College of Engineering and Applied Science

# Engineering Advisory Council

Engineering & Applied Science
UNIVERSITY OF COLORADO **BOULDER**

November 3, 2023

# Agenda

- Welcome
- State of the College
- Lattice Scholars™ Program
- Western Partnership Program
- Lunch with Chancellor DiStefano
- Signature Industry Partnerships

# Welcome New EAC Members

**Hari V. Krishnan**
PropertyGuru Group

**Johnathon Caldwell**
Lockheed Martin

**Robert Sawaya**
Campos EPC

## Nomination Opportunities

- EAC Nominations (2/1)
- Alumni Nominations (11/15)
  - Distinguished Engineering Alumni Awards
  - Recent Alumni Award

# Engineering Advisory Council

**Purpose:**

- Advise the college on programs and policies
- Encourage and advocate for resource development
- Develop and guide education, outreach, and research programs
- Recognize achievements of alumni and other supporters in publicity and public relations

**Meeting Expectations:**

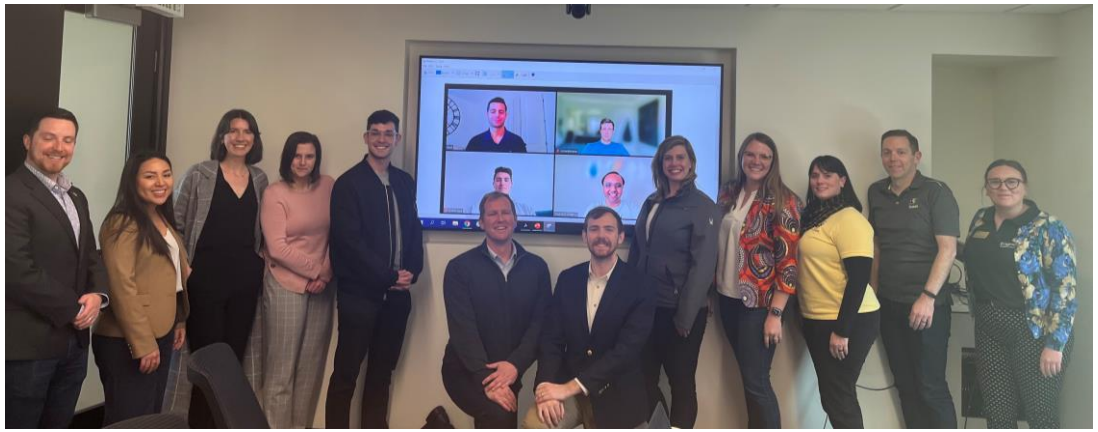
- Provide candid assessment to help us improve
- Speak and listen for understanding

# GOLD Board

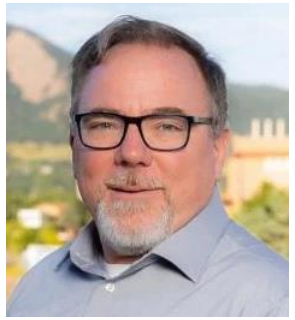
**Beth Myers and Chris Kohl, Co-Chairs**
**20 Current Board Members**

**Initiatives**

- Virtual Mock Interviews
- Recent Alumni Award
- Ring & Pin Ceremony
- ProReady Partners
- Pilot Mentorship Program
- CU Engineering Donor



# New College Leadership



**Michael Gooseff**
Associate Dean
for Research

**Sriram Sankaranarayanan**
Associate Dean
for Digital Education

**Sean Humbert**
Robotics Program

**Corey Neu**
Biomedical Engineering

**Kristen Gallagher**
Assistant Dean
for Advancement

**Kevin Lobdell**
Deputy Assistant Dean
for Advancement

**Joseph Baldwin**
Sr. Director

**Abby Dunn**
Sr. Director

# Since our last EAC meeting…

## Short-Term Task Group Work

- Completed Strategic Planning Process
- Launched Engineering Connections
- Launched Lattice Program

## EAC Prep and Admin

- Filled EAC Executive Committee
- Published EAC Nomination Process
- Started Engineering-Leeds Working Group

# State of the College

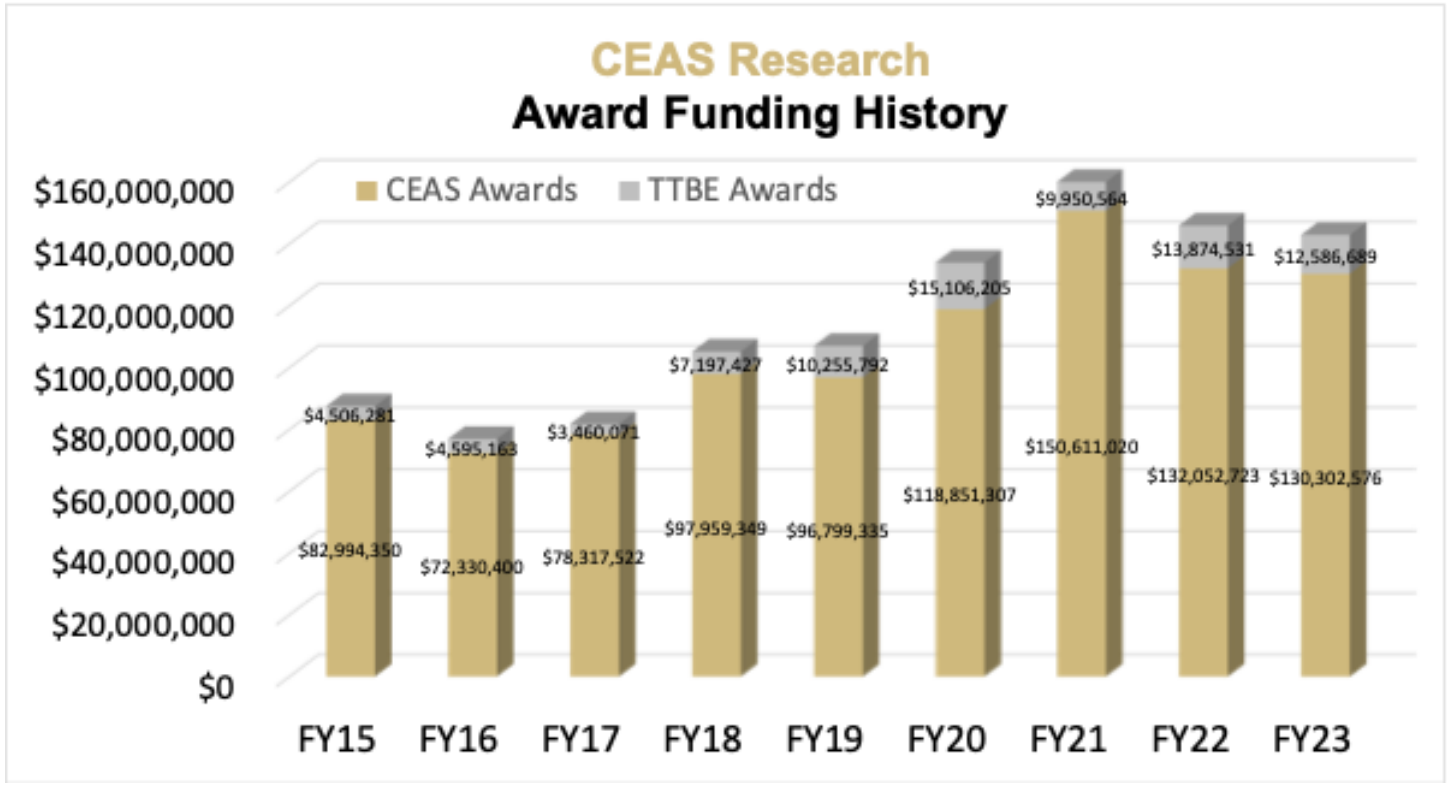

STRATEGIC
VISION
Engineering sustainable solutions to improve the quality of life in our state, nation and world.
College of Engineering & Applied Science
UNIVERSITY OF COLORADO BOULDER

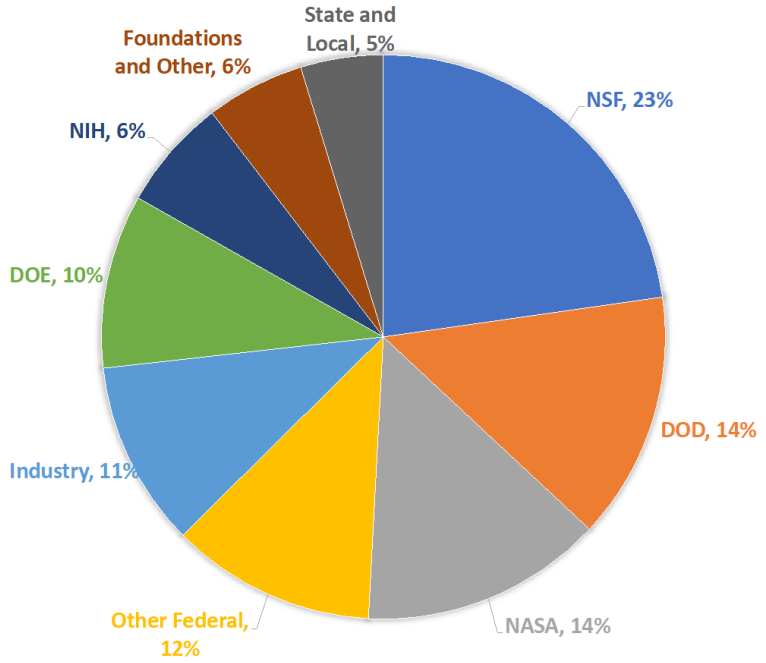

STRATEGIC
VISION
Engineering sustainable solutions to improve the quality of life in our state, nation and world.
Research & Innovation
We shape the world through research that generates fundamental knowledge and translates innovations to impact.
Education
We inspire tomorrow's leaders through engineering education that cultivates curiosity, care and community.
Inclusion
We grow stronger by embracing and cultivating the unique contributions of all community members.
Through this vision and our strategic actions, the college will be recognized as a top 10 undergraduate and graduate institution.
colorado.edu/engineering/vision
College of Engineering & Applied Science
UNIVERSITY OF COLORADO BOULDER
STRATEGIC
ACTIONS
Translate Innovations to Impact
» Invest in interdisciplinary research initiatives across campus and with our external partners.
» Cultivate an environment to inspire faculty and student entrepreneurial work.
» Position faculty to shape local, state and national research and policy agendas.
Shape Tomorrow's Leaders
» Provide access for all students and strive for gender parity in our first-year class.
» Improve student retention rates across all student demographics and close equity gaps.
» Grow the size, diversity and support of our Doctoral student cohort.
Embrace the Unique Contributions of All
» Recruit and retain diverse students, faculty and staff to enrich our community.
» Improve and celebrate inclusive policies and practices affecting students, staff and faculty.
» Invest, resource and build collaborative relationships that support inclusion.
colorado.edu/engineering/vision

# State of the College

- Research & Innovation
- Education
- Inclusion

# Research & Innovation



# Research & Innovation

## Anticipating the future and shaping the world

- Aerospace and Defense
- Quantum Engineering
- Microelectronics

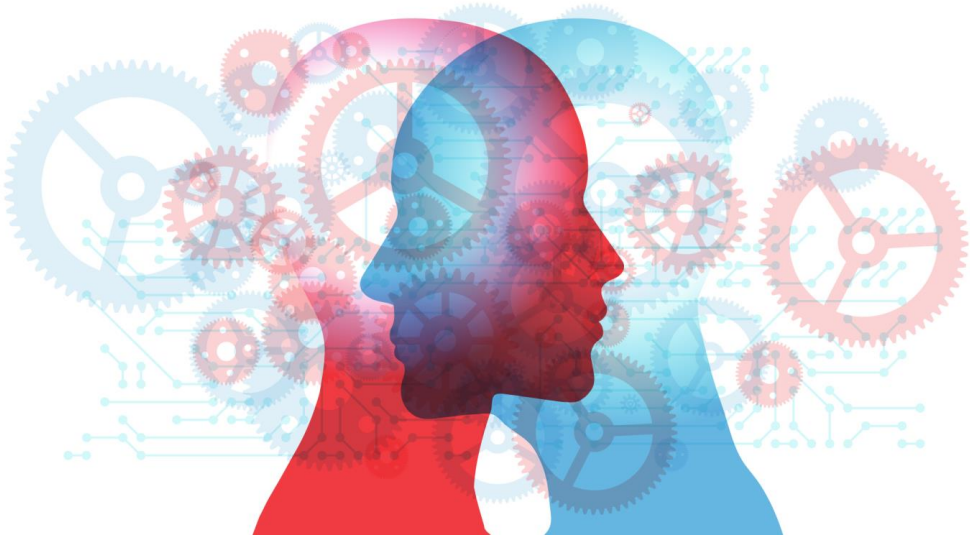
Elevate Quantum


# Research & Innovation

## Anticipating the future and shaping the world

**Engineering Education and AI-Augmented Learning Interdisciplinary Research Theme**

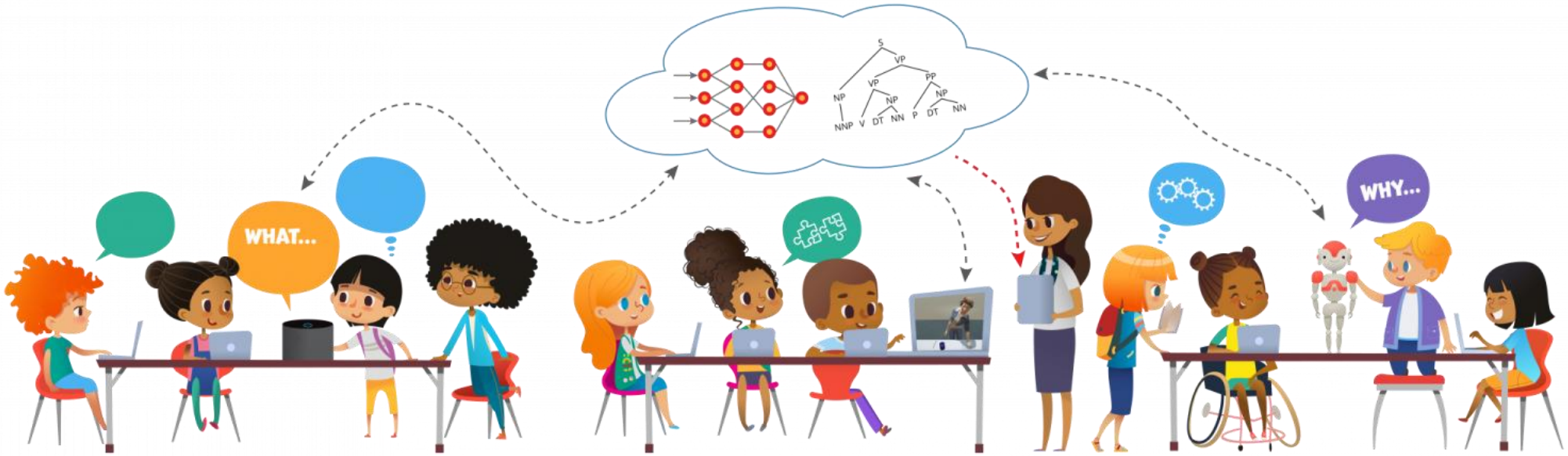
- Catalyze new research collaborations
- Enhance the reputation
- Grow infrastructure and research capacity
- Compete for ‘center-scale’ research grants



# Research & Innovation

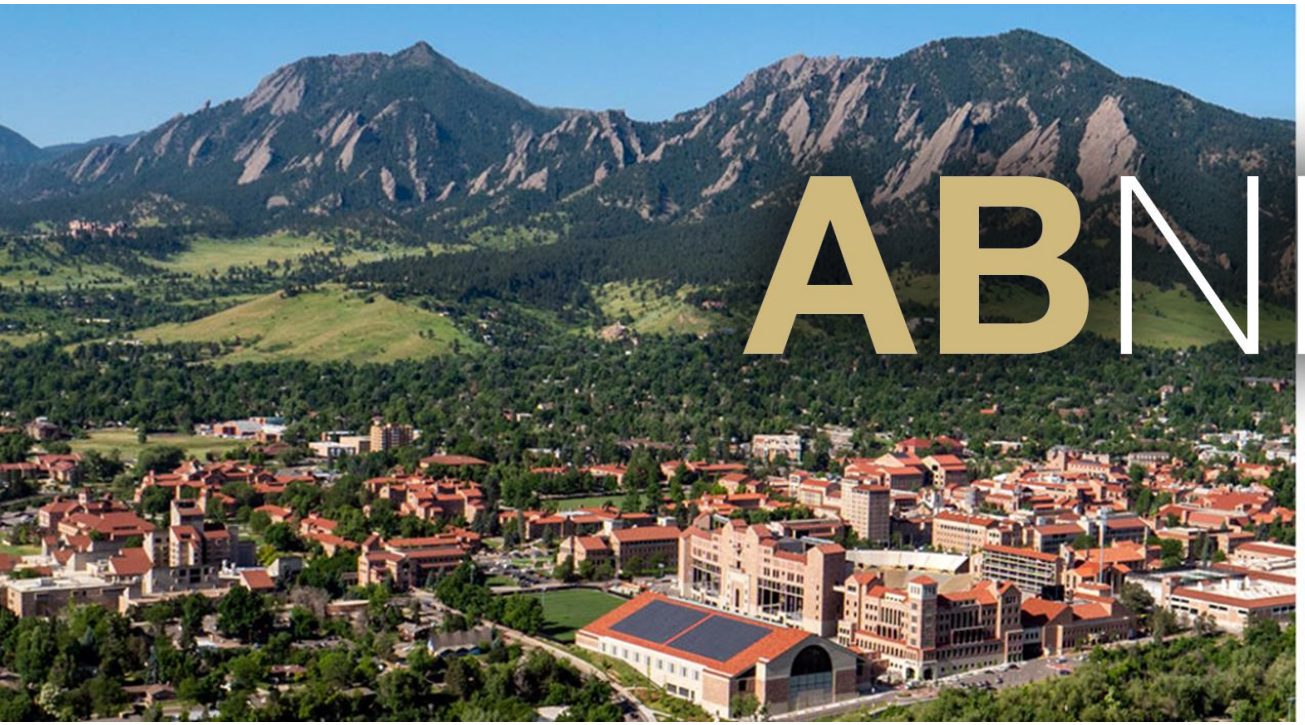
## Anticipating the future and shaping the world

## $20M NSF National AI Institute for Student-AI Teaming



# Research & Innovation

## Anticipating the future and shaping the world



ABNEXUS

# Research & Innovation

Creative & entrepreneurial

**STARTUP COMMUNITY** mindset

**FEDERAL LABS**

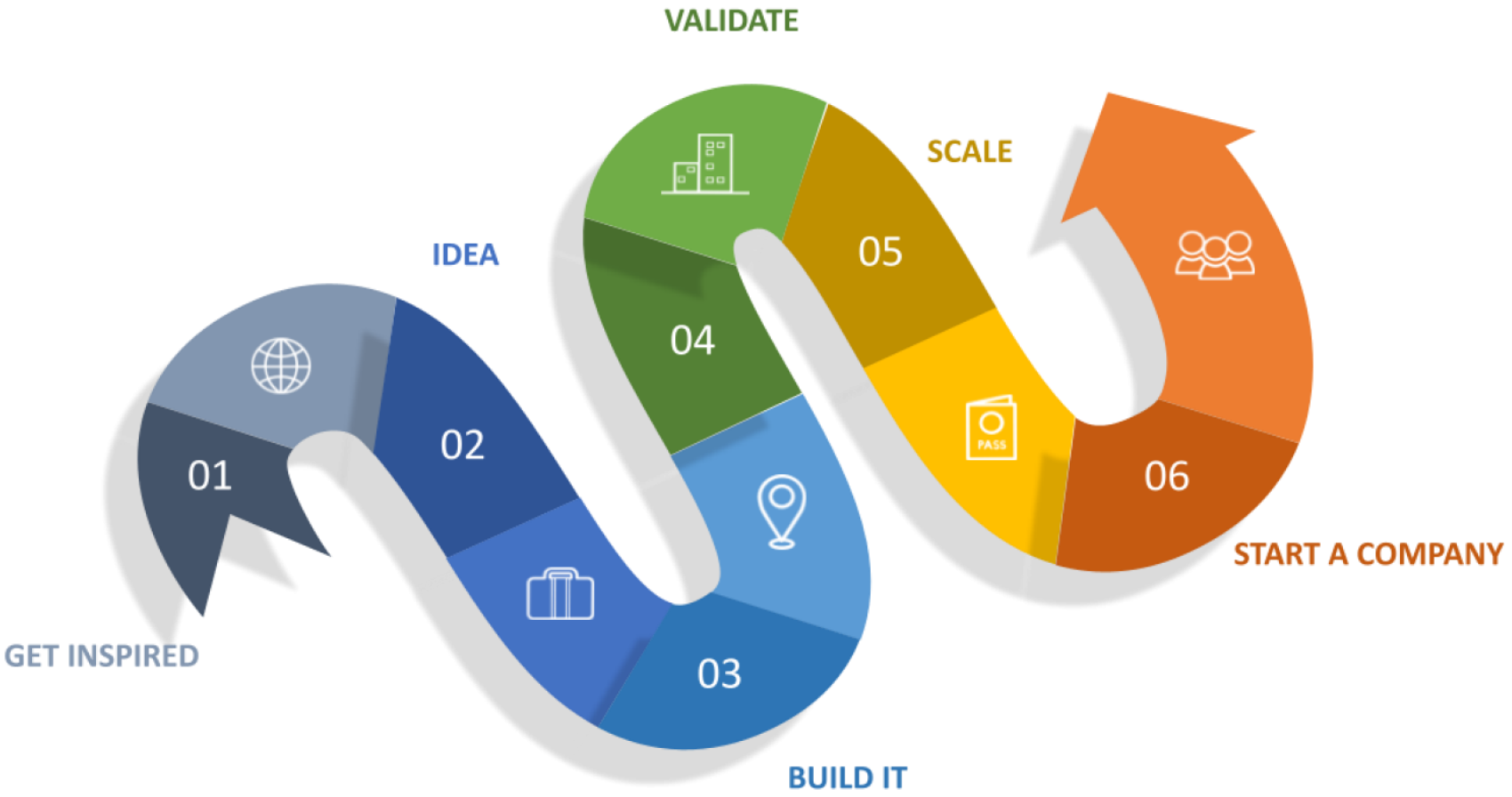
Research tied to the National Agenda

Innovate

**CORPORATE PARTNERS**

Solve & commercialize solutions for society

# Research & Innovation




escend | ENGINEERING INNOVATION & ENTREPRENEURSHIP

# Research & Innovation

**150+**
Active CU Companies

**$21B**
Exits
Since 2004

# State of the College

- ✓ Research & Innovation
- Education
- Inclusion

# Education

## Undergraduate Profile

- 6,068 Students
- 41% Female in first-year class
  - #1 of 167 public engineering colleges
- 18% URM undergraduate students
  - Percent more than doubled in past 10 years
- 89% 2nd fall retention
  - Highest on record and trending up

# Lattice Scholars™ Program

## Debt-Free First-Generation Education

Closing the gap

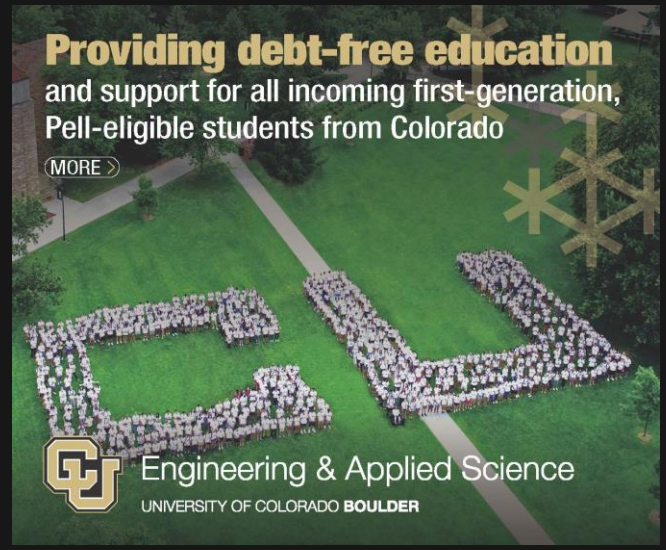
- 100% cost of attendance Pell eligible, first generation, state of CO students

Programming

- Money, Math, Mattering

Special thanks to EAC donors

- Dana and Juliana Andersen
- Paul and Chresta Brinkman
- Marco Campos
- Dale and Patricia Hatfield
- Kile and Judy Morgan
- Cliff and Carol Pearson
- Ann Smead and Michael Byram
- Kiewit Corporation



# Engineering Connections

Engineering Residential Community for All First-Year Students

# Engineering Connections – By the numbers

| 998 | 123 | 49 | 23 | 14 | 13 | 7 |
|---|---|---|---|---|---|---|
| Students in Engineering Connections | Volunteers at Engineering Launch | First-Year Seminars | Major Dinners | Meet Your Major Sessions | Special Interest Sessions | Academic Interest Groups |

# Engineering Connections

## First-Year Seminar

- 5-week, 1-credit course
- Invites students to be part of a community of peers wrestling with what it means to be a university scholar

# Undergraduate Education

## CU Engineering students are more ProReady!

| | 2018-19 | 2022-23 | Increase |
|---|---|---|---|
| **Undergraduate Internship** | 43% | 65% | 22% |
| **Undergraduate Research** | 23% | 34% | 11% |
| **Study Abroad** | 156 | 196 | 20% |
| **Job, grad school, military: upon graduation** | 59% | 72% | 13% |
| **Job, grad school, military: 6 mo post graduation** | 93% | 95% | 2% |
| **Starting salary (average)** | $72K | $80-85K | 11-18% |

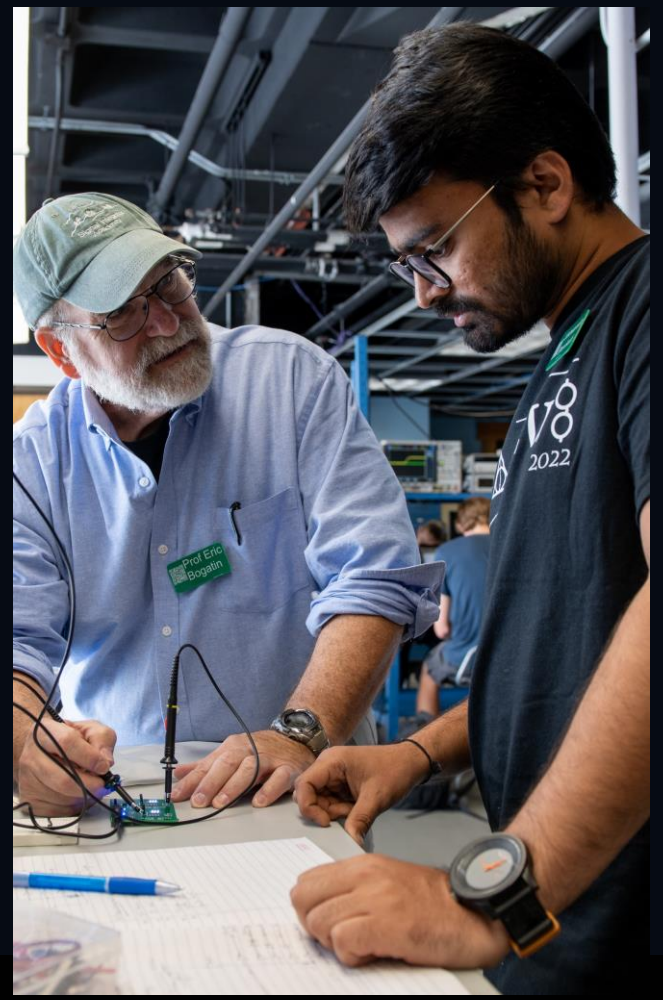
**CEAS Senior Survey, 18-19 to 22-23**

Engineering Projects expo 2022

# Graduate Education

## Graduate Profile

- 1,315 MS Students
  - *-15% from COVID peak*
- 1,028 PhD Students
  - *220 in fall 23 (40% women)*
  - *28 NSF Grad Fellowship Awards in fall 23*



# Digital Education

## Growing our Coursera Offerings

- Electrical Engineering
- Data Science
- Applied Computer Science
- Engineering Management

# State of the College

- ✓ Research & Innovation
- ✓ Education
- Inclusion

# Inclusion


Choose to Challenge: Stories of Progress
Engineering Leaders
Inspiring the next generation
Engineering & Applied Science
UNIVERSITY OF COLORADO BOULDER

# Inclusion

NSF Career Winners
- ’23 – 8 awards
- ’22 – 6 awards
- ’21 – 12 awards

- 100+ in College

NAE Members
- ’22 – Brian Argrow
- ’22 – Zoya Popovic
- ’21 – Chris Bowman

- 10 Current members

# Agenda

- ✓ Welcome
- ✓ State of the College
- Lattice Scholars™ Program
- Western Partnership Program
- Lunch with Chancellor DiStefano
- Signature Industry Partnerships

# Lattice Scholars™ Update

Engineering & Applied Science
UNIVERSITY OF COLORADO **BOULDER**

# Fall 2023 First Year Enrollment

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | **2023** |
|---|---|---|---|---|---|---|---|
| **First-year Total** | 851 | 924 | 945 | 1197 | 1028 | 1084 | **1112** |
| **% Women** | 38% | 40% | 45% | 32% | 32% | 40% | **41%** |
| **% URM** | 21% | 18% | 24% | 17% | 21% | 19% | **18%** |
| **Avg. HS GPA** | 3.93 | 3.91 | 3.91 | 3.90 | 3.92 | 3.94 | **3.95** |
| **Avg. SAT Total** | 1359 | 1368 | 1363 | 1340 | 1374 | 1363 | **1370** |

# Lattice Scholars™ Program

## Debt-Free First-Generation Education

### 2027 Lattice Cohort

- 60 students
- 50% URM, 35% Female
- 49 students from Denver Metro, 8 from Southern Colorado, 3 from Western Slope
- Majority living in Engineering Connections

# Lattice Scholars™ Program

## Debt-Free First-Generation Education

### Funding for Lattice Scholars™ Program

- 100% cost of attendance for a Pell eligible, first generation, resident students
- $7,500 average unmet need per student per year
  - Ranges from $200-$20,000
- Increase in applications, publicity
  - Variable cohort sizes & cost for future years
  - 60-120+ students, $2.8 - 4.2MM/ cohort

# Program Elements

**Money: address financial barriers and career development**

- 1:1 financial support and on-going audit of bills
- Training with ProReady throughout education

**Mattering: increase sense of belonging and social capital**

- Participation in a student club or organization

**Math/Academics: foundational support and through periods of "academic shock"**

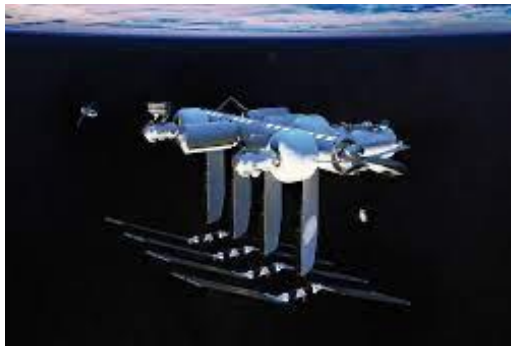
- Specialized academic coaching early in the semester
- Course alerts and interventions

- Leveraging existing campus workshops and events
- Monthly seminar workshops with Lattice cohort and team
- Classroom and academic capital support with faculty advisor
- Spring retreat
- Small group peer mentoring with financial wellness curriculum

# Niko Ortega – Lattice Mentor

Aerospace Engineering Junior
Hometown: Denver, Colorado

## Lattice Impact: A First-Gen Student Story



### Our Past

The influences that we have absorbed along the way

### Our Present

The community and world we have to navigate on day-to-day basis

### Our Future

The dreams we hope to write the rest of our stories with

# Questions?


Western-CU Boulder
Partnership Program
EAC Meeting
November 3rd
University of Colorado Boulder
WESTERN
COLORADO UNIVERSITY
PARTNERSHIP PROGRAM
COMPUTER SCIENCE & ENGINEERING

# Overview

- WCU-CU Boulder Partnership Program Overview
- Exploring New Engineering Partnership Programs

# WCU-CU Boulder Partnership Program Overview

# About the Partnership

1st & 2nd Year:
Enrolled as Western students

WESTERN
COLORADO UNIVERSITY

Physics-Applied Physics/Pre-Engineering
Computer Science-Scientific Computing

3rd & 4th Year:
Enrolled as CU Boulder students

University of Colorado
Boulder

Mechanical Engineering
Computer Science

**Live in Gunnison the entire time!**

# Best of Both Worlds

- Delivering **top-20** CU engineering programs in rural Colorado
- **Small class sizes** & student-to-faculty ratios
- Incredible **location & community** integration
- **Collaborative elective options**, Honors Program participation, minors, certificates & study abroad opportunities
- **Project-based**, industry-focused, hands-on, experiential education
- **Focus** areas in robotics, product design, outdoor industry engineering, engineering management, aerospace, and biomedical
- ABET **accreditation**
- Alignment with both Western and CEAS **Strategic Plans**

# Current Enrollment

| Current Enrollment Totals by Year | | | | | |
|---|---|---|---|---|---|
| | **Fall 2019** | **Fall 2020** | **Fall 2021** | **Fall 2022** | **Fall 2023** |
| **First Year** | 43 | 67 | 78 | 88 | 71 |
| **Sophomore** | | 29 | 52 | 53 | 66 |
| **Junior** | | | 22 | 33 | 38 |
| **Senior** | | | | 19 | 27 |
| **5th yr Senior** | | | | | 5 |
| **TOTAL** | **43** | **96** | **152** | **193** | **207** |

| Current Western-CU Boulder Partnership Program Student Data – Fall 2023 *(as of 9/1/23)* | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Current Students** | **URM*** | **% URM** | **Female** | **% Female** | **First Gen**** | **%First Gen** | **Resident** | **% Resident** | **Non-Resident** | **%Non-Resident** | **Average HS GPA** | **Rady Scholarship Recipients** | **% Rady Scholarship** |
| **Mechanical Engineering** | 171 | 28 | 16% | 24 | 14% | 53 | 31% | 119 | 70% | 51 | 30% | 3.72 | 69 | 40% |
| **Computer Science** | 36 | 8 | 22% | 7 | 19% | 8 | 22% | 29 | 80% | 7 | 19% | 3.65 | 14 | 39% |
| **Total** | 207 | 36 | 17% | 31 | 15% | 61 | 30% | 148 | 72% | 58 | 28% | 3.71 | 83 | 40% |

*URM data is pulled from the Race and Ethnicity fields in Banner (self-reported by students)
**First Generation data is pulled from the First Gen field in Banner (self-reported by students)

# Student Success

- **95%** of graduating students have signed contracts for employment or graduate school*
- **$78,000** is the average starting salary of partnership students**
- **5%** of graduating students accepted into graduate programs
- **90%+** internship rate for Juniors and graduating Seniors
- **13** industry sponsored projects & **5** sponsored capstone projects in Sp 2023

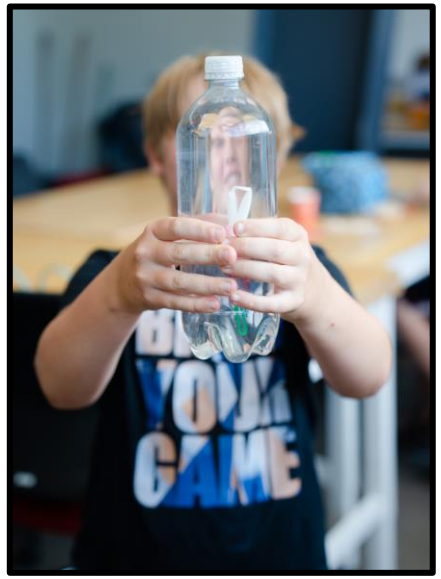
* Standard job placement statistic is measured 6 months after graduation
** Colorado School of Mines ME graduate pay within 6 months after graduation is $72,300
** CU Boulder CS graduate pay average is $80,500 and 92% placement after 6 months

# Partnership Program Opportunities

ADAPTIVE SPORTS CENTER

- Community Partnerships
- Undergrad Summer Research Program
- Innovative curricular programming


Summer Research Program



Rady Middle School
Engineering Academy

Donated Adaptive Gravel Bike

# Program Distinctions

- **Curriculum**
  - Electives, Emphasis Areas, Minors, Certificates
  - Unique programming: Robotics and human centered computing
- **Student retention**
  - Lambda Learning Center, scholarships, professional development
- **Marketing & recruitment**
  - Rural communities, target specific demographics, unique marketing
  - 70% retention for the partnership program
- **Summer programming**
  - Rady Engineering Academy (6-8th grade), community workshops, undergraduate research
- **Scholarship**
  - Total CU Scholarship awarded: $345k/year
  - Total Rady Merit awarded: $400k/year
  - Total donor and industry sponsored scholarship: $40k/year

# Exploring New Engineering Partnership Programs

# Up to now...

- November 1st meeting recap
- Feasibility study and socializing
- Exploring course equivalencies and degree plans/flowcharts
- Meet with ASEN and BSME in the spring to discuss curriculum and curriculum updates

# New Engineering Partnership Programs: Predicted Student Numbers

Predicted capacity and growth potential of engineering partnership programs starting Fall 2026.

| | 1st year (2025) | 2nd year | 3rd year | 4th and 5th year |
|---|---|---|---|---|
| Aerospace | 45-50 | 30-33 | 21-22 | 21-22 |
| Biomedical | 25-30 | 18-22 | 15-17 | 15-17 |
| Computer Science | 20-25 | 13-17 | 10-12 | 10-12 |
| Mechanical | 45-50 | 30-33 | 21-22 | 21-22 |
| **Total** | **135-155** | **91-105** | **67-73** | **67-73** |
| **Total = 345– 391 students** | | | | |

*1st-2nd (66% retention) year and 2nd-3rd (68% retention) year and 3rd – 4th (100% retention) year, assuming a % from 1st year to 4th year based on average retention rates from 2021-2023.

# We welcome you to visit!

University of Colorado Boulder

WESTERN COLORADO UNIVERSITY

**PARTNERSHIP PROGRAM**
**COMPUTER SCIENCE & ENGINEERING**

# Discussion & Questions

# Agenda

- ✓ Welcome
- ✓ State of the College
- ✓ Lattice Scholars™ Program
- ✓ Western Partnership Program
- Lunch with Chancellor DiStefano
- Signature Industry Partnerships

# Signature Industry Partnerships

- Question – What would make CU Engineering your #1 academic partner?
- Breakout Goal – Explore high-value university-industry engagement activities
- Outcome – A framework for defining and measuring signature industry partnerships

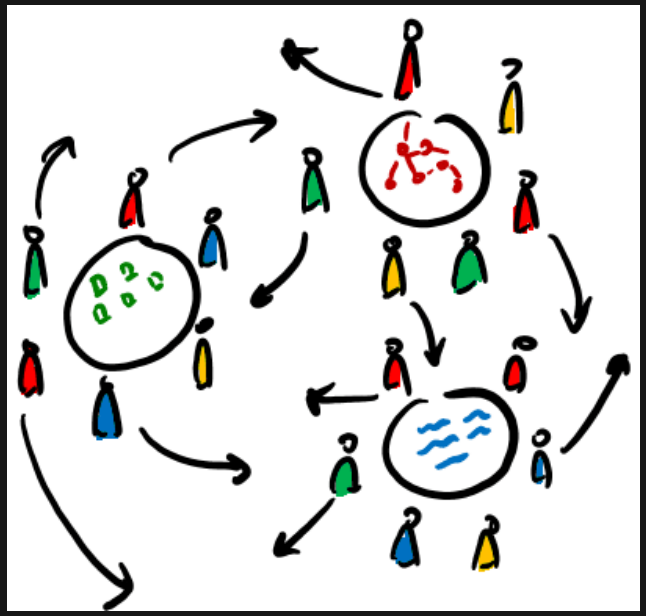
# Signature Industry Partnerships

## World Café Discussion

In Assigned Groups

- Explore questions that matter
- Encourage everyone’s contributions
- Connect diverse perspectives
- Listen together for insights

Debrief by sharing collective discoveries



# Agenda

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- **Next Meeting – April 26, 2024**
- **Theme – Measuring our Progress**

# Engineering Advisory Council

## College of Engineering and Applied Science

Engineering & Applied Science
UNIVERSITY OF COLORADO **BOULDER**

November 3, 2023