



2023 Colorado Mathematics Awards

The 28th annual awards program to recognize outstanding performance in national and international mathematics competitions and contests by Colorado middle school, high school, and undergraduate college students.

Wednesday, May 17, 2023

4:15 – 6:30 p.m.

Grant-Humphreys Mansion

770 Pennsylvania Street – Denver, Colorado

Program

4:15 – 5:00pm Refreshments

5:00 – 6:25pm Welcome by CMA Co-Chairs: Dr. David Carlson, Founder, Ethics and Ecological Economics (EEE) Forum and **Dr. Richard Gibbs**, Professor Emeritus, Ft. Lewis College

Recognition of Supporters, Guests and Steering Committee (past and present): Dr. Carlson

Remarks: Dr. Timothy J. Tsai, Associate Professor of Engineering, Harvey Mudd College:
"Reflecting on Math Competitions: 20 Years Later"

Introduced by **Ms. Rhonda Naylor**, past president, Colorado Council of Teachers of Mathematics

Presentation of Awards by CMA Steering Committee members and other CMA colleagues:**

- **MATHCOUNTS:** presented by **Mr. Thomas Davids**, ARML Team Coach and Colorado Math Circle Director, and **Ms. Christy Marini**, Campus Middle School, and coach of the Colorado MATHCOUNTS National Team
- **American Mathematics Competitions 8:** presented by **Dr. Tsai**
- **American Mathematics Competitions 10:** presented by **Dr. Carlson** and **Ms. Joanie Funderburk**, Past President of the Colorado Council of Teachers of Mathematics, and Strategic Alliance Director at Texas Instruments
- **American Mathematics Competitions 12:** presented by **Dr. Carlson** and **Ms. Funderburk**
- **AMC Young Women in Mathematics Certificate Program:** presented by **Dr. Sheila Davis****, Health and Wellness Chair, CO WY MT State Conference, NAACP
- **U.S.A. Junior Mathematics Olympiad and U.S.A. Mathematics Olympiad:** presented by **Dr. Mike Jacobson****, Professor, Dept. of Mathematics and Statistical Sciences, Univ. of Colorado Denver
- **American Regions Mathematics League Colorado Team 1:** presented by **Thomas Davids**, Team Coach.

*Picture-taking of AMC medalists: Mr. Rocke Verser***, independent computer consultant

6:25pm Closing Remarks: Dr. Carlson

*Our deep thanks to **Dr. Raymond Johnson****, Mathematics Content Specialist, Colorado Department of Education, in preparing us for this day!*

MATHCOUNTS

MATHCOUNTS is an afterschool program for 6th, 7th, and 8th graders which leads to a series of three-hour competitions at school, chapter, state, and national levels. Each year, approximately 140,000 students nationwide participate in school MATHCOUNTS competitions, with about 40,000 students participating at chapter competitions. This year, the state competition for individuals and teams was held in-person at Campus Middle School on March 18th. The top four finishers are listed in ranked order and comprised the Colorado National Team, which represented Colorado at the MATHCOUNTS National Competition held May 13-15 in Orlando, Florida. Colorado's National Team finished in 22nd place out of 56 teams.

Colorado First Place Team (and Coach)

Jisu Bang, Rohith Thomas, Agastya Prabhu, and Michael Zhang, Campus Middle School, Greenwood Village (Christy Marini)

Colorado National Team (and Coaches)

Joshua Liu, Denver Online, Denver (Matt Bixby and Silva Chang); **Alex Zhang**, The Manning School of Academics and Arts, Golden (Cheri Cahill); **Jisu Bang**, Campus Middle School, Greenwood Village (Christy Marini); and **Jonah Wang**, Hulstrom K-8, Northglenn (Angela Newberry). Team Coach: Christy Marini

Honorable Mention (and Coaches)

Rohith Thomas, Campus Middle School, Greenwood Village (Christy Marini); **Helen Wan**, Challenger Middle School, Colorado Springs (Hui Wan); **Om Khurana**, Challenge School, Denver (Matt Bixby); **Grayson Manuel**, Slavens K-8, Denver (Kirk Framke); **Agastya Prabhu**, Campus Middle School, Greenwood Village (Christy Marini); **Aarush Goradia**, Challenge School, Denver (Matt Bixby); **Tanvi Dua**, Altona Middle School, Longmont (Tim Criger); **Allison Duan**, Peak to Peak Charter School, Lafayette (Anita Chakraborty-Spotts)

American Mathematics Competition 8

The AMC 8 is a 40-minute 25-question multiple-choice exam in middle school mathematics designed to promote the development of problem-solving skills. The exam was given during January 17-23, 2023. Students in 8th grade and below are eligible. Nationally, 74,388 students from 1,910 schools participated.

AMC 8--Top Colorado Individual Winners (and Coaches)

- (1) **Jisu Bang**, Campus Middle School, Greenwood Village (Christy Marini)
- (1) **Rohith Thomas**, Campus Middle School, Greenwood Village (Christy Marini)
- (3) **Sophia Dai**, D'Evelyn Jr./Sr. High School
- (3) **Joshua Liu**, Denver Online (Silva Chang, Univ. of Colorado Boulder)
- (3) **Grayson Manuel**, Slavens K-8, Denver (Kirk Framke)
- (3) **Derek Yin**, Altona Middle School, Longmont (Tim Criger) Joshua and Derek are 7th graders!

6th Grade First Place: **Reid Beckett**, Northridge Elementary School, Highlands Ranch (Mara Howell) Reid is a 5th grader!

Honorable Mention (and Coaches)

Allison Duan, Peak to Peak Charter School, Lafayette (Anita Chakraborty-Spotts); **Sadie Anderson**, Kinard Core Knowledge School, Fort Collins (Cecilia Bonertz); **Reid Beckett**, Northridge Elementary School, Highlands Ranch (Mara Howell); **Johnlin Feng**, Preston Middle School, Fort Collins (Ryan Martine); **Agastya Prabhu**, Campus Middle School, Greenwood Village (Christy Marini)

American Mathematics Competitions 10 and 12

The AMC 10 and AMC 12 are both 25-question, 75-minute, multiple-choice examinations in high school mathematics with approximately 12 common problems between them. The AMC 10 is for students in 10th grade and below and covers the high school curriculum up to 10th grade. The AMC 12 is for students in 12th grade and below and covers the entire high school curriculum, including trigonometry, advanced algebra, and advanced geometry, but excluding calculus. Each contest was administered in two different versions on different dates in November 2022. The AMC 10A and 10B exams were taken by 27,417 and 22,887 students respectively; many students took both exams. Similarly, the 12A and 12B exams were taken by 19,393 and 18,074 students, respectively.

American Mathematics Competitions 10 and 12 (continued)

AMC 10--Top Colorado Individual Winners (and Coaches)

- (1) **Shruti Arun**, Cherry Creek High School, Greenwood Village (Jim Padavic) Shruti is a 9th grader!
- (1) **Abhinav Krishna**, Cherry Creek High School, Greenwood Village (Jim Padavic)
- (3) **Patrick Li**, Cherry Creek High School, Greenwood Village (Jim Padavic)

8th Grade First Place: **Joshua Liu**, Denver Online (Silva Chang—Univ. of Colorado Boulder) Joshua is a 7th grader!

AMC 10--Honorable Mention (and Coaches)

Jacob Greene, Stargate Charter School, Thornton (Paul Rightmyer); **Rohith Thomas**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Austin Zhang**, Grandview High School, Aurora (Jocelyn Hatfield); **Ellie Wang**, Kinard Core Knowledge Middle School, Fort Collins (Cecilia Bonertz); **Shourya Hooda**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Davin Yin**, Fairview High School, Boulder (Dominique Youngren); **Sabrina Xu**, Rock Canyon High School (Highlands Ranch (Karen Bukowski); **Ethan Lou**, Cherry Creek High School (Jim Padavic); **Ben Gabrielson**, Niwot High School, Niwot (Megan Schlagel)

AMC 12--Top Colorado Individual Winners (and Coaches)

- (1) **Ruoxi Hu**, The Vanguard School, Colorado Springs (Vic Dallin)
- (2) **Jackson Dryg**, Fossil Ridge High School, Fort Collins (Todd Pfeifer)
- (3) **Srinivas Arun**, Cherry Creek High School, Greenwood Village (Jim Padavic)

AMC 12—Honorable Mention (and Coaches)

Jeremy Huang, Stargate Charter School, Thornton (Paul Rightmyer); **Ari Wang**, Rampart High School, Colorado Springs (Manuel Mestas); **Kelly Young**, Fairview High School, Boulder (Dominique Youngren); **Max Xu**, Rock Canyon High School, Highlands Ranch (Karen Bukowski); **Aryamann Sheoran**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Charlie Flaxbeard**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Warren Chen**, Peak to Peak Charter School, Lafayette (Anita Chakraborty-Spotts); **Jayden Wang**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Keelan Hu**, Cherry Creek High School (Jim Padavic); **Ayan Vaishnav**, Cherry Creek High School (Jim Padavic)

AMC Young Women in Mathematics Certificate Program

The American Mathematics Competition's Young Women in Mathematics Awards and Certificate Program honors the top-performing female students on the AMC 8, 10A, 10B, 12A, and 12B. The top 5 scorers in each competition nationwide split a \$5,000 scholarship, and the top 5 scorers from each MAA Section in each competition receive certificates. These are the Certificate winners from the Rocky Mountain Section of the MAA; for students not already listed in this printed program, schools and their teachers are included.

AMC 8: **Jisu Bang**, Campus Middle School, Greenwood Village (Christy Marini); **Sophia Dai**, D'Evelyn Jr./Sr. High School, Denver; **Allison Duan**, Peak to Peak Charter School, Lafayette (Anita Chakraborty-Spotts); **Elizabeth Von Stroh**, Mackintosh Academy, Littleton (Anne Wolf); and **Darya Yazdi**, Summit Middle School, Boulder (Maryam Yekta)
Elizabeth is a 5th grader!

AMC 10A/10B: **Shruti Arun**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Justine Dong**, Fairview High School, Boulder (Dominique Youngren); **Naomi Huang**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Ellie Wang**, Kinard Core Knowledge Middle School, Fort Collins (Cecilia Bonertz); **Valerie Xin**, Stargate Charter School, Thornton (Paul Rightmyer); and **Sabrina Xu**, Rock Canyon High School, Highlands Ranch (Karen Bukowski)
Ellie is a 7th grader!

Shruti Arun, a 9th grader from Cherry Creek High School, placed among the top five young women nationally who took the AMC 10B exam. The five of them will split a \$5,000 scholarship!

AMC 12A/12B: **Ruoxi Hu**, The Vanguard School, Colorado Springs (Vic Dallin); **Cynthia Liu**, Stargate Charter School, Thornton (Paul Rightmyer); **Tanishqa Puhan**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Maya Vendhan**, Colorado Academy, Denver; **Pei Xiao (Mia) Wu**, D'Evelyn Jr./Sr. High School, Denver (Cory Ryckman); and **Kelly Young**, Fairview High School (Dominique Youngren)

Jisu Bang--1st place tie (AMC8); Shruti Arun-- 1st place tie (AMC10); Ruoxi Hu—1st Place (AMC12)!

American Invitational Mathematics Examination (AIME) and the USA Math Olympiads

The *American Invitational Mathematics Examination* (AIME) is a 15-question, 3-hour examination, in which each answer is an integer number between 0 to 999. The questions on the AIME are much more difficult than those on the AMC 10 and AMC 12. Invitations were issued to approximately 2.5% of all AMC 10 scorers and 5% of AMC 12 participants. Two versions of the exam were administered on different days in February. This year, 5,861 students nationwide participated in AIME I; an additional 697 students took the AIME II exam on the alternate date.

The *USA Mathematical Olympiad* (USAMO) and the *USA Junior Mathematical Olympiad* (USAJMO) are six-question, two-day, 9-hour essay/proof examinations given to the top students participating in the AMC 10 and 12 exams and the AIME.

Currently, approximately 260-270 students are invited to take the USA Math Olympiad (USAMO) exam each year, and 230-240 students are invited to take the USA Junior Math Olympiad (USAJMO) exam. Invitations are based upon weighted averages of student scores on the AIME and the AMC 12 (or AMC 10) exam, respectively. This year, two Colorado students qualified for the USAMO exam, and two qualified for the USAJMO exam. Top finishers are invited to a 3-week intensive summer program to select and train the six members of the U.S. team for the *International Mathematical Olympiad* (IMO) to be held in Chiba, Japan in July.

USA Math Olympiad Qualifiers: **Srinivas Arun**, Cherry Creek High School, Greenwood Village (Jim Padavic) received a **Silver Winner** award and **Jackson Dryg**, Fossil Ridge High School, Ft. Collins (Todd Pfeifer) received **Honorable Mention**.

USA Junior Math Olympiad Qualifier: **Shruti Arun**, Cherry Creek High School, Greenwood Village (Jim Padavic) and **Joshua Liu**, Denver Online (Silva Chang, Univ. of Colorado Boulder) both received **Honorable Mention**.

Srinivas is an 11th grader; Shruti is a 9th grader; and Joshua is a 7th grader!

American Regions Mathematics League – Colorado Team 1

Each year about 2000 high school students from the U.S. and other countries form 15-member teams to compete at the national ARML competition in June. In the 2022 ARML Competition, half of the 110 teams competed at one of the four regional sites and the other half (including the Colorado team) competed in person locally. The Colorado Team finished in **9th place** in the off-site A Division. **Jackson Dryg** of Fossil Ridge High School **placed 9th** among all off-site participants. This year's team members and their schools are listed below:

Shruti Arun, Srinivas Arun, Abhinav Krishna, Ethan Lou, and Jayden Wang, Cherry Creek High School, Greenwood Village; **Jackson Dryg**, Fossil Ridge High School, Fort Collins; **Jacob Greene** and **Jeremy Huang**, Stargate School, Thornton; **Pavan Gudavalli, Chris Payne, Natalie Pujet, Davin Yin, and Kelly Young**, Fairview High School, Boulder; **Joshua Liu**, Denver Online; and **Ari Wang**, Rampart High School, Colorado Springs.
Team Coach and Colorado Math Circle Director, Thomas Davids.

Colorado Math Awards also tracks results for college students in the **William Lowell Putnam Mathematical Competition** and the **Mathematical Contest in Modeling (MCM)** and **Interdisciplinary Contest in Modeling (ICM)**. To the best of our knowledge, there were no Colorado Math Awards honorees for these competitions this

Looking ahead to CMA 2024: Three initiatives are under consideration by the CMA Steering Committee: (1) moving this awards event to a larger venue next year; (2) possibly making cash awards to top students and coaches; and (3) supporting efforts to increase opportunities for rural, African-American, Latinx, and Native American students in Colorado to prepare for, and participate in, CMA-tracked and other regional and state-level math competitions.

We welcome suggestions and other comments on these initiatives from students, parents, teachers, and organizations that value mathematical excellence and equal opportunity. Please contact Steering Committee Co-Chair, David Carlson at davidcarlson824@gmail.com.

Tax-deductible contributions toward next year's CMA event and/or these initiatives can be sent to **FLC Foundation, 1000 Rim Drive, Durango CO 81301-3911**. Please write **CO Math Awards** on the memo line.
Or use the QR code!

