



FALL 2018 NEWSLETTER

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

Fall 2018 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/fall2018news.pdf>

Table of Contents

Fall 2018 Newsletter in PDF Format for Printing	1
Table of Contents	2
2018 - 2019 Section Officers and Committee Members	4
Jeanne Clelland of University of Colorado at Boulder named 2018 Burton W. Jones Distinguished Teacher	6
Ian Pierce of the United States Air Force Academy awarded 2018 Early Career Teaching Award	6
2019 Distinguished Teaching Award Call for Nominations	7
2019 Early Career Teaching Award Call for Nominations	7
Past Burton W. Jones Distinguished Teaching Award Recipients	8
Past Early Career Teaching Award Recipients	8
Chair's Corner	8
MAA National Representative's Report	9
23rd Annual Colorado Mathematics Awards Ceremony/Reception	10
16th Annual PPRUMC United States Air Force Academy Saturday, March 2, 2019 ..	11
MSU Denver to host the 2018-2019 SCUDEM Modeling Competition October 27, 2018	11
Rocky Mountain Section Voting goes Electronic!	12
CCTM News	12
Section News	12
RMS Members invited to join TRIUMPHS	13
Section Nominating Committee Report	14
Section NEXt News	14
Fort Lewis College to host the annual Rocky Mountain Section Meeting April 5 - 6, 2019	15
Student Activities	16
15th Annual Pikes Peak Regional Undergraduate Mathematics Conference Report ..	16
SCUDEM 2018-2019 Modeling Competition MSU Denver, October 27, 2018	18
2018 Section Meeting Report	19
Contributed Papers - 2018 Section Meeting	20
The Current State of PreK-12 Math Teaching in Colorado	20
Teaching with Open Source Materials	20
Adopting and Adapting the MAA Instructional Practices Guide	20
Mathematics Education	21
Teaching Mathematics	21
General Session	22
Undergraduate Student Paper Session	23
2018 Business Meeting Minutes Saturday, April 13, 2018	24
2018 Executive Committee Meeting Minutes Thursday, April 12, 2018	27
MAA Rocky Mountain Section Suggestions for Speakers	29
Grants Available	30
Section Activity Grants Available	30
Student Recognition Grants Available	30
About Our Logo	31

Meetings Calendar	31
Burton W. Jones Award Nomination Form	32
Early Career Teaching Award Nomination Form	33
Early Career Teaching Award Guidelines	34
Voluntary Section Dues	36
MAA Rocky Mountain Section Voluntary Dues Contribution Form	36
MAA Rocky Mountain Section Mission Statement	37

2018 - 2019 Section Officers and Committee Members

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

Current term of service in parentheses; The Chair serves for 4 years – one as Chair Elect, two as Chair, one as Past Chair; All other positions are 1 year terms unless otherwise noted

Section Executive Committee Officers for 2018 – 2019

Chair (2017 - 2021)	Alexander Hulpke Colorado State University Fort Collins, CO 80523	alexander.hulpke@colostate.edu 970-491-4288
Past Chair (2015-2019)	Mike Jacobson University of Colorado Denver Denver, CO 80217	michael.jacobson@ucdenver.edu 303-315-1708
Vice-Chair (2018-2020)	Shawna Mahan Pikes Peak Community College	shawna.mahan@ppcc.edu 719-502-3268
Secretary/ Treasurer (2017-2020)	Mona Mocanasu MSU Denver Denver, CO	mmocanas@msudenver.edu 303-615-0747
MAA National Rep (2017-2020)	Debra Carney Colorado School of Mines Golden, CO	dcarney@mines.edu 303-273-3977
Program Co-Chairs	Laura Scull Veronika Furst Fort Lewis College	scull_l@fortlewis.edu furst_v@fortlewis.edu

Other Committee Members and Representatives

Section Nominating Committee

Kyle Riley (Chair), SDMST	kyle.riley@sdsmt.edu
Gulden Karakok, UNC	gulden.karakok@unco.edu
Greg Oman, UCCS	goman@uccs.edu

DTA Awards Selection Committee

Mike Jacobson (Chair), UCD	michael.jacobson@ucdenver.edu
Jeanne Clelland, UCB	jeanne.clelland@colorado.edu
Elizabeth Burroughs, Montana State University	burroughs@montana.edu
TBA	

ECTA Awards Selection Committee

Mike Jacobson (Chair), UCD	michael.jacobson@ucdenver.edu
Ian Pierce, USAFA	ian.pierce@usafa.edu
Elizabeth Burroughs, Montana State University	burroughs@montana.edu
TBA	

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) Heather Johnson, UCD heather.johnson@ucdenver.edu

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 aschaef6@msudenver.edu

Public Information Officer and Section Liaison Coordinator

(2017-2020) Mona Mocanasu, MSU Denver mmocanas@msudenver.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

**Jeanne Clelland
of
University of Colorado
at Boulder
named
2018 Burton W. Jones
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 27th recipient of this award is Dr. Jeanne Clelland, Professor at UC Boulder, nominated by Eric Stade, also from UC Boulder. As noted in her nominating package, Dr. Clelland is recognized as an engaging and respectful lecturer whose inspiring classes are informed by a deep understanding of the underlying research. As calculus coordinator and later as undergraduate chair she spearheaded the evolution of the undergraduate curriculum towards student-centered and active learning, all while conducting an internationally renowned research program that feeds back to her own classes. Undergraduate research projects supervised by Dr. Clelland have lead already to five peer-reviewed publications with several further publications in the works.

The awards committee's decision reads: There are many facets of teaching at a research university, ranging from service courses to advising graduate students and addressing communities that range from school teachers over different classes of majors down to administrators. The winner of this year's DTA has excelled in all of these areas (and more often than not in a leading role) — as teacher, as mentor, as textbook author and as undergraduate chair. All of this has been accompanied by a successful research career. Many letters from colleagues, collaborators and former students speak to her qualities and made this an easy decision.

Alexander Hulpke
Chair, Awards Committee of the RMS-MAA

**Ian Pierce
of the
United States Air Force Academy
awarded
2018 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 third recipient of this award is Dr. Ian Pierce from the US Air Force Academy, nominated by Col. Scott Williams, also from the Air Force Academy. Dr. Pierce is known as a passionate teacher who quickly rose to one of the institutions outstanding instructors. His classroom is recognized as one of conversation and inquiry that combines classical and modern teaching approaches successfully. His work has been recognized with both departmental and institutional teaching awards. In a department that has a high turnover of (military) career instructors, he has quickly become the "go-to" mentor for many instructors.

He already advised or co-advised 11 undergraduate research projects with topics ranging from missile trajectories to numerical semigroups, leading several students to the pursuit of advanced degrees.

The awards committee's decision reads: There were numerous nominations for the early career award, from a range of institutions. Many candidates excelled in particular areas and easily could have ended up as winner in a slightly different pool. We would like to encourage nominators to resubmit strong candidates if still eligible.

In the end our task was to select one winner and after discussion we agreed on Dr. Ian Pierce from the Air Force Academy.

Our decision is based on Ian's strong performance in all criteria for the award. His teaching has been recognized by the Air Force Academies highest teaching award. His initiatives on calculus have widespread impact at a university that requires all its students to take this class. Senior colleagues cite him as an inspiration on teaching, and a substantial number of undergraduate research projects have not only awoken many students interest in Mathematics

but also led some to continue academic studies into graduate degrees.

A veritable renaissance man, his extracurricular work ranges from co-organizing the well-regarded Pikes Peak Undergraduate Math Conference, over mentorship of new instructors, to serving as a character coach for future military officers.

Exemplifying many aspects of what "teacher" can mean, Ian Pierce is a worthy recipient of the 2018 Early Career Teaching Award.

Alexander Hulpke

Chair, Awards Committee of the RMS-MAA

2019 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 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

2019 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 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 2018**. **Complete nomination materials** (described on the website) are due **15 January 2019**.

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 2018**. **Complete nomination materials** (described on the website) are due **15 January 2019**.

Past Burton W. Jones Distinguished Teaching Award 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 Zerger
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
Colorado School of Mines
- 2007** Lynne Ipiña
University of Wyoming
- 2008** Steven Janke
Colorado College
- 2009** Richard Grassl
University of Northern Colorado
- 2010** Eric Stade

- 2011** Rich Bogdanovich
University of Colorado at Boulder
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
- 2018** Jeanne Clelland
University of Colorado at Boulder

Past Early Career Teaching Award Recipients

- 2016** Rebecca Swanson
Colorado School of Mines
- 2017** Mary Pilgrim
Colorado State University
- 2018** Ian Pierce
United States Air Force Academy

Chair's Corner

With 2018 being an even numbered year, a new section chair gets to write this report. Before getting to events and changes (and, wow, did we have them) it seems more than appropriate to start with thanks to all those who guided the section over the last year and made events happen:

I'll start with **Michael Jacobson** who served as chair over the previous two years (and still is serving as past chair, not least in chairing the awards committee this year). Also ending his term has been **Bruce Lundberg** on the nominating committee (which, see below, had to work really hard this spring). This being an even year also brought an end to the term of the Vice Chair, I'm pleased to note that the outgoing Vice Chair, **Shawna Mahan**, volunteered (and was elected) for another term. Many Thanks to them for their past and ongoing service.

That was supposed to be all, but job changes happen, which sadly caused us to lose both our Secretary/Treasurer and MAA National Representative.

Spencer Bagley is heading towards a new position at Westminster College in Utah, and **Heidi Keck**, is following her husband to a new job in California. I would like to thank both of them for their extensive past service to the section and wish them all the best on their new endeavors as they go west.

Luckily, we were able to elect two highly qualified new officers: **Mona Mocanasu** is our new Secretary/Treasurer and **Debra Carney** our new National Representative.

Speaking of elections brings me to our (one hundred and first!) annual meeting, which this year was held at UNC in Greeley under the expert organization of **Oscar Levin** and **Nat Miller**.

While I can't list all speakers and events, I'd like to mention the well-received presentation by our Burton Jones DTA recipient **Diane Davis** on *Building a Math Community*, the banquet talk by the national MAA section visitor **Matt Boelkins** on *Fibonacci's Garden*, the session on Active Learning facilitated by two of our Early Career Teaching Awardees, **Mary Pilgrim** and **Rebecca Swanson**, who also, together with **Amanda Schaeffer-Fry** contributed to the Section Next Workshop.

August then saw the MAA MathFest on our home turf in Denver. As with Venus transits, National Meetings in Colorado occur twice in brief succession. Mark your calendars for the Joint Math Meeting, January 15-18, 2020 in Denver.

Our next section meeting will happen **April 5-6, 2019**, at Fort Lewis College in Durango. (The date changes from what was previously announced as the Powers that be at Fort Lewis imposed a change on us.) The local organizers are **Laura Scull** and **Veronica Furst**.

Our section visitor will be the new Deputy Executive Director of MAA, **Rachel Levy**, who previously has served as vice president for education of SIAM.

As if all of this were not enough changes, our section also has updated by-laws. I would like to thank **Kyle Riley** and in particular, **Janet Barnett** for getting the changes not only formulated but also for spearheading them through the approval process. This is often unexciting and thankless work and I greatly appreciate the effort that has gone into these changes.

In brief, the changes follow recommendations from National MAA and allow for electronic voting, an increased minimum quorum for business meetings (12 persons), and more attention being paid to issues of diversity and implicit bias. The latter changes also will imply a slight change of the membership of the awards committee. (If you are interested in serving on the awards committee, or for that matter in any officer position, please contact Shawna or myself.)

Talking of the awards committee, I would like to remind you, no: implore you, to nominate your colleagues for the **Early Career** and **Burton W Jones** teaching awards! The nomination forms should reach our Awards Coordinator **Jeremy Muskat** by December 15 (there is a grace period for the full nomination package until January 15). See the section web pages for details.

Also, on the web, with a deadline of November 1, you will find information for how to apply for section activity grants, that can help with supporting projects that serve the mission of the MAA.

Finally, this report would not have arrived if it hadn't been for **Linda Sundbye** who has been editing the newsletter so excellently for many years and made sure I wrote this report.

Alexander Hulpke, CSU
Chair, Rocky Mountain Section

MAA National Representative's Report

First let me introduce myself as I have replaced Heidi Keck (who moved out of our section) as the Rocky Mountain Section representative to the MAA Congress. My name is Debra Carney and I am a Teaching Professor at the Colorado School of Mines. I will complete my term as representative in June 2020. Representatives to congress are now only required to attend one meeting per year (MathFest) due to reduced financial support from the MAA.

The MAA Congress met for a full day on August 1, 2018 during MathFest in Denver, CO. The morning agenda included reports from the outgoing MAA Deputy Executive Director Doug Ensley, incoming MAA Executive Director Rachel Levy, and MAA President Deanna Haunsperger. It was clear that the function of the congress is still a work in progress and part of the morning

was spent reviewing newly proposed expectations for the members of congress. Part of my role as section representative includes communicating concerns and acting as a liaison between the section and the MAA.

During the afternoon session we held discussions on how the MAA Congress and MAA Board of Directors should communicate with one another, how to include more voices on the MAA Congress, and what representatives need to know to be an informed member of the MAA Congress. Additionally, plans were then set in motion for the year round work of the MAA Congress. The fifty members of congress were divided up into seven Congress Learning Communities or CLiCs according to the themes:

- (1) Beyond MAA,
- (2) Communication (Publications, Meetings, etc.),
- (3) Community: K-12 Connections,
- (4) Communities: Students and Sections,
- (5) Inclusivity,
- (6) Mission & Membership, and
- (7) Teaching & Learning.

I am a member of the Community: Students and Sections learning community and I am looking forward to learning about how other sections operate and bringing exemplars back to our own section operations. As a member of the learning community on Students and Sections I will learn about the assigned theme, communicate highlights to the Congress, and to serve as a resource for the MAA. My learning community (consisting of seven other representatives) will meet virtually one or two times per semester, attend sessions at JMM (for those representatives who can attend), and will report back at the next MAA Congress.

I look forward to serving you. Please don't hesitate to reach out if you have ideas or concerns about other things that you would like considered by the MAA.

***Debra Carney, Colorado School of Mines
Representative, Rocky Mountain Section***

23rd Annual Colorado Mathematics Awards Ceremony/Reception

The 23rd annual Colorado Mathematics Awards (CMA) Reception/Ceremony was held on Thursday, May 10 at the Grant-Humphreys

Mansion in Denver. Organized by **Dick Gibbs**, Emeritus Professor of Mathematics at Fort Lewis College, and **David Carlson**, founder and convener of the Ethics and Ecological Economics Forum at 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 seven national and international mathematics competitions: MATHCOUNTS, the American Mathematics Contests 8, 10 and 12, the high school team MathWorks Math Modeling Challenge, the William Lowell Putnam Mathematical Competition, the collegiate team Mathematical 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 **Rebecca Kantor**, Dean of the School of Education and Human Development, University of Colorado Denver give the opening remarks.

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

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

Section Governor, Past Section Chair, **Mike Jacobson** from the University of Colorado Denver was on hand to recognize **Professor Jeanne Clelland**, University of Colorado Boulder, recipient of this year's Burton W. Jones Teaching Award and **Professor Ian Pierce**, U.S. Air Force Academy, recipient of this year's Early Career Teaching Award. Mike also presented the winners of the William Lowell Putnam Mathematical Competition and the International Mathematical Contest in Modeling.

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. Of 10,670 teams worldwide, 16 were judged to be Outstanding — including one from the University of Colorado Denver! The team, coached by **Professor Anne Dougherty**, consisted of **Derek Gorthy, Christine Reilly, and Marc Thompson**.

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:

Samuel Reinehr and **Matthew Iverson**, both at the Colorado School of Mines. Samuel placed in the top 184 participants. Professors **Rebecca Swanson**, and **Steve Pankavich** 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 24th Colorado Mathematics Awards Reception/Ceremony to be held again at the Grant-Humphreys Mansion on Tuesday, May 7, 2019.

Dick Gibbs

Emeritus Professor of Mathematics

Fort Lewis College



**MSU Denver to host the 2018-2019 SCUDEM Modeling Competition
October 27, 2018**

Metropolitan State University of Denver will again be a host site for the 2018-2019 SCUDEM (Student Competition Using Differential Equations Modeling) on October 27, 2018. SCUDEM is an international student contest in modeling using differential equations, run by SIMIODE (Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations). This contest is written for students who are currently in a differential equations course, or students who have recently completed a differential equations course (examples on their website, below). There will be three problems released on October 19th for students to choose from, and they will submit their solution papers on the morning of October 27th at the host site. The students are then given a modification to the problem that morning, which they complete and present that day. Faculty judge the solution papers and presentations, and may also attend an on-site professional development workshop.

More details are available on the SCUDEM website:

<https://www.simiode.org/scudem/scudem-iii-2018>

This competition is a great opportunity for students! They have an opportunity to build and present a differential equations model for an open-ended problem, see other students' solutions, and receive immediate feedback on their work. This is also a great opportunity for faculty interested in incorporating mathematical modeling into their courses. Students and

**16th Annual PPRUMC
United States Air Force Academy
Saturday, March 2, 2019**

The 16th Annual Pikes Peak Regional Undergraduate Mathematics Conference (PPRUMC) will be hosted in Polaris Hall at the United States Air Force Academy on Saturday March 2, 2019. Please note the date change to the first Saturday in March instead of the last Saturday in February. We are looking forward to hosting this conference in Polaris Hall, USAFA's newest building, which is easily accessible to visitors. As in past years, registration will be free and lunch will be provided. Detailed conference information and a call for papers will appear later. If you want further information, please contact our conference director, **Shelby Stanhope**, at shelby.stanhope@usafa.edu.



faculty coaches register online through SIMIODE: <https://www.simiode.org/scudem/scudem-iii-2018/registration>, there is a registration fee of \$100 for each visiting coach-team pair.

Additional faculty may participate in the associated faculty development workshop, and judge for the contest at no charge. Registration is available through October 6th!

If you have any questions, or would like to serve as a judge, please contact **Shelley Poole**: srohde2@msudenver.edu

CCTM News



Heather Lynn Johnson will be serving as the MA representative to the Board of Directors of the Colorado Council of Teachers of Mathematics (CCTM). Heather is an associate professor of mathematics education at the University of Colorado Denver.

In her program of research, Heather investigates students' mathematical reasoning, focusing on the mathematics of change and variation. She designs interactive, online tasks to provide students opportunities to expand their mathematical reasoning, and she teaches teachers to grow their students' mathematical reasoning. Currently, she is the PI of a National Science Foundation funded grant: Implementing Techtivities to Promote Students' Covariational Reasoning in College Algebra. Heather earned her BS, M.Ed. and PhD from Penn State. She has received awards for both her teaching and her research. Learn more about Heather's research at: <http://hthrllynnj.com/>

Have ideas that you would like for Heather to address with the CCTM Board? Email Heather at heather.johnson@ucdenver.edu or tweet Heather @HthrLynnJ.

Rocky Mountain Section Voting goes Electronic!

Following a change to the Section By-Laws that was recently approved by MAA national, the section will begin using electronic voting procedures for future officer elections beginning in Spring 2019.

The "Regulations and By-Laws" tab of the section [website](#) includes a copy of the newly amended Rocky Mountain Section By-laws and its two new companion documents:

- MAA RMS Procedures Handbook,
- MAA RMS Section Meeting Organization Handbook.

Members interested in the details about our new voting procedures and other recently approved procedural changes can find those as follows:

1. **Electronic voting procedures for future officer elections:** Articles II-4, VI -2b
2. Items related to **Section Meeting organization and financial guidelines:** Articles IV-4, VI
3. Modifications in the **Teaching Award Committee Structure:** Article VI-3
4. **Strengthened language related to diversity and implicit bias** with regard to officer and committee membership selection: Articles III-3, V-2, VI, VI-3
5. **Increased quorum requirement** for the section business meeting **from 12 to 15:** Articles IV-3, VII-1

The By-laws also received a thorough overall clean-up in order to ensure its language aligns with our actual section practices and with recent changes at the national level.

Section News

Editor's Note:

I did not receive any department news for the fall newsletter. Please plan to share what's happening in your department in the spring newsletter. The deadline for submissions to the spring newsletter is January 15.

Is news from your school missing?

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

RMS Members invited to join TRIUMPHS

RMS Members invited to join TRIUMPHS in studying the masters to stimulate student learning and transform your teaching

It appears to me that if one wishes to make progress in mathematics, one should study the masters and not the pupils.

Niels Abel (1802-1829),

as quoted in O Ore,

“Niels Abel, Mathematician Extraordinary”

Mathematics faculty and educational researchers are increasingly recognizing the value of the history of mathematics as a support to student learning. But how can mathematics instructors – especially those of us who are not historians of mathematics ourselves – tap into this potential? And how we do avoid the risk of placing too much emphasis on learning the history of mathematics per se, as opposed to using that history to support the learning of mathematics? The NSF-funded *Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources* (TRIUMPHS) national collaborative project has an approach to bringing history to your classroom which answers both these concerns.

The key to TRIUMPHS' approach is a collection of "Primary Source Projects" (PSPs) which focus on core mathematical content through the original writings of masters such as Euler, Lagrange, Cauchy, and even Abel himself. Students read select excerpts from these mathematical works, and through a series of exercises that are woven throughout the project, develop a fuller understanding of the mathematics in question as they react to the historical source, organize their thoughts about the mathematical ideas in it, and rediscover groundbreaking ideas for themselves. Along the way, students also engage directly in activities that mirror how mathematicians work: making sense of and interpreting ideas, stating

conjectures and testing them, developing definitions and proving theorems.

Learning from the PSP via project tasks and in-class discussions thus fully **replaces** standard lectures and does so in a fashion closely allied to the instructional techniques of inquiry-based learning (IBL). The pedagogy of PSPs thus offers all the usual benefits associated with IBL – and much more!! As in the humanities and social sciences, where learning from primary sources has long been common practice, reading texts in which individuals first communicated their thinking offers an effective means of becoming educated in the broad sense of understanding both the traditions *and* the modern methods of our discipline. PSPs also offer undergraduates an opportunity to experience research at a frontier stage, as it was practiced by some of the greatest mathematical minds throughout time. The works of these thinkers are generally more compelling than traditional textbook expositions, and problems and the motivations for solving them are both more apparent and natural in the primary sources. As a result, the use of primary sources in the classroom thus promotes an enriched understanding of the subject and its genesis for us as instructors, as well as for our students.

The TRIUMPHS collection of PSPs continues to grow, but now includes 25 full-length PSPs and 16 shorter “mini-PSPs” on core topics in courses ranging from pre-calculus and introductory statistics, to linear algebra and number theory, to abstract algebra, analysis and topology. Student-ready PSPs are available in pdf format from the TRIUMPHS [website](#), with LaTeX code available from PSP authors in order to allow instructors to tailor a project to better meet their course goals. TRIUMPHS is also publishing its collection of mini-PSPs as a series in [Convergence](#), MAA's on-line journal dedicated to the use of history of mathematics in teaching.

TRIUMPHS materials are also being widely site-tested by instructors across the US, with the Rocky Mountain Section leading the way among MAA sections in terms of the number of faculty who have taught with a PSP! Included among those who have served as (official or unofficial) TRIUMPHS site-testers thus far are **Ed Bonan-Hamada** (Mesa), **John Carter** (MSU Denver), **Lynne Ipiña** (UW), **Mark Koester** (MSU Denver), **Carl Lienert** (Fort Lewis), **Bruce Lundberg** (CSU-Pueblo), **Ken Monks** (FRCC – Boulder), **Jeremy Muskat** (Western) and **Qin Yang** (MSU Denver) – and many of these individuals have

begun sharing their PSP classroom experiences through conference talks as well. **Dave Ruch** (MSU Denver) has also developed a superb collection of Analysis projects as an external author for TRIUMPHS, and two of the project's PIs – **Janet Barnett** (CSU-Pueblo) and **Diana White** (CU Denver) – reside in our section.

RMS members interested in learning more about TRIUMPHS certainly don't have far to go – and there's still time for you to join the TRIUMPHS site-tester cadre!

To get started on your own TRIUMPHS journey, please contact [Janet Barnett](#) or [Diana White](#), or visit the TRIUMPHS [website](#). Support for official site testers 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. Application deadlines are October 15 for Spring academic terms, and June 15 for Fall academic terms.

Section Nominating Committee Report

The nominating committee is seeking nominations for the position of **Chairperson-Elect** for our section. This leadership position is vital to the organization and operation of the MAA Rocky Mountain Section.

From our by-laws the description of this position is: Chairperson-Elect is elected at the Annual Meeting. This person holds that position for one year, followed automatically by a two-year term as Chairperson, then a one-year term as Past Chairperson. The Chairperson-Elect will assume the duties of the Vice-Chairperson if the Vice-Chairperson is absent or incapacitated. The Chairperson-elect should assist the Chairperson in leading the section and learn the duties of the position. The Chairperson-elect will serve on various section committees as appointed by the section Chairperson as well as chair the Teaching Award Committee. In summary, the duties are:

1. Watch and learn.
2. Attend all Executive Committee Meetings.
3. Assist Chair in leading the section as needed
4. Assume the duties of the Vice-Chairperson if the Vice-Chairperson is absent or incapacitated.
5. Serve on Program

Committee 6. Chair the Teaching Award Committee

If you have an interest in running for Chairperson Elect or would like to nominate a colleague who would be an outstanding candidate, please contact any member of the nominating committee:

- **Kyle Riley**, Chair, SDSMT, kyle.riley@sdsmt.edu
- **Greg Oman**, UCCS, goman@uccs.edu
- **Gulden Karakok**, UNC, gulden.karakok@unco.edu

Elections will be held during the business meeting at the MAA Rocky Mountain Section annual meeting to be held at Fort Lewis College on April 5-6, 2019.

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

*With Gratitude,
The Nominating Committee*

Section NExT News

At the spring 2018 sectional meeting, eleven individuals participated in Section NExT activities. These activities included a lunch panel, talks, and workshops held Friday and Saturday outside of the conference schedule. Section NExT participants formed professional learning communities around topics of interest and are meeting throughout this year to study these topics and to plan sessions for the 2019 sectional meeting. These sessions are related to Undergraduate Research, Active Learning Techniques, and Flipped Learning. A mix of talks, workshops, and panels will be organized by Section NExT participants and these sessions will be open to all conference participants. Due to the small population of our section, we plan to open applications to new members of Section NExT biannually, and our next call for applicants will be for the spring 2020 meeting. .

Rebecca Swanson, CSM
Mandi Schaeffer-Fry, MSU Denver

**Fort Lewis College
to host the annual
Rocky Mountain Section Meeting
April 5 - 6, 2019**

The 2019 Rocky Mountain Section meeting will be held April 5-6, 2019 on the campus of Fort Lewis College in Durango, CO. The meeting promises two days of engaging speakers, student activities, book sales, and more.

Plenary Speakers for the meeting will include:

- **Jeanne Clelland**, University of Colorado at Boulder, Rocky Mountain Section 2018 Burton W. Jones Distinguished Teaching Award recipient.
- **Ian Pierce**, United States Air Force Academy, Rocky Mountain Section 2018 Early Career Teaching Award winner
- **Rachel Levy**, MAA Deputy Executive Director

The program will include a Friday evening banquet and the return of Student Jeopardy.

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

We invite proposals for contributed paper sessions and panels. In particular, the organizers welcome proposals aimed at undergraduates, such as REU or undergraduate research, careers for bachelor's in mathematics, graduate school advice, or similar topics. All proposals should be submitted by November 27, 2018 to the Program Co-Chairs:

Laura Scull scull_l@fortlewis.edu
Veronika Furst furst_v@fortlewis.edu

Student Activities

Jeopardy Winners! Congratulations to the Pikes Peak Community College Jeopardy team, who won the Spring 2018 Jeopardy over two very tough Black Hills State teams at the 2018 RMS MAA meeting in Greeley. I sense a rematch coming soon!



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 conference.

15th Annual Pikes Peak Regional Undergraduate Mathematics Conference Report

The 15th PPRUMC (<https://www.uccs.edu/pprumc/>) took place on Saturday, February 24, 2018 at UCCS, with a pre-conference event on Friday, February 23. We had over 120 participants. **Ethan Berkove**, Lafayette College, delivered a keynote address on "*Folding Mathematics into Origami*." We had a very well-attended panel discussion "*Beyond an Undergraduate Mathematics Degree*," with six panelists from UCCS, Colorado College, Colorado School of Mines and CU Boulder, and 16 student talks in parallel sessions.

This year's conference was again offered at no cost to participants, thanks to generous funding from the Department of Mathematics, the College of Letters, Arts and Sciences, and the Provost Office at the University of Colorado at Colorado Springs. Thanks to the MAA-RMS support, we were also able to provide travel reimbursement to our invited panelists and to a large group of participants from Western State Colorado University. Door prizes were donated by the UCCS bookstore (in the amount of \$100), the MAA-RMS (three MAA books) and the UCCS Mathematics Department (a t-shirt and a couple of mugs). The Chancellor Office provided the shuttle bus service to and from the Roaring Fork dining hall. The PPRUMC Steering Committee is also grateful to the faculty who contributed their time and expertise to preparing student presenters, recruiting student participants and moderating conference sessions, and especially to **Barbara Prinari** for her splendid organization of this year's event.

Participants numbers (student and faculty) by institution were as follows:

31 from UCCS
1 from Metro State University

16 from United States Air Force Academy
22 from Western State Colorado University

8 from CSU Pueblo
22 from Pikes Peak Community College
7 from Colorado College
1 from Lafayette College

1 from Davidson Technology
17 from University of Northern Colorado
2 from CSU Fort Collins

The student presentations included in the program were:

Jordan Armstrong, United States Air Force Academy
Devil's Staircase

Christopher Botica, United States Air Force Academy
Multiplex Imaging: Linear Algebra and Error Minimization

Laney Bowden, Colorado State University – Fort Collins
What is the Least Symmetric Triangle?

Amie Bray, University of Northern Colorado
Geometric Realizations of Nested Torus Links

Malcolm Gabbard, Colorado College
A Study of Metrics on Visual Boundaries, Part II

William Hubert, United States Air Force Academy
Prime Labelling, Complete Graphs, and Surprising Periodicity

Joshua Jalowiec, United States Air Force Academy
Mathematics and the Game of Risk: What's the Best Way to Start?

Sam Kottler, United States Air Force Academy
A Study of Metrics on Visual Boundaries, Part I

Taylor McMillan, University of Northern Colorado
On Locally Harmonious Labelling

Tristan Neighbors, University of Colorado - Colorado Springs
Perturbed Solitons of the KP equation

Meghan Pattillo, United States Air Force Academy
Statistical Analysis in Carpal Tunnel Syndrome Research

Lauren Stierman, Colorado College
Harmonic Mappings from Generalizations of Hypocycloids

Marcel Such, Western State Colorado University
Bayesian Inference with an Application to Population Modeling

Christopher Toomey, Colorado State University – Pueblo
On Celestial Orbits and the Derivation of Kepler's Laws

Vladimir Vintu and David Cui, Colorado College
The Growth of Language Speakers in the Next 50 Years

Kyle Weishaar, Regis University
Ebola could be Eradicated through Voluntary Vaccination

SCUDEM 2018-2019 Modeling Competition MSU Denver, October 27, 2018



SCUDEM III 2018 MODELING CHALLENGE

Competition Saturday – 27 October 2018

Registration: 1 August – 5 October 2018 - see simiode.org/scudem.

SIMIODE Challenge Using Differential Equation Modeling

Form a team and challenge yourselves in a friendly community to learn and show your skills in this unique competition for modeling with differential equations! Registration for teams of three high school or undergraduate students opens 1 August 2018.

Teams and coaches gather Saturday 27 October 2018 at local sites around the United States and beyond to present their findings at a day for presentation, networking, learning, faculty development, and awards – Outstanding, Meritorious, and Successful. For students there is a fun Math Bowl. Team registration is reduced to \$100.

Challenge is the word we use for we believe this is truly a growth experience in modeling. Join us and grow!

www.simiode.org
SIMIODE A SYSTEMIC INITIATIVE FOR MODELING INVESTIGATIONS
& OPPORTUNITIES WITH DIFFERENTIAL EQUATIONS

Modeling First
Differential
Equations

Build modeling skills

Network with peers

Fun Student
MathBowl

Faculty Development
Modeling Workshop

Complete details and
past results at
simiode.org/scudem

SIMIODE

SIMIODE.org/scudem

Questions? Please contact:

Director@simiode.org

Registration:

1 August – 5 October 2018

Register early. Do not miss your
chance to learn and grow.



2018 Section Meeting Report

The 2018 Annual Meeting of the Rocky Mountain Section of the MAA was hosted by the University of Northern Colorado in Greeley, Colorado on April 13 and 14th. The meeting organizers were **Oscar Levin** and **Nat Miller**. The more than 145 participants included more than 45 students in addition to university faculty, K-12 educators and representatives from business and industry.

The meeting opened Friday afternoon with a welcome message from Dean **Ellen Gregg** of UNC's College of Natural and Health Sciences. The program kicked off with **Diane Davis**, the 2017 Burton W. Jones Distinguished Teacher Award Winner, who gave the opening keynote address: '*Building a math community.*'

Friday's activities concluded with a keynote address from **Robin Wilson**, speaking on '*Euler's Pioneering Equation,*' and a lively presentation by our Banquet Speaker **Matt Boelkins**, who told us about '*Fibonacci's Garden.*'

The scientific program included an invited presentation on Active Learning by **Rebecca Swanson** and **Mary Pilgrim**, the recent recipients of the sections Early Career Teaching Award. There were three panel discussions: '*Adopting and Adapting the MAA Instructional Practices Guide,*' '*Teaching with Open Source Materials,*' and '*The current state of PreK-12 Math Teaching in CO by Colorado Council of Teachers of Mathematics (CCTM).*' This in addition to 44 contributed presentations including 11 by undergraduate students.

Other meeting highlights included a pre-meeting workshop on '*Teaching with Primary Historical Sources*' from **Janet Barnett** and a post-meeting workshop for Section NExT. Undergraduate students were welcomed at the Student Luncheon and concluded the meeting with the now traditional *Student Jeopardy* competition organized by **Beth Schaubroeck**.

We would like to acknowledge the exhibitors who participated: **Janet Barnett** (MAA book sales), **Erin Daubenmire** (Pearson), and **Zim Olson** (Zim Mathematics).

Finally, a big thank-you to **Jeff King** and the UNC faculty, staff, graduate students, and members of the undergraduate Math Club who helped organize and run the meeting.

Contributed Papers - 2018 Section Meeting

The Current State of PreK-12 Math Teaching in Colorado

Moderator: Gulden Karakok, University of Northern Colorado

Panelists:

Joanie Funderburk, President of CCTM

Raymond Johnson, Colorado Department of Education Math Content Specialist

Mary Pittman, Western State Colorado University

Teaching with Open Source Materials

Panelists:

Matt Boelkins, Grand Valley State University

Brenda Forland, Red Rocks Community College

Oscar Levin, University of Northern Colorado

Nathaniel Miller, University of Northern Colorado

Adopting and Adapting the MAA Instructional Practices Guide

Panelists:

Spencer Bagley, University of Northern Colorado

Gulden Karakok, University of Northern Colorado

Hortensio Soto-Johnson, University of Northern Colorado

History of Math and its use in Teaching

Organizer: Janet Barnett, Colorado State University – Pueblo

Robin Wilson, London School of Economics

The Pillow-Problems of Charles L. Dodgson (Lewis Carroll)

Gerald Harnett, Eagle Academy HS

The Maurer-Cartan form and the return of Halley's Logarithm

Edward Bonan-Hamada, Colorado Mesa University

Using a TRIUMPHS PSP and the Growth Mindset

Shawna Mahan, PPCC

Finite Sums and Interpolations: Creating a Calculus Project from Primary Sources

Dave Ruch, MSU Denver

Uniform and Pointwise Behavior in Cauchy's Work

Pam Peters, LCCC
Beyond Euclid, Euler, and Descartes: Women in Math

George Heine, Math & Maps
Two Brothers and the Lemniscate

Janet Barnett, Colorado State University - Pueblo
A Gaussian Tale for the Classroom: Lemniscates, Arithmetic-Geometric Means, and More

Roger Mansfield, Astronomical Data Service
Modern Space Situational Awareness: It Began with Piazzzi, von Zach, and Gauss in 1801

Robert Powers, University of Northern Colorado
Benefits of History of Mathematics for Prospective Secondary Teachers

Mathematics Education

Organizer: Jeffrey King, University of Northern Colorado

Brent Hancock, University of Northern Colorado
Undergraduates' Collective Argumentation Regarding Integration of Complex Functions within Three Worlds of Mathematics

Ian Pierce, United States Air Force Academy
When the Going Gets Tough...Can Diligence and Grit Tell Us Which Students Will Succeed?

Ben Sencindiver, Colorado State University
Measuring Self-Regulated Learning: A Tool for Understanding Disengagement in Calculus I

Robert Powers and Melissa Troudt, University of Northern Colorado
Practicing Teachers' MKT of an Exponential Functions Tasks and Implications to Secondary Mathematics Teacher Preparation

Jess Ellis Hagman, Colorado State University
Studying Successful Calculus Programs: With ALL Students in Mind

Spencer Bagley, University of Northern Colorado
Using Machine Learning Algorithms to Categorize Free Responses to Calculus Questions

Jessica Gehrtz, Colorado State University
Investigating College Calculus Instructors' Knowledge, Disposition, and Responsiveness to Student Thinking

Melissa Troudt, Michelle Morgan, Lindsay Reiten, and Jodie Novak, University of Northern Colorado
Teacher Decisions to Enact a Trajectory of Student Thinking and Reasoning

Teaching Mathematics

Organizer: Nathaniel Miller, University of Northern Colorado

Kyle Riley, South Dakota School of Mines & Technology

Case Study of Student Success

John Ethier, MSU Denver

Stretch College Algebra: A Two Semester Approach to Addressing High DFW Rates

Mona Mocanasu, MSU Denver

An IBL Approach to Abstract Algebra

Susan Holloway and Chuda Baral, Aurora Public Schools/CU Denver

Growing University Level Math Departments through Concurrent Credit Courses

Phil Gustafson, Colorado Mesa University

Fourier Analysis: Capturing Student Interest with Sound Waves

Gary Olson, Jeremiah Kalir, Heather Johnson, University of Colorado Denver

Desmos Techivities for the College Algebra Classroom

Megan Patnott, Regis University

Visualizing Newton's Method and Other Calculus Topics with Desmos

General Session

Organizers: Oscar Levin, University of Northern Colorado

Dan May, Black Hills State University

An Introduction to SET

Dan Swenson, Black Hills State University

The Proportion of Comets in the Card Game SET

Donald Teets, South Dakota School of Mines and Technology

Computing a Satellite Orbit from Photographs

Martha Garlick, South Dakota School of Mines and Technology

Modeling Large Scale Ecological Processes over Heterogeneous Landscapes with Small Scale Variability

Michael Brilleslyper, US Air Force Academy and **Ethan Berkove**, Lafayette College

Fibonacci Identities: No Induction Required

Dale Peterson, US Air Force Academy

Issues Facing the Local Space and Mathematical Community: Satellite/laser Deconfliction, the Space Corps Question, and Standing up of the Front Range Mathematical Institute

Bruce N Lundberg, Colorado State University - Pueblo

A Very Short Intro to Optimal Control

Erik Packard, Colorado Mesa University

The Normal Curve Derived from Very Basic Principles

Undergraduate Student Paper Session

Organizer: Beth Schaubroeck, United States Air Force Academy

Andy Cross, Red Rocks Community College
Applying Machine Learning to Genomic Assay Classification

Conner Hatton, University of Northern Colorado
Computability and Complexity of Hypergraph Colorings

Erin Mecaller, Regis University
Using Sage to Solve Confused Electrician Games

Diego Novoa, Fort Lewis College
The Categorical Product of Graphs

Coleman Kane, Fort Lewis College
Counting Graph Homomorphisms Through the Exponential Object

Kerry Tarrant, Black Hills State University
Cops and Robbers: A Look at Copwin Graphs

Jonathon Thompson, Fort Lewis College
The Connectivity Products of Graphs

Kyle Weishaar, Regis University
Ebola could be Eradicated through Voluntary Vaccination

Arjun Ayyangar, South Dakota School of Mines and Technology
Numerical Methods on Irregular Domains for Animal Movement Models

Ryan Waggener, South Dakota School of Mines and Technology
Optimal Harvesting: Fisheries Management and Fishing Strategies

Brandon Engle, Fort Lewis College
A Generalization to the Collatz Conjecture

2018 Business Meeting Minutes

Saturday, April 13, 2018

Minutes: MAA Rocky Mountain Section Annual Business Meeting
Date: Saturday, April 13, 2018 at 8:00 am – 9:00 am
Location: Ross 1090, University of Northern Colorado

1. Mike Jacobson called the meeting to order at 8:00. Minutes from the 2017 meeting and the current agenda were approved by acclamation. Mike reminded attendees that MathFest is in Denver this year, and that it is always an enjoyable conference.
2. **Vice Chair election:** Gulden Karakok, on behalf of the nominating committee, presented the candidates for Vice Chair: Shawna Mahan (Pikes Peak Community College; current Vice Chair) and Shelly Ray (Aims Community College). Shawna Mahan spoke on her own behalf. She stated that being Vice Chair has been a wonderful experience, and that she would like to continue to work with the board. Shelly Ray was not in attendance. Gulden spoke on her behalf, stating that Shelly has served as vice chair in several other associations. Shawna Mahan was re-elected to a three-year term as Vice Chair.
3. **Secretary / Treasurer election:** Gulden presented the candidates for Secretary / Treasurer: Mona Mocanasu (MSU Denver) and Tracii Friedman (Colorado Mesa University). Mona Mocanasu spoke on her own behalf. She stated that MAA has become more of her academic home, and that she is interested in the position because she would like to know more about the community and give back to the MAA. She has not yet had an officer position but promises to be a good representative. Tracii Friedman was unable to attend the meeting due to an injury. Lisa Driskell read a statement on her behalf. Mona Mocanasu was elected to the remaining two years of the three-year term, expiring in 2020. Since both Spencer Bagley and Heidi Keck are leaving the region, Mona Mocanasu will become the primary signer on the RMS bank account, and Alexander Hulpke (chair) will be secondary signer.
4. **Election for Section Representative to the MAA Congress:** Gulden presented the candidates: Debra Carney (Colorado School of Mines), Anne Dougherty (University of Colorado, Boulder), and Gus Grievel (Colorado School of Mines). None of the candidates were able to attend the meeting. Rebecca Swanson read a statement from Deb Carney: "Deb Carney is a Teaching Professor at the Colorado School of Mines. She has served as the Assistant Department Head for a number of years, and has a variety of duties in that position, which include class scheduling. Deb has also been fundamental in the creation of and advising of our local AWM chapter, the Society for Women in Mathematics." Debra Carney was elected to the remaining two years of the three-year term, expiring in 2020.
5. **Referendum on proposed by-law amendments:** Janet Barnett presented a summary of the proposed by-law amendments and opened the floor for discussion. The section voted in favor of the proposed by-law amendments.
6. **Chair's report:** Mike Jacobson spoke about what it's been like to be chair for two years. MAA is an association close to his heart; he was a 25-year member and then moved from U of Louisville to Colorado and the MAA lost me. He became a member again and enjoys a lot of components of membership. One of the nicest things is the section meeting, which is an opportunity for reconnecting with colleagues from across the region and a great way to find out what's going on mathematically and educationally across the region. He looks forward to many more years of attending this meeting and being part of the MAA. He stated that the two years have gone by at times faster and at times slower than he would have liked, and that

he looks forward to just being "out there" in attendance at the meetings. ECTA and Burton Jones award winners were announced at the banquet on Friday night. On top of the plaque, there is a check in the amount of 100e dollars. There was some discussion among the board members as to whether it should be 100π dollars for the DTA winner -- perhaps this will be a motion made in a future meeting.

7. **Section Representative to MAA Congress report:** Heidi Keck reported that the biggest difference between governor and representative is structure of the job: it is now to serve as an information conduit between the MAA Congress and the membership, and vice versa. If members have things that they wish the national organization did, Heidi recommends that they talk to Deb Carney (the incoming representative). Heidi reported that the national organization is struggling financially and with membership. The largest moneymaker used to be book sales; with the rise of e-publishing, book sale revenues have decreased. The MAA has thus taken a partnership with Taylor and Francis, in which the MAA retains control over editing and content, but T&F takes over publishing and marketing. In particular, this allows the MAA to increase its reach to international markets, and thus increase the potential financial impact of book sales. Local sections lose the book sales kickback, but there are substantial financial benefits to the national organization. Heidi reminded attendees that Diane Davis spoke in her keynote about departmental membership, which allows all students in a department to have free MAA memberships. While processing student memberships is a little extra work on the department coordinator's part, this is a great way to get young people involved in the organization and potentially boost membership numbers. The national website has been revamped, and now includes a career resource center page with information on jobs and advice on how to find them. Heidi reports that her term as section representative was a great 1-year position that she is sorry to be leaving, and notes that the section representative position is a great opportunity to work with the national organization.
8. **National:** Matt Boelkins provided more information about the impact of the publishing changes on the financial picture. Journals have been the center of the MAA as a national organization for a long time. Until the internet existed, MAA membership was the only way to get the journals, so this was a big incentive for membership, and thus a financial driver that subsidized the publication of books at a loss. When the internet happened and journals became more available, this led to big structural deficits. The 2017 operating budget predicted a net operating loss in the high six figures. However, with the AMS book deal, the operating budget predicts a net operating GAIN in the high six figures. T&F gave the MAA a large lump sum for the rights to publish the journals, but also promised considerable royalties. The AMS book deal was also a large financial gain because AMS bought the rights to almost all of the MAA's math titles. Even without the book and journal deals, though, the net operating budget probably would have been about even; national has been doing a lot of work to understand the complicated financial situation, and has eliminated a number of professional staff. Matt acknowledged that these changes have been hard and destructive for people, and that there are unintended consequences at the local level.
9. **Financial report:** Spencer Bagley reported that as of immediately before the spring meeting, we have about \$9500 cash on hand. The 2017 meeting took a small loss of about \$250, but the 2018 meeting is on track to make a substantial profit. We continue to fund Activity Grants, and Spencer encouraged the members to consider applying for them. Hortensia Soto noted that the section could do a better job of advertising events that are funded by Activity Grants to make them more accessible to everyone in the section. Spencer appointed George Heine and Oscar Levin as co-webmasters for the remainder of the term. Janet Barnett noted that the appointed positions whose terms end in 2019 are the Newsletter Editor and the Section NExT coordinator.
10. **Book Sales:** Janet Barnett reported further on the changes to book sales. MAA members now get a discount on most AMS titles, and there is still a section meeting discount of 40% with free shipping.

11. **PPRUMC:** Janet Barnett gave the report on behalf of Barbara Prinari, who was unable to attend. The 15th PPRUMC had 120 participants and many great talks. Janet thanked the section for continued funding, and reminded attendees that they can contribute to PPRUMC under the voluntary dues program. Beth Schaubroeck reported that next year's PPRUMC will be at USAFA. They hope to fund it themselves, perhaps with support from a section activity grant.
12. **Colorado Mathematics Awards:** Dick Gibbs gave a brief report on the Colorado Math Awards. This year, two students from School of Mines made it into the top 500 in the Putnam Exam. Dick thanked the section for its continued support.
13. **Section NExT:** Mandi Schaeffer Fry reported on the new cohort model, in which new cohorts join the program in even years, and then organize events for the section meeting in odd years. This year's cohort is 11 people, partitioned into three professional learning communities. Section members who are interested in supporting Section NExT in some way are invited to contact Mandi or Rebecca Swanson.
14. **Jim Loats** reported that the CCTM is interested in identifying department liaisons who could distribute information to institutions and strengthen the connection between CCTM and MAA. He also is assembling an exploratory group to consider doing a mathematical art show. He asked that any interested section members would contact him.
15. **Student Activities:** Beth Schaubroeck thanked the section for its ongoing support of student activities, including lunches and Jeopardy at the spring meetings. If you are interested in helping with lunches or submitting questions for Jeopardy, please contact Beth.
16. **Final comments from Mike Jacobson:** Further encouragement for section members to submit activity grants. Thanks to exiting officers; thanks to UNC for hosting a great meeting and Nat Miller and Oscar Levin for organizing. Welcome to Laura Scull, program chair of the Fort Lewis meeting, which will be held on April 5-6, 2019.

Meeting was adjourned at 8:50am.

Respectfully submitted,

Spencer Bagley,

University of Northern Colorado

Secretary / Treasurer of the MAA Rocky Mountain Section

2018 Executive Committee Meeting Minutes

Thursday, April 12, 2018

Minutes: MAA Rocky Mountain Section Executive Committee Meeting
Date & Time: Thursday, April 12, 2018, 7:00 – 10:00 pm
Location: Pellegrini Restaurant, 2400 17th St, Greeley, CO
Attendance: Mike Jacobson, Oscar Levin, Spencer Bagley, Janet Barnett, George Heine, Heidi Keck, Nat Miller, Matt Boelkins, Laura Scull, Alexander Hulpke, Shawna Mahan

Mike Jacobson called the meeting to order at 8:50.

1. **Meeting update:** Nat reported that 144 people were registered as of Thursday afternoon. Oscar will introduce Matt Boelkins and Mike will introduce Robin Wilson. Section NExT is holding a lunch event on Friday and an afternoon workshop on Saturday after the conference concludes. Alexander will introduce the winners of the teaching awards at the banquet; the winners will be re-announced at the business meeting.
2. **DTA:** There was only one nominee this year, which is unusual, but the EC can make more noise asking people to nominate their colleagues, and perhaps ask Awards Coordinator Jeremy Muskat to consider strategies to develop more nominees. Five minutes of discussion on this topic were added to the agenda for the business meeting.
3. **Colorado Mathematics Award ceremony:** Historically the section has provided some financial support (between \$250 and \$500) to this event, organized by Dick Gibbs to honor participants in the Putnam and modeling competitions. Dick Gibbs writes to local organizers to compile data that is not generally publicly available. Mike raised a concern that it is not clear how this event benefits the section, and proposed building a similar event into the spring section meeting. However, it's not clear that the necessary data would be available from Putnam organizers before the spring meeting. Alexander stated that this is a reasonable event for the section to spend money on, but asked if there were ways to include students from other states in the section.
4. **Proposed Mentorship Facilitator position:** Section officers recently received an email from Lisa Marano about identifying a person who could serve as a Mentorship Facilitator in conjunction with both Project NExT and the MAA Mentoring Network. Such a person would help to pair interested junior faculty with more senior faculty at a separate but geographically close institution. This would require extensive knowledge of institutions and people across the section. Mike is unsure that a person with the requisite knowledge exists within the section, and noted that this would be a difficult and demanding job. Alexander noted that this is a geographically difficult problem in a section as far-flung as RMS. Mike suggested that Section NExT could be a good start, and will speak with Rebecca Swanson and Mandi Schaeffer Fry to see how they feel this proposed initiative might integrate with their ongoing work with Section NExT.
5. **Proposed Meeting Coordinator position** (See also item 9): Janet spoke to the provision in the new by-laws that would allow the creation of a new Meeting Coordinator position on a three-year term. Such a person could help provide background infrastructure and organize the scientific program of the spring meeting to lighten the load on local organizers. Alternatively, the previous program chair could serve on the EC to provide continuity and advice for the next program chair. Shawna noted that many national organizations like AMATYC have more permanent conference coordinators. Oscar said that it was very useful for him to have Janet's notes from the Pueblo meeting, but that he feels requiring the previous local organizer to take on significant responsibility for the next meeting would be

inappropriate and asking a lot, thus making it more difficult for people to agree to be the local organizer.

6. **Book sales:** Janet reported that MAA Press books are now published and distributed by AMS, which is good for national, but we lose commissions at the section level. Janet asked for guidance from the EC about what to do with the remaining inventory of display books. The general consensus was to distribute them as door prizes, and perhaps to members of Section NExT. Janet noted that Beth Schaubroeck will likely ask for money for more appropriate books as Jeopardy prizes. Janet also asked if we should continue to build up a new inventory of display books. The EC moved to let Janet make this decision in her ongoing capacity as book sales coordinator. Mike suggested that we start soliciting people to serve in this role (with appropriate changes) at the business meeting.
7. **Spring newsletter deadline:** Janet noted that the current deadline of February 15 is a little too late to get the newsletter out in time to announce PPRUMC and other events early in the semester, and proposed moving the deadline to January 24 or January 31. Concerns were raised about whether the congress representative's report could be done by January 24, and about the ability of schools that start after Martin Luther King Jr. Day to meet a January 24 deadline. The consensus of the EC is that January 31 seems best.
8. **Webmaster and other three-year positions:** Spencer is happy to reappoint George Heine to this position; George is willing to continue but only for the next 2-3 years. Heidi proposed that we announce the upcoming opening in the business meeting to solicit other potential candidates. Janet reminded the EC that the terms for the newsletter editor and Section NExT coordinator expire in 2019.
9. **Report from Fort Lewis:** Laura reported that the department is on board and excited to host the meeting, but that she has recently realized that the task was larger than originally thought; in particular, it was a surprise to her that the local organizers are also responsible for the scientific program. Matt noted that most other MAA sections have a program chair on the EC whose job it is to organize the scientific meeting, and that local organizers are generally only responsible for arranging rooms, hotels, restaurants, etc.; he noted further that it is an enormous undertaking for a local arrangements committee to try to do everything involved in planning a meeting. Mike asked if we should bring this question to the business meeting, but Heidi suggested that the EC talk through the issue further before bringing it to everyone.
10. **2020 meeting:** Mike noted that it is not too early to start asking who might be interested in hosting the 2020 meeting. A Front Range location seems appropriate.
11. **Financial report:** Spencer gave the financial report. Before the meeting, the section has about \$9500 on hand, \$750 of which belongs to PPRUMC. The 2017 meeting was almost a wash, with a net loss of about \$250. Subvention income was \$764 and book sales income was around \$300. The section gave activity grants to the Colorado Mathematics Awards, Section NExT, the UNCO Celebration of Mind, and PPRUMC. Mike suggested that the EC solicit more applications for activity grants. Nat reported that the 2018 meeting is on track to turn a profit of a couple thousand dollars.
12. **Concluding remarks:** Mike reiterated that it is a good idea to start soliciting local organizers for the 2020 meeting, and thanked the UNCO committee for their great job organizing the meeting.

Meeting was adjourned at 10:00.

Respectfully submitted,

Spencer Bagley,

University of Northern Colorado

Secretary / Treasurer of the MAA Rocky Mountain Section

MAA Rocky Mountain Section Suggestions for Speakers

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

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

Grants Available

Section Activity Grants Available

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

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

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

Student Recognition Grants Available

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

Proposals for such grants must

1. Originate from a member of the Rocky Mountain Section of the Mathematical Association of America on behalf of an agency, institution, or organization whose stated purposes are consistent with

recognizing or encouraging superior academic achievement at the high school level;

2. Be in the hands of the Chair of the Rocky Mountain Section no later than March 15 of the year in which the proposed recognition is to be made;
3. Include the criteria under which superior achievement in mathematics is to be recognized, together with the time and the manner of such recognition;
4. Report, insofar as possible at the time of the proposal, other potential sources of support together with proposals or requests made or intended; and
5. Be limited to a maximum amount of \$250.

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

About Our Logo

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

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

Meetings Calendar

Joint Mathematics Meetings; Baltimore, MD
January 16-19, 2019

ICTCM; Scottsdale, AZ
March 14-17, 2019

**MAA Rocky Mountain Section Meeting;
Fort Lewis College, April 5-6, 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

Joint Mathematics Meetings; Seattle, WA
January 5-8, 2022

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

Joint Mathematics Meetings; Boston, MA
January 4-7, 2023

**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:

Mona Mocanasu
MAA Rocky Mountain Section Treasurer/Secretary
Metropolitan State University of Denver
Department of Mathematical and Computer Sciences
Campus Box 38, PO Box 173362
Denver, CO 80217

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.