College of Science
Fall Conference 2016
Sept. 20, 2016

CAL POLY POMONA  College of
Welcome!

- Who is your new dean?
- Who are our new faculty and staff? Who was promoted? Who has retired?
- Updates from our departments and programs.
- Who received Provost or College awards last year?
- What is coming in 2016-2017?
Who am I?

1. Stanford, Ph.D.
2. UC-Boulder
   B.S. Physics
3. Naval Research Labs
   Washington, D.C.
   1993-1996
4. VCU in Richmond
   1996-2016
5. BASF-Germany
   1991-1993
6. Cal Poly Pomona!
Who am I? . . . as a Teacher

General Education
*Energy!*
800 students/sem

Engagement using Technology

Honors College
*Science, Technology, and Society*
100 students/sem

Outreach

Training Teachers
*Elementary Science*

Training Graduate Students
26 M.S. and 5 Ph.D.
Who am I? . . . as a Scholar

AAAS Fellow for “elegant elucidation of the structure of semiconductor surfaces; and for service to science in the form of educational outreach and professional and administrative work.”

Scanning Tunneling Microscopy
Special Silicon Surface
Inventors of STM
Rohrer & Binnig, Nobel 1986
Binnig, Kavli Prize 2016

NSF-funded for 14 yrs
President, 2012

Atomic Force Microscopy
Gallium Nitride
Inventor of AFM
C. Quate, Kavli 2016
Why College of Science at Cal Poly?

• Active faculty of teacher-scholars who engage students in research

• Learn-by-doing philosophy

• Focus on Student Success!
CoS Accomplishments in 2015-2016

- Completed searches for (13) new tenure-track faculty, total of 109 Tenure Track faculty in Fall 2016.

- Taught 5,240 FTES and supported 3,460 CoS majors.

- Published 82 peer-reviewed articles, submitted 99 proposals, and obtained 78 new grants (total of $4.7 million in FY16).
New Faculty Hires

Andrea Bonisoli-Alquati
Biological Sciences

Juanita Jellyman
Biological Sciences

Alex John
Chemistry & Biochemistry

Kathryn McCulloch
Chemistry & Biochemistry

Sampath Jayarathna
Computer Science

Hao Ji
Computer Science

Ryan Robert McCune
CS and CEMaST

Kristen Cochran
Kinesiology & HP

Elizabeth Foster
Kinesiology & HP

Jillian Cannons
Math & Stats

Briana Foster-Greenwood
Math & Stats

Ivan Ventura
Math & Stats

Shohreh Abdolrahimi
Physics & Astronomy
New Staff Hires

Vanessa Lopez
Advising Center

Kristi Werner
Advising Center

Rui Zhao
Dean’s Office

Amanda Hernandez
Chemistry & Biochemistry

Frank Wille
Geological Sciences
Faculty Promotion and Tenure

Edward Bobich
BIO, Professor

Jayson Smith
BIO, Associate Prof.

Angel Valdes
BIO, Professor

Floyd Klavetter
CHM, Professor

Mohammad Husain
CS, Associate Prof.

Kristine Fish
KHP, Professor

Mitsuo Kobayashi
MAT, Associate Prof.

John Arlo Caine
MAT, Associate Prof.

Ryan Szypowski
MAT, Associate Prof.

Robin Wilson
MAT, Professor

Ertan Salik
PHY, Professor
Faculty & Staff Retirements

James Rego
Chemistry & Biochemistry

Craig Rich (FERP)
Computer Science

Perky Vetter (FERP)
Kinesiology

Kamta Rai
Math & Stats

Claudia Pinter-Lucke
Math & Stats

Steve McCauley (FERP)
Physics & Astronomy

Doug Johnson
Physics & Astronomy

CAL POLY POMONA  College of
CFA Events in Fall Quarter 2016

• **All Faculty meeting**
  Thursday 10/20/16, 11:30 -1 pm at KW

• **New Faculty Welcome Lunch**
  Thursday 10/27/16, 11:30 – 1 pm at KW

• **Unconscious Bias Workshop**
  Fri. 10/28/16, 11:30-4pm, 4th fl. Library Special Events Room
  (boxed lunch provided)
  *Hosted by CFA and Co-Sponsored by Office of the President*

• **Lecturer Lunch**
  Tuesday 11/1/16 & Wednesday 11/2/16, 11:30 – 1 pm at KW

• **Eboard/deptreps meeting with President Coley:**
  Thur. 11/3/16, 12-1 pm, 4th fl. Library Special Events Room
Biological Sciences

1,310 undergraduates (287 FTF); >65 graduate students; 27 TT faculty; 3 FERPing faculty; 18 Lecturers; 61 graduate teaching associates

32 peer-reviewed publications with 29 student coauthors

184 conference presentations
118 graduate student coauthors
156 undergraduate student coauthors

52 extramural grant proposals and contracts submitted
17 funded for $1,854,753, 18 pending
35 continuing for a total portfolio of $16,157,335
Biological Sciences

Number of Incoming Students

- '12
- '13
- '14
- '15
- '16

Transfers
Freshmen

CAL POLY POMONA College of
Chemistry & Biochemistry
Student Success

Scholarships
Total $13,000

Record graduating class UG & Grad

Goldstein Research Award

Student Research

Library Award

CAL POLY POMONA
College of
Chemistry & Biochemistry
Faculty Success

RSCA (Barding, Stieber)
CPP Minigrant (Starkey, Stieber, Sun)
Teacher/Scholar (Mogul, Liu, Y.)
CSU Proven Course Redesign (Starkey)
SPICE (Sun, Liu, Y.)
NSF (Schartschneider, Page)
MENTORES (Barding & Liu,Y.)
NASA (Mogul)

Publications/Presentations with students
Computer Science

• 11 full time T/TT, 750 undergraduate/graduate majors

• New courses
  o CS 299 Python Programming (Yang)
  o CS 499 Identity Management (Rich)
  o CS 599 Game Theory and its Applications in Communication Networks (Chen)

• Research and Scholarly activities
  o 23 externally peer reviewed publications
  o 28 presentations at professional conferences
  o 86 graduate/undergraduate research projects

• New grants
  o 10 extramural and 13 intramural grants funded, a total of $1.3M+
  o NSA GenCyber (Husain)
  o NSF EAGER in smart phone security (Husain)
  o NSF REU in UAV technologies (Tang, Raheja)
  o Google IgniteCS community outreach (Sun, Sang, Husain, Manna)
  o Intel, Northrop Grumman Corporation, Lottery, SPICE.....
Computer Science

• New Initiatives
  o Department Center of Big Data & Cloud Computing
  o Google Applied CS partnership
  o App Inventor Programming Summer Camp

• Student Engagement Activities
  o Electronic Bulletin Board
  o CS Tutoring Center
  o Hardware Parrot Drones, Oculus Rift etc
  o Technology Workshop

• CS babies
  o March - Andrew Sun
  o August - Ahyan Husain

• 2016-2017
  o 12 full time T/TT, 940 undergraduate/graduate majors
We promote student success through interactive learning, peer mentoring, laboratory / field investigations, and on-site presentations by students. Below are examples resulting from Geology faculty enterprise:

**Jascha Polet’s Team--Geophysical Mapping of Caldera Structure in Long Valley and Yellowstone Park:**

**Jeff Marshall’s NSF Grant--Constraining Earthquake Hazards on New Zealand’s North Island:**

New Smart Boards in 4-A-608 and 4-A634:
Geological Sciences
Providing knowledge and practical skills for modern geoscientists

Nick Van Buer--U/Pb Zircon Geochronology from Start to Finish

Stephen Osborn
Groundwater Modeling and Isotopic Tracers

Bryan Murray--Sedimentary and Volcanic Processes

Student Research Presentations:
The Mind-Body-Heart Center for Integrated Wellbeing was initiated by Dr. Kristine Fish and Dr. Alane Daugherty.

The Motor Development Clinic completed its 38th academic year serving Pomona and the surrounding community. Congrats to Dr. Perky Vetter (just retired and FERPing) and Mary Stegemann.
Dr. Michael Liang’s research paper presentation at the 5th Annual International Conference on Global Healthcare in July was awarded the Best Research Paper.

KHP completed our first year with our Challenges Rope Course. A number of classes are being taught on the course, and groups from on-campus and off-campus are now using the facility.
Mathematics & Statistics
Research and Scholarly Activities

- Undergraduates
- Teacher-Scholar
- Publications
- Books
- Presentations
Mathematics & Statistics
Teaching, Service and Outreach

• Teaching
• Outreach
  • Gift of Numbers
  • Prison Education
  • School Districts

... and Semester Conversion.
Physics and Astronomy

• Largest catalog to date of *Bowshock Nebulae* in the Milky Way leads to high-impact publication. – M. Povich with students A. Julian, D. Dixon

• **Milky Way Project**: Citizen-scientist online mapping of the galaxy with Cal Poly Pomona as lead institute. – M. Povich with student T. Jayasinghe *master python programmer*

• Astronomy **CAMPARE** program becomes an institutional partner in international HERA consortium to explore early star formation with 240 radio dishes. – A. Rudolph
Physics and Astronomy

• Research on student-understanding of electrodynamics boundary value type problems given “Notable Papers” distinction.
  – Q. Ryan

• New experimental apparatus (Faraday rotation, intro to lockin-amplifiers) introduced into upper-division bottleneck labs to meet massive enrollment growth this year.
  – K. Vandervoort.

• NSF STEM Education Research grant awarded to improve learning in Quantum Mechanics.
  – H. Sadaghiani
CEMaST

Grants and Outreach
- Current grants total over $11.4 million
- Working with over 250 teachers in summer institutes this year
- Supporting Cal Poly Students who will be math/science teachers

Student Advising
- CEMaST received the 2016 Outstanding Advising Program

CAL POLY POMONA  College of
CEMaST
HHMI: Inclusive Excellence Challenge

- Identify groups of natural science students who have “opportunity gaps” (*possible focus: URM women*)
- Describe the institution’s role in creating barriers
- Propose a **sustainable** solution in which faculty play a central role in creating inclusive learning environments. *pmbeardsley@cpp.edu*

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*COURSE GPA ACHIEVEMENT GAPS FOR ALL FRESHMAN, TRANSFER, AND GRADUATE STUDENTS*

<table>
<thead>
<tr>
<th>Course</th>
<th>URM Gaps Chart</th>
<th>Ethnicity Gap Chart</th>
<th>Data Tables</th>
<th>Chart Explanation</th>
<th>Methodology</th>
<th>Applying This Data</th>
<th>Further Resources</th>
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<tbody>
<tr>
<td>Statistics With Applications STA120</td>
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Average GPA  White  African American  Latino  Asian
SEES Program

• Received grant to establish 2017 summer research program in collaboration with University of Havana, Cuba.

• Created the STEMpire program (STEM summer orientation, STEM House competitions, House shields).

• Ran the Discovery Camps to train aspiring teachers, outreach to surrounding school districts and bring in scholarship money.
SEES Program

• Established CPP Shark Tank as a freshman innovation program to develop commercialization of STEM ideas.

• Created 7-minute animated STEMpire movie for STEM Success program.

• SEES students presented to the Chancellor about student support programs (workshops, internships, mentoring programs, research).
Provost and College Awardees during 2015-2016!
Provost Award

Excellence in Scholarly & Creative Activities

Craig LaMunyon, professor and chair of the biological sciences department, has developed a nationally recognized research program to investigate nematode sperm motility and methods to control agricultural parasites. LaMunyon has published 34 peer-reviewed papers, has obtained $2.7M in grants and has trained 37 graduate and undergraduate students.
Mike Brown was responsible for creating Rain Bird BioTrek, an on-campus simulated rainforest used in education and outreach. As curator he is responsible for growing and maintaining the center’s exotic flora, seeking out grants to support its mission, and running its K-12 outreach programs.
CEMaST (Center for Excellence in Mathematics & Science Teaching) works to help students succeed and achieve their goals. They help connect area teachers and administrators with faculty to improve teaching and learning by solving context specific problems in the curricula, teaching, and evaluation of science & mathematics.
Dr. Jascha Polet, Associate Professor in Geology, was instrumental in the development of the M.S. program. She is a graduate advisor to geology students who specialize in seismology and geophysics.
Jennifer Switkes
2015 Ralph W. Ames 
Distinguished Research Award
Mathematics & Statistics

Mohammad Husain
2015 Distinguished Teaching Award
Computer Science
College of Science Staff Awards

Pearl Viggers, Biology
Spring 2016

Christina Schwaller, Math
2015 Annual Staff Award Recipient

Greg Harnden, Chemistry
Fall 2015

Benjamin Lucas, Biology
Winter 2016

Becki King, CEMaST
Fall 2015
Coming in 2016-2017

- Large incoming class of 1,070 freshmen and 590 transfers!
- Update CoS strategic plan to align with new university plan
  Key ideas: polytechnic identity, CSU Graduation Initiative 2025
- How we can support student success, faculty scholarship and create a vibrant working and learning environment?

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<th>Most Recent Rate</th>
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<td>38%</td>
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<td>75%</td>
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<tr>
<td>Gap - Underrepresented Minority</td>
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<td>0</td>
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Which aspect of being a Polytechnic University is most important to you?
(results from real-time poll taken at Fall Convocation on Monday)

- Learn by doing
- Addressing real-world problems

Integrate Liberal Arts and STEM

Innovation

STEM
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Let’s have a great year!

Thanks to Juliet Hidalgo and her crew!