

UC San Diego

JACOBS SCHOOL OF ENGINEERING  
Corporate Affiliates Program



# Welcome CAP Executive Board June 8, 2023

# CAP Chair and Vice Chair



**Magaly Drant**

Vice President, Developer Productivity  
ServiceNow



**Rob Vasquez**

Chief Operating Officer, Energy Group  
General Atomics

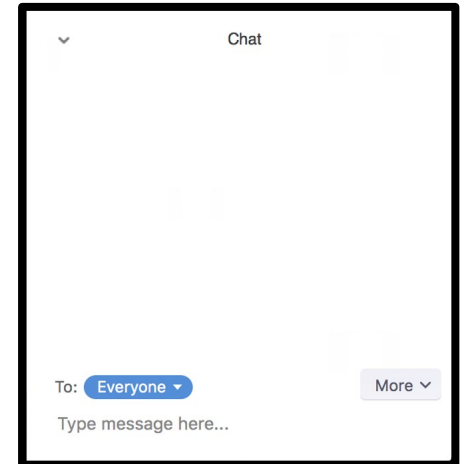
Welcome

**UC San Diego**

**JACOBS SCHOOL OF ENGINEERING**  
Corporate Affiliates Program

# Virtual Attendee Protocol

- We will be recording this meeting
- You will be muted; Use chat box for questions & comments
- We will create a Zoom room for the discussion portion of the meeting, please turn on your cameras at that time.



# Agenda

**5:00-5:10pm**

**CAP Executive Board Chairwoman Welcome**

*Magaly Drant*

*Vice President of Developer Productivity, ServiceNow*

**5:10-5:30pm**

**Dean's Report**

*Al Pisano*

*Dean, Jacobs School of Engineering*

**5:30-5:50pm**

**Building Compassion and Human Bridges through Research Collaboration**

*Olivia Graeve*

*Professor, Mechanical & Aerospace Engineering*

**5:50-6:20pm**

**Executive Input: The Students We Share**

**6:20-6:30pm**

**CAP Business**

*Wil Dyer*

*Director, Corporate Affiliates Program*

**6:30pm**

**Adjournment**



## Why We're Here: Investing in Students



*Some ServiceNow Scholars meet with company leadership*

## Welcome New CAP Partners



## Welcome Guests

8 Rivers

National Instruments

Clark Dietrich

Noblis

DRS Daylight Solutions

Nuance Communications

Green Hills Software

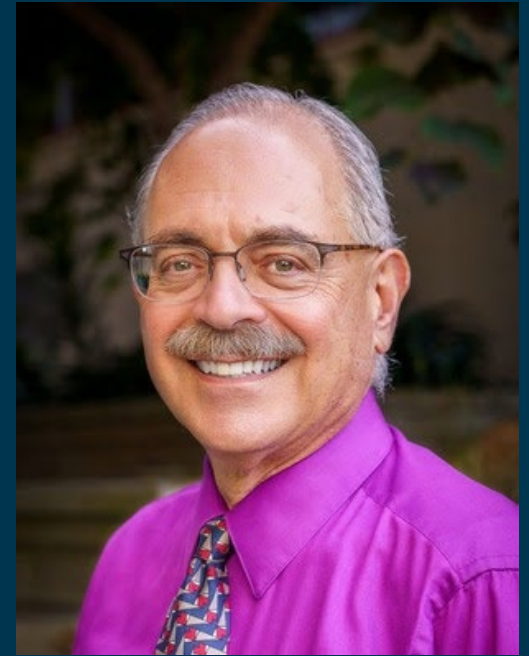
Oportun Financial

Limeade

# Dean's Report

Albert P. Pisano

Dean, Jacobs School of Engineering



Phase Three

**UC San Diego**

**JACOBS SCHOOL OF ENGINEERING**  
Corporate Affiliates Program

# Rankings Update

#12 in the nation

#8 public engineering school in the nation

- Last year, the Jacobs School was one of three engineering schools tied at #10
- All three schools surged forward this year
- We increased our research expenditures by an astonishing 12.6% year over year
- But the other two schools had great years as well, and they finished just ahead of us
- We are #1 in California, and the West Coast, for Research Expenditures

# 10 Years

I've been Dean of the Jacobs School  
for 10 years.

# Thank You

Thank you for your partnership,  
collaboration, and generosity.



# Spoiler Alert

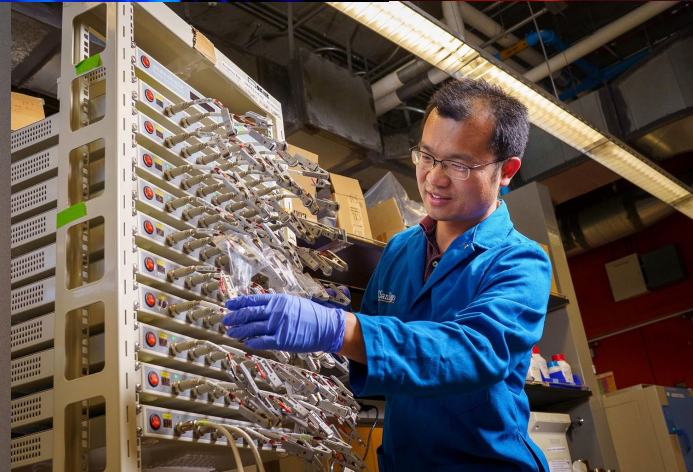
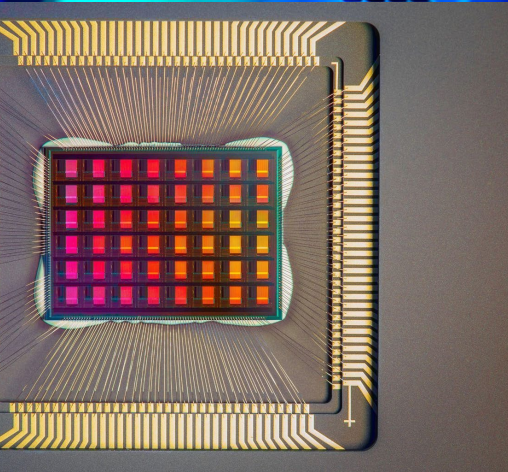
I'm sharply focused on my  
**next 5 years**  
as Dean of the Jacobs School,  
Phase Three!

**In 10 years,  
we accomplished a lot!**

Franklin Antonio Hall - We did it!







We'll do even more  
in **the next 5 years!**

**Over the last 10 years**



Your feedback and support has been critical for our achievements and momentum.

We will build on all of this over the next five years!

## Over the last 10 years



- **YOU SAID**  
Build on your strengths / differentiate / increase quality / increase relevance
- **WE DID**
  - ▶ Accelerated success of Faculty / Grad Students / Undergraduates
  - ▶ Built **Franklin Antonio Hall** and strengthened innovation infrastructure across Jacobs
  - ▶ Created a **21st Century Systems Engineering program**
  - ▶ Raised the national profile of Jacobs School



# Last CAP Board Meeting Discussion: Enhancing Relevance & Excellence of Talent Pipeline



- **YOU SAID**  
Diversify / hands-on learning / early talent pipeline / project-based learning
- **WE DID**
  - ▶ Dean's Scholars of Excellence
  - ▶ ENLACE Program
  - ▶ Guided Engineering Apprenticeship in Research (GEAR) to Career
  - ▶ Early Research Scholars Program
  - ▶ EnVision Maker Studio

# **My 8 Point Plan for the next 5 years**

# 8 Point Plan Theme

Reinvention while doubling down  
on the fundamentals

# Point 1

## Continue the momentum for all kinds of **engineering diversity**

- **Faculty:** Excellence in diversity program resulted in a **hiring rate of 40% women faculty** in Academic Year 2021-22.
- **Undergraduates:** For the past two years, student recruitment has achieved **26% women** in the undergraduate first year.
- **Graduate students:** There are now **25% women in the graduate program** across the school (although some Departments are lagging).
- **Staff:** We are building and strengthening our culture of cooperation where every staff member is empowered to thrive.

## Point 2

# Build an Ever-growing Number of Multi-faceted Campus Partnerships

**In 10 years, we launched 20 centers** which operated with external partners.

**13** are new engineering interdisciplinary research centers; **5** are new joint institutes.

Center for Engineered Natural Intelligence (CENI)  
CHO Systems Biology Center  
Center for Extreme Events Research (CEER)  
Machine-Intelligence, Computing & Security Center (MICS)  
Center for Microbiome Innovation (CMI)  
CaliBaja Center for Resilient Materials & Systems  
Nano ImmunoEngineering Center (NanoIE)  
Sustainable Power and Energy Center (SPEC)  
Center for Visual Computing (VisComp)  
Center for Wearable Sensors (CWS)

Deep Decarbonization Initiative (DDI)  
Convergent Systems Engineering (CoSE)  
Contextual Robotics Institute (CRI)  
Institute for Materials Discovery & Design (IMDD)  
Institute for Supply Chain Excellence & Innovation (ISEI)  
Institute for the Global Entrepreneur (IGE)  
EnVision Arts & Engineering Maker Studio  
Processing with Intelligent Storage and Memory Center (PRISM)  
Power Management Integration Center (PMIC)

## Point 3

# Enhance Undergraduate Education for Diverse Technical Talent

- Student diversity rose simultaneously with student quality, reinforced by our **Student Success Initiative**
- Major increase in hands-on and experiential-learning opportunities via **E4 / Experience Engineering**
- Undergraduate diversity includes training deeply creative engineers / interdisciplinary talent

# Point 4

## Drive Graduate Education Quality

- Customized, highly-focused masters programs will produce highly-relevant graduates
  - Ex: MS programs in development for ISEI (supply chain engineering) and CoSE (systems engineering)
- Laboratory infrastructure renewal
  - GMP Lab (Good Manufacturing Practices) / Shadi Dayeh
  - NANO3 / emerging opportunities via the CHIPS Act
- Re-energize our Agile Centers program at the Jacobs School



## Point 5

# Accelerate Faculty Career Growth and Impact

- The number of ladder-rank and teaching faculty headcount increased to 273, with **excellence in diversity candidates comprising approximately 1 in 3 of the faculty hired per year**
- In 3 years, 45% of all faculty will have been hired while Albert P. Pisano has been Dean. We need to create new ways to accelerate the careers of these faculty
- **Create a culture of success through collaboration**
  - step 1: Early Career Faculty Acceleration Program to fund early collaboration
  - step 2: Agile Centers involvement
  - step 3: Increasingly larger research collaborations
- Endowed Chair professorships
- Double down on prestigious awards / prestigious academic Academies and Fellows

# Point 6

## Implement the “Leviathan Project”

Exceptional individual contributor and small-group engineering is critical, but world-class engineering schools must **also** step up and do more:

- A "Leviathan Project" is a major project, spanning the interests of several faculty, and which could command a grant in the size range of \$50-100M over a 5-year period
- Each department will identify candidates for 2 Leviathan Projects by the end of the Summer 2023 quarter

# Point 7

## Accelerate Fundraising

- Fundraising has jumped from \$18-20M/year to \$45M/year
- **Goal:** Reach and sustain \$50M/year in fundraising
- We surpassed our fundraising goal for Franklin Antonio Hall
- Thank you to everyone involved with the CAP Board past and present who has made this fundraising a success
- Leviathan Project is part of the strategic plan to accelerate fundraising at the Jacobs School

## Point 8

# Build National and International Cachet

- Making sure the world knows about our Leviathan projects / through strategic communications of accomplishments and impact
- Empower faculty to step into the spotlight and get recognized for their excellence



# What Keeps Me Up at Night

- Fully resourcing Leviathan Projects
- Strengthen faculty-graduate student dynamics schoolwide
- Accelerating faculty research careers despite myriad headwinds
- Finding ways to work smarter, because there isn't headroom for working any harder

# Questions/Comments/Input?

# Faculty Presentation

## Olivia Graeve

Professor, Mechanical & Aerospace Engineering  
Director, Materials Science & Engineering Program  
Director, Calibaja Center for Resilient Materials  
Director, ENLACE



Materials Science + The Students We Share

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## Olivia A. Graeve

*Jacobs Faculty Scholar and Professor*

Department of Mechanical and Aerospace Engineering

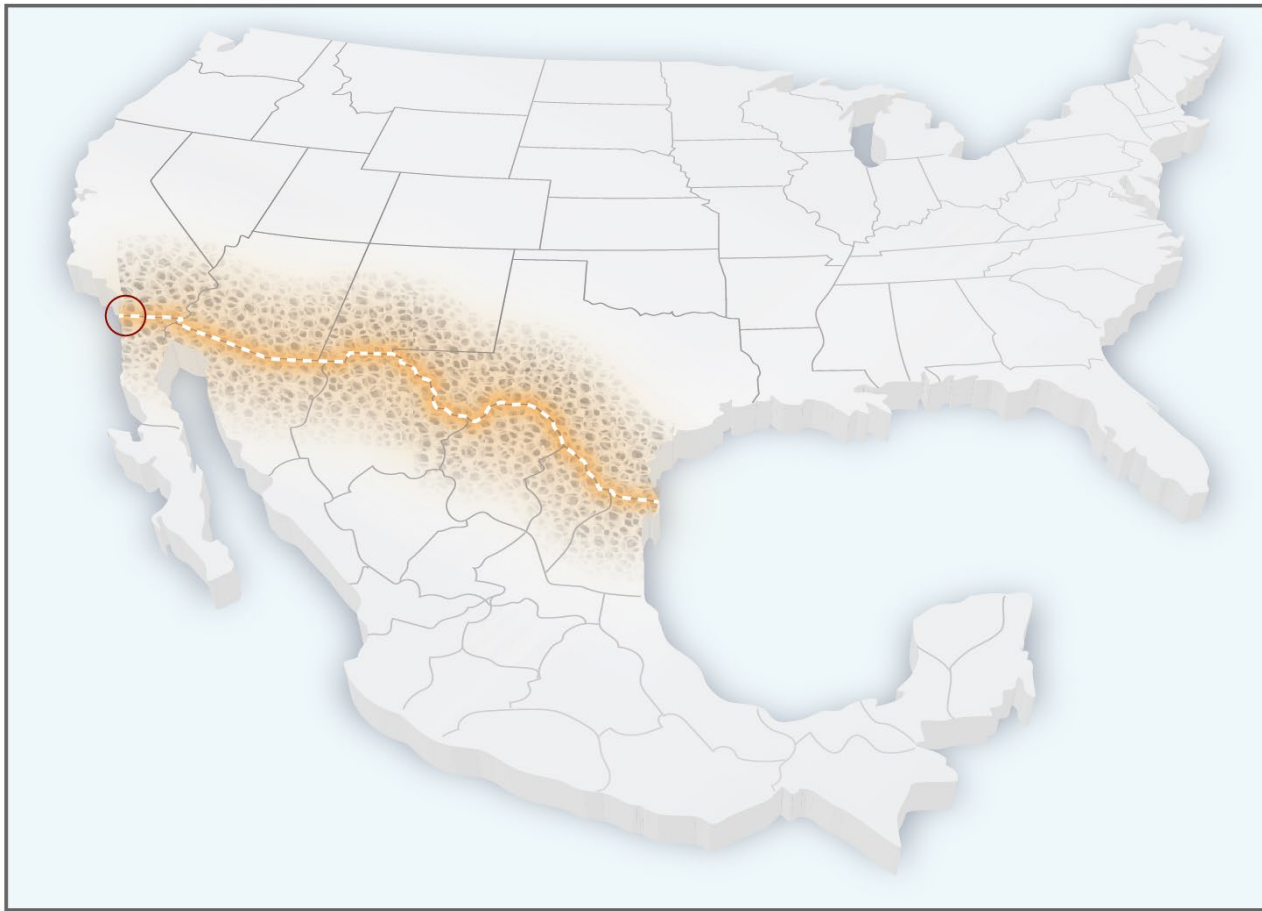
*Director, Program in Materials Science and Engineering*

*Director, CaliBaja Center for Resilient Materials and Systems*

[ograeve@ucsd.edu](mailto:ograeve@ucsd.edu)

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# The Students We Share





Students play in the schoolyard of the Jardin de Niños Xochimilli. Sometimes families up and leave Tijuana schools without warning, the school director said. “We do have children who leave school,” because their parents migrate, she said. “They don’t always tell us. The other children ask and ask and ask where they are, and then after a while they understand.” Photo: Alice Proujansky for The Intercept

Breaking Barriers



Building Bridges

**My goal is to eliminate walls and barriers, both physical and mental, through education.**

Specifically, I am working to build bridges between the U.S. and México.



# Building Compassion and Human Bridges through Research Collaborations

Olivia A. Graeve,\* Jorge A. Arróyave García de la Cadena, and Aranza S. Martínez López



Cite This: *ACS Omega* 2022, 7, 1542–1546



Read Online

ACCESS |



Metrics & More



Article Recommendations

**ABSTRACT:** Our ENLACE binational summer research program was established with the aim of encouraging the participation of high school and college students in research in the sciences and engineering, while promoting cross-border friendships between the United States and Mexico. The program unites students around science and engineering questions and concurrently engages them in a rich curriculum that promotes understanding of broader societal issues of equity, inclusion, tolerance, and social justice. Because we built our program around hope and cooperation, it is our aspiration and promise that walls and borders—all kinds of walls and borders—can be eradicated through kindness, compassion, and respect for others. ENLACE is not just a program we organize every summer, it is also a program that defines who we are as people and the kind of contribution we want to make in the world.



O.A. Graeve, J.A. Arróyave García de la Cadena, A.S. Martínez López, "Building compassion and human bridges through research collaborations," *ACS Omega*, 7 [2] 1542-1546 (2022).

# ENLACE Summer Research Program



As a model of collaboration, students are organized in pairs (one from each side of the U.S.-Mexico border) and they work together in an assigned research laboratory at UC San Diego supporting the activities of a PhD student mentor.

During a lighthearted moment, some of the students from the ENLACE 2016 program discuss their projects. The program was highlighted in the San Diego Union-Tribune as a program of "Science without borders":

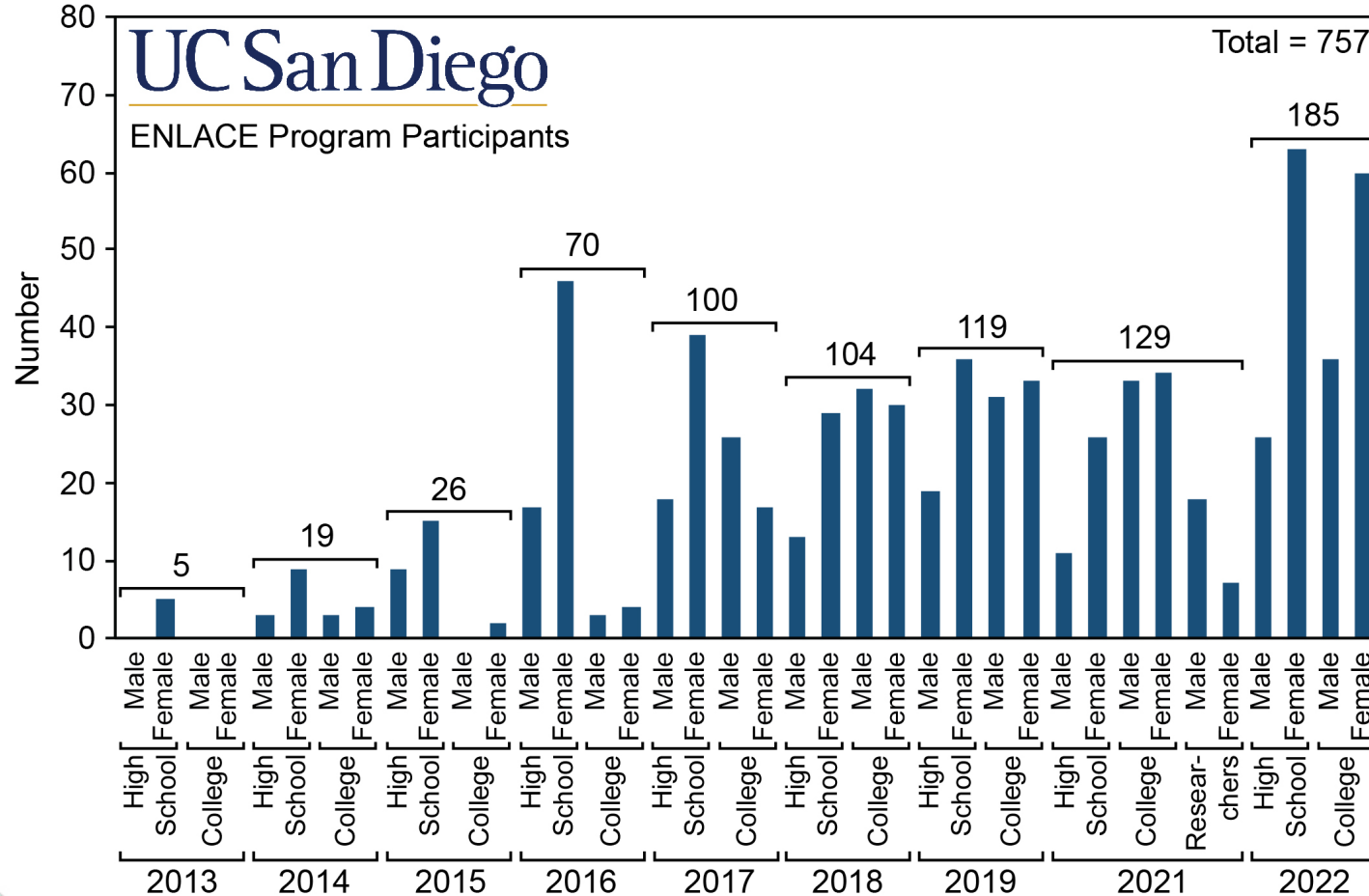
<http://www.sandiegouniontribune.com/news/border-baja-california/sdut-ucsd-science-program-seeks-to-bridge-border-2016aug04-story.html>



# UC San Diego

## ENLACE Program Participants

Total = 757



# Lectures and Tours



Science and Society Lectures: (every Monday at 8:00 AM)

Musician Nathan East, City Attorney Mara Elliott,  
Ambassador Carlos Gonzalez, Judge Gonzalo Curiel

Tours: (Saturdays)

San Diego Zoo, Air and Space Museum,  
Birch Aquarium, Midway Museum

# Additional Lectures and Tours

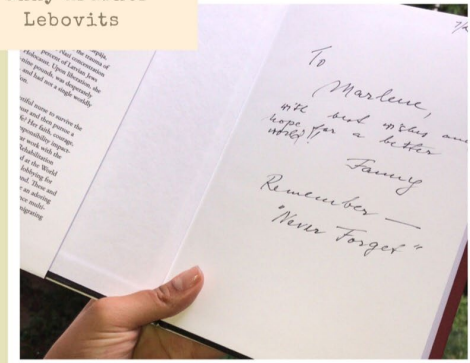
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**CaliBaja Webinars:** Every Tuesday from 4:00 to 6:00 PM

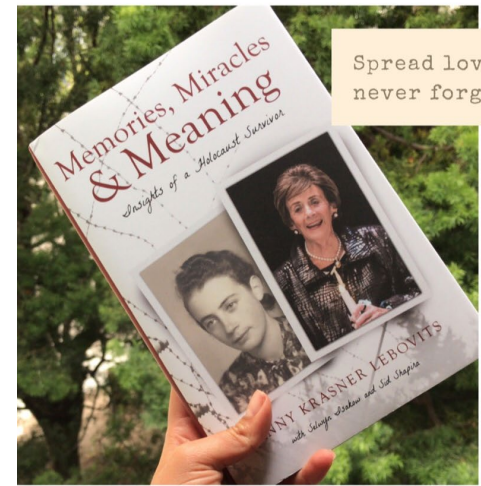
**Futures Summit:** A full day retreat where we discuss future goals and career objectives.

**Anti-bias Training:** A discussion on acceptance and compassion. This training is in preparation for the Science & Society Lecture of a Holocaust survivor.

Fanny Krasner  
Lebovits



Spread love, and never forget. <3



# College Prep and Grad School Prep

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**Grad School Prep** (for college students)

**College Prep** (for high school students)



# Grad School Prep Program

## Summer 2023



### Virtual GRAD SCHOOL PREP

## Welcome!

The objective of these workshops is to prepare students to apply for graduate school. These workshops are open to all interested college students and have no cost. All sessions are in English.

### Registration:

<https://forms.gle/F3W1qhB5iYb3bXyM8>

Instructions on connecting to all sessions will be sent by email once the student registers for the program.

### Virtual Webinar Platform:

**All sessions will be via the Zoom app**



### Schedule:

Wed, 28 June 2023

Topic: The Resume and Curriculum Vita

Wed, 5 July 2023

Topic: Time Management

Wed, 12 July 2023

Topic: The Advisor/Student Relationship

Wed, 19 July 2023

Topic: The Statement of Purpose and Letters of Recommendation

Wed, 26 July 2023

Topic: Graduate Fellowships and Financial Aid

### Times:

All sessions are scheduled from 2:00 PM to 5:00 PM (Pacific time; Tijuana); some sessions may end earlier.

### Registration Deadline:

23 June 2023



### Instructor

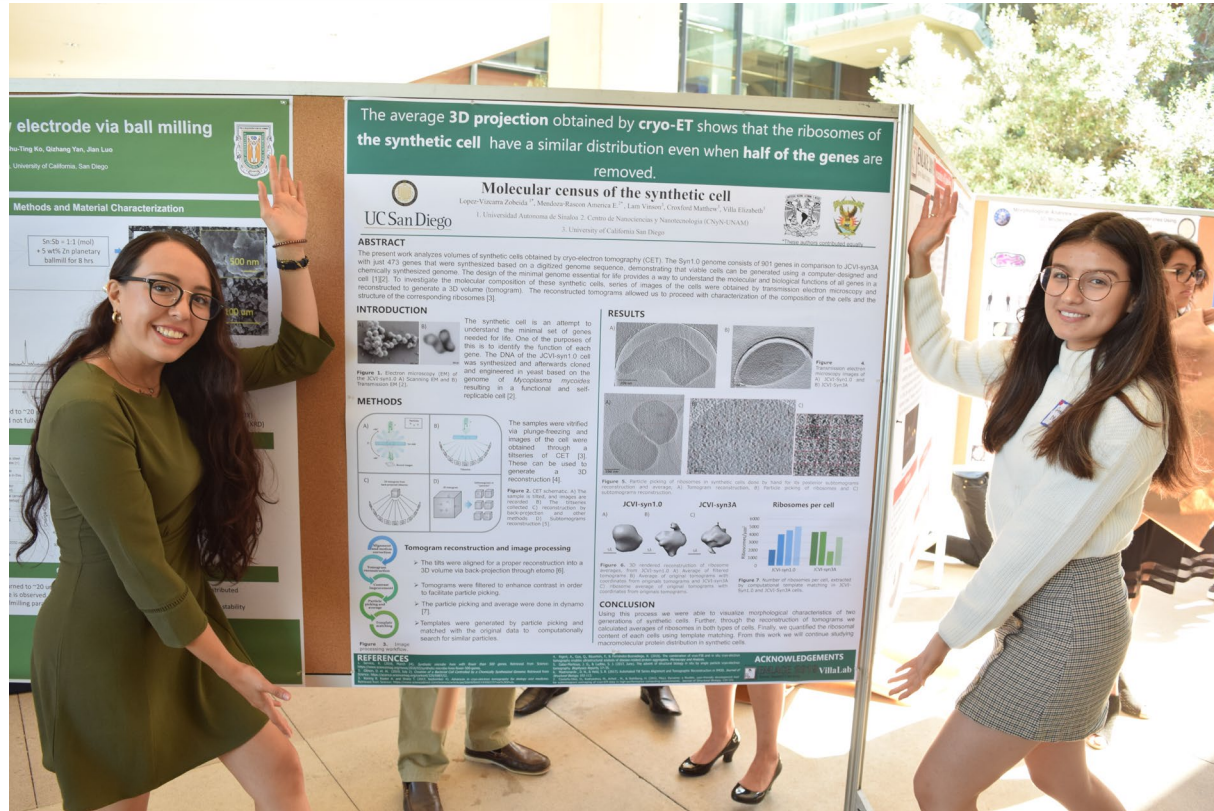
**Olivia A. Graeve, Ph.D.**

Professor, UC San Diego  
Department of Mechanical and Aerospace Engineering

## Registration:

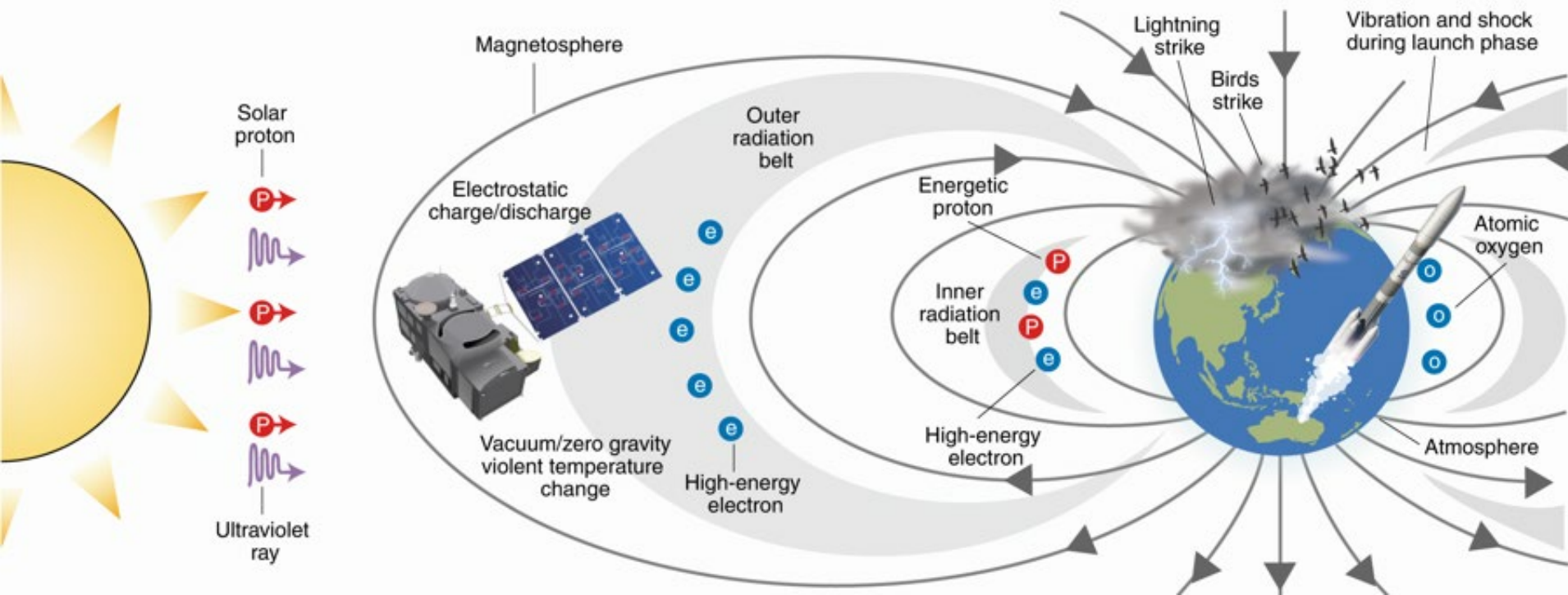
<https://forms.gle/F3W1qhB5iYb3bXyM8>

# Closing Ceremony and Symposium



Friday, August 11, 2023

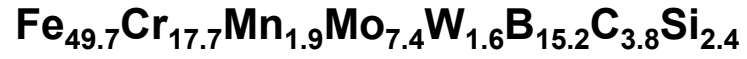
# In my research group, our goal is to explore the design and manufacturing of materials for applications in extreme environments.



<https://www.nature.com/articles/s41563-018-0184-4>



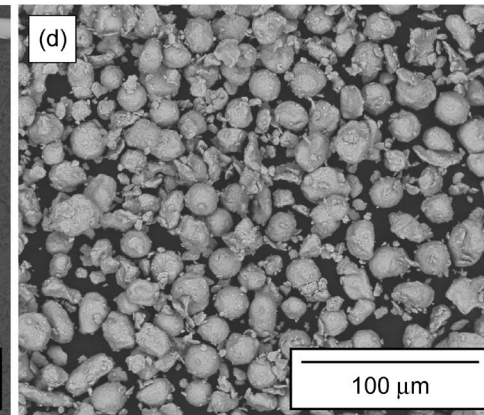
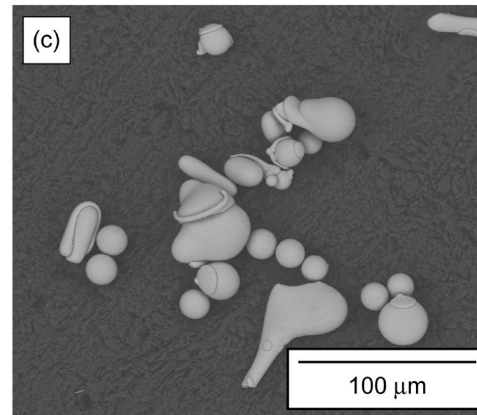
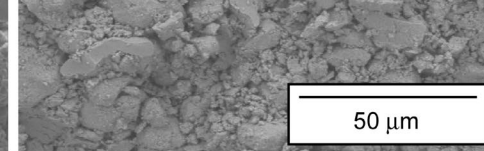
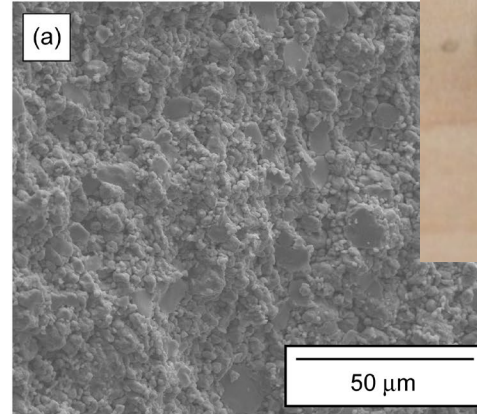
# SAM2x5 –



Scanning electron micrographs of:

- (a) sintered SAM7 fracture surface,
- (b) sintered SAM2X5 fracture surface,
- (c) as-received SAM2X5 powders,
- (d) milled SAM2X5 powders.

O.A. Graeve, M.S. Saterlie, R. Kanakala, S. Diaz de la Torre, and J.C. Farmer, "The kinetics of devitrification of amorphous alloys: The time-temperature-crystallinity diagram describing the spark plasma sintering of Fe-based metallic glasses," *Scripta Materialia*, **69** [2] 143-148 (2013).



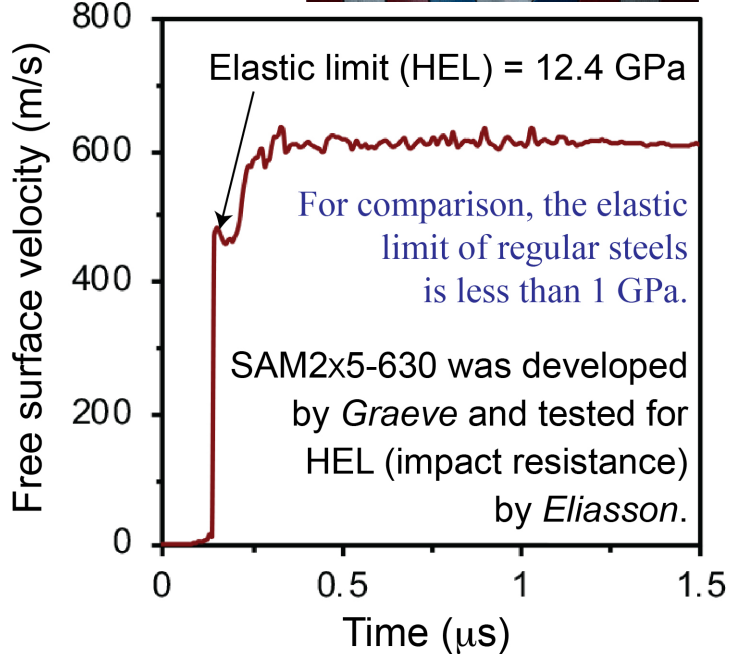
# Impact Resistant Materials

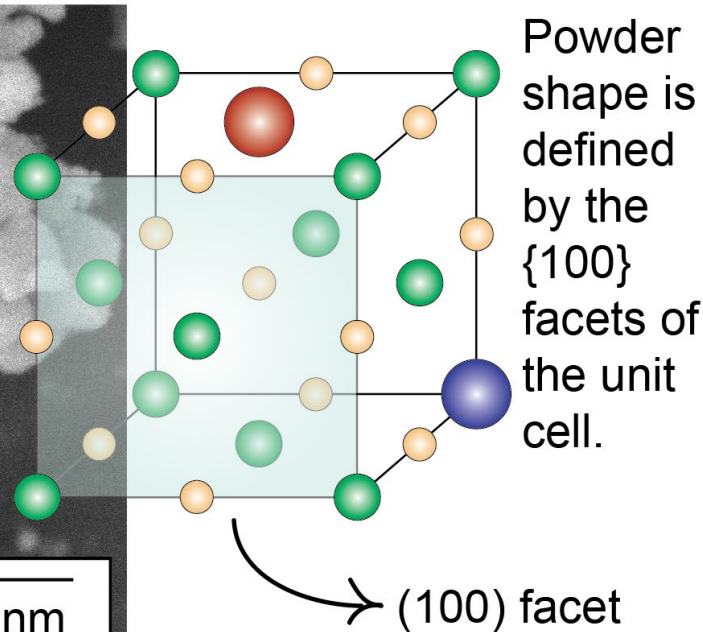
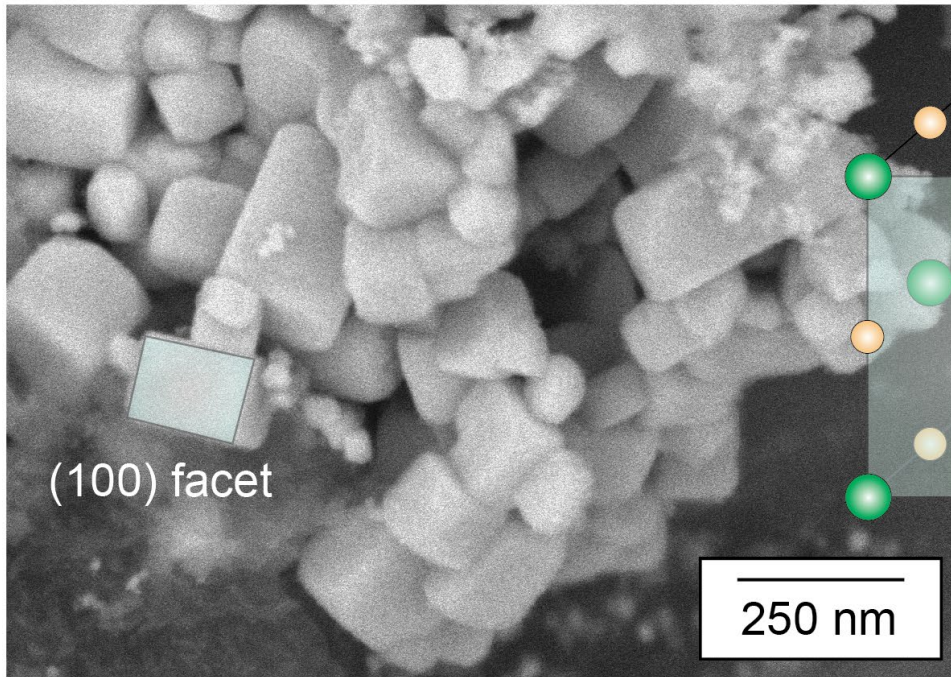
We have produced the highest ever recorded HEL for a metallic glass:  
**A value of 12.4 GPa.**

G.R. Khanolkar, M.B. Rauls, J.P. Kelly, O.A. Graeve, A.M. Hodge, and V. Eliasson, "Shock Wave Response of Iron-based *In Situ* Metallic Glass Matrix Composites," *Scientific Reports*, **6**, 22568 (2016).

I.-C. Cheng, J.P. Kelly, E. Novitskaya, V. Eliasson, A.M. Hodge, and O.A. Graeve, "Mechanical Properties of an Fe-based SAM2x5-630 Metallic Glass Matrix Composite with Tungsten Particle Additions," *Advanced Engineering Materials*, **20** [9] 1800023 (2018).

- Turneure: 7.0 GPa on  $Zr_{56.7}Cu_{15.3}Ni_{12.5}Nb_{5.0}Al_{10.0}Y_{0.5}$
- Martin (2007): 6.86 GPa on  $Zr_{57}Nb_5Cu_{15.4}Ni_{12.6}Al_{10}$
- Xi (2010): 6.9 to 9.6 GPa on  $Zr_{51}Ti_5Ni_{10}Cu_{25}Al_9$
- Mashimo (2006): 6.2 GPa on  $Zr_{55}Al_{10}Ni_5Cu_{30}$





## Powder cubic morphology in TaC co-doped with Ni+Ti

T. Ren, R. Tran, S. Lee, A. Bandera, M. Herrera, Z.-G. Li, S.P. Ong, and O.A. Graeve, "Morphology Control of Tantalum Carbide Nanoparticles Through Dopant Additions," *Journal of Physical Chemistry C*, **125** [19] 10665-10675 (2021).



# Materials in Extreme Environments

Revolutionizing the way we design, test and manufacture materials and systems for extreme environments

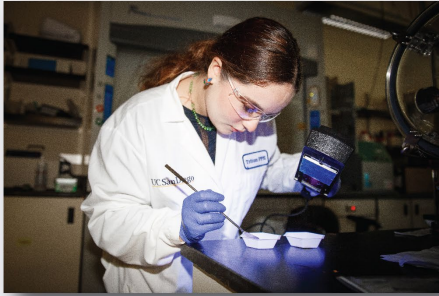


**Prof. Olivia A. Graeve**

<http://graeve.ucsd.edu/>  
[ograeve@ucsd.edu](mailto:ograeve@ucsd.edu)

- ❖ **Design** materials and systems for extreme environments such as ultra-high temperatures, extreme pressures and deformations, radiation, and acidic conditions, *etc.*
- ❖ **Manufacture** materials and systems using innovative techniques.
- ❖ **Innovate** advanced technologies for:
  - ❖ Aerospace
  - ❖ Energy
  - ❖ Nuclear
  - ❖ Biomedical
  - ❖ Environmental

# Materials Science & Engineering



<http://matsci.ucsd.edu>

Interested in a cutting-edge materials science and engineering interdisciplinary MS or PhD program? Join us!

UC San Diego was named the nation's eighth best public university by U.S. News & World Report

Olivia A. Graeve, PhD  
Professor and Program Director  
[matscidirector@ucsd.edu](mailto:matscidirector@ucsd.edu)

Yvonne Wollmann  
Admissions & Financial Support  
[mats-gradadmissions@eng.ucsd.edu](mailto:mats-gradadmissions@eng.ucsd.edu)

Catherine Ingco  
Academic Advising  
[mat-mats-academicadvising@eng.ucsd.edu](mailto:mat-mats-academicadvising@eng.ucsd.edu)



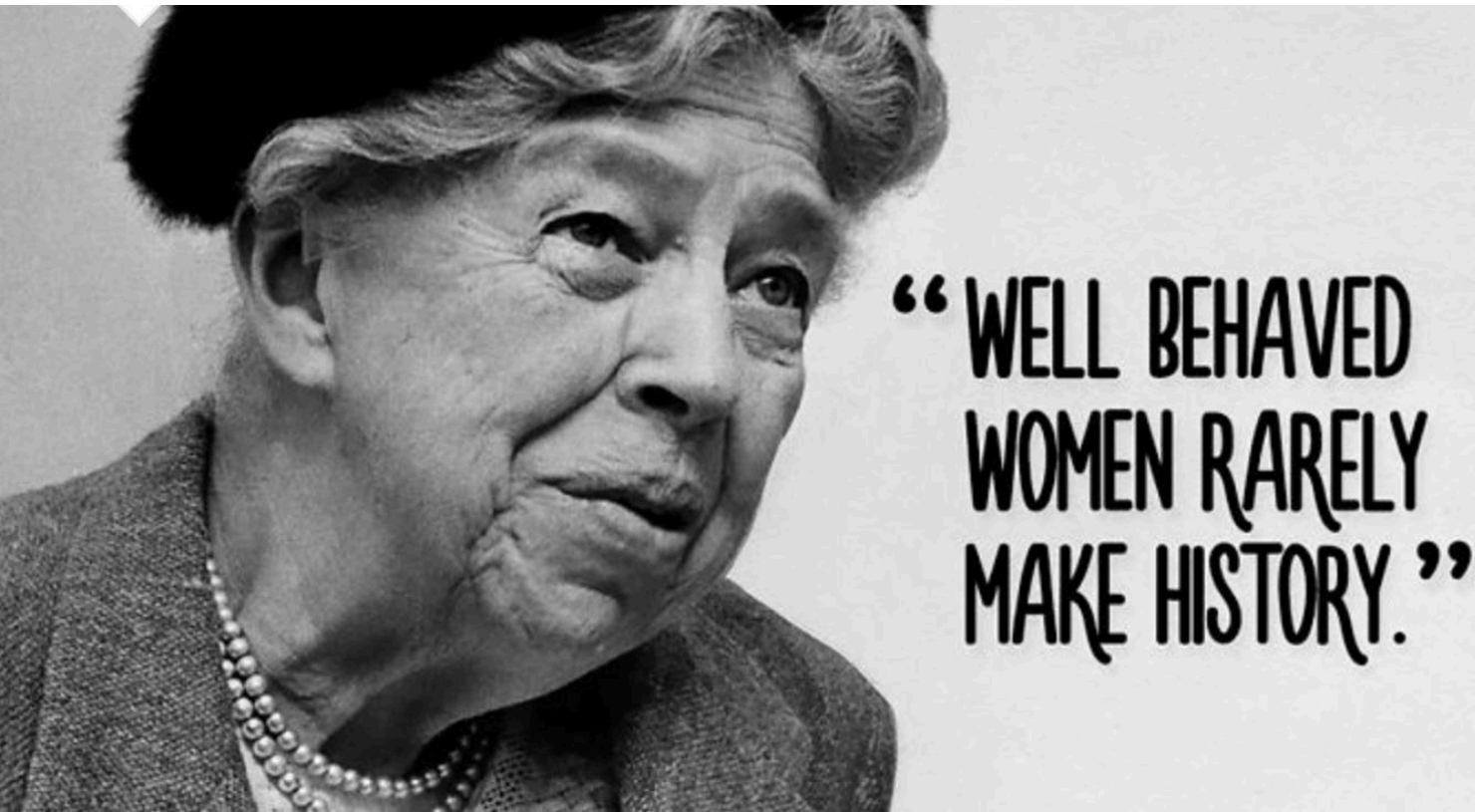
**UC San Diego**



<http://matsci.ucsd.edu/>



<https://www.nasa.gov/feature/goddard/2022/new-webb-image-captures-clearer-view-of-neptune-s-rings-in-decades>



Las mujeres bien portadas  
rara vez hacen historia.

Think Different

# Questions/Comments/Input?



# CAP Executive Board Input: The Students We Share

- Could a two year internship structure (summer 1 at UC San Diego, summer 2 at your organization) work for your org? Other recommendations?
- How could we generate awareness in your company and in your industry/community around the students we share, to ensure other organizations are aware of this unique talent pipeline?
- Additional ideas/input regarding ENLACE, Calibaja Center for Resilient Materials & Systems, others?

# CAP Business

Wil Dyer

Director, Corporate Affiliates Program



## CAP Updates

**UC San Diego**

**JACOBS SCHOOL OF ENGINEERING**  
Corporate Affiliates Program

# Jacobs School Corporate Affiliates Program



# Take Advantage of Your VIP Parking Permits

- Chancellor's "C" permit - park anywhere on campus!
- Register up to 5 license plates
  - Only one car can use permit at a time
- Permit runs from July 1 - June 30
- **Details coming from [donorrelations@ucsd.edu](mailto:donorrelations@ucsd.edu) mid-June**



# *Spirit of Solar* Cruise is back!

Save-the-date for  
the annual CAP  
Spirit of Solar Cruise

September 25, 2023

# New Addition to the CAP Team!

**New Director of Corporate Research Partnerships starting this month!**

New Director will:

- Lead strategic alignment of portfolio of agile research centers and institutes
- Drive meaningful collaboration with industry
- Strengthen industry partnerships to achieve common goals and maximize value

We look forward to introducing the new Director formally at the next board meeting

# CAP Talent Programs: Talent Strategy Planning this Summer

**Plan your 2023-2024 academic year talent strategy early with the CAP Team!**

- Tailored events for your organization
- Internships
- Team Internship Program (TIP)
- Cooperative Education (Co-op)



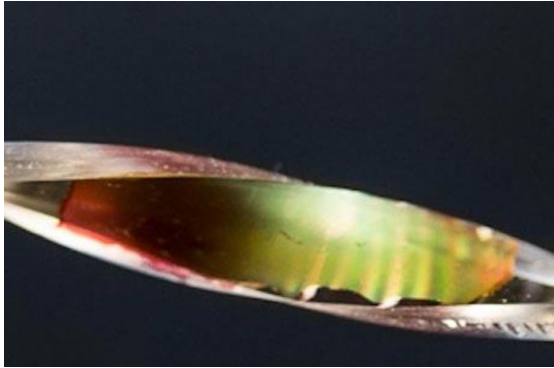
**Have current openings? Send us the description(s) and we'll take care of the rest!**

- Full-time new college graduate roles (students graduate June 17)
- Alumni for experienced roles (0-5 years)

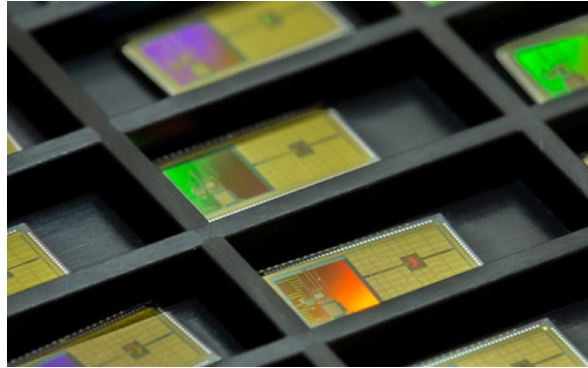
Contact Alice Grgas at [agrgas@ucsd.edu](mailto:agrgas@ucsd.edu); Learn more at [jacobsschool.ucsd.edu/talent](https://jacobsschool.ucsd.edu/talent)



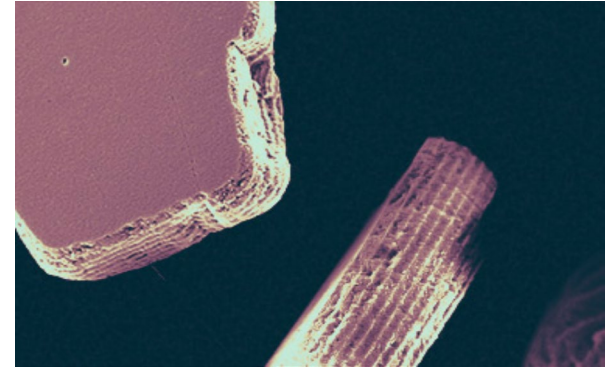
## CAP Partner Invitations to Research Reviews



Sustainable Power &  
Energy Center  
June 15, 2023



Power Management  
Integration Center  
June 22-23, 2023



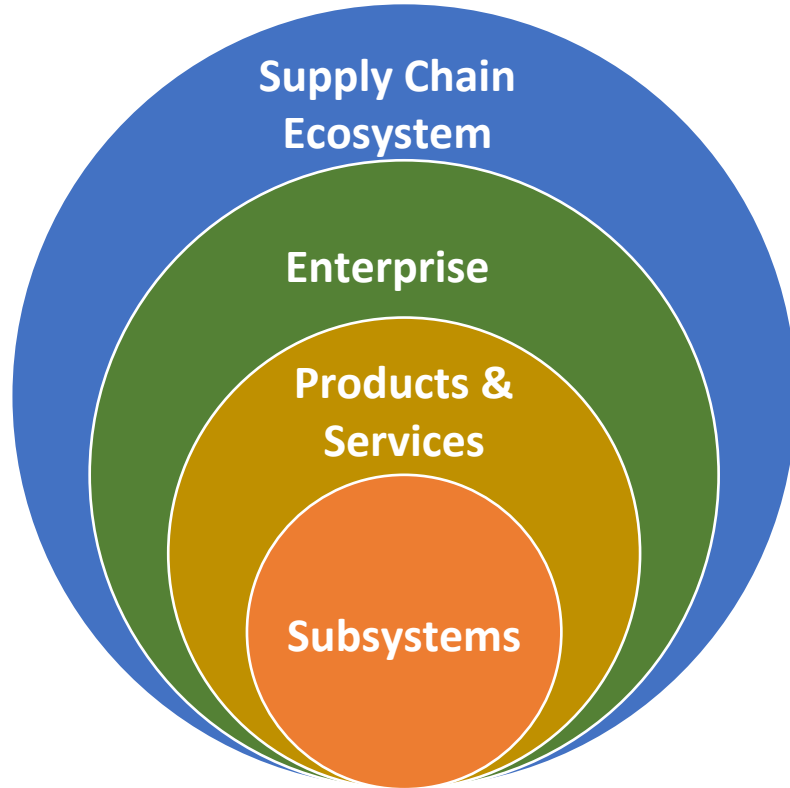
Institute for Materials  
Discovery & Design  
October 10-11, 2023

Contact: Wil Dyer, [wdyer@ucsd.edu](mailto:wdyer@ucsd.edu)

**Problem:** Industry is leading a revolution in complex, massively distributed, data-driven systems that rely on data, analytics, and machine learning and modeling to constantly evolve and improve, during ever-shorter iterations.

**New systems engineering methods, processes and tools need to be created and translated into education to meet this need.**





Cyber-Physical Social Systems	Architecture-Based Enterprise Systems	Value Supply Chains
<b>COSE 200: Leadership Skills, Values, and Team-building (MGT 406)</b>		
<b>COSE 210: Modeling, Simulation and Analysis (AESE 278C)</b>		
<b>COSE 215: Decision and Risk Analysis (AESE 241)</b>		
<b>COSE 220: Sustainable Innovation (MGT 291: Essentials for Business Practice)</b>		
<b>COSE 225: Management of Complex Systems (AESE 261: Managing Stakeholder Relationships)</b>		
<b>COSE 250A: CPSS - Conception (MAE 207)</b>	<b>COSE 260A: Complexity and Large-scale Systems (AESE 278A)</b>	<b>COSE 270A: VSC - Conception (MGT 453: Supply Chain Management)</b>
<b>COSE 250B: CPSS - Architecture (MAE 207)</b>	<b>COSE 260B: Enterprise Architecting (AESE 278B)</b>	<b>COSE 270B: VSC - Architecture (MGT 499: Supply Chain Cost Management)</b>
<b>COSE 250C: CPSS - Implementation (MAE 207)</b>	<b>COSE 260C: Engineering Essentials for Distributed Systems (AESE 278D)</b>	<b>COSE 270C: VSC - Implementation (MGT 499: Strategic Sourcing)</b>
<b>COSE 250D: CPSS - Evolution (N/A)</b>	<b>COSE 260D: Patterns for Enterprise Architecting (AESE 278E)</b>	<b>COSE 270C: VSC - Evolution (N/A)</b>
<b>COSE 230: Capstone Team Projects (AESE 279)</b>	<b>COSE 230: Capstone Team Projects (AESE 279)</b>	<b>COSE 230: Capstone Team Projects (AESE 279)</b>

# Accepting Applications: Master of Advanced Studies

MAS programs are interdisciplinary engineering degrees designed for working professionals with classes taught on Fridays and Saturdays every other week.



## **Architecture-based Enterprise Systems Engineering (AESE)**

Engineering professionals with 5+ years of relevant professional experience who are in a position to drive enterprise systems

## **Wireless Embedded Systems (WES)**

Engineering professionals with a background in CS / EE who want to enhance their understanding of IoT, edge computing, 5G and beyond (6G...)

## **Data Science and Engineering (DSE)**

Engineering professionals with a background in CS / Math / Statistics with substantial experience in data analysis

Contact:

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## Fall 2023 Application Deadline:

**July 19, 2023** (extensions available upon request)

# Current Slate of Important Dates

June 8, 2023	Center for Visual Computing Retreat
June 17, 2023	Commencement; Jacobs School of Engineering Ring Ceremony
June 14-15, 2023	Sustainable Power & Energy Center Board Meeting and Research Summit
June 22-23, 2023	Power Management Integration Center Industry Board Meeting
September 25 , 2023	CAP Executive <i>Spirit of Solar</i> Cruise
October 5, 2023	Fall CAP Executive Board Meeting
October 10-11, 2023	Institute for Materials Discovery & Design Symposium

UC San Diego

JACOBS SCHOOL OF ENGINEERING  
Corporate Affiliates Program

Thank you!  
Next CAP Executive Board Meeting:  
October 5, 2023