado Denver Denver, CO 80217	michael.jacobson@ucdenver.edu 303-315-1708
Vice-Chair (2016-2018)	Shawna Mahan Pikes Peak Community College	shawna.mahan@ppcc.edu 719-502-3268
Secretary/ Treasurer (2017-2020)	Spencer Bagley University of Northern Colorado Greeley, CO 80639	spencer.bagley@unco.edu 970-351-2254
MAA National Rep (2017-2020)	Heidi Keck Western State Colorado University Gunnison, CO 81231	hkeck@western.edu 970-943-3167
Program Co-Chairs	Oscar Levin Nathaniel Miller University of Northern Colorado	oscar.levin@unco.edu nathaniel.miller@unco.edu

Other Committee Members and Representatives

Section Nominating Committee

Gulden Karakok (Chair), UNC	gulden.karakok@unco.edu
Bruce Lundberg, CSU-Pueblo	bruce.lundberg@csupueblo.edu
Kyle Riley, SDMST	kyle.riley@sdsmt.edu

Awards Selection Committee

Alexander Hulpke (Chair), CSU	alexander.hulpke@colostate.edu
Shawna Mahan, PPCC	shawna.mahan@ppcc.edu
Diane Davis, MSU Denver	ddavi102@msudenver.edu
Mary Pilgrim, CSU	mary.pilgrim@colostate.edu

Section Awards Coordinator

(2017-2020) Jeremy Muskat, Western State Colorado University jmuskat@western.edu

Section Student Activity Coordinator

(2017-2020) Beth Schaubroeck, USAFA beth.schaubroeck@usafa.edu

Higher Education Representative on CCTM Governing Board

(2016-2019) Erica Hastert, Early College of Arvada efastert@ecarvada.org

Section Book Sales Coordinator

(2015-2018) Janet Heine Barnett, CSU - Pueblo janet.barnett@csupueblo.edu

Section NExT Committee

(2016-2019) Rebecca Swanson, Colorado School of Mines swanson@mines.edu
Amanda Schaeffer-Fry, MSU Denver aschae6@msudenver.edu

Public Information Officer and Section Liaison Coordinator

(2017-2020) Spencer Bagley, University of Northern Colorado spencer.bagley@unco.edu

Website Editor

(2015-2018) George Heine, Math and Maps gheine@mathnmaps.com

Newsletter Editor

(2016-2019) Linda Sundbye sundbyel@msudenver.edu
Metropolitan State University of Denver 303-615-0746
Department of Mathematical and Computer Sciences
P. O. Box 173362, Campus Box 38
Denver, CO 80217-3362

**Diane Davis
of
Metropolitan State University
of Denver
named
2017 Distinguished Teacher**

The Rocky Mountain Section of the MAA started the Distinguished Teaching award in 1992 with an award to John “Jack” Hodges of CU-Boulder. In 1998, the section decided to dedicate the Distinguished Teaching Award in honor of Burton W. Jones and the 26th recipient of this award is Dr. Diane Davis, Associate Professor from Metropolitan State University of Denver. As noted in her nominating package, Dr. Davis has established a reputation among our students as an inspiring teacher who will go to extraordinary lengths to help her students. Dr. Davis has supervised 24 research, or independent study, projects since joining the department in 2007. Many of these projects resulted in presentations, or poster sessions, at professional conferences.

Dr. Davis is also a recognized champion for student groups that are active in learning mathematics and she initiated active participation from her university at the Nebraska Conference for Undergraduate Women in Mathematics (NCUWM). This tradition of participating in NCUWM resulted in the Metro Women Math Club, which was initiated in 2010 and continues to this day. She was later recognized as Student Organization Advisor of the Year in 2012. Dr. Davis has also been active in producing a Metro Math Newsletter where she helps to bring recognition to the contributions of faculty and students. Dr. Davis remains active in the professional development of her fellow mathematics faculty in the section and was one of the early contributors of the Section NExT efforts that were organized by Dr. Amelia Taylor in 2009. Dr. Davis has a passion for teaching a compassion for her students that was clearly recognized in one of her student comments: “I may occasionally forget integration techniques, but I’ll never forget the life lessons I’ve learned from you.”

Special thanks to Lindsay Packer for the time and effort he devoted to preparing the nomination materials for Professor Davis.

Kyle Riley

Chair, Awards Committee of the RMS-MAA



**Diane Davis, MSU Denver and
Mary Pilgrim, CSU**

**Mary Pilgrim
of
Colorado State University
awarded
2017 Early Career Teaching
Award**

The Rocky Mountain Section of the MAA started the Early Career Teaching Award in 2016 to honor faculty that have demonstrated excellence in teaching early in their career. The second recipient of this award is Dr. Mary Pilgrim from Colorado State University at Ft. Collins. Dr. Pilgrim is an energetic instructor that brings engagement and excitement to her classes that involve a great deal of student interaction. The engaging teaching style is evident in one student comment, “you learn best when you can teach a fellow classmate, and she applied that every day in the classroom. Everyone was participating and from what I saw, everyone enjoyed the class.” Dr.

Pilgrim has made a significant impact in the teaching of Calculus I through her leadership in coordinating the class across numerous sections. She was able to extend the training program for the graduate teaching assistants involved in the course and was also successful in attracting the funding for the Calculus Center, which was an addition of \$250,000 in base funding. She is currently a co-director of the center and helps manage operations.

Dr. Pilgrim's development efforts extend beyond the department with her contributions to the Institute for Learning and Teaching at CSU-Ft. Collins along with her leadership roles in the Park City Math Institute. Her research emphasis is in mathematics education and so she is uniquely qualified to contribute in the area of teaching and learning mathematics at the collegiate level. She continues to work at developing enhancements in teaching and learning for her department, her university, and for the profession. It is clear Dr. Mary Pilgrim is an excellent person to recognize with the Early Career Teaching Award.

Special thanks to Dan Bates for the time and effort he devoted to preparing the nomination documentation for Professor Pilgrim

Kyle Riley

Chair, Awards Committee of the RMS-MAA

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 2017**. **Complete nomination materials** (described on the website) are due **15 January 2018**.

2018 Early Career Teaching Award Call for Nominations

The Rocky Mountain Section of the MAA approved in 2015 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

2018 Distinguished Teaching Award Call for Nominations

Each year since 1992, 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* 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

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. 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 2017**. **Complete nomination materials** (described on the website) are due **15 January 2018**.

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 College of Denver
- 1996 Zenas Hartvigson
University of Colorado Denver
- 1997 Thomas Kelley
Metropolitan State College of Denver
- 1998 Monte Zenger
Adams State College
- 1999 Bill Briggs
University of Colorado Denver
- 2000 Barbara Bath
Colorado School of Mines
- 2001 Jim Loats
Metropolitan State College 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

- 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
- 2016 Hortensia Soto-Johnson
University of Northern Colorado
- 2017 Diane Davis
Metropolitan State University of Denver

Past Early Career Teaching Award Recipients

- 2016 Rebecca Swanson
Colorado School of Mines
- 2017 Mary Pilgrim
Colorado State University

Editor's Note: Postcards to be Discontinued

We will be discontinuing the mailing of postcards to inform MAA section members that the newsletter is posted on the Section Website. The Section Secretary Spencer Bagley will be sending out an email notification to the membership. Please make sure that the National MAA has your current email address.

The fall newsletter is usually posted online by late September to early October, and the spring newsletter is usually posted by late February to early March. Alternatively, bookmark the Section Website <http://sections.maa.org/rockymt> and check there.

Please contact me if you would like to receive a hardcopy of the newsletter.

Linda Sundbye, Newsletter Editor
sundbyel@msudenver.edu

Chair's Report

The calendar (and the students in my office) say September, strangely enough, my internal clock is still reading May; it seems like the CSU-Pueblo meeting just finished up and planning for the next section meeting spring 2018 is just beginning. But, before going on, this provides me an excellent lead-in to **once again** thank **Janet Barnett** and the whole planning group at CSU-Pueblo for hosting an excellent centennial meeting. And again thank all of the section participants, speakers and attendees – and in particular the main speakers, which included **Tim Chartier** from Davidson College, **Brian Hopkins** from Saint Peter's University, **Michael Dorff** from Brigham Young University and **Hortensia Soto** from the University of Northern Colorado, who was the 2016 Burton W. Jones Distinguished Teaching Award Recipient and opening speaker at the meeting.

Although these last several months have flown on by, there has been quite a lot of progress on planning for the 2018 section meeting, which will be held at the University of Northern Colorado, in Greeley. The UNC local organizers, **Oscar Levin** and **Nat Miller**, have been planning for an exciting meeting, April 13-14, 2018, with **Matt Boelkins** and **Robin Wilson** as two of the principle speakers. It is also worth noting that this meeting will be just a few months before 2018 MAA MathFest, which will be in Denver August 1-4.

I want to remind section members of the two teaching awards offered through the section. At our spring meeting, the section announced that **Diane Davis** from Metropolitan State University was the 2017 recipient of the Burton W. Jones Distinguished Teaching Award (DTA) and the **Mary Pilgrim** from Colorado State University – Fort Collins was the recipient of the Early Career Teaching Award (ECTA). Nominations for the 2018 awards will be due in a few months; consider nominating faculty in your department for the 2018 awards. Additional information can be found later in this newsletter and on the section website. This is an exceptional way to

honor your most successful and imaginative department colleagues.

Every five years, the section is able to bestow the national recognition of the MAA Certificate of Meritorious Service to one of our section members. **Heidi Keck** was the 2017 section choice for this recognition. Her service to the section and the MAA has been endless for over 20 years, which includes service on multiple levels and has always worked to get more colleagues and students involved in section activities. Her service as program chair as well as numerous section committees has been endless, but I certainly want to highlight the tremendous organization and coordination that Heidi brought to serving as the section Secretary – Treasurer for the last five years, and the important contribution that this has brought to the section.

I want to remind RMMAA members that our section offers small Activity Grants in support of projects that progress the mission of the MAA. Information about these and other section activities can be found at our website: sections.maa.org/rockymt/.

Finally, last fall, I mentioned in my section chair report, the MAA initiative in support of Active Learning Day, which was an initiative proposed by the President's Office of Science and Technology Policy. I hope that some members participated and as a follow up, the MAA maintains a blog (<http://activelearningdaymaa.blogspot.com/>) including resources and research related to Active Learning and active learning day, in particular.

Michael Jacobson, UC Denver
Chair, Rocky Mountain Section

MAA National Representative's Report

MathFest 2017 saw the first meeting of the newly structured Congress of the MAA. People formerly known as "Governors" are now referred to as "Representatives to the Congress." This new title reflects a new structure for the group as well. The day-to-day operations of the MAA are now overseen by a much smaller group called the Board of Directors. The MAA Congress serves as a vehicle for communication between the members of the MAA and the Board of Directors

and staff. It is anticipated that the Board of Directors and the staff will inform the Congress of contemplated policy changes and actions and give the Congress an opportunity to provide feedback; and that the Congress will make recommendations about possible policy changes and actions to the Board of Director and staff that it determines to be important for the members.

At this first meeting of the Congress, the Board of Directors was looking for feedback on these particular issues: 1. The Evolving Role of the MAA in Support of Professors, 2. Reaching out to historically underrepresented groups, 3. The IP Guide and the Mentoring Network, 4. Increasing Section participation, 5. Connecting mathematics and other disciplines, 6. MAA finances, and 7. How Congress Can Support the Mission of the MAA. Representatives generated ideas on these issues that will be used by working groups in each area.

While I don't have a Governor's meeting to compare this to, it felt like a productive meeting. This structure allowed participants to think about big ideas for the MAA's mission.

Heidi Keck, WSCU

Representative, Rocky Mountain Section

22nd Annual Colorado Mathematics Awards Ceremony/Reception

The 22nd annual Colorado Mathematics Awards (CMA) Reception/Ceremony was held on Thursday, May 18 at the Grant-Humphreys Mansion in Denver. Organized by **Dick Gibbs**, Emeritus Professor of Mathematics at Fort Lewis College, and **David Carlson**, adjunct faculty of the Josef Korbel School of International Studies at the University of Denver and the Iliff School of Theology, the event recognized Colorado students and teachers from junior and senior high schools, and colleges and universities in Colorado for outstanding performances on eight national and international mathematics competitions: MATHCOUNTS, the American Mathematics Contests 8, 10 and 12, the high school team Moody's Mega Math Challenge, the William Lowell Putnam Mathematical Competition, the collegiate team Mathematical Contest in Modeling, and Interdisciplinary Contest in Modeling. The fifteen members of the Colorado American Regions Mathematics

League high school team were also recognized.

We were very pleased and honored to have **Mr. Raymond Johnson**, Mathematics Content Specialist, Colorado Department of Education, give the opening remarks. Raymond is the newest member of the CMA steering committee.

The AMC 8, AMC 10, AMC 12, and Putnam Competitions are sponsored programs of the national MAA, which also provides support for MATHCOUNTS, the Mathematical Contest in Modeling (MCM), and the Interdisciplinary Contest in Modeling (ICM).

The Rocky Mountain Section of the MAA is an educational sponsor of the Colorado Mathematics Awards.

Section Governor, **Bill Emerson** was on hand to recognize **Diane Davis**, Metropolitan State University of Denver, recipient of this year's Burton W. Jones Teaching Award **Mary Pilgrim**, Colorado State University-Ft. Collins, recipient of this year's Early Career Teaching Award. Because of problems with the weather, **Section Chair, Mike Jacobson** was unable to attend, so Bill Emerson presented the William Lowell Putnam Mathematical Competition, International Mathematical Contest in Modeling, and Interdisciplinary Contest in Modeling 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 student teams excelled in this year's Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling. Out of 8843 teams worldwide, 18 were Outstanding and 23 were Finalists—including one from the University of Colorado Denver: The team, coached by **Gary Olson**, consisted of **Zachary Foreman, Robert Lewis**, and **Samuel Stanton**. Out of 8085 teams worldwide, 14 were Outstanding and 23 were Finalists—including two from University of Colorado Boulder: The team consisting of **Christopher Arehart, Nicholas Inslee**, and **Jacob Vendl**, was coached by **Bengt Fornberg**, and the team consisting of **Ellen Considine, Suyog Soti**, and **Emily Webb**, (all three freshmen!) was coached by **Anne Dougherty**.

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:

Ibraheem Khan and **Nicholas Boschert**, both at University of Colorado Boulder. **Keith**

Kearnes, Alexander Gorokhovsky, and Sergei Kuznetsov coached both students.

Special thanks to the CMA Steering Committee for identifying and recognizing these outstanding young mathematicians and their 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 23rd Colorado Mathematics Awards Reception/ Ceremony to be held again at the Grant-Humphreys Mansion on Thursday, May 10, 2018.

Dick Gibbs

Emeritus Professor of Mathematics

Fort Lewis College

Mathematics Conference (PPRUMC) had to deal with the significant loss of funding when the NSF discontinued their support of regional undergraduate mathematics conferences. The directors of the PPRUMC approached the section for assistance and also asked the section to be involved in helping to manage the private donations that they were gathering to support the PPRUMC. Heidi was very supportive of this arrangement and was influential in bringing this new collaboration to a successful conclusion. The timing of the MAA Award for Meritorious Service is fortuitous since we can recognize Dr. Keck at the conclusion of her second term as Secretary/Treasurer and the section is also celebrating our centennial year.

**Heidi Keck
receives the Rocky Mountain
Section Certificate of
Meritorious Service Award**

**The MAA 2017
Rocky Mountain Section
Certificate of Meritorious
Service Award Nominees**

The Rocky Mountain Section is pleased to nominate Heidi Keck to be the recipient of the 2017 Mathematical Association of America Certificate of Meritorious Service.

Professor Keck became a member of the section in 1997 when she joined the faculty at Western State Colorado University. She received her B.S. from Bemidji State, M.S. from the University of Utah, and her Ph.D. from the University of Montana. Dr. Keck is a member of the MAA along with being a member of the NCTM and AMTE. She has been very active in the section over many years and has served as the section meeting program chair, has served on several section committees, and has also served two terms as the section Secretary/Treasurer.

The Secretary/Treasurer position is a crucial officer in our section governance since all section activities depend on the involvement of the section Secretary/Treasurer. Heidi has managed to keep the section financially secure and she has also played a vital part in the growth of our section awards program. Our section has a long tradition of recognizing outstanding teaching with the Burton W. Jones Distinguished Teaching Award, but Heidi has worked hard to add a new Early Career Teaching Award just this past year, and still manages to oversee the Section Activity Grant program. Another recent challenge is when the Pikes Peak Regional Undergraduate

At its August meeting in 1983, the Mathematical Association of America Board of Governors established a Certificate for Meritorious Service to be presented for extraordinary contributions and outstanding efforts consistent with the stated purposes of the MAA and the Section. The first such awards were presented at the August 1984 meeting.

At the Sectional level, each Section is entitled, and encouraged, to nominate one person for the award every five years. For this purpose, the Sections of the Association are separated into five groups, with one group of Sections making their nominations to the Board each year on a rotating basis. At each Summer MathFest, honorees from roughly six Sections are recognized.

The Rocky Mountain Section is included in the 2012-2017 rotation. Nominations for the award are first reviewed by a three-person committee. The committee's recommendation must then be approved by both the Section Executive Committee and the MAA's National Board of Representatives.

All three nominees for the 2017 Rocky Mountain Section Certificate of Meritorious Service have extensive records of exemplary service to the section which were recognized at the Section's Annual Meeting in April:

Jeff Berg,
Arapahoe Community College
Heidi Keck,
Western State Colorado University
Linda Sundbye,
Metropolitan State University of Denver

The section encourages all members to extend their thanks to these three nominees for the excellent service they have provided – and continue to provide - to the section and to the MAA.

15th Annual PPRUMC
University of Colorado
Colorado Springs
Saturday, February 24, 2018

Please mark your calendars 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 be no registration or lunch fees for the conference, as well as limited financial reimbursement for student travel expenses. The PPRUMC Steering Committee is exploring a variety of fund-raising options for the continuing support of 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 Barbara Prinari bprinari@uccs.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, 2018.**

Section News

Colorado School of Mines

The Mines' Applied Mathematics and Statistics department is happy to introduce and welcome our new members:

Soutir Bandyopadhyay, Associate Professor, Applied Math and Statistics, PhD, Texas A&M University. Soutir earned a doctorate in statistics at Texas A&M University, a master's degree in statistics at the Indian Statistical Institute in New Delhi and a bachelor's degree in statistics at St. Xavier's College in Calcutta. He has been a visiting scientist at the Computational and Information Systems Laboratory at the National Center for Atmospheric Research studying climate models. His area of expertise is spatial statistics and bioinformatics. He has published his work in the Journal of Time Series Analysis, the Journal of the Royal Statistical Society, Series B and the Annals of Statistics.

Forest Mannan, Visiting Assistant Professor, Applied Math and Statistics; PhD, Tulane University. Forest grew up in Carbondale, Colorado, and obtained his PhD from Tulane University in April 2017. He conducts research in computational fluid dynamics, especially flows in the Stokes regime relevant to biology.

Bradley Martin, Visiting Assistant Professor, Applied Math and Statistics, PhD, University of Colorado Boulder. He recently completed his PhD in applied mathematics with Bengt Fornberg and the RNF research group at CU- Boulder while investigating new, radial basis function based methods for numerically solving partial differential equations. His work on heat and wave interface and transport problems has been published in Geophysics, J. of Comp. Phys. and Engr. Anal. With Boundary Elements.

Kevin Ahrendt, Post-doctoral Teaching Fellow, Applied Math and Statistics; PhD, University of Nebraska Lincoln. Kevin completed his PhD in mathematics under the supervision of Allan Peterson at UNL, researching fractional calculus on a discrete domain. He has published

work with undergraduates pertaining to this area, and looks forward to engaging in research with more undergraduates in the future.

Our department presented Outstanding Graduating Senior Awards to two students in recognition of their academic excellence and their service to the department, university and community:

Carrie Kralovec received the award for Computational and Applied Mathematics.



Nicholas Koprowicz received the award for Statistics.



Jessica Deters received the 2017 Professor Everett Award in Mathematics. This award is given to a senior who demonstrates scholarship, leadership, community service and potential for innovative application of mathematics to mineral engineering.



Stephen Molinari received 2017 the Graduate Teaching Award that is given annually to the graduate student who has shown the greatest effectiveness as a teacher of undergraduate mathematics or statistics courses.



Izabel “Izzy” Aguiar received the 2017 Job/McAuliffe Award, recognizing her hard work and determination to succeed as a Mines student. Izzy was awarded \$900 and a plaque for the Learning and Perseverance Award. Izzy recognized Paul Constantine as being influential in helping her to succeed academically at Mines. The educational vision of Carol Job and Sharon McAuliffe and helped this award come to fruition.



Rebecca Swanson received the 2017 Board of Trustees Outstanding Faculty Award, recognizing achievement that contributes to the breadth of students' classroom learning, as well as significant achievements outside of the classroom. She is fully invested in the success of her students and tirelessly works on improving her teaching. Additionally, she has been very active in providing service and support within and outside of the Applied Mathematics and Statistics Department. For example, she co-founded the Society for Women in Mathematics and the Mines' Putnam Team.

Stephen Pankavich received the 2017 Mines Teaching Award, presented to recognize superior teaching at the undergraduate level and to provide encouragement and incentive for teaching achievement.

William Navidi received the 2017 Outstanding Faculty Award by the Mines' Class of 2017 Graduating Seniors.

Holly Eklund received the 2017 Faculty Award from the Mines' Society of Asian Scientists and Engineers. Additionally, she received the Mines' Martin Luther King, Jr. Faculty Recognition award, honoring Mines faculty members who foster understanding and respect for diversity through their commitment to a philosophy of inclusion.

Jaime Bachmeier received the 2017 Outstanding Staff Award from the Mines' Blue Key, Order of Omega and Tau Beta Pi student honorary societies.

Agate Dean, adjunct faculty member, received the 2017 Mines Blue Key Outstanding Faculty Award.

Steve Pankavich was tenured and promoted to associate professor. **Deb Carney**, **Mike Nichols** and **Becky Swanson** were promoted to Teaching Professor.

Luis Tenorio published his book *An Introduction to Data Analysis and Uncertainty Quantification for Inverse Problems* with SIAM. **Gregory Fasshauer** with Larry Schumaker as editors published *Approximation Theory XV: San Antonio 2016* with Springer

Luis Tenorio received a collaborative NSF grant for research on stochastic approximations for the solution and uncertainty analysis of data-intensive inverse problems. **Cecilia Diniz Behn** received a collaborative NIH grant to study sensitivity of the circadian clock to light in early childhood.

Doctoral student **Katy Martinez** working under **Steve Pankavich** was one of only 12 nationwide recipients in mathematical biology to receive an NSF Graduate Research Fellowship. Her research concerns the spatial spread of communicable diseases using stochastic SEIR models.

Paul Constantine, **Deb Carney** and **Ashlyn Munson** organized a satellite event for the Women in Data Science Conference held at Stanford University. A local keynote lecture was presented by **Dorit Hammerling** from the National Center for Atmospheric Research.

Mines' SWiM members **Izabel Aguiar**, **Jacqueline Feuerborn**, and **Megan Wolf** attended NCUWM, along with SWiM Co-advisors **Deb Carney** and **Kelley Tatangelo**. Izzy and Jacqui presented a poster of their research in which they developed a numerical model to investigate the spread of gossip throughout a community using a dynamical system. All attended research and career talks and panels, including a keynote presentation by AWM president **Ami Radunskaya**.

Mines' Putnam Team ranked 76 out of 568 teams, putting us in the top 15% of all participating universities. Of special note, all but one participant received a non-zero score. **Rebecca Swanson** and Post-Doctoral Teaching Fellow **Tim Trujillo** advised Putnam Team.

On April 8, 2017, the Mines' Math Club continued their annual sponsorship of the Ryan Sayers Memorial Pi Mile Run. Students, faculty, and members of the community ran 3.14 miles, raising scholarship funds for math, statistics, and physics students.

Students **Jackie Feuerborn**, **Jessica Deters** and **Izzy Aguiar** served as executive board members of the student group Equality Through Awareness, seeking to address issues facing minorities in STEM, including gender, ethnic and racial minorities. As board members, they received the Mines' Martin Luther King, Jr. Student award. The award honors Mines' community members that foster understanding and respect for diversity through their commitment to a philosophy of inclusion.

Colorado State University

Tim Penttila has retired in Summer 2017 and headed out west to Australia.

Congratulations to **Mary Pilgrim** for being awarded the 2017 Early Career Teaching Award for Excellence in Teaching in the Mathematical

Sciences by the Rocky Mountain Section of the MAA.

We have been joined recently by a panoply of postdocs:

Manuchehr Aminian: PhD U. N. Carolina. Mathematical modeling, Applied PDEs.

Harrison Chapman: PhD U. Georgia. Combinatorial methods in Geometry and Topology.

Juliane Dannberg: PhD U. Potsdam, Germany. Dynamics of mantle plumes.

Oslem Ejder: PhD U. Southern California. Algebraic Geometry, Number Theory

Rene Gassmoeller: PhD U. Jena, Germany. Geodynamic models

Spencer Gerhardt: PhD U. Southern California. Algebraic groups and Representation Theory.

Manuela Girotti: PhD Concordia U., Montreal, Canada. Integrable systems, Random matrix theory.

Henry Kvinge: PhD UC Davis. Data science, Lie theory, Algebraic Combinatorics.

Courtney Ngai: PhD U. Mass. Boston. Math Education

Colorado State University - Pueblo

The Mathematical Association of America Annual 100th Anniversary Rocky Mountain Section meeting, hosted by the Department of Mathematics and Physics, was held at CSU-Pueblo April 21-22. **Janet Heine Barnett**, professor of mathematics at CSU-Pueblo chaired the conference organizing committee Provost **Rick Kreminski** (also Professor of Maths) gave the opening remarks. **Tracey Blanco** and **Tammy Watkins** organized a session on "First Two Year Courses" Math and also gave talks, which drew good interest and discussion. Drs. Barnett, Lyons and Lundberg, and math senior **Yassin Bahid**, gave talks. **Janet Nichols** served on a panel; **Byron Hurley** co-produced the Math Jeopardy competition, which included a team of five CSU-P students. **Frank Zizza** and **Michael Payne** co-moderated a session on General Mathematics topics. **Paul Chacon** contributed some of his famous framed fractals for prizes. and **Jonathan Poritz** contributed pre-conference tech help, and **Bruce Lundberg** hosted the Department Chair's luncheon and discussion.

Janet Barnett received the 2017 Outstanding Faculty Award from the CSU-Pueblo College of Science and Mathematics. She is currently

completing a one-year transitional retirement appointment.

Jake Buchholz (MI State Math MS+ 2016) is the new director of our MLC. **Tracey Blanco** (former Director) is now Assistant Professor and Assistant Director of Secondary Education at NMSU (<https://ci.nmsu.edu/faculty/dr-tracey-gorham-blanco/>)

Darren Funk-Neubauer, Associate Professor, produced "Bidiagonal Triples," *Journal of Linear Algebra and its Applications*, 521, (2017) 104-134.

David Grollmund, our new tenure-track Assistant Professor of Mathematics, presented: "The Development of Technological, Pedagogical, and Content Knowledge (TPACK) in Preservice Mathematics Teachers," ICTCM, Chicago, IL, Mar. 11, 2017.

Corey Lyon, visiting Assistant Professor, produced "Induced Characters of Equal Degree Constituents", *Communications in Algebra*, p.1-11, 2017.

Igor Melnykov, Associate Professor of Mathematics, has returned from a year working at Nazarbayev University, Astana, Kazakhstan, where he led curriculum and faculty development of a Masters program in statistics. He also continued his research in statistics, producing several recent papers.

Jonathan Poritz, Associate Professor, is on leave this academic year. He produced "Academic Governance on the Virtual Shop Floor," *Academe*, May/June, 2017 and a text *Lies, Damned Lies, or Statistics: How to Tell the Truth with Statistics*, released under a Creative Commons BY-SA 4.0 license, May, 2017 poritz.net/jonathan/share/ldlos, He is one of four faculty on the State of Colorado's Open Educational Resources Council.

Yassin Bahid, senior math major presented his undergraduate research (advisor Bruce Lundberg) on optimal controls for halo orbits in two talks (MAA April 21, Space Grant Symposium April 22), along with a poster, and an online proceedings paper.

Community College of Aurora

James Gray is on sabbatical to work with the Center for Urban Education at the University of Southern California.

Chris Juarez is the new Department Chair of Mathematics.

We have added **Jason Ray** and **Eric Cline** to our ranks as full-time faculty. Both were adjuncts for us previously.

We continue to look into unique ways we can help our students successfully complete courses with minimal barriers. So far, we have done so with co-requisite courses for our Math for Liberal Arts and College Algebra courses.

Metropolitan State University of Denver



Diane Davis was awarded the 2017 Burton W. Jones Distinguished Teacher Award by the Rocky Mountain Section of the MAA.

Patricia McKenna and **Brook Evans** were promoted to full professor. **Elizabeth Ribble** and **John Carter** were tenured and promoted to associate professor. **Pat Tucker** retired. The Department welcomes new Computer Science faculty member **Jiang Feng**.

Three teams of MSU Denver students, supervised by **Shelley Rohde**, participated in COMAP's Mathematical Contest in Modeling. **Michael Roos**, **Michael Chambliss**, and **Eric Roon** earned a Meritorious Winner (Top 10% of solutions) on Problem C. **Tanner Saylor**, **Jonathan Grant**, and **William McKinney** earned an Honorable Mention (Top 50% of solutions) on Problem B. **Joseph Hurni**, **Joshua Gonzalez**, and **Sasha Moonitz** earned a Successful Participant (Completed solution) on Problem C.

Twenty Metro Math and Computer Science students participated in the Department's annual Student Poster Presentation, organized by **Diane Davis** and **Mona Mocanasu**, on May 1.

Metro Women in Math, led by club President **Roxanne Thoren**, organized the annual Pi Day pi-ing fundraiser. The "winners" of the pie in the face were Department Chair **Lindsay Packer** and former MWM president **Julia Blackmon**. The club raised \$230 from the event.

Regis University

Jim Seibert returned from his spring semester sabbatical where he studied linear systems of plane curves. While he had a great time, he is excited to be back teaching, and we are excited to have him back. We traded Jim out for **Suzanne Caulk**, who left for a much anticipated year-long sabbatical this fall.

Tim Trenary, in conjunction with an ecologist, **Cath Kleier**, presented at the 2017 Ecological Association of America conference in Portland on August 8 in a talk entitled "*Revegetation success of plugs with and without cushion plants in an alpine restoration project on Mount Yale, CO.*" They also published a paper in the New Zealand Journal of Ecology: Kleier, C., & Trenary, T. (2017). *An exploratory study of facilitation in three species of Raoulia*. New Zealand Journal of Botany, vol 55. pp 215-224.

Two of our math undergraduates, **Trinh Lai** and **Kyle Weishaar**, attended REUs. Miss Lai spent her time with NIST in Gaithersburg, Maryland, where she worked on data collection and analysis of graphene oxide release during polymer nanocomposite weathering. Mr. Weishaar, while at the University of North Carolina Greensboro, studied volunteer vaccination of Ebola using game theory to see if voluntary vaccinations can eradicate Ebola.

And, undergraduate **Aubrey Kane** interned with NCAR, where she reviewed software written by Unidata, and then wrote descriptions of the functions and functionality of the software for the data management resource center.

South Dakota School of Mines and Technology

Last year was a very active year with **Debra Bienert**, **Kyle Caudle**, and **Mengyu Qiao** all getting promotions along with **Donna Kliche** earning tenure. The big news for our department is **Travis Kowalski** receiving the George Polya award for his article: "*The Sine of a Single Degree*", which appeared in the College Mathematics Journal late last year. Dr. Kowalski traveled to Chicago in July to receive his award at Mathfest and a picture from the ceremony is attached.



Travis Kowalski, SDMST

University of Northern Colorado

We are pleased to welcome three new tenure-track faculty to the school this semester: **Abhishek Bhattacharjee**, in statistics; **Christopher Harris**, in computer science; and **Lindsay Reiten**, in mathematics education.

We are conducting a national search for a new director (chair). Interested parties can view our job posting at:

<https://careers.unco.edu/postings/1877>

Jodie Novak will be serving as co-project director on a new five-year, \$1 million, multidisciplinary grant from the Howard Hughes Medical Institute to establish the new Center of Inclusive Excellence in STEM. The Center's goal is to help faculty implement instructional practices to help promote student success, in particular among STEM majors from traditionally underserved backgrounds, including under-represented racial and ethnic groups, families in which the student is the first to attend college, low socioeconomic backgrounds, transfer students, military veterans, or those who identify as LGBTQ.

Hortensia Soto has been named the Coordinator-Elect of the SIGMAA on RUME.

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. sundbye@msudenver.edu

RMS Members invited to Site-Test with TRIUMPHS

The *Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources* (TRIUMPHS) grant is now entering its third year, and cordially invites mathematics instructors at all RMS universities and colleges to join this national effort by site-testing our materials in your classrooms.

A national, seven-university NSF-funded collaboration, TRIUMPHS is actively developing, testing, and evaluating ready-to-use classroom materials based on primary historical sources for teaching undergraduate mathematics courses ranging from pre-calculus and elementary statistics to abstract algebra, analysis and topology.

These materials 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 focuses 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.

The TRIUMPHS collection of PSPs is still growing, but already includes 21 full-length PSPs and 12 shorter "mini-PSPs." Student-ready PSPs are available in pdf format from the TRIUMPHS [website](#), with LaTeX code also available from PSP authors in order to allow instructors to tailor a project to better meet their course goals. We have also begun publishing our mini-PSPs as a series in [Convergence](#), MAA's on-line journal dedicated to the use of history of mathematics in teaching.

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** (MSU-Denver) has developed a collection of Analysis projects as an external author for TRIUMPHS, and a growing

number of Rocky Mountain Section members have joined our site-testing cadre.

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. Each PSP also comes with a set of *Notes to Instructors* offering guidance on classroom implementation. Site-tester application deadlines are October 15 for Spring academic terms, and June 15 for Fall academic terms.

For more information, please contact [Janet Barnett](#) or [Diana White](#), or visit the [TRIUMPHS website](#).

Section Nominating Committee Report

The nominating committee is seeking nominations for the position of Vice-Chair for our section. This leadership position 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:

- Gulden Karakok, Chair (University of Northern Colorado)
Gulden.karakok@unco.edu
- Bruce Lundberg (Colorado State University - Pueblo)
bruce.lundberg@csupueblo.edu
- Kyle Riley (South Dakota School of Mines and Technology)
Kyle.Riley@sdsmt.edu

Elections will be held during the business meeting at the MAA Rocky Mountain Section

annual meeting to be held at the University of Northern Colorado, April 13-14, 2018.

Note: Elected officers of the section must be members of the MAA.

***With Gratitude,
The Nominating Committee***

Section NExT News

We plan to have a Section NExT event this year for faculty at MAA Rocky Mountain Section member institutions who have been teaching full time (after their final degree; teaching during a graduate program is not included in the count) for no more than 5 years. There will be more details about the application process and planned activities in the coming months. In the meantime, contact:

Rebecca Swanson

swanson@mines.edu or

Mandi Schaeffer Fry

aschaef6@msudenver.edu

with any questions or to get involved.

Rebecca Swanson, CSM

Mandi Schaeffer-Fry, MSU Denver

**University of Northern Colorado
to host the annual
Rocky Mountain Section Meeting
April 13 - 14, 2018**



UNIVERSITY OF
**NORTHERN
COLORADO**

The 2018 Rocky Mountain Section meeting will be held April 13-14, 2018 on the campus of the University of Northern Colorado in Greeley, CO. The meeting promises two days of engaging speakers, student activities, book sales, and more.

Plenary Speakers for the meeting will include:

- **Dr. Diane Davis**, Associate Professor of Mathematics at Metropolitan State University of Denver and the Rocky Mountain Section's 2017 Burton W. Jones Distinguished Teaching Award recipient.
- **Dr. Matt Boelkins**, MAA Chair of the Congress and Professor of Mathematics at Grand Valley State.
- **Dr. Robin Wilson**, Open University

The weekend's agenda will once more include a Friday Pre-Conference Workshop and a Friday evening banquet. Other tentative happenings include a return of Student Jeopardy, door prizes from generous vendors, and special networking opportunities.

On-line registration and other conference information will be forthcoming via the meeting website.

We invite proposals for contributed paper sessions and panels, which should be submitted by November 27, 2017 to the Program Co-Chairs:

Oscar Levin oscar.levin@unco.edu or
Nathaniel Miller nathaniel.miller@unco.edu

Student Activities

Jeopardy winners! Congratulations to the Fort Lewis College Jeopardy team, who won the inaugural Rocky Mountain Section Jeopardy competition at the spring meeting at CSU-Pueblo. Team members were **Kassi Chappell, Autumn Hanberry, Max Dielman, Gerardo Xahuentla,** and **Gloria Sharlein**. Well done! The runners up were an inter-school Rocky Mountain Section team, with members **Nicolas Guerrero** (USAFA), **Kerry Tarrant** (Black Hills State), **Jaelani Uthe** (Black Hills State), **Tiffany Carpenter** (Colorado Mesa University), and **Erika Esquinea** (Colorado Mesa University).

Students and Advisors: Attending the section meeting is a great way to meet students from other schools, attend talks where you may learn some new and interesting mathematics, and present the results of your own research! Start thinking now about a presentation topic for the April 2018 meeting at UNC in Greeley.

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

2017 Section Meeting Report

Nearly 200 mathematicians, mathematics educators and mathematics students came together on April 20 – 21 to celebrate the **100th Anniversary of the Rocky Mountain Section** at the 2017 Annual Spring Section Meeting, co-hosted by Colorado State University – Pueblo and Pueblo Community College. The 185 total participants included 97 faculty, 3 graduate students and 72 undergraduates students, as well as representatives from the Business and Industry sector and the K-12 mathematics education community.

The meeting officially opened on Friday afternoon with a welcoming message from CSU-Pueblo Mathematics Professor and University Provost **Rick Kreminski**. Our 2016 Burton W. Jones Distinguished Teacher Award Recipient **Hortensia Soto-Johnson** (University of Northern Colorado) then moved the audience to an appreciation of the theoretical lens of *embodied cognition* in her talk *Making & Moving in order to Perceive, Imagine, and Mathematize*.

Three other invited plenary speakers further entertained participants with talks on intriguing applications of mathematics. Clips from several well-known movies were featured in the Friday afternoon talk *Math in Hollywood Movies* by MAA's new President-elect **Michael Dorff** (Brigham Young University), while MAA Vice President **Tim Chartier** (Davidson College) helped us to see how linear algebra aids in facial recognition in his Saturday morning talk *Mathematical Celebrity Look-Alikes*. Friday evening banquet participants also sampled some applied algebraic combinatorics in a colorful talk by the editor of MAA's College Mathematics Journal **Brian Hopkins** (Saint Peter's University): *The Symmetric Group and Fair Division: Does Knowledge Matter?*

The 2nd annual **Rocky Mountain Section Student Jeopardy Competition**, organized by **Beth Schaubroeck** (United States Air Force Academy) with assistance from **Byron Hurley** (CSU-Pueblo), was another program highlight, with five enthusiastic teams joining in the fun. Congratulations to the first-place team from Fort Lewis College [members **Kassi Chappel, Max Dielman, Autumn Hanburry, Gloria Sherlein, Gerardo Xahuentitla**], and the mixed-institution Rocky Mountain Section Team for its second place finish [members **Tiffany Carpenter** (Colorado Mesa University), **Erika Esquinea** (Colorado Mesa University), **Nicolas Guerrero** (United States Air Force Academy), **Kerry Tarrant** (Black Hills State University), **Jaelani Uthe** (Black Hills State University)].

The scientific program further featured the pre-conference workshop *Active Learning Bootcamp* led by University of Colorado Denver's **RaKissa Manzanares** and **Gary Olson**, as well as three panel discussions and eight contributed paper sessions featuring 56 talks on topics by a total of 47 faculty and 18 undergraduate speakers. (A complete list of panelists, moderators and speakers appears later in this newsletter.)

Meeting activities to celebrate the Section's founding in 1917 included poster displays and contributed talks featuring highlights of our 100-year long history, as well as the panel discussion *A tribute to MAA-RMS in its first 100 years: A Panel Reflecting on Events and Experiences in the Rocky Mountain Section*. Individuals who have contributed their expertise and time to the section's mission over the past decade were also honored with a small token of appreciation during Friday's Award Ceremony as part of an anniversary "Section Officer and Volunteer Recognition" organized by **Kyle Riley** (SDSMT) and **Janet Barnett** (CSU-Pueblo). (A list of these individuals appears elsewhere in this newsletter.) The celebration culminated with a special Anniversary Champagne Toast and Cake Break on Saturday morning, followed by prize awards for those who took part in the meeting's *Section Anniversary Scavenger Hunt*.

Other meeting activities included a Department Chairs and Liaison Luncheon, a Student Pizza and Board Game Luncheon, a highly successful MAA Book Sales Display (nearly \$3000 in sales this year!), the usual early morning Business Meeting, and door prizes for more than a few lucky winners at Friday's Banquet and Saturday's 100th Anniversary Toast and Cake Break.

Special thanks go out to **Paul Chacon** (CSU-Pueblo) for creating and donating three beautiful fractal images as special door prizes.

Congratulations and thanks to all speakers, panelists and session organizers for the success of the meeting program! The Section also wishes to acknowledge the following exhibitors and other contributors for their support of the meeting and the section:

- Cenage Publishing, Representative Timothy Cali
- Hawkes Learning, Representative Kate Gallagher
- Pearson Publishing, Representative Nick Reinhardt
- Texas Instruments, Representative Brian Dunncliffe
- College of Arts and Sciences, Pueblo Community College
Dean Jeffrey Alexander
- Department of Mathematics and Physics, Pueblo Community College
Prof. Chip Nava, Chair; Ms. Tammy Farmer, Administrative Assistant
- Department of Mathematics and Physics, Colorado State University - Pueblo
Dr. Bruce Lundberg, Chair; Ms. Joleen Ryan, Administrative Assistant
- Admissions Office, Colorado State University - Pueblo
Ms. Tiffany Kingrey, Director
- External Affairs Office, Colorado State University - Pueblo
Ms. Cora Zaletel, Executive Director
- University Bookstore, Colorado State University - Pueblo
Ms. Cindy Hall, Manager

Finally, many thanks to Local Program Committee members **Janet Nichols** (CSU-Pueblo) and **Michael Payne** (Pueblo Community College), and the numerous **Colorado State University – Pueblo Mathematics faculty and students** for their many hours of volunteer work and hospitality throughout the meeting.

Section Officer and Volunteer Recognition

Founded in 1917, the Rocky Mountain Section originally consisted of the states of Wyoming and Colorado. Sometime in the late 1940s or early 1950s, institutions in Utah were also included; these split off in 1975 as the Intermountain Section. Sometime in the 1950s, institutions in the western part of South Dakota began to be included, and are still part of the section. Bozeman Montana is also part of the section, have been added at some as-yet-unknown time. Additional information about our section's history, as well as archival materials related to that history, can be found on the section's website: <http://sections.maa.org/rockymt/history.php>

The Rocky Mountain Section owes its vitality to the numerous individuals who have contributed their expertise and time to the organization's missions. On the occasion of its 100th Anniversary, it is especially appropriate to offer thanks and recognition to current members who have made such contributions. Please extend your own thanks to the individuals on the following list – and talk with them about the rewards of becoming more involved in the section's next hundred years yourself!

Name	Service Rendered	Name	Service Rendered
Aldrich, Stephen	Program Chair\Co-Chair	Hindie, Jean	Committee Work
Anderson, Marlow	Program Chair\Co-Chair	Ikle, Matt	Program Chair\Co-Chair
Arledge, Jane	Program Chair\Co-Chair	Ipina, Lynne	Program Chair\Co-Chair
Barnett, Janet Heine	Officer\Program Chair	Jacobson, Michael	Officer
Barrus, Michael	Committee Work	Karakok, Gulden	CCTM Representative
Berg, Jeff	Officer	Keck, Heidi	Officer\Program Chair
Bonan-Hamada, Cathy	Program Chair\Co-Chair	Leinert, Carl	Student Activities
Boneh, Shahar	Program Chair\Co-Chair	Loats, Jim	CCTM Representative
Briggs, Bill	Webmaster	Mahan, Shawna	Officer
Brilleslyper, Mike	Officer	Moskal, Barbara	Program Chair\Co-Chair
Brown, John	Officer	Muskat, Jeremy	Committee Work
Bruder, Andrea	Program Chair\Co-Chair	Nichols, Janet	Program Chair\Co-Chair
Carter, John	Committee Work	Pauley, Sarah	Officer
Chappell, Kelly	CCTM Representative	Pilgrim, Mary	CCTM Representative
Cherowitzo, Bill	Officer	Riley, Kyle	Officer
Cohen, Bob	Committee Work	Rogers, Mark	Committee Work
Davis, Diane	Committee Work	Schaubroeck, Beth	Student Activities
Dougherty, Ann	Committee Work	Siewert, Daluss	Officer
Doherty, Gudryn	Committee Work	Soto-Johnson, Hortensia	Officer
Emerson, Bill	Officer	Swenson, Dan	Committee Work
Enright, Patrick	Officer	Stade, Eric	Program Chair\Co-Chair
Fairweather, Graeme	Committee Work	Sundbye, Linda	Newsletter Editor
Fix, Kin	Committee Work	Talman, Lou	Officer
Friedman, Tracii	Program Chair\Co-Chair	Tavener, Simon	Program Chair\Co-Chair
Grievel, Gus	Committee Work	Taylor, Amelia	Committee Work
Hardy, Darel	Program Chair\Co-Chair	Tubbs, Rob	Officer
Hastert, Erica	Program Chair \Co-Chair	Walters, Karen	Officer
Hauk, Shandy	Program Chair\Co-Chair	Watkins, John	Program Chair\Co-Chair
Heine, George	Webmaster	Wingard, Cheryl	Committee Work

With our apologies for any omissions due to inaccuracies in compiling the list from section records, please contact janet.barnett@csupueblo.edu or kyle.riley@sdsmt.edu if you know of an individual whose name should be added to the above list.

Contributed Papers - 2017 Section Meeting

A Tribute to MAA-RMS in its First 100 Years: A Panel Reflecting on Events and Experiences in the Rocky Mountain Section

Moderator: Jeff Berg, Arapahoe Community College

Panelists:

Erica Hastert, Early College of Arvada
Darel Hardy, Colorado State University
Jeremy Muskat, Western State Colorado University
Janet Nichols, Colorado State University – Pueblo
Linda Sundbye, Metropolitan State University of Denver
Don Teets, South Dakota School of Mines and Technology

Teaching Statistical Thinking

Moderator: Mike Brilleslyper, United States Air Force Academy

Panelists:

Shahar Boneh, Metropolitan State University of Denver
AnnMarie Cunningham, Pueblo West High School
Andy Keck, Western State Colorado University
Chip Nava, Pueblo Community College

Elementary Math Specialists State Endorsement

Moderator: Gulden Karakok, University of Northern Colorado

Panelists:

Jennifer Harding, University of Northern Colorado
Heather Johnson, University of Colorado Denver
Richard Kitchen, University of Denver

First Two Year Courses: Successes and Challenges

Organizers: Tracey Blanco and Tammy Watkins, Colorado State University – Pueblo

Travis Kowalski, South Dakota School of Mines and Technology
SD Mines Math Initiative: Building Proficiency and Grit through Gateways

Eric Miles, Colorado Mesa University
Estimating π as an Introduction to Limits in Calculus I

Frieda Parker and Angela Steele, University of Northern Colorado
Supplemental Academic Instruction as Impetus to Rethink College Algebra

Michelle Richard-Greer, South Dakota School of Mines and Technology
SD Mines Math Initiative: MathSpark

Kyle Riley, South Dakota School of Mines and Technology
SD Mines Math Initiative: Enhancing Student Success through the Use of Recitations

Curtis Turner, University of Colorado – Colorado Springs
Math Pathways – Meeting the Needs of the Novice Math Learner

Tracey Blanco and Tammy Watkins, Colorado State University – Pueblo *Developing Dynamic College Algebra: Success through the Pipeline Pilot Program*

General Mathematics

Moderators: **Michael Payne**, Pueblo Community College
Frank Zizza, Colorado State University - Pueblo

Shahar Boneh, Metropolitan State University of Denver
An Optimal Parking Problem

Corey Lyons, Colorado State University - Pueblo
Induced Characters of Equal Degree Constituents

Erik Oackard, Colorado Mesa University
Mathematics and Peak Bagging

Jim Siebert, Regis University
Polynomial Interpolation

Geraldo de Souza, United States Air Force Academy
Lipschitz Spaces and Generalized Lipschitz Spaces and their Importance in Analysis

History of Mathematics and its Associations

Organizers: **Janet Barnett**, Colorado State University - Pueblo
George Heine, Math & Maps

Janet Barnett, Colorado State University - Pueblo
Monsters in the Classroom: Learning Analysis through the Works of Darboux

Jeff Berg, Arapahoe Community College
George Heine, Math and Maps
Vignettes from the History of the Rocky Mountain Section – Chapter II

John Carter, Metropolitan State University of Denver
The Nine Point Circle

Darel Hardy, Colorado State University
History of CSU Math Day

Lynne Ipina, University of Wyoming
Greta Neubauer and the MAA Rocky Mountain Section

Pam Peters, Larimer County Community College
Go Ask Alice: The Math of Lewis Carroll

Dave Ruch, Metropolitan State University of Denver
Mean Value Theorem: History and a Primary Source Project for a Real Analysis Course

Don Teets, South Dakota School of Mines and Technology
A Light Look at the RMS-MAA

Qin Yang, Metropolitan State University of Denver
Learning Mathematics through Historical Projects

IBL Methods and More

Organizers: Patty McKenna and Mona Mocanasu, Metropolitan State University of Denver

Lisa Driskell, Colorado Mesa University
Connections across Disciplines: The Why and How of Team Teaching an Interdisciplinary Course

Jessica Hearns, Northwestern Community College
Seeing the World through a Mathematical Lens – One Class at a Time

Jane McDougall, Colorado College
Some Explorations with the Logarithm in Complex Analysis

A. Duane Porter, University of Wyoming
Native-American based Mathematics Materials for Undergraduate Courses

Interesting Ideas in Math

Organizers: Lisa Driskell, Colorado Mesa University
Dan Swenson, Black Hills State University

Robert Baker, Pueblo Community College
Cards & Poker: Teaching Math since 985 A.D.

Mike Brilleslyper, United States Air Force Academy
How Many Push-ups Did They Do?

Ulrich Hoensch, Rocky Mountain College
A Simple Introduction to Information, Channel Capacity and Entropy

Andy Keck, Western State Colorado University
Robust PCA and the Analysis of Surveillance Video

Oscar Levin, University of Northern Colorado
A Paradox of Finite Cardinality

Bruce Lundberg, Colorado State University – Pueblo
Why i ? PreCALC Paths to $CIS(t) = Exp(it)$

Dan May, Black Hills State University
Contra Dance and the Product of All Elements in a Dihedral Group

Jeremy Muskat, Western State Colorado University
Theoretically Using Applications in a Pure Mathematics Course

Ian Pierce, United States Air Force Academy
Roots of Quadratic Polynomials and Greek Ladders

Dan Swenson, Black Hills State University
Five Proofs of a Simple Combinatorial Result

Mathematics Education, Featuring Highlights from ICME and its Satellite Meetings

Organizers: Spencer Bagley and Hortensia Soto-Johnson, University of Northern Colorado

Spencer Bagley, University of Northern Colorado
The Mathematical Work (Not Knowledge!) of Teaching

Brent Hancock, University of Northern Colorado
Undergraduates' Reasoning about Integration of Complex Functions within Three Worlds of Mathematics

Gabriela Hernandez, Colorado State University
First Year GTAs: Fostering Successful Teaching

Susan Holloway, Aurora Public Schools
Lessons Learned from ICMA-13: International Perspectives on Equity in Mathematics Classrooms

Heather Johnson, University of Colorado Denver
Didn't You Learn that in High School? Why Students Struggle with Rate & Function, and How a Covariation Approach Can Help

Ben Sencindiver, Colorado State University
Understanding Learning in Calculus I through Online Behaviors

Michael Triner, United States Air Force Academy
Study on Education in Mathematics Regarding Integration

Aaron Nielsen, University of Colorado Denver
Analyzing Faculty/Course Questionnaire (FCQ) Scores Using Advanced Data Analysis

Mathematics in K-12 Teacher Preparation

Organizer: Gulden Karakok, University of Northern Colorado

Jenni Harding, University of Northern Colorado
Using Transcription as a Reflective Tool with Preservice Elementary Teachers

Heather Johnson and Ron Tzur, University of Colorado Denver
Adopting Instruction to Students' Mathematical Thinking: Five Practices of Student Adaptive Pedagogy

Gulden Karakok and Steven Leth, University of Northern Colorado
Elementary Education-Mathematics Program at the University of Northern Colorado

Richard Kitchen, University of Denver
Building Teachers' Mathematical Intuition

Curtis Turner, University of Colorado – Colorado Springs
Teacher Assistantships: Bridging the Gap between Theory and Practice

Undergraduate Student Paper Session

Organizer: Beth Schaubroeck, United States Air Force Academy

Moderators: **Laura Scull**, Fort Lewis College
Pam Peters, Larimer County Community College
Ian Pierce, United States Air Force Academy

Yassin Bahid, Colorado State University – Pueblo
Control Methods for Halo Orbits

Christopher Botica, United States Air Force Academy
Fractions, Ratios, and Simpson's Paradox

Lauren Bramblett, Juan Orozco and Cinthya Elizondo, United States Air Force Academy
Numerical Simulation of Missile Trajectories using Orthogonal Polynomials

Tim DeLory, Western State Colorado University
Statistical and Computational Methods for Assessing Recombination Rates

Mawell Dielman and Jackson Shrupp, Fort Lewis College
Hausdorff Dimension of MCRM Fractals

Rachel Eaton, United States Air Force Academy
Ways to Lose at Sylver Coinage

Nicolas Guerrero, United States Air Force Academy
Generated Sequences

Autumn Hanberry and Gloria Sharlein, Fort Lewis College
A Fractal Machine

Taylor McMillan, University of Northern Colorado
Graph Labels and Computability Theory

Tristan Neighbors, University of Colorado – Colorado Springs
The Line Solitons of the KP Equation

Kayce Serafin, Northwestern Community College
What's the Secret? Mysteries Revealed in the Fibonacci and Lucas Numbers

Madison Tung, United States Air Force Academy
A Method for Categorizing Data in Very Large Data Sets

Gerardo Xahuentla and Kassandra Chappell, Fort Lewis College
Fractals from Stochastic Methods

2017 Business Meeting Minutes

Saturday, April 22, 2017

Minutes: MAA Rocky Mountain Section Annual Business Meeting
Date: Saturday, April 22, 2017 at 8:00 am – 8:50 am
Location: General Classroom Bldg, Room 111, Colorado State University - Pueblo

Mike Jacobson called the meeting to order at 8:05am. Minutes from the 2016 meeting and current agenda were approved.

1. Reports:

- a) Nominating Committee: Gulden Karakok introduced the candidates for Chair Elect, Hortensia Soto-Johnson and Alexander Hulpke. Tensia emphasized the need to increase engagement with members of the section. She then spoke strongly in favor of Alexander and read a statement from him, as he was unable to attend the meeting.

“In my view, an obvious area of closer contact amongst MAA member institutions is classes in introductory mathematics and calculus. So far there seems to be comparatively little interaction on *our* goals and expectations for these classes. What exists is organized by the state and guided by formal certifications (that do not contribute to educational improvements) and the desire to have students accumulate credentials, rather than understanding. The MAA section could be an obvious conduit for this kind of discussion. Similarly, the section could support in spirit, by providing an information conduit, rather than funding for more regional seminar activity. Colorado has longer distances between universities than Boston or Los Angeles and so earlier planning is needed. Often one learns about interesting talks at other institutions too late to make a visit feasible. It should be feasible to set up a web repository or monthly email newsletter listing events within the section that could be of broader interest.”

Gulden then introduced the candidates for Secretary/Treasurer. Rebecca Swanson was unable to attend the meeting. Spencer Bagley told the group that there were multiple good candidates and people should vote for whomever they liked.

- b) Financial: Heidi Keck gave the financial report. The section has about \$11,000 on hand. Last year saw \$2000 in expenses and \$4000 in income due to significant sponsorship for the 2016 spring meeting. We continue to fund Activity Grants, give Teaching Awards, and sponsor student speakers.
- c) Student Activities: Beth Schaubroeck reported on student activities. More students sign up than actually show up, so planning can be tricky. She thanked Janet Barnett for ordering food, Byron Hurley for assisting with the technology related to Jeopardy, Heidi Keck for ordering the buzzer system sent directly to her, and the executive committee for approving it all.
- d) Chair: Mike Jacobson reported that at the JMM he learned that membership is declining but less rapidly. No ideas were forth coming from National, it will be up to the local sections to work on increasing membership. He recommended the new Math App for math news.

There is ongoing discussion about how sections manage online registration and payment. Various sections have used PayPal, EventBrite, and Stripe. George Heine explained the problems we've have with insecure servers at national which caused him to hire someone locally to host the site. We need an institution to host this. Please speak to George if you think your institution would be willing. He would also like to know about problems people had with either registration or payment.

- e) National: Tim Chartier updated us on the new By-Laws and the change from Section Governors to a Congress with national representatives. The hope is that a smaller group of leaders will be more nimble, and that the new larger group of Representatives will have more influence.

- f) Governor: Bill Emerson gave the governor's report. Bill Emerson voiced his approval for the changes in governance at National. He also spoke to concerns of declining membership. Currently more than 40% of MAA members are more than 60 years old. Many people who participate in Project NExT do not stay MAA members. He suggested that departmental memberships would allow undergraduates to become members easily and that might help recruit. He also spoke of financial strains - book sales used to be a large source of income for the national organization, but have declined as electronic sources displace printed media. He also thanked the group for the opportunity to serve as Governor.
 - g) Section NExT: Mandi Schaeffer Fry spoke on behalf of Rebecca Swanson. They hope to rekindle Section NExT.
 - h) Awards: Kyle Riley announced the Burton Jones DTA winner is Diane Davis. The ECTA winner is Mary Pilgrim. Mike Jacobson reminded people to nominate their colleagues for these awards, in particular the ECTA is a way to promote MAA among younger faculty.
 - i) CCTM: Erica Hastert reported that the CCTM fall meeting is looking for a new venue, still in Denver. She would welcome ideas on how to promote collaboration.
2. Discussion Items:
- a) What should the ECTA winner do? The executive committee believes this person could "host" the speaker from national. Gulden suggested the person speak to the Section NExT group or lead something related to this. Consensus was that whatever is decided it should be an honor that makes them a part of the meeting, but not in a burdensome way.
 - b) Nomination Process: Our by-laws require that nominations occur six weeks before the meeting, so we need to work on that. Question from executive committee meeting about absentee ballots. Should people be required to attend the business meeting to vote? General discussion followed on pros and cons. Michael Dorff, guest from InterMountain Section, shared that they vote electronically after the meeting. The national office helps them set up the voting. It gives people a chance to campaign at the meeting. This would require change in our by-laws. Kyle and Janet will investigate the change.
 Second question was raised that maybe the reason our business meeting attendance is low is the time. Historically the meeting is at 8am on Saturday. Could this be changed? Could we fit it in on Friday afternoon between last speaker and social hour?
 - c) Announcement that the executive committee would like the appointed positions (newsletter editor, web master, book sales representative, awards coordinator, student activities coordinator, Section NExT director) to be on three-year renewable terms. This would allow the person serving in the role a chance to quit gracefully. All current people voiced that they were happy in their jobs, but also happy to let others take over if someone wanted to. We will start a rotation of asking two of the six every year if they'd like to continue. People interested in taking on one of these tasks will be able to volunteer also.
 - d) Spencer Bagley suggested that during cake and champagne break there could be a March for Science group. He volunteered to lead this effort.
3. Final comments from Mike Jacobson: Thanks to Heidi Keck for serving as Secretary/Treasurer and welcome to new role as national representative, thanks to Kyle Riley for work as outgoing Chair, thanks to Janet Barnett for running an outstanding meeting. And welcome to Oscar Levin and Nathaniel Miller the program co-chairs at UNC who will lead the meeting April 13 & 14, 2018.

Meeting was adjourned at 8:55am.

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

2017 Executive Committee Meeting Minutes

Thursday, April 20, 2017

Minutes: MAA Rocky Mountain Section Executive Committee Meeting
Date & Time: Thursday, April 20, 2017, 6:30—8:50 pm
Location: Mr. Tandoori, 310 S. Victoria Ave, Pueblo, CO
Attendance: Kyle Riley, Erica Hastert, Bill Emerson, Heidi Keck, Brian Hopkins, Tim Chartier, Oscar Levin, Mike Jacobson, Shawna Mahan, Janet Barnett, George Heine

1. Mike Jacobson called the meeting to order at 7:50. Minutes from 2016 were approved by acclamation.
2. Agenda for Saturday's Business Meeting was reviewed. Two items were added: announce purchase of buzzer system for student Jeopardy, include Mandi Schaeffer Fry's report on Section NExT restart attempt.
3. Overall meeting flow was discussed. Opening remarks will be given by the CSU-Pueblo Provost. Gulden Karakok will introduce DTA winner, Kyle Riley and Mike Jacobson will introduce the speakers from National. All else seemed to be in order.
4. History of the Awards coordinator position was discussed. No one was appointed in 2016, so more effort will be made to get someone in the position this year. General discussion followed about our other appointed positions. How are people selected? How long do they serve? How do we get a variety of people to have opportunities? Consensus was reached that these positions should be renewable three-year terms. AT the end of three years the person should be given the option to renew or not.
 - (a) Newsletter Editor appointed by Secretary (current term ends 2019)
 - (b) Web master appointed by Secretary (current term ends 2018)
 - (c) Book Sales coordinator appointed by Governor (or whatever this person is called in future) (current term ends 2018)
 - (d) Student Activities Coordinator appointed by Vice-Chair (current term ends 2020)
 - (e) Awards Coordinator appointed by Secretary (current term ends 2020)
 - (f) Section NExT appointed by Chair (current term ends 2019)
5. Question of whether there should be an official Program Chair Coordinator to help with the program each year. Tasks such as setting up web page for meeting and online registration would benefit from continuity of position. Discussion followed on who currently helps the program chair. Suggestion was made that the previous year's chair (or previous two years' chairs) would be available to help new person. Janet Barnett volunteered herself and Tracii Friedman to work with George Heine to get some guidelines written up and put on the web page.
6. Student book prizes. Last year we spent \$150. Kyle made a motion to spend \$500 this year, Janet seconded, unanimously in favor. Books will be given out as prizes for Jeopardy at this meeting and at the PPRUMC next winter.
7. Mike Jacobson asked how closely do we want to work with other groups, in particular the American Statistical Association? Should we try to coordinate our meeting with other

professional organizations? Many meeting dates are set years in advance and there are many potential conflicts (other meetings, school breaks, finals weeks). General feeling that we should set our own meeting dates and then reach out to other organizations to join us. Mike will contact the ASA about working with us in 2018.

8. What should the ECTA winner do? We haven't satisfactorily given the ECTA winner a role at the meeting. Concerns include not being a burden on the person and encouraging the person to stay active in the MAA. Kyle suggested that the winner should act as informal host for representative from National—introduce the talk, have lunch, maybe include the last few years' winners since people can't always attend the meeting and this would make the lunch more friendly. Bring up this idea at the business meeting.
9. Nominating committee and deadlines. Kyle pointed out that the Bylaws require the nominating committee to have names 6 weeks before the meeting. People believe that no one told the committee of this deadline and had they known, it would have happened. Early nominations would allow better advertising of the election with the meeting announcement. Question was raised about requirement to be at the business meeting in order to be allowed to vote. On one hand it might encourage people to attend the business meeting, on the other hand there are valid reasons why people can't attend. Bring this up at the Business Meeting to ask for input.
10. Kyle told the committee that he and Janet have worked on some recognition of service to the section in honor of our 100th anniversary. There will be announcements at the banquet. And they spent some money from the meeting registration.
11. Meeting update: 179 early registrations, on track to break even financially.
12. Future meetings: Heidi will represent the section at MathFest in July. Mike will be the section representative to JMM in January.

2018 Oscar Levin and Nathaniel Miller are the program co-chairs for 2018 in Greeley. Dates are set for April 13 & 14.

2019 Fort Lewis has expressed interest in hosting in 2019, Mike will follow up.

2020 We should try to be back on the Front Range at a large school like CSU-FC, Mines, or CU. Mike will talk to Anne Dougherty to see if CU has any interest in hosting.

13. Erica reported that CCTM doesn't have much interest in partnering with us at this time. She will try to raise level of support.

Meeting adjourned at 8:50.

Respectfully submitted,

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

2016 Financial Report

(A) BEGINNING BANK BALANCE(S), 12/31/2015	<u>\$13,759.54</u>
(B) REVENUES	
B.1 MAA Subvention	<u> </u>
B.2 Project NExT	<u> </u>
B.3 Meeting - Registrations	<u> </u>
B.4 Meeting Income	<u>\$5,713.94</u>
B.5 Workshop Registrations	<u> </u>
B.6 Meeting Exhibitors	<u> </u>
B.7 Contributors	<u> </u>
B.8 Interest on Checking	<u> </u>
B.9 Interest Savings/CD	<u> \$4.84</u>
B.10 Book Sales	<u> \$215.67</u>
B.11 Dues	<u> \$10.00</u>
B.12 Advertisements	<u> </u>
B.13 Institute Memberships	<u> </u>
B.14 PPRUMC fund (restricted)	<u>\$1,703.00</u>
(B) TOTAL REVENUES	<u>\$7,647.45</u>
(C) EXPENSES	
C.1 Secretarial	<u> </u>
C.2 Honoraria	<u> </u>
C.3 Postage	<u> \$162.88</u>
C.4 Telephone	<u> </u>
C.5 Printing	<u> </u>
C.6 Newsletters	<u> </u>
C.7 Travel	<u> </u>
C.8 Meeting Expenses	<u> \$3,102.90</u>
C.9 Speakers Travel/Lodging	<u> \$200.00</u>
C.10 Students Lecture Program	<u> </u>
C.11 Book Sale	<u> </u>
C.12 Project NExT	<u> </u>
C.13 Awards	<u> \$650.03</u>
C.14 Miscellaneous Office	<u> </u>
C.15 Activity Grant UNCO	<u> \$750.00</u>
C.16 Activity Grant PPRUMC	<u> \$750.00</u>
C.17 Books for door prizes	<u> \$482.42</u>
C.18 Jeopardy buzzer system	<u> \$350.25</u>
C.19 PPRUMC	<u> \$2,000.00</u>
(C) TOTAL EXPENSES	<u>\$8448.48</u>
(D) ENDING BANK BALANCE, 12/31/2016	<u>\$12958.51</u>
(A + B - C = D)	

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; San Diego, CA
January 10-13, 2018

ICTCM; Washington DC
March 15-18, 2018

MAA Rocky Mountain Section Meeting;
University of Northern Colorado, April 13-14, 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 3-6, 2019

MAA MathFest; Cincinnati, OH;
July 31-August 3, 2019

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

NCTM Centennial Meeting; Chicago, IL
April 1-4, 2020

NCTM annual meeting; St. Louis, MO
October 21-24, 2020

MAA MathFest; Philadelphia, PA;
July 29-August 1, 2020

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

NCTM annual meeting; Atlanta, GA
September 22-25, 2021

MAA MathFest; Sacramento, CA;
August 4-7, 2021

MAA MathFest; Washington DC;
August 3-6, 2022

**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 Awards Coordinator by December 15 of each year.
Complete nomination materials should reach Awards Coordinator by January 15 of each year.

Jeremy Muskat, Section Awards Coordinator,
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 Awards Coordinator by December 15 of each year.
Complete nomination materials should reach Section Awards Coordinator by January 15 of each year.

Jeremy Muskat, Section Awards Coordinator,
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 recognize 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 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

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.

Contributions may also be made in support of the Pikes Peak Regional Undergraduate Mathematics Conference; simply choose "Other" on the coupon below, and specify "PPRUMC" in the space provided.

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
_____ Teaching Award Fund (Burton W. Jones DTA and ECTA)
_____ 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:

Spencer Bagley
MAA Rocky Mountain Section Treasurer/Secretary
University of Northern Colorado
School of Mathematical Sciences
501 20th St, Campus Box 122
Greeley, CO 80639

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.