UNDERGRADUATE MIDYEAR COMMENCEMENT
December 16, 2016 | Lockridge Arena, Golden, Colorado

BOARD OF TRUSTEES
James Spaanstra, Chairman
Thomas Jorden ’80, Vice Chairman
Stewart Bliss
Timothy Haddon ’70
Patty Starzer ’83
Richard Truly
Frances M. Vallejo ’87
Wendy Harrison, Faculty Trustee
Sarah Steers, Student Trustee

CEREMONY

Processional
National Anthem
Colorado School of Mines Natural Miners
Welcome
Dr. Paul C. Johnson, President
Student Address
Ms. Stacey Dean
Distinguished Speaker
Ms. Frances M. Vallejo, Vice President Corporate Planning and Development, ConocoPhillips
Presentation of the Distinguished Achievement Medal and Mines Medal
Dr. Paul C. Johnson and Thomas Jorden
Recognition of Retiring Faculty
Dr. Thomas Boyd, Provost and Vice President
Recognition of Commissioned Cadets
Colonel John T. Cairney, United States Air Force
Announcement of Baccalaureate Degree Recipients
Presentation of Candidates for Baccalaureate Degrees
Dr. Thomas Boyd, Provost and Executive Vice President
Presentation of the Class of 2016 to the Board of Trustees
Dr. Paul C. Johnson
Acceptance of Class
Mr. James Spaanstra
Conferral of Degrees
Dr. Paul C. Johnson
Closing Remarks
Dr. Paul C. Johnson
Alma Mater
Colorado School of Mines Natural Miners
Recessional
Audience is requested to stand and remain in place until the platform party has exited the arena.

All graduates will be photographed by a professional photographer after receiving their diplomas. Proofs will be sent to each graduate; copies may be ordered directly from the photographer.
BACHELOR OF SCIENCE

COLLEGE OF EARTH RESOURCE SCIENCES AND ENGINEERING
Dr. Ramona M. Graves, Dean

MINING ENGINEERING
Dr. Priscilla P. Nelson, Department Head

MINING ENGINEERING, Bachelor of Science
Ryan M. Bevans  Colorado Springs, Colorado
Vassil Ivanov Boasherliev  Arvada, Colorado
Josef Patrick Bourgeois  Derby, Vermont
Stephen James Candelandia  Dolores, Colorado
Alex Jordan Gribben  Burlington, Colorado
Sedam Sid Ahmed Iveckou  Nouadhibou, Mauritania
Mohamed Lemine Yahya Maghari Sr.  Nouadhibou, Mauritania
Zarifa McIntosh  Golden, Colorado
Tyler N. Rockley  Golden, Colorado
Max Ian Ross  Littletown, Colorado
Enkhjin Tumurbaatar  Ulaanbaatar, Mongolia
Joshua Joseph Wood  Chesapeake, Virginia

GEOLGY AND GEOLOGICAL ENGINEERING
Dr. M. Stephen Enders, Department Head

GEOLGY AND GEOLOGICAL ENGINEERING, Bachelor of Science
Laura Kiyomi Anderson  Littletown, Colorado
Alyssa Marie Schwarz  Golden, Colorado

PETROLEUM ENGINEERING
Dr. Erdal Ozkan, Department Head

PETROLEUM ENGINEERING, Bachelor of Science
Mohamed Husain Alarayedh  Zinj, Bahrain
Ethina Belinda Ameer-Yahia  Columbus, Ohio
Jason Daniel Beckmann*  Altamont, New York
Junchen Dai  Chengdu, China
Cameron J. Davis  Conifer, Colorado
Stacey Rebecca Dean  Cypress, Texas
Tewodros Tefera Dinku  Thornton, Colorado
Justin Russell Dowar  Tomball, Texas
Ryan Christopher Fraley  Farmington, New Mexico
Aaron E. Handke  Loma, Colorado
Brent Robert Harris  Norwood, Colorado
Harrison R. Higgins  Westminster, Colorado
Cody J. Huffmeister  Montgomery, Texas
Allison Elizabeth Keator**  Chesterton, Indiana
Drew Matthew Kerstetter  San Antonio, Texas
Archana Kumari  Golden, Colorado
Caleb L. Lopez  Taft, California
Garrett John Luellen  Colorado Springs, Colorado

GEOPHYSICS
Dr. Roel Snieder, Department Head

GEOPHYSICAL ENGINEERING, Bachelor of Science
Thanyanat Akarapatima*  Hatyai, Thailand
Donald Dennis Arthur  Thornton, Colorado
Brandon Scott Clayton*  Golden, Colorado
Patrick Beard Corwin*  Afton, Virginia
Scott Ryan Harper  Montrose, Colorado
John Stephen Hinton Jr.*  Orangevale, California
Ryan James Meier  Parker, Colorado
Matthew R. Peters  Highlands Ranch, Colorado

ECONOMICS AND BUSINESS
Dr. Michael Walls, Division Director

ECONOMICS, Bachelor of Science
Patrick Sean Callahan  Colorado Springs, Colorado
Evan Li  Highlands Ranch, Colorado
Courtney Elizabeth Neumann  Cypress, Texas

* Summa cum Laude  ** Magna cum Laude  * Cum Laude
COLLEGE OF APPLIED SCIENCE AND ENGINEERING
Dr. Michael J. Kaufman, Dean

GEORGE S. ANSELL DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING
Dr. Angus Rockett, Department Head

METALLURGICAL AND MATERIALS ENGINEERING, Bachelor of Science
Martin Wayne Baldwin Jr. Broomfield, Colorado
Zachary Jermaine Keith Parker, Colorado
Daniel Robert Lanciotti Fort Collins, Colorado
Weston Hill Morris Annapolis, Maryland
Emily Lauren Onsager Lakewood, Colorado
Brandon Allen Ott Larkspur, Colorado
Jacob Paul Tavenner** Arlington, Washington
David Mathew Windom Colorado Springs, Colorado
Logan M. Woish*** Monument, Colorado
Mason M. Woish* Monument, Colorado

CHEMICAL AND BIOLOGICAL ENGINEERING
Dr. David Marr, Department Head

CHEMICAL ENGINEERING, Bachelor of Science
John Patrick Fuller Scottsdale, Arizona
Evan Li Highlands Ranch, Colorado
Steven John Madachy* Erie, Colorado
Logan Anthony Patrick Kenai, Alaska
Olivia Marcus Clarke Rajchel Arvada, Colorado
Jonathan David Wells* Downingtown, Pennsylvania

CHEMICAL AND BIOLOGICAL ENGINEERING, Bachelor of Science
Justin Boyd Cantrall Boulder, Colorado
Harley Joseph Ihrig Golden, Colorado
Ryan Steven Spiller Littleton, Colorado
Seth Nathaniel Topper* Colorado Springs, Colorado

CHEMISTRY AND GEOCHEMISTRY
Dr. David T. Wu, Department Head

CHEMISTRY, Bachelor of Science
Jason Arthur Loving** Colorado Springs, Colorado
Keegan Alec McGehee Montrose, Colorado
Tadeusz Tyler Nitka Pueblo, Colorado
Jacob Kale Warnke Sheridan, Wyoming

PHYSICS
Dr. Jeff Squier, Department Head

ENGINEERING PHYSICS, Bachelor of Science
William Taylor Counley Durango, Colorado
Daniel Michael Dubuisson Boulder, Colorado
Joshua Eric McNeely** Crestone, Colorado
Mollie E Murray** Fort Worth, Texas
Marc Andrew Valdez** Arvada, Colorado
Welton Roger Whitley IV Baton Rouge, Louisiana
Jacob Kieran Wilson** Castle Rock, Colorado

COLLEGE OF ENGINEERING AND COMPUTATIONAL SCIENCES
Dr. Kevin L. Moore, Dean

APPLIED MATHEMATICS AND STATISTICS
Dr. Gregory Fasshauer, Department Head

APPLIED MATHEMATICS AND STATISTICS, Bachelor of Science
Robert Andrew Balkin* Honolulu, Hawaii
Anna M. Kight Bailey, Colorado
Derek Charles Smith** Kingwood, Texas

CIVIL AND ENVIRONMENTAL ENGINEERING
Dr. John E. McCray, Department Head

CIVIL ENGINEERING, Bachelor of Science
Melodie Grace Clayton Hayden, Colorado
David Alan Gabrielson Franktown, Colorado
Eliott Moshe Gordon** Austin, Texas
Alexander John Horvat Littleton, Colorado
Stephen F. Simon Golden, Colorado

ENGINEERING – CIVIL SPECIALTY, Bachelor of Science
Kirk David Woltemade* Thornton, Colorado

ENVIRONMENTAL ENGINEERING, Bachelor of Science
Matthew Eric Greff Golden, Colorado
Frances A.J.E.M. Marlin Idaho Springs, Colorado
Keegan James O’Day Clarendon Hills, Illinois
Shaunta Lee Oehlerking Brighton, Colorado
Justin L. Ripley** Arvada, Colorado
Alejandra L. Ruiz Olathe, Kansas
Mengyuan Yu Thornton, Colorado

*** Summa cum Laude | ** Magna cum Laude | * Cum Laude
COLORADO SCHOOL OF MINES

COMPUTER SCIENCE
Tracy Camp, Division Director

COMPUTER SCIENCE, Bachelor of Science
Erikka Baker***
Evan Jane Balogh
Jess A. Boerner
Ross Conrad Bunker*
Jerrod Alan Crook
Eric Lawrence Dattore
Connor Reid Dougan**
Harrison R. Higgins
Kelbyn R. Larson*
Daniel Edward Mawhirter**
Zachary William McClain
Taylor Jacob McClure
Erik Mark Ponder*
Taylor Allen Rummel
Jordan Jacob Schmerge*
Joshua Brian Snell
John Spielvogel*
Joseph Cody Stockwell
Stephen Philip Unger
Jon Antony Weldon Jr.
Trevor Calvin Worth***

Graham Corcoran*
Caleb Alexander Clough**
Ryan Alan Cohn**
Graham Corcoran*
Matthew Raymond Craig*

Golden, Colorado
Littleton, Colorado
Colorado Springs, Colorado
Albuquerque, New Mexico
Calhan, Colorado
Broomfield, Colorado
Highlands Ranch, Colorado
Westminster, Colorado
Pueblo West, Colorado

MATHEMATICAL AND COMPUTER SCIENCE, Bachelor of Science
Ezekiel T. Chopper

Arvada, Colorado

MECHANICAL ENGINEERING
Dr. Gregory Jackson, Department Head

MECHANICAL ENGINEERING, Bachelor of Science
Yassin Ali Alhauwaj
Matthew John Atherton
Justin Eric Baca***
Blake Michael Beier
Robert William Bennett
Steven Edward Blickley
Jason James Brown
Cassandra Moskovitz Calahan
Urey Chan
Caleb Alexander Clough**
Ryan Alan Cohn**
Graham Corcoran*
Matthew Raymond Craig*

Damam, Saudi Arabia
Durand, Michigan
Highlands Ranch, Colorado
Glenwood Springs, Colorado
Bellaire, Texas
Centennial, Colorado
Brighton, Colorado
Littleton, Colorado
Aurora, Colorado
Greeley, Colorado
Buena Vista, Colorado
Golden, Colorado
Golden, Colorado

Glenwood Springs, Colorado
Boulder, Colorado
Brighton, Colorado
Littleton, Colorado
Aurora, Colorado

MECHANICAL ENGINEERING
Dr. Gregory Jackson, Department Head

MECHANICAL ENGINEERING, Bachelor of Science
Kyle Michael Crews*
Nicholas Peter Davenport**
Robert Chancellor Davis
Zachary Benjamin DeMeyer
Kelly Jane Dempsey***
Grant Henry Buel DeShazer
Victoria Ann Eagen**
Michael David Eckles Jr.
Cortney Danielle Ewert
Alexander Stuart Fornoch
Jaime DeBois Frazier
Benjamin John Gallman**
Jade Elaine Gearhart
Audrey Meredith Gerhart
Jessica Lynn Gerstner**
Brendon Alan Gesior
Alexis Renee Giovannoni
Amber Nicole Harley**
Allen Foster Jackson**
Barton Shaye Justice**
Nicholas Long Kapela
Neil Anthony Kee
Luke Alan Kitten
Benjamin Daniel Koehler***
Christopher Allen Kurikyama
Patrick Tae Lee
Nicholas Joel Markel*
Evan J. Marshall***
Samuel Casey McAlexander
Kyle Knears McClinclont
Justin Andrew McDonald*
Grant Michael Mills*
Steven D. Mohan III
Matthew Dale Myers
Caden Josepaul Nakorniak
Jeffrey S. Nichols**
Logan Stuart Nichols***
Keegan Lee Pratt*
Christine Camille Pumford
Joshua Philip Reed
Kathryn Jennine Regas***
David Ian Rozier
Brittany Valentina Sandoval
Eric Cameron Schalch
Younghun Sim
Riley Jacob Sloan
Steven Michael Staszak
Victoria L. Steffens
Jake R. Stuckey
Raul Noquaye Tackie
Aaron Matthew Therkildsen**
Evan James Thomas
Aleithia Nicole Toews
Cory Matthew Varney

Greeley, Colorado
Keller, Texas
Massillon, Ohio
Colorado Springs, Colorado
Boulder, Colorado
Larkspur, Colorado
Golden, Colorado
Chicago, Illinois
Arvada, Colorado
Kennebunk, Pennsylvania
Evergreen, Colorado
Savannah, Georgia
Thorton, Colorado
Denver, Colorado
Glenwood Springs, Colorado
Downs Grove, Illinois
Fruitland, Colorado
Fort Collins, Colorado
Fulshear, Texas
Colorado Springs, Colorado
Longmont, Colorado
Redmond, Washington
Lubbock, Texas
Sumas, Washington
Lakewood, Colorado
Hudson, Massachusetts
Colorado Springs, Colorado
Colorado Springs, Colorado
Brighton, Colorado
Madison, Wisconsin
Tahkent, Uzbekistan

MECHANICAL ENGINEERING, Bachelor of Science
Ross Conrad Bunker
Computer Science and Electrical Engineering
Harrison R. Higgins
Computer Science and Petroleum Engineering
Evan Li
Chemical Engineering and Economics
Nicholas Joel Markel
Electrical Engineering and Mechanical Engineering

DOUBLE DEGREE RECIPIENTS

Ross Conrad Bunker
Computer Science and Electrical Engineering
Harrison R. Higgins
Computer Science and Petroleum Engineering
Evan Li
Chemical Engineering and Economics
Nicholas Joel Markel
Electrical Engineering and Mechanical Engineering

*** Summa cum Laude | ** Magna cum Laude | * Cum Laude
CEREMONY

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National Anthem
Colorado School of Mines Natural Miners
Welcome
Dr. Paul C. Johnson, President
Student Address
Keynote Address
Dr. Martin Keller, NREL Director
Presentation of the Dr. Bhakta Rath and Sushama Rath Research Award
Dr. Anthony M. Dean, Senior Vice President for Research and Tech Transfer
Announcement and Hooding of Doctoral Degree Recipients
Announcement of Master's Degree Recipients
Presentation of the Class of 2016 to the Board of Trustees
Dr. Bettina Voelker, Dean of Graduate Studies
Presentation of Candidates for Graduate Degrees
Conferring of Graduate Degrees
Dr. Paul C. Johnson
Acceptance of Class
Mr. Thomas Jorden
Closing Remarks
Dr. Paul C. Johnson
Alma Mater
Colorado School of Mines Natural Miners
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## MASTER OF ENGINEERING / MASTER OF SCIENCE

### COLLEGE OF EARTH RESOURCE SCIENCES AND ENGINEERING

Dr. Ramona M. Graves, Dean

### MINING ENGINEERING

Dr. Priscilla P. Nelson, Department Head

**MINING AND EARTH SYSTEMS ENGINEERING, Master of Science**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
</tr>
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<tbody>
<tr>
<td>Soon-Won Kang</td>
<td>Seoul, South Korea</td>
</tr>
<tr>
<td>Charis Karakatsanis</td>
<td>Athens, Greece</td>
</tr>
<tr>
<td>José Eduardo Lozano Sanchez</td>
<td>Granada, Spain</td>
</tr>
<tr>
<td>Ryan P. McCombe</td>
<td>Las Vegas, Nevada</td>
</tr>
<tr>
<td>Leah Mario Young</td>
<td>Fullerton, California</td>
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</table>

### GEOLOGY AND GEOLOGICAL ENGINEERING

Dr. M. Stephen Enders, Department Head

**MINERAL EXPLORATION, Professional Master**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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<tbody>
<tr>
<td>Dennis Esen Alp</td>
<td>Naperville, Illinois</td>
</tr>
<tr>
<td>Bridgette Marie Miller</td>
<td>Amistad, New Mexico</td>
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**PETROLEUM RESERVOIR SYSTEMS, Professional Master**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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<tbody>
<tr>
<td>Louise Marie Kiteley</td>
<td>Austin, Texas</td>
</tr>
</tbody>
</table>

**GEOLOGICAL ENGINEERING, Master of Science**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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<tbody>
<tr>
<td>Emma Louise Bradford</td>
<td>St. Louis, Missouri</td>
</tr>
<tr>
<td>Hayden Edward Brown</td>
<td>Crestwood, Kentucky</td>
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<tr>
<td>Robert L. Duran</td>
<td>Lubbock, Texas</td>
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<tr>
<td>Stephen Nelson Semmens</td>
<td>Morgantown, West Virginia</td>
</tr>
</tbody>
</table>

**GEOLOGY, Master of Science**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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<tbody>
<tr>
<td>Aqeel Al-Khalifa</td>
<td>Hofuf, Saudi Arabia</td>
</tr>
<tr>
<td>Nicole Kirsten Allen</td>
<td>Seattle, Washington</td>
</tr>
<tr>
<td>Nathan Brown</td>
<td>Burke, Virginia</td>
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<tr>
<td>Wesley Shayne Bucker</td>
<td>Houston, Texas</td>
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<tr>
<td>Rania Eldam</td>
<td>Sugar Land, Texas</td>
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<tr>
<td>Mehmet Hazar</td>
<td>Ankara, Turkey</td>
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<td>Andrew William Heger</td>
<td>Cairo, Nebraska</td>
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<tr>
<td>Anna K. Hissem</td>
<td>Castle Rock, Colorado</td>
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<tr>
<td>Elizabeth Agnes Horne</td>
<td>Fort Collins, Colorado</td>
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<tr>
<td>Madison Cheyenne Lytle</td>
<td>Ithspeming, Michigan</td>
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<tr>
<td>Patrick Quigley</td>
<td>New Castle, Colorado</td>
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<tr>
<td>Allison Courtney Schaiberger</td>
<td>Maplewood, New Jersey</td>
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<tr>
<td>Stephen Peter Schwarz</td>
<td>Evergreen, Colorado</td>
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<tr>
<td>Wiley Boulden Skewes</td>
<td>North Andover, Massachusetts</td>
</tr>
<tr>
<td>Amanda Lee Wescott</td>
<td></td>
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</table>

### HYDROLOGY, Master of Science

- Nicole M. Bogenschuetz, Pueblo West, Colorado
- Megan Eileen Cardenas, Cinnaminson, New Jersey
- Mary Michael Forrester, Kingsport, Tennessee
- Savannah Rae Miller, Greenville, South Carolina
- Celeste Danielle Wieting, Bellaire, Texas

### PETROLEUM ENGINEERING

Dr. Erdal Ozkan, Department Head

**PETROLEUM ENGINEERING, Master of Engineering**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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<tbody>
<tr>
<td>Paden Phillipps</td>
<td>Kearns, Utah</td>
</tr>
<tr>
<td>Rocio Lizeth Starr</td>
<td>Santa Cruz, Bolivia</td>
</tr>
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**PETROLEUM ENGINEERING, Master of Science**

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Aidil Adham</td>
<td>Jakarta, Indonesia</td>
</tr>
<tr>
<td>Bekdar Baizhanov</td>
<td>Almaty, Kazakhstan</td>
</tr>
<tr>
<td>Angela Kim Thi Dang</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Xiexiaomeng Hu</td>
<td>Shenzhen, China</td>
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<tr>
<td>Lois Kamga-Ngameni</td>
<td>Yaounde, Cameroon</td>
</tr>
<tr>
<td>Shaken Kenzhekhanov</td>
<td>Almaty, Kazakhstan</td>
</tr>
<tr>
<td>Theerapat Suppachoknirun</td>
<td>Bangkok, Thailand</td>
</tr>
<tr>
<td>Douglas Charles Wilson</td>
<td>Englewood, Colorado</td>
</tr>
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</table>

### GEOPHYSICS

Dr. Roelof K. Snieder, Department Head

**PETROLEUM RESERVOIR SYSTEMS, Professional Masters**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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</thead>
<tbody>
<tr>
<td>Tamer Mohamed Ali</td>
<td>Kafr El Sheikh City, Egypt</td>
</tr>
<tr>
<td>Jennifer Nicole Francis</td>
<td>Evergreen, Colorado</td>
</tr>
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**GEOPHYSICS, Master of Science**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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</thead>
<tbody>
<tr>
<td>Elias Arias</td>
<td>El Paso, Texas</td>
</tr>
<tr>
<td>Mason Thomas Bridges</td>
<td>Hattiesburg, Mississippi</td>
</tr>
<tr>
<td>Hui Wang</td>
<td>Ningbo, China</td>
</tr>
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</table>

### ECONOMICS AND BUSINESS

Dr. Michael R. Walls, Division Director

**ENGINEERING AND TECHNOLOGY MANAGEMENT, Master of Science**

<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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</thead>
<tbody>
<tr>
<td>Cameron Lee Afkhami</td>
<td>Richardson, Texas</td>
</tr>
<tr>
<td>Angelos Barlagiannis</td>
<td>Athens, Greece</td>
</tr>
<tr>
<td>Dallas Matthew Fields</td>
<td>Colorado Springs, Colorado</td>
</tr>
<tr>
<td>Kenneth Huntington Graff</td>
<td>Cincinnati, Ohio</td>
</tr>
<tr>
<td>Matthew Allen Gully</td>
<td>Big Lake, Texas</td>
</tr>
<tr>
<td>Thomas Bradley Hoskins</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>Michael Raymond Lutz</td>
<td>Lakewood, Colorado</td>
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<tr>
<td>Matthew Alan McDowell</td>
<td>Arvada, Colorado</td>
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<tr>
<td>Oluwaseun Shalom Oyatogun</td>
<td>Port Harcourt, Nigeria</td>
</tr>
<tr>
<td>Benjamin David Hansen Smith</td>
<td>Mansfield, Ohio</td>
</tr>
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</table>
### MINERAL AND ENERGY ECONOMICS, Master of Science

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Bansidhar Bandi</td>
<td>Hyderabad, India</td>
</tr>
<tr>
<td>James Crompton</td>
<td>Baltimore, Maryland</td>
</tr>
<tr>
<td>Sarmad Mohamed Diab</td>
<td>Calgary, Canada</td>
</tr>
<tr>
<td>Laila Ahmed El-Ashmawy</td>
<td>Lewisville, Texas</td>
</tr>
<tr>
<td>Rose Fierman</td>
<td>Kingston, Pennsylvania</td>
</tr>
<tr>
<td>William Garrett Hensley</td>
<td>Laramie, Wyoming</td>
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<tr>
<td>Jose Miguel Hofer</td>
<td>Santiago, Chile</td>
</tr>
<tr>
<td>Joao Maio</td>
<td>Porto, Portugal</td>
</tr>
<tr>
<td>Fares Khalil Nasrallah</td>
<td>Paris, France</td>
</tr>
<tr>
<td>Antonio Jose Perez Diaz</td>
<td>Montebello, Colombia</td>
</tr>
<tr>
<td>Victoria Borisovna Pogonyaylova</td>
<td>Moscow, Russia</td>
</tr>
<tr>
<td>Ashwin Kumar Ravichandran</td>
<td>Chennai, India</td>
</tr>
<tr>
<td>Luis Ricardo Rizo Patron Demitriades</td>
<td>Lima, Peru</td>
</tr>
<tr>
<td>David John Rodziewicz</td>
<td>Franklin Park, Illinois</td>
</tr>
<tr>
<td>I Made Artha Segara</td>
<td>Surabaya, Indonesia</td>
</tr>
<tr>
<td>Huma Seth</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>Andrew Hayden Shaw</td>
<td>Riverside, California</td>
</tr>
<tr>
<td>Thomas Andrew Stocker</td>
<td>Lakewood, Colorado</td>
</tr>
<tr>
<td>Simon Ucros Diaz</td>
<td>Bogota, Colombia</td>
</tr>
<tr>
<td>Ramiro Israel Zuniga Chambi</td>
<td>Lima, Peru</td>
</tr>
</tbody>
</table>

### CHEMICAL AND BIOLOGICAL ENGINEERING

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xuhui Feng</td>
<td>Shijiazhuang, China</td>
</tr>
<tr>
<td>Kelley Lynch Heatley</td>
<td>Woodside, California</td>
</tr>
<tr>
<td>Corey Laws Kinsinger</td>
<td>Chandler, Arizona</td>
</tr>
<tr>
<td>Ye Liu</td>
<td>Jilin, China</td>
</tr>
<tr>
<td>Tara Prasad Pandey</td>
<td>Mulibas, Nepal</td>
</tr>
<tr>
<td>Kirby L. Tate</td>
<td>Spartanburg, South Carolina</td>
</tr>
<tr>
<td>Jason Richard Trevithick</td>
<td>Lake Havasu City, Arizona</td>
</tr>
</tbody>
</table>

### PHYSICS

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casey Cameron Cartwright</td>
<td>Parker, Colorado</td>
</tr>
<tr>
<td>Logan Edward Hillberry</td>
<td>Westminster, Colorado</td>
</tr>
<tr>
<td>David Lucio Vargas</td>
<td>Commerce City, Colorado</td>
</tr>
</tbody>
</table>

### MATERIALS SCIENCE, Master of Science

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethan Isaac Palay</td>
<td>Solon, Ohio</td>
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### COLLEGE OF ENGINEERING AND COMPUTATIONAL SCIENCES

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<tbody>
<tr>
<td>Kelsey Renee Kalmbach</td>
<td>Broomfield, Colorado</td>
</tr>
<tr>
<td>Thomas Marion Luctett</td>
<td>Fountain, Colorado</td>
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<tr>
<td>Nathan J. Neri</td>
<td>Oakley, California</td>
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<tr>
<td>Lucas E. Quintero</td>
<td>Parker, Colorado</td>
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<tr>
<td>Benjamin Roger Sattelberg</td>
<td>Broomfield, Colorado</td>
</tr>
<tr>
<td>Nora Stack</td>
<td>College Park, Maryland</td>
</tr>
<tr>
<td>Sarah Anne Verros</td>
<td>Colorado Springs, Colorado</td>
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### NUCLEAR ENGINEERING, Master of Science

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<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Clinton Wilson</td>
<td>Helena, Montana</td>
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### CHEMICAL ENGINEERING, Master of Science

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td>Dr. David W. Marr, Department Head</td>
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### APPLIED PHYSICS, Master of Science

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<tr>
<td>Dr. Jeff Squier, Department Head</td>
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**CIVIL AND ENVIRONMENTAL ENGINEERING**
Dr. John E. McCray, Department Head

**CIVIL AND ENVIRONMENTAL ENGINEERING, Master of Science**
Audra Leigh Agajanian
Grand Junction, Colorado

Brad E. Burbach
Fort Collins, Colorado

Victoria Bennett Frank
Greeley, Colorado

Meaghan Eileen Guyader
Glenwood, Maryland

Maxwell Inge Hill
Montgomery, Alabama

Caitlin Helen Kowels
Las Vegas, Nevada

York Windsor Lewis
Freeville, New York

Ryan J. Logan
Colorado Springs, Colorado

Taylor Raine Madden
Loveland, Colorado

Brandon Scott Miller
Cass City, Michigan

Brian Weiner
Akron, Ohio

Travis Corwin Goddard White
Arvada, Colorado

**ENVIRONMENTAL ENGINEERING SCIENCE, Master of Science**
Chelsea Michele Bokman
Albion, New York

Lisa Marie Cherry
Cape May, New Jersey

Jason Coontz
Davis, California

Cynthia Mai Kanno
Eastchester, New York

**HYDROLOGY, Master of Science**
Adam Paul Backsmier
Bloomington, Illinois

Rachel Elizabeth Blomberg
Sacramento, California

Mark Russell Collar
Hanford, California

**UNDERGROUND CONSTRUCTION AND TUNNELING, Master of Science**
Noah Bria Kimmes
Bessemer, Michigan

Ali Nazem
Tehran, Iran

Adam Benjamin Reinbold
Minneapolis, Minnesota

**COMPUTER SCIENCE**
Dr. Tracy K. Camp, Division Director

**COMPUTER SCIENCE, Master of Science**
Zheming Deng
Shanghai, China

Benjamin Thomas Fuller
Lone Tree, Colorado

Stephen Davidson Kennicutt
Highlands Ranch, Colorado

Chenchen Nie
Hefei, China

Yuhui Zhang
Jiang Su, China

**ELECTRICAL ENGINEERING**
Dr. Atef Z. Elsherbeni, Division Director

**ELECTRICAL ENGINEERING, Master of Science**
Mohammad Babakmehr
Shiraz, Iran

Justin A. Cyrus
League City, Texas

Ross Michiel Eldridge
Casper, Wyoming

Adam Tracker Goree
Keatchie, Louisiana

Nicole Elaine Gruber
Evergreen, Colorado
COLLEGE OF EARTH RESOURCE SCIENCES AND ENGINEERING

Dr. Ramona M. Graves, Dean

MINING ENGINEERING

Dr. Priscilla P. Nelson, Department Head

MINING AND EARTH SYSTEMS ENGINEERING, Doctor of Philosophy

Hafiz Syed Mahmood Arshad Lahore, Pakistan
Advisor: Masami Nakagawa
Numerical Analyses of the Long Term Behavior of Enhanced Geothermal System (EGS)

Amin Azhari Isfahan, Iran
Advisor: Mustafa Ozbay
Evaluating the Effect of Earthquakes on Open Pit Mine Slopes

Lisa Maria Mori Steyr, Austria
Advisor: Michael Mooney
Advancing Understanding of the Relationship between Soil Conditioning and Earth Pressure Balance Tunnel Boring Machine Chamber and Shield Annulus Behavior

Eric Clayton Poeck New Braunfels, Texas
Advisor: Mustafa Ozbay
Analyzing the Potential for Unstable Mine Failures with the Calculation of Released Energy in Numerical Models

Collin Lee Stewart Farmington, New Mexico
Advisor: Mustafa Ozbay
Estimating the Probability of Satisfactory Conditions for Main Entry Intersections in A Coal Mine in Weak Rock under Deep Mining Depth

Ady De Almeida Dias Van-Dunem Luanda, Angola
Advisor: Kadri Dagdelen
Open-Pit Mine Production Scheduling Under Grade Uncertainty

GEOLOGY AND GEOLOGICAL ENGINEERING

Dr. M. Stephen Enders, Department Head

HYDROLOGY, Doctor of Philosophy

Dong Ding Changyuan, China
Advisor: David Benson
Application of the Lagrangian Particle-Tracking Method to Simulating Mixing-Limited, Field-Scale Biodegradation

James Matthew Gilbert Iowa Falls, Iowa
Advisor: Reed Maxwell
Exploring Catchment Connections with Integrated Hydrologic Models: System Interactions and Responses to Groundwater Extraction and Climate Change In the San Joaquin River Basin

PETROLEUM ENGINEERING

Dr. Erdal Ozkan, Department Head

PETROLEUM ENGINEERING, Doctor of Philosophy

Ali Abdulrahman Albinali Dammam, Saudi Arabia
Advisor: Erdal Ozkan
Analytical Solution for Anomalous Diffusion in Fractured Nano-porous Reservoirs

Qi Cui Tianjin, China
Advisor: Hazim Abass
Stress Dependent Compaction in Tight Reservoirs and its Impact on Long-Term Production

Ralf Werner Holy Vienna, Austria
Advisor: Erdal Ozkan
Numerical Investigation of 1D Anomalous Diffusion in Fractured Nanoporous Reservoirs

Sanyog Kumar Lakhisarai, India
Advisor: Monica Prasad
Rock-Fluid Interaction and Phase Properties of Fluids in Nano- and Subnano-Pores of Shales: Sorption-Based Studies

GEOPHYSICS

Dr. Roelof K. Sniider, Department Head

GEOPHYSICS, Doctor of Philosophy

Esteban Fernando Diaz Pantin Caracas, Venezuela
Advisor: Paul Sava
Extended Imaging and Tomography Under Two-Way Operators

Yuting Duan Kaifeng, China
Advisor: Paul Sava
Elastic Wavefield Migration and Tomography

ECONOMICS AND BUSINESS

Dr. Michael R. Walls, Division Director

INTERDISCIPLINARY - OPERATIONS RESEARCH WITH ENGINEERING, Doctor of Philosophy

Vitaliy A. Krasko Denver, Colorado
Advisor: Steffen Rebennack
Optimal Natural Hazard Management for Post-Wildfire Debris Flows

MINERAL AND ENERGY ECONOMICS, Doctor of Philosophy

Matthew Nicholas Doyle Parker, Colorado
Advisors: Harrison Fell and Ian Lange
Three Empirical Essays on Power Plant Operating Decisions

Mohammad Kemal Jakarta, Indonesia
Advisor: Ian Lange
Empirical Studies on Changes in Oil Governance
GEORGE S. ANSELL DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING
Dr. Angus A. Rockett, Department Head

MATERIALS SCIENCE, Doctor of Philosophy
Nasser Aljassem  
Al Hasa, Saudi Arabia  
Advisor: Brajendra Mishra  
Fundamental Studies To Elucidate The Protection Mechanism(s) For Making Intelligent Choices Of Coatings Used In Oil And Gas Production

Adam Weld Stokes  
Jamestown, Colorado  
Advisor: Brian Gorman  
Relating Nanoscale Chemistry to Electrical Properties for High-Efficiency Cu(In,Ga)Se2 Solar Cells

Bo Wang  
Chengdu, China  
Advisors: Michael Kaufman and Gerald Bourne  
An Investigation of the Adhesion Behavior of Aluminum on Various PVD Coatings Applied To H13 Tool Steel to Minimize or Eliminate Lubrication during High Pressure Die Casting

METALLURGICAL AND MATERIALS ENGINEERING, Doctor of Philosophy
Daniel Schofield Baker  
Cedar Falls, Iowa  
Advisor: John Speer  
Comparison of Oil and Intensive Quenching Via Coupled Thermal, Transformation, and Mechanical Modeling

Myungwon Jung  
Seoul, South Korea  
Advisor: Brajendra Mishra  
Recovery of Valuable Materials from Fine Industrial Waste Streams

Cody Alan Miller  
Charlotte, Michigan  
Advisor: Michael Kaufman  
The Effects of Thermomechanical Processing and Annealing On the Microstructural Evolution and Stress Corrosion Cracking of Alloy 690

Whitney Ann Poling  
Colorado Springs, Colorado  
Advisor: Kip Findley  
Tensile Deformation of Third Generation Advanced High Strength Sheet Steels Under High Strain Rates

Caryn Nicole Ritosa  
Fremont, Michigan  
Advisor: Chester Van Tyne  
Influence Of Processing Parameters And Alloying Additions On The Mechanically Determined No-Recrystallization Temperature In Niobium Microalloyed Steels

Ellen Elizabeth Wright  
Highlands Ranch, Colorado  
Advisor: Michael Kaufman  
Effects of Strain Variations on Aging Response and Corrosion Properties of Third Generation Al-Li Alloys

CHEMICAL AND BIOLOGICAL ENGINEERING
Dr. David W. Marr, Department Head

CHEMICAL ENGINEERING, Doctor of Philosophy
Ye Liu  
Jilin, China  
Advisors: Andrew Herring and Matthew Liberatore  
Effect of Bulky Cations on the Function and Stability of Anion Exchange Membranes

Tara Prasad Pandey  
Mulibas, Nepal  
Advisors: Andrew Herring and Matthew Liberatore  
Transport Properties of Anion Exchange Membranes for Fuel Cell Applications

MATERIALS SCIENCE, Doctor of Philosophy
Jiaojiao Li  
Shijiazhuang, China  
Advisor: Colin Wolden  
Development of ZnTe:Cu Contacted CdTe Solar Cells

YE LIU, Jilin, China  
Advisors: Andrew Herring and Matthew Liberatore  
Effect of Bulky Cations on the Function and Stability of Anion Exchange Membranes

TARA PRASAD PANDEY, Mulibas, Nepal  
Advisors: Andrew Herring and Matthew Liberatore  
Transport Properties of Anion Exchange Membranes for Fuel Cell Applications

CHEMISTRY AND GEOCHEMISTRY
Dr. David T. Wu, Department Head

APPLIED CHEMISTRY, Doctor of Philosophy
Carmen Robert Mills Bria  
Denver, Colorado  
Advisor: Kim Williams  
Development of Asymmetrical Flow Field-Flow Fractionation for the Characterization of Proteins, Protein Aggregation, and Nanoparticles

Jonathan Thomas Morelli  
Golden, Colorado  
Advisor: Mark Eberhart  
Making Theoretical Chemistry Useful to Practicing Chemists as Researchers and Educators

Caleb Andrew Tormey  
Grand Junction, Colorado  
Advisor: David Wu  
RISM Theories for Polymers and Multi-Site Molecules: Applications to Polymer Blends Near Surfaces and Hybrid Theory/Simulations

Jacob Lee Williamson  
Cincinnati, Ohio  
Advisor: James Ranville  
Development and Application of Field Methods for Determination of the Extent of Acid Mine Drainage Contamination, and Geochemical Characteristics of Stream Sediment Recovery

Benjamin David Zeidman  
Lakewood, Colorado  
Advisor: David Wu and Ning Lu  
Monte Carlo Simulations of Phase Distribution in Porous Materials

GEOCHEMISTRY, Doctor of Philosophy
Elizabeth Marie Traudt  
Lakewood, Colorado  
Advisor: James Ranville  
Evaluation of Toxicity and Bioavailability of Metal Mixtures to Two Freshwater Invertebrates

MATERIALS SCIENCE, Doctor of Philosophy
Frederick Carl Prehn Jr.  
Wausau, Wisconsin  
Advisor: Stephen Boyes  
Use of Chain Growth Polycondensation via Substituent Effects for the Development of New Polymer Brush Systems

PHYSICS
Dr. Jeff Squier, Department Head

MATERIALS SCIENCE, Doctor of Philosophy
Grant William Klafehn  
Naperville, Illinois  
Advisor: Reuben Collins  
Silicon Nanoparticle Optimization and Integration Into Amorphous Silicon via PECVD for Use in Photovoltaics
COLLEGE OF ENGINEERING AND COMPUTATIONAL SCIENCES
Dr. Kevin L. Moore, Dean

APPLIED MATHEMATICS AND STATISTICS
Dr. Gregory E. Fasshauer, Department Head

APPLIED MATHEMATICS AND STATISTICS – COMPUTATIONAL AND APPLIED MATH SPECIALTY, Doctor of Philosophy
Charles Omer Morgenstern Colorado Springs, Colorado Advisor: Mahadevan Ganesh High-Order High-Performance Computing Algorithms for Wave Propagation in Heterogeneous Media Geothermal System (EGS)

APPLIED MATHEMATICS AND STATISTICS – STATISTICS SPECIALTY, Doctor of Philosophy
Karen Elizabeth Kazor Edison, New Jersey Advisor: Amanda Hering Identifying Clusters in Multivariate Temporal and Spatial Data with Application to Environmental Processes

CIVIL AND ENVIRONMENTAL ENGINEERING
Dr. John E. McCray, Department Head

CIVIL AND ENVIRONMENTAL ENGINEERING, Doctor of Philosophy
Ali Moradi Dharehztapeh Ardabil, Iran Advisor: Kathleen Smits Experimental and Numerical Analysis of Heat Transfer in Unsaturated Soil With An Application to Soil Borehole Thermal Energy Storage (SBTES) Systems

Hydrology, Doctor of Philosophy

ENGINEERING – CIVIL SPECIALTY, Doctor of Philosophy
Minal Lalit Parekh Erie, Colorado Advisor: Michael Mooney Advancing Internal Erosion Monitoring Using Seismic Methods in Field and Laboratory Studies

ENVIRONMENTAL SCIENCE AND ENGINEERING, Doctor of Philosophy
Dina Marie Drennan Milbrae, California Advisors: Jonathan Sharp and Robert Almstrand Biogeochemistry of Sulfate Reducing Bioreactors: How Design Parameters Influence Microbial Consortia and Metal Precipitation

INTERDISCIPLINARY – OPERATIONS RESEARCH WITH ENGINEERING, Doctor of Philosophy
Ashley Marie Beyers Arigoni Danville, California Advisors: Cameron Turner and Alexander Newman Optimization Techniques in Coal Markets: A Global Cost Minimization and a Multi-State Procurements Strategy

MECHANICAL ENGINEERING, Doctor of Philosophy

Michael Stanley Morse Marquette, Michigan Advisors: Ning Lu and Jonathan Godt Field and Laboratory Investigations of Variably Saturated, Potential Landslides

COMPUTER SCIENCE
Dr. Tracy K. Camp, Division Director

COMPUTER SCIENCE, Doctor of Philosophy
Rui Zhao Xi’an, China Advisor: Chuan Yue Vulnerability Exploration and Data Protection in End-User Applications

ELECTRICAL ENGINEERING
Dr. Atef Z. Elisherbeni, Division Director

ELECTRICAL ENGINEERING, Doctor of Philosophy
Paul R. Kaster Towanda, Pennsylvania Advisor: Pankaj Sen A Novel Approach to Quantify Cybersecurity for Electric Power Systems

MECHANICAL ENGINEERING
Dr. Gregory Jackson, Department Head

ENGINEERING SYSTEMS, Doctor of Philosophy
Andrew Michael Neill Dallas, Texas Advisor: John Steele The Application of 3D Reconstruction by Stereo Vision for the Purpose of Assessing Weld Quality

Jeffrey Lee Wheeler Pullman, Washington Advisor: Jason Porter Spectroscopic and Optical Diagnostics for Investigations of Liquid Electrolytes

INTERDISCIPLINARY – OPERATIONS RESEARCH
Advisor: Alex Drzewiecki

This list is incomplete and does not include all the students who have graduated. It is provided for illustrative purposes only.
## Senior Awards

<table>
<thead>
<tr>
<th>THE OUTSTANDING GRADUATING SENIOR AWARD</th>
<th>CHARLES N. BELL, 1906, AWARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>May be presented by each degree-granting department to its outstanding graduating senior.</td>
<td>Provided for by Mr. Bell, is a Brunton transit, awarded in mining for completing the course in mining with the most progress in school work during the entire period for which the course is given.</td>
</tr>
<tr>
<td>Computational and Applied Mathematics Derek Smith</td>
<td>Nikky McIntosh</td>
</tr>
<tr>
<td>Civil and Environmental Engineering Elliott Gordon</td>
<td>The Honorable D. W. Brunton Award</td>
</tr>
<tr>
<td>Chemistry and Geochemistry Jason Loving</td>
<td>Provided by Mr. Brunton to recognize meritorious work in mining.</td>
</tr>
<tr>
<td>Computer Science Erikka Baker</td>
<td>Josef Bourgeois</td>
</tr>
<tr>
<td>Economics and Business Patrick Sean Callahan</td>
<td>The Clark B. Carpenter Award</td>
</tr>
<tr>
<td>Electrical Engineering Nicholas Joel Markel</td>
<td>Presented to the graduating senior in mining or metallurgy who, in the opinion of the seniors in mining and metallurgy and the professors in charge of the respective departments, is the most deserving of this award.</td>
</tr>
<tr>
<td>Geophysics John S. Hinton</td>
<td>Enkhjim Tumuraatar Jacob Tavenner</td>
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<tr>
<td>Mechanical Engineering Kathryn Regas</td>
<td>The Mary &amp; Charles Cavanaugh Award</td>
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<tr>
<td>Metallurgical and Materials Engineering Logan Woish</td>
<td>Presented in metallurgy, is determined by scholarship, professional activity and participation in school activities.</td>
</tr>
<tr>
<td>Mining Engineering Tyler Rockley</td>
<td>Mason Woish</td>
</tr>
<tr>
<td>Petroleum Engineering Richard Rice</td>
<td>Computer Science Outstanding Undergraduate Researcher</td>
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<tr>
<td>Physics Marc Valdez</td>
<td>Daniel Mawhirter</td>
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<tr>
<td><strong>COMPUTER SCIENCE FACULTY CHOICE AWARD</strong></td>
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<tr>
<td><strong>THE PRESIDENT’S SENIOR SCHOLAR ATHLETE AWARD</strong></td>
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<tr>
<td>Presented to one graduating female and male athlete with a cumulative grade point average of 3.0 or higher, has lettered in a sport during their senior year, and who has demonstrated leadership qualities of an exemplary student-athlete.</td>
<td>Presented to a graduating senior who demonstrates early leadership potential in the field of Geophysical Engineering.</td>
</tr>
<tr>
<td>Amber Harley Richard Rice</td>
<td>Brandon S. Clayton</td>
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<tr>
<td><strong>THE MARYANNA BELL KAFADAR AWARD</strong></td>
<td><strong>THE MARYANNA BELL KAFADAR AWARD</strong></td>
</tr>
<tr>
<td>Presented to the graduating senior who has excelled in humanities courses and humanities-related activities.</td>
<td>Christine Pumford</td>
</tr>
<tr>
<td><strong>H.G. WASHBURN AWARD</strong></td>
<td><strong>H.G. WASHBURN AWARD</strong></td>
</tr>
<tr>
<td>Presented in mining for good scholastic record and active participation in athletics.</td>
<td>Stephen Candelaria</td>
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<tr>
<td><strong>MATERIALS ENGINEERING FACULTY AWARD</strong></td>
<td><strong>MATERIALS ENGINEERING FACULTY AWARD</strong></td>
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<tr>
<td>Presented from time to time by the faculty of the department to the graduating senior who, by participation in and contribution to campus life and by academic achievement, has demonstrated those characteristics of a well-rounded graduate that Mines aspires to develop in its students.</td>
<td>Logan Woish</td>
</tr>
<tr>
<td><strong>PHYSICS FACULTY DISTINGUISHED GRADUATES</strong></td>
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</tr>
<tr>
<td>Jacob Wilson Mollie Murray</td>
<td><strong>GEORGE T. MERIDETH AWARD</strong></td>
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<td>Presented to a graduating senior who demonstrates early leadership potential in the field of Geophysical Engineering.</td>
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ACADEMIC HONORS, SCHOLARS AND HONOR SOCIETIES

Mines awards the academic honors designations of summa cum laude, magna cum laude and cum laude. The honor cords worn by students earning the highest designation, summa cum laude, are royal blue and orange. Magna cum laude is represented by light blue and orange. Cum laude is represented by silver and orange. Honor cords and stoles are also worn to signify involvement in honor societies, scholars programs and recognition of international students.

HARVEY SCHOLARS
Many Mines students benefit from scholarships provided by our generous alumni and friends. The Harvey Scholars program provides full tuition for four years.
Mollie Murray
Kylen McClintock

GRADUATE AWARDS
RATH AWARD
The Dr. Bhakta Rath and Sushama Rath Research Award recognizes a Colorado School of Mines doctoral graduate whose thesis demonstrates the greatest potential for societal impact.
Rui Zhao (Computer Science)

RATH AWARD FINALISTS
Kevin Albrecht (Mechanical Engineering)
Ali Moradi (Civil and Environmental Engineering)
Whitney Poling (Metallurgical and Materials Engineering)
Adam Stokes (Materials Science)
Michael Teter (Operations Research with Engineering)

MENDENHALL PRIZE
The Mendenhall Prize is awarded by the Department of Geophysics to its outstanding PhD graduate.
Yuting Duan

OUTSTANDING CHEMICAL AND BIOLOGICAL ENGINEERING STUDENT
Ye Liu

MILITARY COMMISSIONS
The following students will be commissioned as Second Lieutenants in the United States Air Force:
Heidi M. Logsdon
Jason A. Loving
Steven D. Mohan
The following student will be commissioned as Second Lieutenant in the United States Army:
Patrick S. Callahan

SENIOR GIFT
Senior Gift is a long-standing tradition recognizing the numerous seniors who actively participated in acquiring contributions for the Senior Class Gift to Colorado School of Mines.

Thank you, Class of 2016, for embracing this tradition of giving back to the institution. Your generosity makes a lasting difference for future Mines students and further advances the school’s long history of excellence.

EMERITUS FACULTY
Five faculty members announced their retirement during the past academic year and have been awarded Emeritus status by the Board of Trustees.
Dr. Willy A. Hereman — Emeritus Professor of Applied Mathematics and Statistics
Joanne V. Lerud-Heck — Emeritus Librarian, Arthur Lakes Library
D. Graham G. W. Mustoe — Emeritus Professor of Mechanical Engineering
Dr. Terry Parker — Emeritus Professor of Mechanical Engineering
Frances M. Vallejo
Vice President, Corporate Planning and Development, ConocoPhillips

Frances M. Vallejo is Vice President, Corporate Planning and Development for ConocoPhillips, the world’s largest independent oil company in terms of production and proved reserves. Currently responsible for strategic planning, during her 28 years with ConocoPhillips Ms. Vallejo has played key roles in a variety of major transactions, among them mergers and acquisitions, divestitures and spinoffs, and formation of multi-company partnerships. An enthusiastic supporter of the Colorado School of Mines, she was appointed to its Board of Trustees in 2010, following years of voluntary service.

Ms. Vallejo graduated from Mines in 1987 with a B.S. in Mineral Engineering Mathematics, after having received the Outstanding Senior Award from the McBride Honors Program and the E-Day Engineer Award for the mathematics department. A native of Pueblo, Colorado, Ms. Vallejo graduated from South High School and was named a Boettcher Scholar. She was inducted into that school’s Hall of Fame in 2009.

Ms. Vallejo joined ConocoPhillips predecessor Phillips Petroleum Company in 1987 as a geophysicist, and served in a number of technical assignments. She later earned an M.B.A. from Rice University, where she was named a Jones Scholar, and subsequently advanced through management assignments in strategy and finance, including serving as Vice President and Treasurer, until assuming her current position in 2016.

She has also served on a number of other boards, including for Teach For America - Houston Region, the 66 Federal Credit Union, and the United Way in Bartlesville, Oklahoma. Ms. Vallejo married a Mines alumnus, Scott Irvine, and together they have three children, one of whom is currently a student at Mines majoring in Petroleum Engineering.

Established in 1942, the Distinguished Achievement Medal is awarded to alumni of any year in recognition of distinguished career achievements.
James R. Spaanstra

Chairman of the Board of Trustees

James Spaanstra was named Executive Director for Great Outdoors Colorado (GOCO) in 2016. Prior to accepting his position with GOCO he was a partner in the law firm of Faegre Baker Daniels LLP. Mr. Spaanstra has been in private practice for more than 35 years, developing one of the largest and most diverse environmental practices in the Rocky Mountain region.

Early in his career, he served as a staff attorney for the Council on Environmental Quality in the Executive Office of the President of the United States for President Carter, where he helped develop national environmental policy. Since that time, Mr. Spaanstra has actively participated in the drafting and development of environmental laws and regulations at the local, state and federal levels.

Mr. Spaanstra served as the Treasurer, and then as Vice-Chair, of the Great Outdoors Colorado Board and, as past Chairman of the Jefferson County Colorado Planning Commission. He is a member of the Board of Regents of the American College of Environmental Lawyers.

Mr. Spaanstra received his B.S. from Grand Valley State University, and studied Law and Public Policy at the University of Michigan Law School, where he received his J.D.

Mr. Spaanstra was appointed to the Colorado School of Mines Board of Trustees in January 2008 and was reappointed in 2012. He currently serves as Chairman of the Board.

The Mines Medal is awarded by the Colorado School of Mines Board of Trustees to individuals who have rendered unusual and exemplary service to the university.
Martin Keller, Ph.D.
Director, National Renewable Energy Laboratory

Martin Keller became the National Renewable Energy Laboratory’s (NREL) director on November 30, 2015. NREL is the Department of Energy’s primary laboratory for energy efficiency and renewable energy research and development. NREL is operated for the U.S. Department of Energy (DOE) by Alliance for Sustainable Energy, LLC (Alliance). Dr. Keller also serves as the President of Alliance.

Dr. Keller joined Oak Ridge National Laboratory (ORNL) in July 2006. He was appointed to the role of Associate Laboratory Director at ORNL on July 1, 2009. On November 1, 2010, a new directorate was formed, Energy and Environmental Sciences, and he was asked to lead this newly-established directorate. As Associate Laboratory Director of this directorate, he was responsible for the energy, biological, and environmental research programs at ORNL supported by DOE, the Environmental Protection Agency, and the National Institutes of Health. Dr. Keller served as the Founding Director of the DOE BioEnergy Science Center, and, before being named Associate Laboratory Director at ORNL, he served as the Director of the Biosciences Division.

Between 1996 and 2006 Dr. Keller held a series of research management positions within Diversa Corporation, a publicly-traded biotechnology company in San Diego. Dr. Keller joined Diversa Corporation in June 1994 as a consultant to build and develop the microbiology expertise within Diversa, before joining Diversa Corporation full time in 1996.

Dr. Keller was elected Fellow of the American Association for the Advancement of Science in 2013. Dr. Keller received his Ph.D. in Microbiology from the University of Regensburg, Germany.
COLORADO SCHOOL OF MINES

An historic public research university with a specialized STEM mission, known globally for producing top scientists and engineers, and for its unparalleled depth in subjects related to earth, energy and the environment.

Colorado School of Mines is a highly selective institution, having the highest admissions standards of any public university in Colorado and among the highest of any public university in the nation. It seeks students who are academically accomplished, enjoy challenges, are team players, and who will be engaged members of the Mines community.

Throughout its history, Mines has delivered a unique brand of practical and professional education. Its programs combine rigor, hands-on experiences, collaborative problem-solving, and professional work experience. Additional professional development and exploration occur through the 200+ clubs and organizations.

Students and faculty work together at Mines to innovate and advance the frontiers of knowledge in areas that are critical to society, including: unconventional natural gas, solar materials, fuel cells, biofuels, advanced water treatment, gas hydrates, critical minerals, geothermal energy, subsurface hydrology, ferrous metallurgy, subsurface characterization, intelligent geosystems and high-performance computing.

Mines students graduate with a strong sense of integrity, resilience, confidence in tackling new problems, ability to work in collaborative environments, an enhanced sense of responsibility to promote positive change in the world, and pride in their Mines degree.

Home of the Mines campus since 1874, the picturesque town of Golden offers Colorado’s famous outdoor adventures as well as access to the many attractions of nearby Denver.
CONFERRED DEGREES
Departmental degrees are awarded at Colorado School of Mines according to the order in which the department or program originally conferred a degree, dating back to the first Mines commencement in 1883, at which two Mining degrees were awarded. The College of Engineering and Computational Sciences, established in 2011, offers the newest degrees.

SILVER DIPLOMAS
While the degrees granted by Colorado School of Mines are valuable and unique, so are the diplomas themselves. The Mines silver diploma is a long-standing tradition dating back to 1933 when Charles A. Hull engraved a silver diploma as a gift for his son, a recent graduate. The diploma caught the eye of then President Melville F. Coolbaugh, who asked that silver diplomas be made for all Mines graduates.

Starting with the commencement of 1934, Mines began issuing silver diplomas, measuring five by six inches and etched into pure sterling silver. Creating these diplomas required two workers spending six weeks (or 500 hours) making 19 delicate etchings in each diploma.

Today the tradition of metal diplomas continues, with all students receiving a silver/nickel plated diploma upon graduation from Mines.

ACADEMIC REGALIA: CAPS, GOWNS AND HOODS
The academic dress worn by today’s graduates reflects a tradition begun in the late 12th century, when universities were taking form, and codified in the U.S. in 1895 under the Academic Costume Code. Originally the dress may have had a practical purpose: to keep the student warm in unheated buildings, but today it is ceremonial and divided into three parts: caps, gowns and hoods.

The traditional cap is the mortarboard with colored tassels to identify the graduate’s discipline or field of study. Doctors of Philosophy wear a gold tassel, Masters of Science a yellow tassel, Masters of Engineering an orange tassel and Bachelors of Science a black tassel.

Bachelor’s and master’s gowns are untrimmed (though women may wear white colors with a bachelor’s gown), but doctor’s gowns are faced down the front with velvet and trimmed with three velvet bars across the sleeves. The velvet facing and bars are black or the color of the field of study.

Hoods are also black. The doctor’s hood is four feet in length, and the master’s three and one-half feet. Colorado School of Mines hoods are lined with silver and blue, the official school colors. The velvet border on the hood, which is three and five inches wide for the master’s and doctor’s degree, respectively, identifies the field of study to which the degree pertains. Colorado School of Mines hoods have yellow velvet borders for Master of Science, orange velvet borders for Master of Engineering and blue velvet borders for Doctor of Philosophy.
THE BOOK: DE RE METALLICA
The Colorado School of Mines Faculty Senate President, Dinesh Mehta, leads the academic portion of the commencement procession, carrying a replica of the 16th century treatise De Re Metallica. Widely regarded as the seminal text on mining and the science of metallurgy, this historic volume serves as a symbol of the body of knowledge shared by Mines’ faculty and students. The book is placed on a stand at the front of the stage. Its opening marks the start of the commencement ceremony and also recalls the beginning of the students’ education at the school. The ceremony’s end is signified by the closing of the book.

A first edition of De Re Metallica, written by Georg Bauer under the pseudonym Agricola and printed in 1556, resides in the vault of Mines’ Arthur Lakes Library, as does a subsequent edition printed in 1621. In addition to these original texts, the library also houses several copies of Herbert Hoover’s 1912 translation from Latin, including one signed by the nation’s 31st president and his wife, Lou. Hoover contributed the introduction and lengthy footnotes. He visited mine sites and carried out Agricola’s formulas in laboratories to check the translations. Issued in a limited edition, it quickly became a collector’s item. Of the 3,000 copies printed, more than half were given free to mining engineers and students.

UNIVERSITY MACE
The Colorado School of Mines Faculty Senate Distinguished Lecturer, Dr. Tracy Camp, carries the mace, which has a rich history as a symbol of authority back to the 13th century. In commencement processions, the mace is carried before the president and the dignitaries composing the platform party. The Mines Mace stands 4 feet 8 inches high and weighs 16 pounds. The core is a rosewood staff, covered by fitted brass and cast bronze, silver plated and topped by Mines’ mascot, Blaster. Mines Professor Emeritus Robert Taylor executed the design and Mr. Emil Dangreau produced the finished standard with the official school seal photoengraved on the base of the staff.

PRESIDENTIAL MEDALLION
The silver medallion, worn only by the Colorado School of Mines president, was designed by Rex Bull, an emeritus professor in the George S. Ansell Metallurgical and Materials Engineering Department and cast by students using silver donated by the Colorado School of Mines Alumni Association. It was first used at the inauguration of George S. Ansell as the 13th president of the school on February 8, 1985.
The Mines Alma Mater, to the tune of “Aura Lee,” is played during the Commencement Recessional, to acknowledge graduates’ transition from Mines students to Mines alumni.


**MINES ALMA MATER**

Raise your voices engineers, your devotion sing

To the greatest School of Mines, let the chorus ring

Hail to thee, C.S.M. to our hearts most dear

Ev’ry miner lauds name and ev’ry engineer.

Honor, glory to thy name, these we pledge anew

While we live to sing thy fame, Alma Mater true

Hail to thee School of Mines, silver and blue

Ev’ry Miner sings thy praise, Alma Mater true.