



# 2021 Colorado Mathematics Awards

*The 26<sup>th</sup> annual reception to recognize outstanding performance  
in national and international mathematics competitions and contests  
by Colorado middle school, high school, and undergraduate college students.*

**Thursday, May 13, 2021  
4:00 – 5:30pm**

## **Program (Online)**

**4:00 – 4:10pm** Connect to the program waiting room: breakout rooms available for informal connecting

**4:10 – 4:20pm** Welcome: **Dr. Richard Gibbs**, CMA Co-Chair and Emeritus Professor of Mathematics,  
Ft. Lewis College

Recognition of Underwriters, Guests, and Steering Committee: **Dr. David Carlson**, CMA  
Co-Chair; Founder and Convener, Ethics and Ecological Economics (EEE) Forum

**4:20 – 4:35pm** Guest Presentation: **Dr. Andrea Bruder**, Associate Dean of the Faculty, Associate Professor and  
Chair, Department of Mathematics and Computer Science, Colorado College [CC]  
*“How Mathematical Models Have Informed Our Covid-19 Mitigation Strategy at CC”*

**4:35 – 5:25pm** Presentation of Awards by CMA Steering Committee members:

- **MATHCOUNTS**: presented by **Mr. Paul Gulman**, P.E., National Society of Professional Engineers of Colorado
- **American Mathematics Competitions 8**: presented by **Ms. Silva Chang**, Director, Colorado Math Circle, and AMC 8 co-Editor-in-Chief, University of Colorado Boulder
- **American Mathematics Competitions 10**: presented by **Ms. Rhonda Naylor**, Campus Middle School (retired) and Past President, Colorado Council of Teachers of Mathematics
- **American Mathematics Competitions 12**: presented by **Mr. Rocke Verser**, independent computer consultant
- **American Regions Mathematics League Colorado Team 1**: presented by **Ms. Chang**
- **U.S.A. Junior Mathematics Olympiad and U.S.A. Mathematics Olympiad**: presented by **Ms. Chang**
- **William Lowell Putnam Mathematical Competition**: presented by **Dr. Gibbs**
- **Mathematical Contest in Modeling**: presented by **Dr. Gibbs**

**5:25 – 5:30pm** Closing Remarks: **Dr. Carlson** and **Dr. Gibbs**, CMA Co-Chairs

*Our deep thanks to CMA Steering Committee member, **Dr. Raymond Johnson**, Mathematics Content Specialist, Colorado Department of Education, for being our “Zoom engineer” for the day!*

## MATHCOUNTS

MATHCOUNTS is an afterschool program for 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> 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. The top four students at each state competition will represent their state at the national competition online on May 8-11. The Colorado Team is comprised of the top four individual winners in this year's online state competition, held on March 25<sup>th</sup>. Team members are listed in ranked order, as are the next six Honorable Mention students.

### Colorado MATHCOUNTS Team

**Abhinav Krishna**, Challenge School, Denver (Matt Bixby); **Eric Wang**, Kinard Core Knowledge Middle School, Ft. Collins (Cecilia Bonertz); **Joshua Liu**, Challenge School, Denver (Matt Bixby); **Ethan Lou**, Cherry Creek Elevation, Greenwood Village (Christy Marini)

### Honorable Mention (and Coaches)

**Shruti Arun**, Campus Middle School, Greenwood Village (Christy Marini and Jim Padavic); **Davin Yin**, Altona Middle School, Longmont (Tim Criger); **Austin Zhang**, Challenge School, Denver (Matt Bixby); **Benjamin Wu**, Cherry Creek Academy, Englewood (William Wu); **Audrey Haas**, Veritas Christian Academy, Parker (Jennifer Haas); and **Wesley Ding**, Summit Middle School, Boulder

## American Mathematics Competition 8

The AMC 8 is a 40-minute 25-question multiple-choice exam was given on November 10<sup>th</sup>, 2020. Students in 8th grade and below are eligible. Nationally, 56,136 students from 1,408 schools nationwide participated. The D.E. Shaw Group AMC 8 certificates of excellence go to the 5 top scoring young women from the Rocky Mountain MAA Section.

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

- (1) **Abhinav Krishna**, Challenge School, Denver (Matt Bixby)
- (1) **Eric Wang**, Kinard Core Knowledge Middle School, Ft. Collins (Cecilia Bonertz)
- (3) **Shruti Arun**, Campus Middle School, Greenwood Village (Christy Marini and Jim Padavic)
- (3) **Austin Zhang**, Challenge School, Denver (Matt Bixby)

Top student in 6<sup>th</sup> grade or below: **Joshua Liu**, Challenge School, Denver (Matt Bixby)

### Honorable Mention (and Coaches)

**Wesley Ding**, Summit Middle School, Boulder; **Jacob Greene**, Summit Middle School, Boulder (Heather Politi and Erin Eastwood); **Davin Yin**, Altona Middle School, Longmont (Tim Criger); **Ben Gabrielson**, Flagstaff Academy, Longmont (Laura Gabrielson); **Gyuyeon Kim**, Monarch K-8 School, Louisville (Min Jung Kim and Silva Chang); and **Joshua Liu**, Challenge School, Denver (Matt Bixby)

### D. E. Shaw Group Certificates of Excellence for Young Women in Mathematics

**Shruti Arun**, Campus Middle School (Christy Marini and Jim Padavic); **Gyuyeon Kim**, Monarch K-8 School (Min Jung Kim and Silva Chang); **Audrey Haas**, Veritas Christian Academy (Jennifer Haas); **Kelly Yang**, Summit Middle School (Heather Politi); and **Emma Russell**, Steamboat Springs Middle School (Shane Lambert and Sally Lambert)

## American Mathematics Competitions 10 and 12

Each contest is a 75-minute 25-question multiple-choice test with approximately 12 common problems between them. Students in grades 10 and below are eligible for the AMC 10 exam; students in grades 12 and below are eligible for the AMC 12 exam. Each contest was administered in different versions in 2021 on February 4<sup>th</sup> [10/12A] and February 10<sup>th</sup> [10/12B]. The AMC 10A and 10B exams were taken by 41,704 students from 2,925 schools; students who took both exams are counted twice. The 12A and 12B exams were taken by 30,564 students from 2,612 schools; students who took both exams are counted twice.

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

- (1) **Eric Wang**, Kinard Core Knowledge Middle School, Ft. Collins (Cecilia Bonertz) \*\*an 8<sup>th</sup> grader!
- (2) **Srinivas Arun**, Cherry Creek High School, Greenwood Village (Jim Padavic and Silva Chang) \*\* a 9<sup>th</sup> grader!
- (3) **Ari Wang**, Rampart High School, Colorado Springs (Ming Song)

Top student in 8<sup>th</sup> grade or below: **Eric Wang**, Kinard Core Knowledge Middle School, Ft. Collins (Cecilia Bonertz)

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## American Mathematics Competitions 10 and 12 (continued)

### AMC 10--Honorable Mention (and Coaches)

**Ethan Lou**, Cherry Creek Elevation, Greenwood Village (Christy Marini); **Jackson Dryg**, Fossil Ridge High School, Ft. Collins; **Davin Yin**, Altona Middle School, Longmont (Tim Criger); **Shruti Arun**, Campus Middle School, Greenwood Village (Christy Marini); **Abhinav Krishna**, Challenge School, Denver (Matt Bixby); **Max Xu**, Rock Canyon High School, Highlands Ranch (Silva Chang and Karen Bukowski); **Maya Vendhan**, Colorado Academy, Denver (Erin Gray and Silva Chang); **Chris Payne**, Fairview High School, Boulder (Terrin Kelly and Silva Chang)

### AMC 12—First Place Colorado Team (and Coach)

**Aiden Lee, Rahul Thomas, and Emily Zhang**, Cherry Creek High School, Greenwood Village (Jim Padavic)

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

- (1) **Rahul Thomas**, Cherry Creek High School, Greenwood Village (Jim Padavic, Cayel Dwyer, and Silva Chang)
- (2) **Aiden Lee**, Cherry Creek High School, Greenwood Village (Jim Padavic and Silva Chang)
- (3) **Emily Zhang**, Cherry Creek High School, Greenwood Village (Jim Padavic, Ming Song, and Silva Chang)

Top student in 10<sup>th</sup> grade or below: **Ethan Lou**, Cherry Creek Elevation, Greenwood Village (Christy Marini) \*\*an 8<sup>th</sup> grader!

### AMC 12—Honorable Mention (and Coaches)

**Anthony Wang**, Rock Canyon High School, Highlands Ranch (Karen Bukowski and Silva Chang); **Quinn Perian**, Stanford Online High School (Naomi Perian and Silva Chang); **Richard Zhou**, Fairview High School, Boulder (Michelle Considine); **Akshati Vaishnav**, Cherry Creek High School, Greenwood Village (Jim Padavic); **Stephen Zhang**, Cherry Creek High School, Greenwood Village (Jim Padavic and Silva Chang); **Brandon Dong**, Cherry Creek High School, Greenwood Village (Jim Padavic and Silva Chang); **Andrew Huycke**, Regis Jesuit High School, Centennial (Austin Glass, Tina Janelle, and Silva Chang); **Shane Lambert**, Steamboat Springs High School, Steamboat Springs (Glenn Dean and Silva Chang); **Grace Zhang**, Grandview High School, Aurora (Kim Mitchell)

## American Regions Mathematics League Team 1

Each year about 2,000 12<sup>th</sup> grade and below students from the U.S. and other countries form 15-member teams to compete at the national ARML competition. In 2020 the in-person ARML Competition was cancelled. Instead, in May 2020, the ARML Local online competition took place with over 1,500 students competing from the U.S. and abroad. Forty-one Colorado students from 15 different schools participated. The Colorado Elbert team placed 16th out of 270 six-member teams.

**Srinivas Arun, Brandon Dong, Ellie Greyson, Aiden Lee, Rahul Thomas, and Emily Zhang**, Cherry Creek High School, Greenwood Village; **Jackson Dryg**, Fossil Ridge High School, Ft. Collins; **Jeremy Huang**, Stargate High School, Thornton; **Andrew Huycke**, Regis Jesuit High School, Aurora; **Abhinav Krishna**, Challenge School, Denver; **Anthony Wang** and **Max Xu**, Rock Canyon High School, Highlands Ranch; **Hannah Wang**, Fairview High School, Boulder; **Grace Zhang**, Grandview High School, Aurora; **Hellen Zhao**, D'Evelyn Jr/Sr High School, Denver.  
Team Coach: Silva Chang, Director, Colorado Math Circle, and AMC 8 co-Editor-in-Chief, University of Colorado Boulder

## American Invitational Mathematics Examination and the USA Math Olympiads

The *American Invitational Mathematics Examination* is a 3-hour, 15-question examination with each answer a 3-digit number. Two versions of the exam were administered on different days to students achieving Honor Roll status on the AMC 10 or 12 exams. The AIME I and II exams were given online this year on March 10<sup>th</sup> and 18<sup>th</sup>. This year, 5,945 students nationwide participated in AIME I.

The *USA Mathematical Olympiad* and the *USA Junior Mathematical Olympiad* are 9-hour 6-question essay examinations to the top 500 or so students participating in the AMC 10 and 12 exams and the AIME; this year, an estimated 60,000 students participated in at least one of these exams nationwide. Both Math Olympiad exams were given on April 13-14 and 19-21. The top 6 USAMO students will comprise the USA team at the International Mathematical Olympiad to be held in July in St. Petersburg, Russia. Nationally, 296 students were invited to take the USAMO exam, including two students from Colorado. Nationally, 254 students qualified for the USAJMO exam, including one from Colorado.

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## USA Mathematical Olympiad and the USA Junior Mathematical Olympiad (continued)

USA Math Olympiad Qualifiers: **Aiden Lee**, Cherry Creek High School, Greenwood Village (Jim Padavic); and **Rahul Thomas**, Cherry Creek High School, Greenwood Village (Jim Padavic, Cayel Dwyer, and Silva Chang)

USA Junior Math Olympiad Qualifier: **Srinivas Arun**, Cherry Creek High School, Greenwood Village (Jim Padavic)  
\*\*Srinivas is a freshman!

## William Lowell Putnam Mathematical Competition

The *William Lowell Putnam Mathematical Competition* is a collegiate examination sponsored by the Mathematical Association of America. It is a 6-hour 12-question essay examination, usually given on campus on the first Saturday in December. This year, however, the exam was held online on February 20<sup>th</sup> without in-person monitoring; hence, results should be considered “unofficial.” No national awards or winners were recognized. This year, 1,953 students from 360 institutions in the U.S. and Canada participated.

### Top 500 Individual Winners (and Coaches) from Colorado Institutions

- (1) **Derek Moran**, Colorado State University (Professors Maria Gillespie and Jae Lee)
- (1) **Frank Rossi**, U.S. Air Force Academy (Professors Kurt Herzinger and Ian Pierce)
- (3) **James Rudd**, Colorado State University (Professors Maria Gillespie and Jae Lee)

## Mathematical Contest in Modeling (MCM) and Interdisciplinary Contest in Modeling (ICM)

These two international contests for college undergraduates and high school students are sponsored by the Consortium for Mathematics and Its Applications (COMAP). Teams of three students work for 100 hours over a long weekend (this year, February 4<sup>th</sup>-8<sup>th</sup>), using applied mathematics to solve their choice of one of six real-world problems. Three MCM problems challenge students to clarify, analyze, and propose solutions to open-ended problems, while three ICM problems are designed to develop and advance interdisciplinary problem-solving skills as well as competence in written communication. In 2021, solutions were submitted by 10,053 teams from 15 countries, including nine Colorado teams from three institutions. There were 17 Outstanding Winners, and 284 Finalists worldwide.

**One of the Outstanding teams and one of the Finalist teams were from CU Boulder! Both teams chose MCM problems and won MAA awards; the Outstanding team also won a SIAM Award and \$10,000 in COMAP scholarships.**

**OUTSTANDING Team:** **Emma Goodwill, Lauren A. Marsh, and Ishika Urvish Patel**, University of Colorado Boulder (Professors Anne Dougherty, Bengt Fornberg, and Manuel Lladser)

**FINALIST Team:** **Branson Camp, Aloha Churchill, and Steven Oakes**, University of Colorado Boulder (Professors Anne Dougherty, Bengt Fornberg, and Manuel Lladser)

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**To see current and past test problems for these competitions, visit these websites:**

- <https://www.mathcounts.org/programs/competition-series/past-competitions> (MATHCOUNTS)
- [https://artofproblemsolving.com/wiki/index.php/AMC\\_Problems\\_and\\_Solutions](https://artofproblemsolving.com/wiki/index.php/AMC_Problems_and_Solutions)  
(AMC 8, 10, 12; AIME, USAJMO & USAMO)
- [https://www.arml.com/ARML/arml\\_2019/page/index.php](https://www.arml.com/ARML/arml_2019/page/index.php) (ARML)
- <https://www.maa.org/math-competitions/putnam-competition> (PUTNAM EXAM)

## Colorado Mathematics Awards Contributors

**Benefactors (\$1,000 or more)**      *Dr. David Larue [former Steering Committee member] and the McGraw-Hill Foundation*  
**Patrons (\$500-\$999)**  
**Supporters (\$100-\$499)**                      *CMA Steering Committee members*

**Contributions and other expressions of support for the Colorado Mathematics Awards (CMA) annual event may be sent to: FLC Foundation, 1000 Rim Drive, Durango CO 81301-3911. Please write CO Math Awards on the memo line.**

*Pictures of students and teacher-coaches from past years may be viewed at [cma.coloradomath.org](http://cma.coloradomath.org).*