Our Timeless Mission

“We, the Colorado School of Mines community, are united by our commitment to our timeless mission of educating and inspiring students from all backgrounds and advancing knowledge and innovations, with the aspiration that our graduates, ideas, actions, and innovations will have a transformative impact on individuals and society, leading to shared prosperity and sustainable use of the Earth and its resources.”

From Values of the Colorado School of Mines Community (2017)
Agenda

• Reflecting On 2018-19
• On the Road to MINES@150
• Focused Efforts for 2019-20
• Q&A
2018-19 Reflection: Our Students Are Amazing

Mines students roll to victory in IEEE Robotics Competition
On the surface, the task facing students at the Institute...

Concrete canoe team headed to national ASCE competition
“The Kraken” is going to the 2019 American Society of...

Brain-controlled wheelchair wins award at hackathon
A team of Colorado School of Mines students earned honors...

Mines students win Facebook Hackathon with navigation app
Finding your way around a new building can be a challenge...

Grad student named Knight-Hennessy Scholar
A Colorado School of Mines master’s student is among the...

Grad student named AWWA Young Professional of the Year
Hooman Vatankhah, a PhD student in civil and environmental...

10 from Mines awarded NSF Graduate Research Fellowships
Four current Mines students and six recent graduates are...

Chemical engineering senior to present research on Capitol Hill
Kristen Hietala, a senior majoring in chemical engineering...

Imperial Barrell Award team qualifies for international finals
A team of graduate students from Colorado School of Mines...
2018-19 Reflection: Faculty Accolades

Speer elected to National Academy of Engineering
John G. Speer, John Henry Moore Distinguished Professor of...

Toberer honored with Presidential Early Career Award
Eric Toberer, associate professor of physics at Colorado...

Kroepsch wins 2019 AAG Professional Geographer Award
Adrianne Kroepsch, assistant professor of humanities, arts...

Higgins wins ASCE Huber Civil Engineering Research Prize
Christopher Higgins, associate professor of civil and...

French instructor named Knight in Order of the Academic Palms
Megan Diercks, a French instructor at Colorado School of...

Yu wins NSF CAREER award for interlayer alloy design
Zhenzhen Yu, assistant professor of metallurgical and...

Leiderman wins NSF CAREER for blood clotting modeling
Karin Leiderman, associate professor of applied mathematics...
2018-19 Reflection: Our Unique Strengths -> Impact

Is treating drinking water enough to limit PFAS exposure?
Researchers from three states currently

New research center to focus on subsurface resource models.
Colorado School of Mines and Virginia Tech have been...

Payne Institute to establish Earth Observation Group
The view from space of the nighttime lights on Earth is...

Edgar Mine to serve as lab for underground robotics research
The Edgar Experimental Mine in Idaho Springs has long been...

Mines leading effort to develop continental water model for all
Hydrologists and computer scientists at 7 U.S....

ADAPT receives DoD funds for cooperative industry research
The Alliance for the Development of Additive Processing...

Applying machine learning to geothermal exploration
Sebnem Duzgun, professor and Fred Banfield Distinguished...
2018-19 Reflection: STEM Education Leadership

EXPLORE ONLINE TEACHING & LEARNING
Register for Engineering and Facilitating Online Learning
Course Begins: October 7, 2019
www.mines.edu/faculty

Mines faculty recognized for teaching, research excellence

www.minesnewsroom.com
2018-19 Reflection: Others Are Paying Attention

Forbes

10 Signs Of Progress In Engineering For The Earth, Energy And Environment

Tom Vander Ark Contributing Editor Education
I write about the future of learning, work and human development.

New policy needed to advance space resources industry
Space mining – the extraction and use of resources from...
Colorado School of Mines beats out Harvard in survey of smartest students

Thousands of students across the country took Lumosity’s fit test to determine which U.S. colleges were the brainiest.
2018-19 Reflection: Mines Athletics Dominates

10 RMAC Team Championships (most in RMAC History)
38 All-Americans
16 Academic All-Americans (our most ever)
121 Student-Athlete Degree Recipients; 3.18 GPA
Every Oredigger cares. Every Oredigger thrives. Every Oredigger succeeds.

At Mines, we climb together.

Every Oredigger is a comprehensive campus-wide initiative aimed at promoting mental health, championing resiliency and preventing suicide at Colorado School of Mines. Through culture change, direct services, campus support and training, policy and procedure, communications and more, we pledge to be a community that encourages and supports the well-being of all.
At Colorado School of Mines, we understand that a diverse and inclusive campus environment inspires creativity and innovation, which are essential to the engineering process.
MINES@150: 2019 DIA Plan Implementation Awards

- President’s Academic Program Award: CS@Mines
- President’s Nonacademic Program Award: Research & Tech Transfer
- Cultivating a Culture of Inclusion Award: Trefny Innovative Instruction Center
- Creative Programming Award: Campus Life and Student Success (CLASS)
- Supporting Student Retention Award: WISEM
- Institutional Engagement Award: Information & Technology Solutions
MINES@150: In 2024+ Mines will be...

- A Top-of-Mind First-Choice University
- An inspiring and caring community in which to learn, explore, live and work
- Accessible and attractive to qualified students from all backgrounds
- A leader in educating STEM students and professionals
- A producer of differentiated and highly desired STEM-educated leaders
- A preferred partner for talent, solutions and life-long learning
- The exemplar for alumni affinity, visibility and involvement
- A go-to place for use-inspired research and innovation needed to solve challenges facing industry, society, and the environment
Top-of-Mind and First-Choice

There is no single formula, but top-of-mind and first-choice schools typically:

- **have a strong brand identity**, built on well-known strengths in education and/or research, distinctive programs, and a signature student experience.
- **have attractive student success indicators** (high retention, graduation, employment, and return on investment).
- **are financially accessible** to qualified applicants from all backgrounds.
- **develop strong affinity** for the school among students, alumni, and partners.
- **are agile** and **entrepreneurial**.
- **have comprehensive partnerships** with industry and agencies, and other complementary education-focused entities.
Our Call to Action - The Imperatives

To achieve our MINES@150 aspirations, we must:

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• grow the scale and impact of our research; build thematic strengths, expand our impact, develop a more social research culture, diversify funding sources.

• build/acquire the infrastructure and grow the leadership needed for MINES@150.

• strengthen affinity for MINES among our students, alumni, and external partners.

• be more innovative and entrepreneurial, especially in the use of our resources.

• attract investment to support our strategic initiatives.
## Become More Accessible and Attractive

### Emphasis Areas
- Student success metrics
- Sub-community support
- Culture change
- Faculty & staff demographics
- Financial support
- Family friendly initiatives

### Student Success Metric

<table>
<thead>
<tr>
<th>Student Success Metric</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st to 2nd year retention</td>
<td>Consistently 92%-94% overall since 2012 (Goal 94%) 2018 cohorts: Pell 90%; and Hispanic 95%</td>
</tr>
<tr>
<td>4-Year Graduation Rate</td>
<td>Up from &lt;50% for 2009 cohort to 63% for 2015 cohort (Goal: 75%)</td>
</tr>
<tr>
<td>6-Year Graduation Rate</td>
<td>Up from 77% for 2009 cohort to 83% for 2013 cohort (Goal: 85%)</td>
</tr>
<tr>
<td>Career Pursuit (employment or graduate school in field)</td>
<td>Typically 84% BS ($70K avg), 90+% MS ($78K avg), 92+% PhD ($80K avg)</td>
</tr>
<tr>
<td>Student Debt</td>
<td>50%-60% of students have debt at graduation; $30K - $35K median for those with debt</td>
</tr>
</tbody>
</table>
Become More Accessible and Attractive

**Emphasis Areas**
- Student success metrics
- Sub-community support
- Culture change
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### Multicultural Engineering Program

MEP works to enroll, retain, and graduate under-represented students, and continue to build a community of support through our many partnerships and advocacies.

<table>
<thead>
<tr>
<th>of Academic Year</th>
<th>T/TT Total</th>
<th>T/TT % Women</th>
<th>Teaching Total</th>
<th>Teaching % Women</th>
<th>PoP Total</th>
<th>PoP % Women</th>
<th>Academic Faculty Total</th>
<th>% Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-14</td>
<td>192</td>
<td>19%</td>
<td>72</td>
<td>43%</td>
<td>0</td>
<td>-</td>
<td>264</td>
<td>25%</td>
</tr>
<tr>
<td>14-15</td>
<td>204</td>
<td>19%</td>
<td>72</td>
<td>44%</td>
<td>0</td>
<td>-</td>
<td>276</td>
<td>25%</td>
</tr>
<tr>
<td>15-16</td>
<td>205</td>
<td>20%</td>
<td>78</td>
<td>44%</td>
<td>0</td>
<td>-</td>
<td>283</td>
<td>26%</td>
</tr>
<tr>
<td>16-17</td>
<td>206</td>
<td>21%</td>
<td>85</td>
<td>45%</td>
<td>0</td>
<td>-</td>
<td>291</td>
<td>28%</td>
</tr>
<tr>
<td>17-18</td>
<td>211</td>
<td>23%</td>
<td>85</td>
<td>44%</td>
<td>8</td>
<td>13%</td>
<td>304</td>
<td>28%</td>
</tr>
<tr>
<td>18-19</td>
<td>218</td>
<td>22%</td>
<td>87</td>
<td>47%</td>
<td>7</td>
<td>14%</td>
<td>312</td>
<td>29%</td>
</tr>
<tr>
<td>19-20</td>
<td>222</td>
<td>25%</td>
<td>89</td>
<td>46%</td>
<td>7</td>
<td>14%</td>
<td>318</td>
<td>31%</td>
</tr>
</tbody>
</table>
Mines Community Alliances support retention and recruitment of employees at Mines. ANYONE can join an MCA.

**Chair(s)**
- BLACK MCA
  - SHAM TZEGAI
  - ANNE STARK WALKER
- LATINX MCA
  - KYLE CASTRO
  - STEFANIE TOMPKINS
- LGBTQ MCA
  - HEATHER HAMILTON
  - MARTIN HECK
  - DAN FOX
- WOMEN MCA
  - SEBNEM DUZGUN
  - ANNETTE PILKINGTON
  - RICK HOLZ
Become More Accessible and Attractive...

**Emphasis Areas**
- Student success metrics
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- Financial support
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About $3M/year in scholarships currently funded by the CSMF endowment.

An additional $4.5M/year ($100M endowment) needed to bring all undergraduate students to $40K or less debt at graduation.

About $25M/year dedicated to financial aid from university resources.

50 - 60% of graduating undergraduates have debt.

<table>
<thead>
<tr>
<th>Student Loan Debt [$] at Graduation (Summer 2017 - Fall 2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5000</td>
</tr>
<tr>
<td>50</td>
</tr>
</tbody>
</table>
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• **Re-align our programs portfolio with the future;** expand offerings and diversify delivery, in particular for professionally-oriented pre- and post-graduate education.

• **grow the scale and impact of our research;** build thematic strengths, expand our impact, develop a more social research culture, diversify funding sources.

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• be **more innovative and entrepreneurial**, especially in the use of our resources.

• **attract investment to support our strategic initiatives.**
Every student has a vertically-integrated experience (freshman-sophomore-junior-senior connections from Day 1) every student is engaged in at least one sub-community (Mines Athletics, Club Sports, Greek life, honors, Blue Key, etc.) professional development is an overarching theme (pervasive in all components of Student Life) students set, communicate, and reinforce community expectations for behavior, inclusion, ethical behavior, etc. (students have ownership status in the community) traditions, opportunities, and uniquely Mines activities (M-Climb, OrediggerCamp, Continuum, % engagement in sports, etc.) Build Mines pride & external promotion of our students (Athletics, community service, student org successes)

Distinctive Traits & Signature Student Experience

MINES@150 Attributes

- Business acumen, leadership, entrepreneurship, societal context & personal passion, global awareness.
- Strong Affinity. Pay it forward.
- Hard-working, creative, & collaborative problem solvers.
- Technical; applied scientific expertise.
Distinctive Traits & Signature Student Experience

2019 Oredigger Camp #2 at YMCA of the Rockies Snow Mountain Ranch
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<table>
<thead>
<tr>
<th>Degree Title</th>
<th>Type</th>
<th>Delivery</th>
<th>BoT Approval</th>
<th>First Semester Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Energy Systems</td>
<td>NT, PhD</td>
<td>Residential</td>
<td>10/26/18</td>
<td>Fall, 19</td>
</tr>
<tr>
<td>Advanced Manufacturing</td>
<td>Cert, NT</td>
<td>Residential</td>
<td>2/9/18</td>
<td>Fall, 18</td>
</tr>
<tr>
<td>Computer Science - Various</td>
<td>Cert</td>
<td>Online</td>
<td>6/1/18</td>
<td>Spring, 20*</td>
</tr>
<tr>
<td>Data Center Engineering</td>
<td>Cert</td>
<td>Online</td>
<td>5/4/18</td>
<td>Spring, 20*</td>
</tr>
<tr>
<td>Data Science</td>
<td>NT</td>
<td>Residential</td>
<td>2/8/19</td>
<td>Fall, 19</td>
</tr>
<tr>
<td>Earth Resources Development</td>
<td>NT, T, PhD</td>
<td>Residential</td>
<td>11/30/18</td>
<td>Fall, 19</td>
</tr>
<tr>
<td>Electrical Engineering - Various</td>
<td>Cert, NT</td>
<td>Online</td>
<td>11/30/18</td>
<td>Spring, 20*</td>
</tr>
<tr>
<td>FEA Professional</td>
<td>Cert</td>
<td>Online</td>
<td>2/8/19</td>
<td>Fall, 19</td>
</tr>
<tr>
<td>GIS - Various</td>
<td>Cert, NT</td>
<td>Online</td>
<td>10/26/18</td>
<td>Spring, 20*</td>
</tr>
<tr>
<td>Humanitarian Eng and Science</td>
<td>Cert, NT, T</td>
<td>Residential</td>
<td>2/8/19</td>
<td>Fall, 19</td>
</tr>
<tr>
<td>Mining Eng. And Management</td>
<td>Cert</td>
<td>Online</td>
<td>2/9/18</td>
<td>Spring, 20*</td>
</tr>
<tr>
<td>Natural Resource &amp; Energy Policy</td>
<td>NT</td>
<td>Residential</td>
<td>12/8/17</td>
<td>Fall, 18</td>
</tr>
<tr>
<td>Quant. Biosciences and Engineering</td>
<td>NT, T, PhD</td>
<td>Residential</td>
<td>2/9/18</td>
<td>Fall, 18</td>
</tr>
<tr>
<td>Resource Commodity Analytics</td>
<td>NT</td>
<td>Residential</td>
<td>10/26/18</td>
<td>Fall, 19</td>
</tr>
<tr>
<td>Space Resources</td>
<td>Cert, NT, PhD</td>
<td>Online</td>
<td>12/8/17</td>
<td>Spring, 19</td>
</tr>
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$84M FY19 Total Research Awards

Research Award Trends FY05 – FY19

- Federal
- State
- Non-Gov’t

Tech Transfer Activity

- 51 new invention disclosures (2-4X the rate of other universities)
- 3 start-up companies (biology, petroleum and civil engineering)
- 7 new licenses for Mines inventions

Grow the Scale & Impact of Our Research
Grow the Scale & Impact of Our Research

Mines at the forefront of future industry and societal needs (3 – 5 pan-university thematic initiatives)

MINES@150

Positioning MINES for leadership at future S&T frontiers

• Materials and Advanced Manufacturing

• Earth and Space Exploration, Technology, and Engineering

• Others (TBD)

Research & Education Frontiers at MINES
MINES@150
The Frontiers Initiatives
The Subsurface Frontiers Initiative - On Earth and In Space

Positioning MINES for leadership at future S&T frontiers

Explore, Identify, Image, Visualize, Model, Value

Extract, Produce, Develop

Dig, Drill, Tunnel, Build

Use, Reuse, Repurpose, Mitigate

COLORADO SCHOOL OF MINES
EARTH • ENERGY • ENVIRONMENT

USGS
science for a changing world
The Universidad Nacional de San Agustín (UNSA) in Arequipa, Peru, and Colorado School of Mines, have developed a partnership to tackle one of the most important societal and environmental issues facing southern Peru – how to manage mining of natural resources in a manner that is sustainable, supports the local economies, and minimizes environmental impacts.
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MINES@150: Infrastructure Investments

Spruce Hall
1st-Year Students
420 beds, 110,000 ft²
Summer 2020 ($43M)

1750 Jackson
Upper Class Students
250 beds, Apartment Style
Spring - Summer 2020 ($38M)

MINES@150 Goal: Have sufficient capacity to house all 1st and 2nd year students on or close to campus.
Subsurface Frontiers Building (2022 opening)
190,000 ft²/$190M project w/parking garage & wrap
USGS lease, $1.8M + $18.2M from State; $1M/year from students

Draft (still under design)
MINES@150: Infrastructure Investments

Classroom wrap on parking garage ($11.4M/Mines Funded)
23,000 ft² of project-style classrooms and office space
First-year and other design-focused courses
The Mines InnoHub Complex innovate • design • build • test • start-up ($20M)
(supports all student project activities, design competitions, and organic innovation)

$5M Student Investment Commitment Secured
MINES@150: The InnoHub Complex

Collaboration Space

Prototyping Space

Lab and Shop Space

Project Team Work Space


+Oredigger Innovation Incubator

Mines.edu
Colorado School of Mines celebrated today the grand opening of a new 10,000-square-foot research facility in Denver that will pave the way for greater collaboration with industry, government and academia to tackle one of the biggest challenges facing society today – access to clean water.
MINES@150: Leadership Changes & Additions

Colorado School of Mines names Richard Holz provost
Colorado School of Mines has named Richard C. Holz its next...

Bradford named dean, vice provost of global initiatives
Colorado School of Mines has named John Bradford its next...

Peter Aaen named Electrical Engineering Department head
Peter Aaen is the new head of the Electrical Engineering...

Chauhan takes reins of Chem & Bio Engineering Department
The new head of the Chemical and Biological Engineering...

Lori Kester
Associate Provost
Enrollment Management

Wendy Bohrson
Geology & Geological Eng.

Jason Hughes
Chief Marketing Officer
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MINES@150: Attract Investment

Communities of Scholars
InnoHub Complex
Business Programs v2.0
Frontiers Initiatives
Excellence Funds
Faculty Leaders
Enrichment Programs
MINES@150: Attract Investment

Colorado School of Mines Foundation FY19

- Raised $46M+ toward a $33 million goal
  - Increased funding for first generation, transfer students and other scholarships + lowering student debt
  - ICH gave full $1M funding to Mines over other schools
  - A condo donation generated $1M for clean energy research
- $95M raised so far for the Campaign for MINES@150
- Purchased 3 properties to advance campus master plan
- 10 new corporate partnerships established through OIR
- #idigmines generated a 44% increase in funding for campus causes
- Most faculty and staff donors to Mines ever - 405!
- Integrating alumni into all aspects of the campus
- $50M goal for Mines in FY20 with 1,000 face-to-face donor visits
Operating Budget Funding Sources & Expenses

**Revenue:**
- Tuition: 62%
- Gifts: 10%
- State Support: 10%
- IDC Recoveries: 6%
- Other: 2%

FY2020 $248.6M

**Expenses:**
- Undergraduate Scholarships (15%)
- Auxiliaries (Housing and Food) (9%)
- Student Services (3%)
- Faculty Salaries + Instruction + Academic Operations + Graduate Student Support + Research Support + Academic Support (48%)
- Operations and Maintenance (12%)
- Institutional Support (8%)
- Information Technology (4%)
- Capital and Renovations (1%)

Excludes direct expense budgets from external grants and contracts
Executive Team Priorities

- Signature Student Experience (Holz)
- Distinctive Programs @ Mines (Holz)
- Frontiers Initiatives (Tompkins)
- Entrepreneurship and Innovation (Holz)
- Business@Mines (Holz)
- Access & Affordability (Holz)
- Professional Education (Holz)
- Brand and Reputation (Han)
- Campaign for Mines@150 (Winkelbauer)
- Working@Mines (Volpi)
- Living & Learning@Mines (Fox)
- Alumni Connections (Winkelbauer)
- Continuous Improvement@Mines (Volpi)
Breakout Sessions

**Campaign for MINES@150 and Building the Oredigger Family**
Brian Winkelbauer
Berthoud 250

**Creating Inclusive Classroom Environments**
Amy Landis
CooksTek 140/150

**Every Oredigger: Addressing Suicide, Mental Health and Resilience at Mines**
Rebecca Flintoff, Derek Morgan, Emilie Rusch, Roel Snieder
SC Ballrooms DE

**Online Education Update and Panel Discussion**
Brown W280
MINES Campus Update 2019: Questions?

Campus Conference: August 16, 2019
Paul C. Johnson: President, Professor, Oredigger Fan