

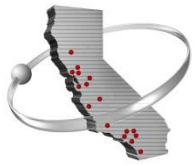
California Space Grant
CONSORTIUM



CaSGC Partnerships with MESA for Community College University Lab Research Experiences

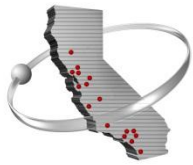
Tehseen Lazzouni
Assistant Director
California Space Grant Consortium
October 10, 2014

*Photo: CaSGC Student
Balloon Launch 12/2008*

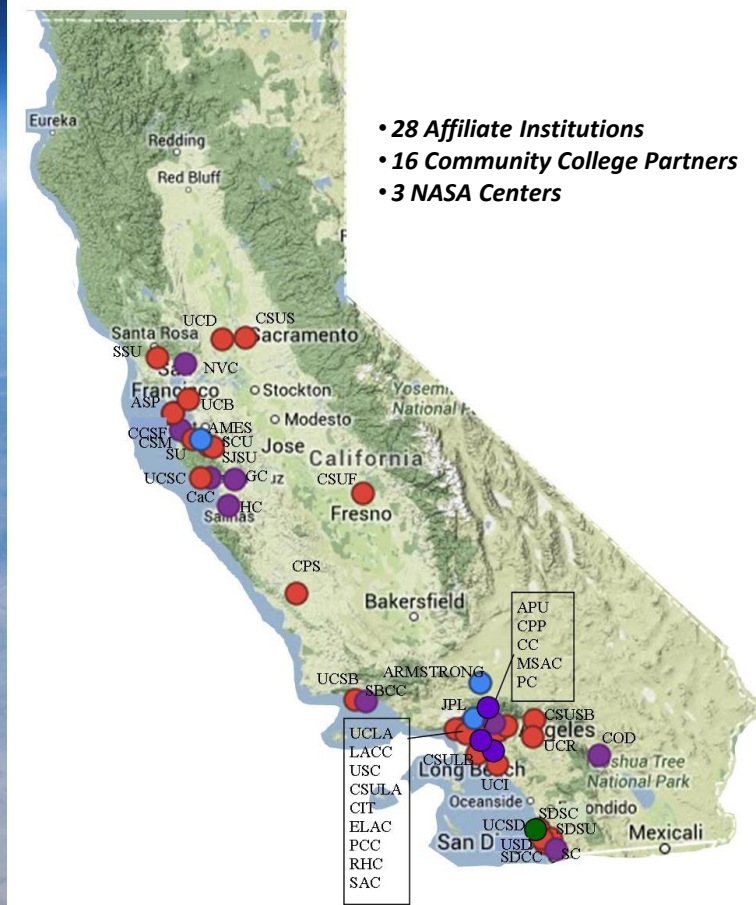


PRESENTATION OVERVIEW

- California Space Grant Affiliates & Partners
- Goals for Community College Pilot Project
- Program Partners
- MESA Program
- Pilot: “San Diego MESA Alliance Research Academy”
- Alignment with Co-STEM, NASA, Research in STEM Retention
- Permanent Program, Growth, Impact



CASGC AFFILIATES & PARTNERS



Lead Institution:

UCSD: University of California, San Diego

Affiliate Members:

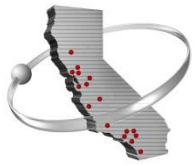
- APU: Azusa Pacific University
- ASP: Astronomical Society of the Pacific
- CIT: California Institute of Technology
- CPP: California State Polytechnic University, Pomona
- CPS: California State Polytechnic University, San Luis Obispo
- CSUE: California State University, Fresno
- CSULA: California State University, Los Angeles
- CSULB: California State University, Long Beach
- CSUS: California State University, Sacramento
- CSUSB: California State University, San Bernardino
- PC: Pomona College
- SCU: Santa Clara University
- SDCC: San Diego City College
- SDSC: San Diego Supercomputer Center
- SDSU: San Diego State University
- SJSU: San Jose State University
- SSU: Sonoma State University
- SU: Stanford University
- UCB: University of California, Berkeley
- UCD: University of California, Davis
- UCI: University of California, Irvine
- UCLA: University of California, Los Angeles
- UCR: University of California, Riverside
- UCSB: University of California, Santa Barbara
- UCSC: University of California, Santa Cruz
- USC: University of Southern California
- USD: University of San Diego

Community College Partners:

- CC: Citrus College
- CaC: Cabrillo College
- CCSF: City College of San Francisco
- COD: College of the Desert
- CSM: College of San Mateo
- ELAC: East Los Angeles College
- GC: Gavilan College
- HC: Hartnell College
- LACC: Los Angeles City College
- MSAC: Mt. San Antonio College
- NVC: Napa Valley College
- PCC: Pasadena City College
- RHC: Rio Hondo College
- SAC: Santa Ana College
- SBCC: Santa Barbara City College
- SC: Southwestern College

California NASA Center Partners:

- AMES: NASA Ames Research Center
- ARMSTRONG: NASA Armstrong Flight Research Center
- JPL: NASA/Jet Propulsion Laboratory



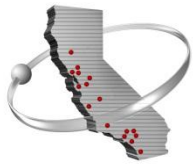
CASGC AFFILIATES & PARTNERS



*Bay Area
Affiliate Mtg
NASA Ames
March 2014*



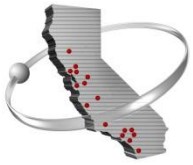
*Southern CA
Affiliate Mtg
UC Los Angeles
April 2014*



CASGC AFFILIATES & PARTNERS

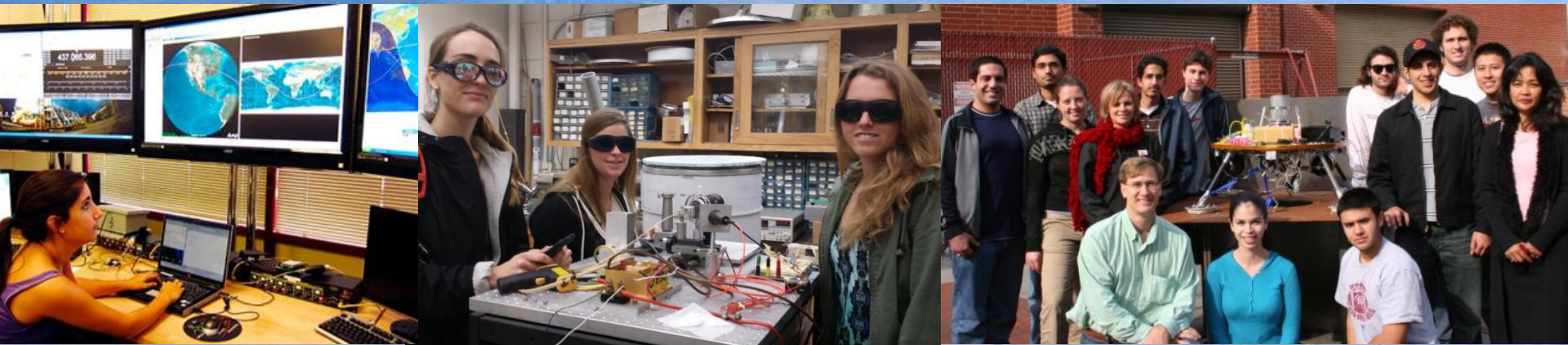
- Programs include graduate and undergraduate research and team projects in: Aeronautics...

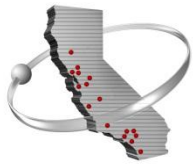




CASGC AFFILIATES & PARTNERS

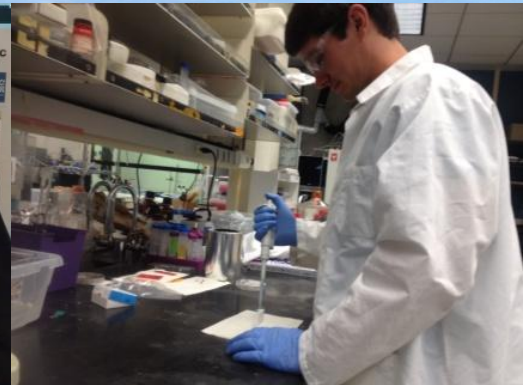
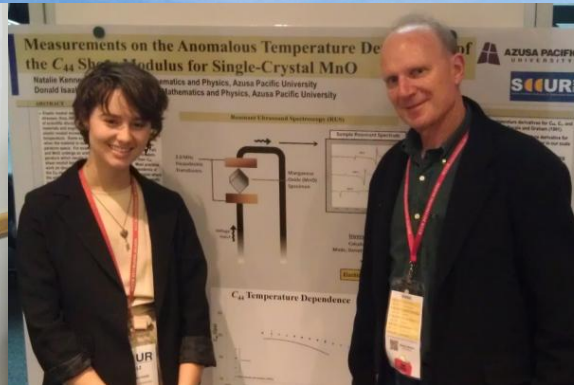
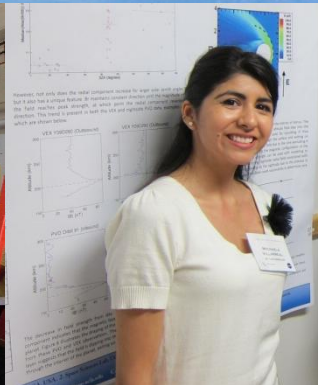
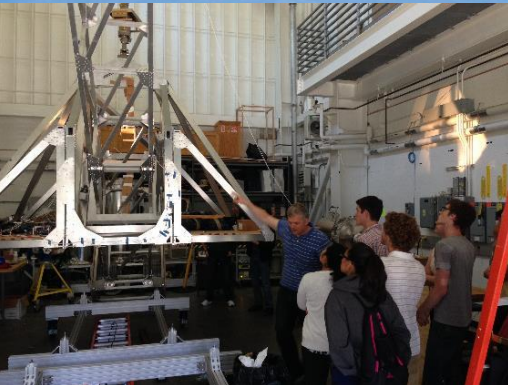
■ Astronautics...

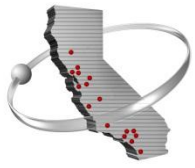




CASGC AFFILIATES & PARTNERS

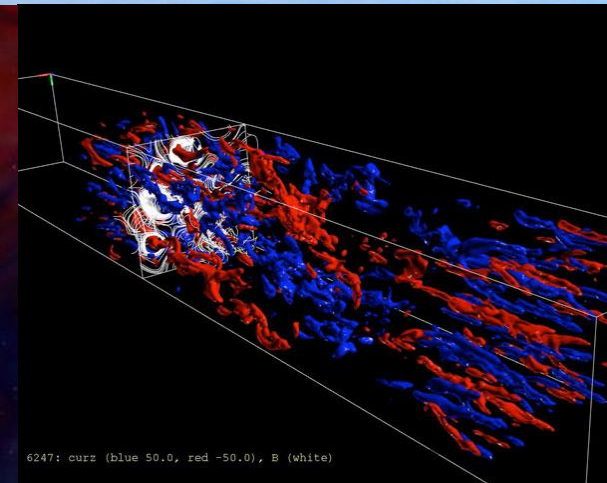
▪ Space & Physical Sciences...

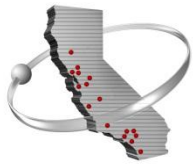




CASGC AFFILIATES & PARTNERS

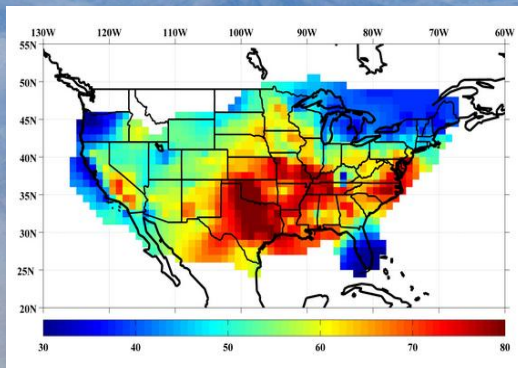
- Astronomy & Astrophysics...

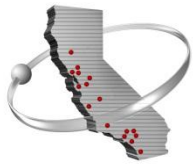




CASGC AFFILIATES & PARTNERS

■ Earth & Environmental Sciences...

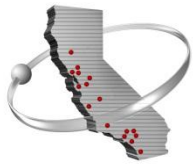




CASGC AFFILIATES & PARTNERS

- Precollege...

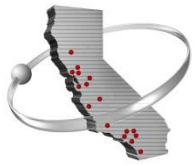




CASGC AFFILIATES & PARTNERS

- ...And Public Outreach...

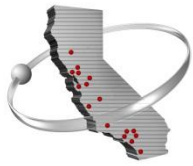




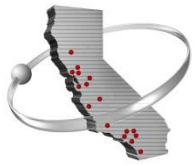
CASGC AFFILIATES & PARTNERS

■ Reaching:

Program Element	Number of Direct Participants (Funded & Non-Funded Students)	Number of Direct Funded Students
Fellowships & Scholarships	194	159
Higher Education	234	113
Research Infrastructure	23	21
TOTAL OUTCOME 1	451 students	293 students

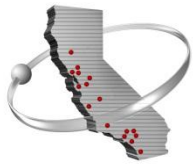


COMMUNITY COLLEGE PILOT PROJECT: RESEARCH ACADEMY SUMMER 2012



GOALS FOR COMMUNITY COLLEGE PILOT PROJECT

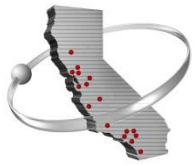
- Responding to NASA Office of Education priorities: Working with more community colleges, Minority Serving Institutions
- Increasing diversity & inclusion in our programs
- Providing university research experience to community college students for increased STEM retention and advanced STEM degrees



PROGRAM PARTNERS

Cooperative program between:

- California Space Grant
 - UC San Diego
- San Diego MESA Alliance
 - San Diego State University
 - San Diego City College
 - Southwestern College

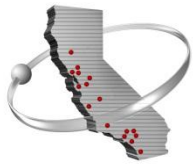


MESA PROGRAM (MATHEMATICS, ENGINEERING, SCIENCE, ACHIEVEMENT)

- Engages educationally disadvantaged students. Most are:
 - First in family to go to college
 - Low-income
 - Attended low-performing schools with few resources
- Three Segments (Together Making A Pipeline):
 - MESA Schools Program
 - MESA Community College Program
 - MESA Engineering Program
- Emphasis on rigorous academics, supportive communities for academic success, industry collaboration, preparing students to transfer to university for higher STEM studies.

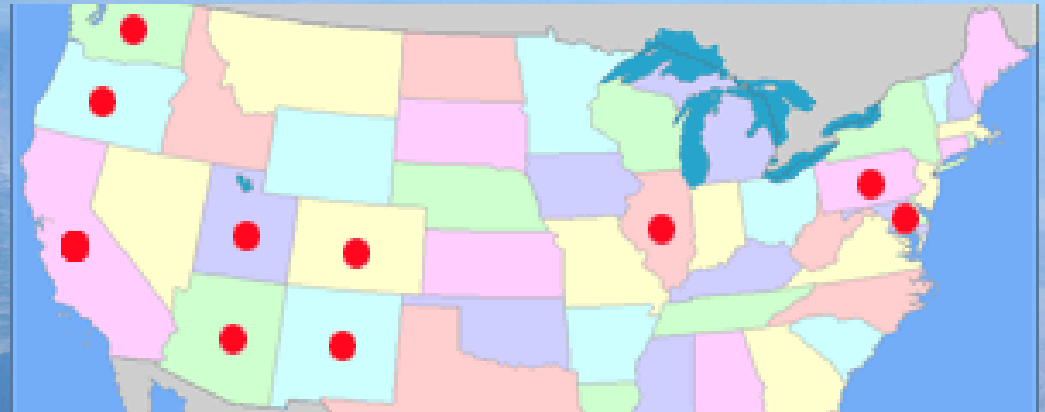


Synergy between MESA and Space Grant

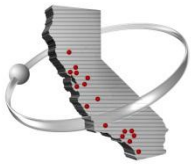


MESA PROGRAMS

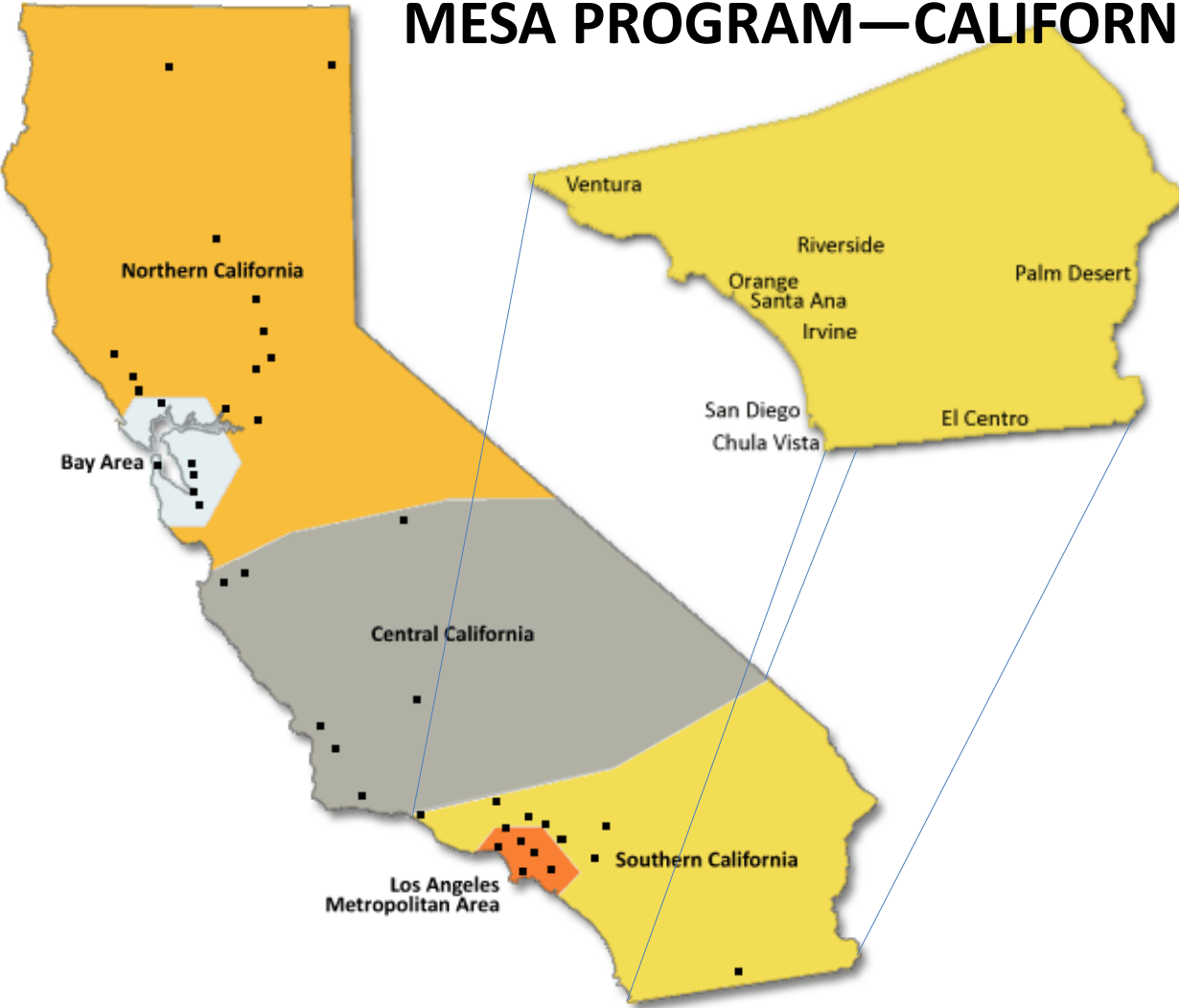
- Arizona
- Colorado
- Hawaii
- Illinois
- Maryland
- New Mexico
- Oregon
- Pennsylvania
- Utah
- Washington



mesausa.org

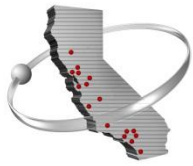


MESA PROGRAM—CALIFORNIA

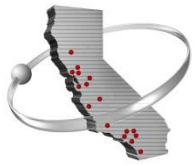


San Diego MESA Alliance

1. Chula Vista: Southwestern College, Chula Vista (MCCP)
2. Orange: Chapman University/UC Irvine (MSP)
3. Palm Desert: College of the Desert, Palm Desert (MCCP)
4. Riverside: UC Riverside (MEP)
5. Riverside: UC Riverside (MSP)
6. San Diego: San Diego City College (MCCP)
7. San Diego: CSU San Diego (MEP)
8. San Diego: CSU San Diego (MSP)
9. San Diego: CSU San Diego, Imperial Valley (MSP)
10. Santa Ana: Santa Ana College (MCCP)
11. Ventura: Ventura College (MCCP)

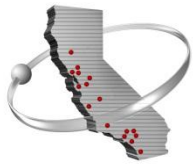


PILOT: “SAN DIEGO MESA ALLIANCE RESEARCH ACADEMY”

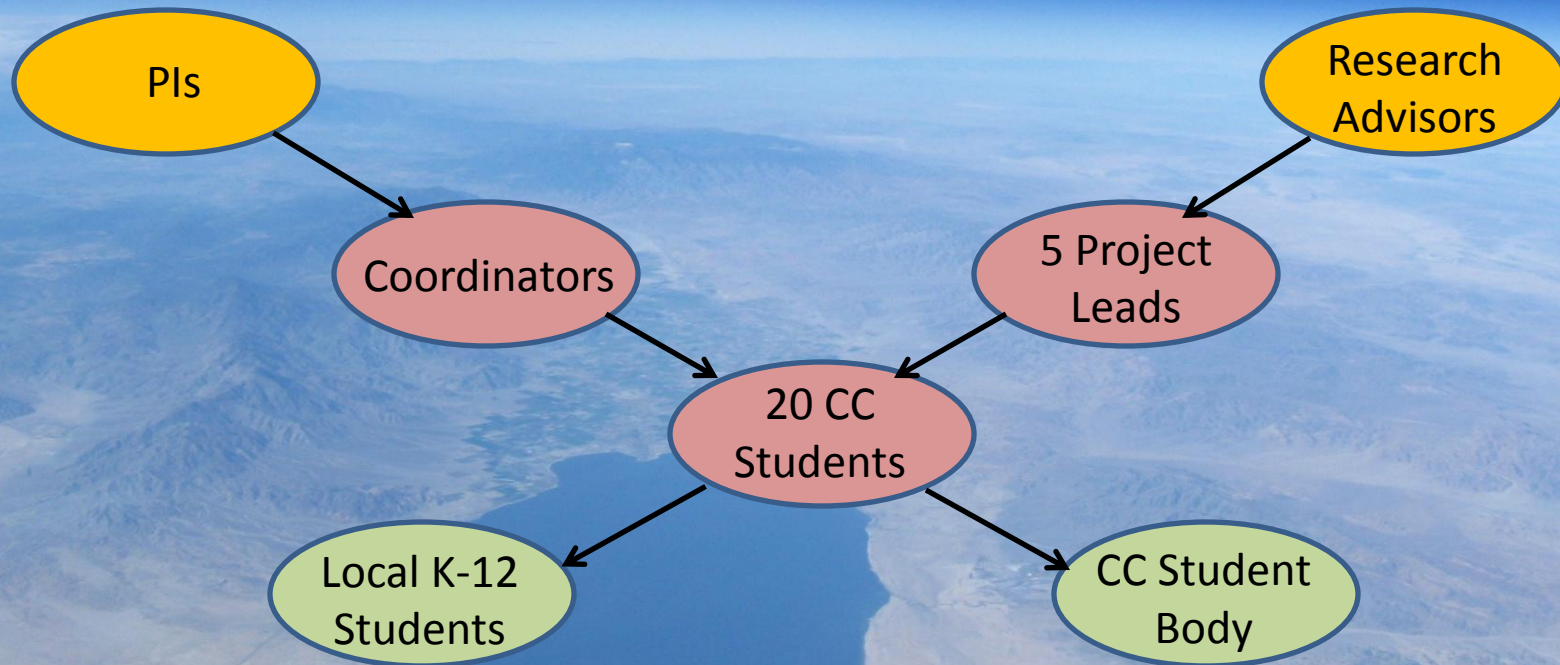


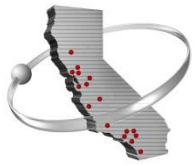
PILOT PROGRAM COMPONENTS

- 5 research projects
- 5 graduate student mentors
- 2 community colleges
- 10 students per college
- Criteria:
 - Academic Achievement
 - Participation in Academic Success Workshops
 - Participation in MESA Center activities
 - Positive Attitude & Hard Working



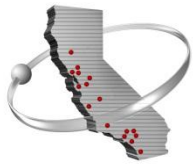
RESEARCH MENTORING PIPELINE





PILOT PROGRAM COMPONENTS

- Learning What is Research
- Developing literature survey skills
- Exploring theoretical & experimental methods
- Placed into groups of 4 students per project
- Preparing presentations on their research
- Presenting research in symposium
- Presenting to Community College peers
- Presenting to K-12
- Multiplier Effect
- Subset in year-long REU in Aerospace



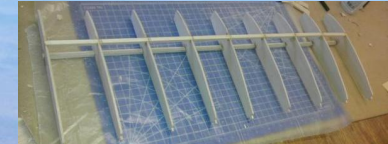
PILOT PROGRAM COMPONENTS

■ Research Projects:

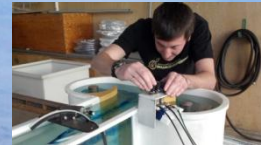
1. High Altitude Balloon Project



2. Aircraft Wing Structural Dynamics



3. Mixing & Flow Control in High Speed Combustors

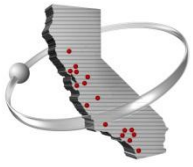


4. Sensorimotor Prosthetic Hand (robotics)

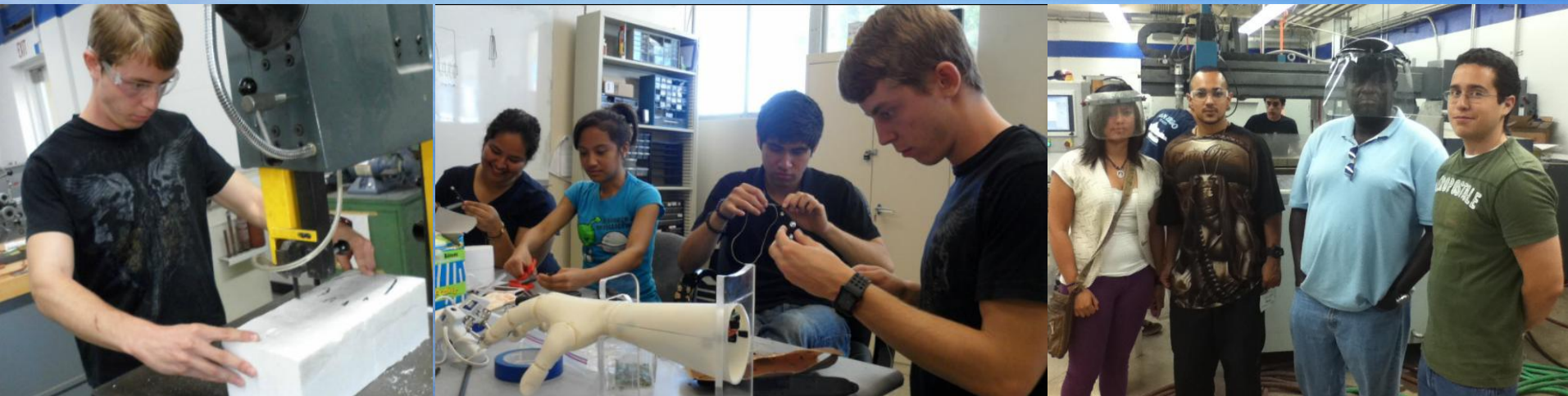


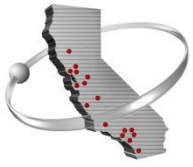
5. Dynamics of Flame Spread in Microgravity





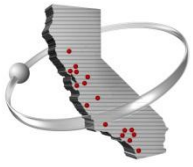
PILOT PROGRAM—HANDS-ON RESEARCH PROJECTS





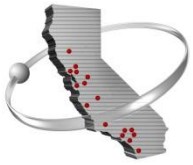
PILOT PROGRAM—HANDS-ON RESEARCH PROJECTS





PILOT PROGRAM—PRESENTATIONS

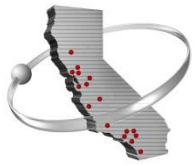




PILOT PROGRAM

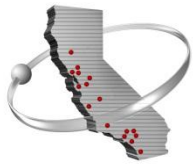


San Diego MESA Alliance Research Academy: Summer 2012



PILOT PROGRAM—IMPACT

Experience Level: 0 = novice, 5 = expert	Pre	Post	Impact
Literature Survey Knowledge - Do you have experience with finding articles in library and using database search?	3.10	3.45	0.35
Scientific Method - Do you have experience with making hypotheses, testing hypotheses, and making conclusions?	2.55	3.60	1.05
Team Work Skills - Do you have experience with working in a group?	3.80	4.30	0.50
Time Management Skills - Do you have experience with planning and meeting deadlines with multiple tasks?	3.80	3.85	0.05
Presentation Skills - Do you have experience with presenting technical information?	3.25	3.90	0.65
Experimental Analysis - Do you have experience with measuring, analyzing, and interpreting data?	2.55	3.85	1.30
Design and Manufacturing - Do you have experience with using CAD and/or building things?	1.30	2.60	1.30



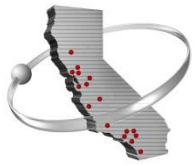
PILOT PROGRAM—IMPACT

The opportunity I was given to participate in the 2012 Summer Research Academy at San Diego State University (SDSU) was phenomenal. Prior to taking part in the Research Academy I had no knowledge of the importance of how becoming involved in research opportunities can open doors for the future...Conyers Nelson



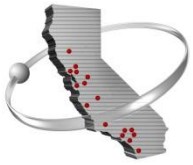
The Research Academy introduced me to research and the process and environment it occurs under. I am more directed in my studies because I know what the knowledge will be used for. I am now absolutely certain of my major and feel prepared to undertake the tasks and accomplish the goals that lie ahead...Alejandro Levesque





ALIGNMENT WITH:

- Co-STEM Priority Areas 3 and 4:
 - Enhance the STEM Experience of Undergraduate Students
 - Better Serve Groups Historically Underrepresented in STEM
- NASA Education Lines of Business
 - STEM Engagement
 - NASA Internships, Fellowships, and Scholarships (NIFS)
- NASA Space Grant Objectives:
 - Cooperative Programs
 - Interdisciplinary Training
 - Recruit & Train U.S. Citizens—Underrepresented Minorities

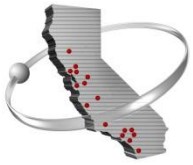


ALIGNMENT WITH RESEARCH ON STEM RETENTION FOR COMMUNITY COLLEGE STUDENTS

- Hands-On Research Experiences
- Academic Success Workshops
- Student Cohort



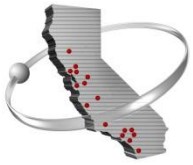
Decision to continue this program...



PERMANENT PROGRAM



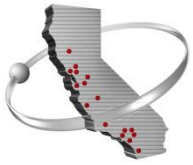
San Diego MESA Alliance Research Academy: Summer 2013



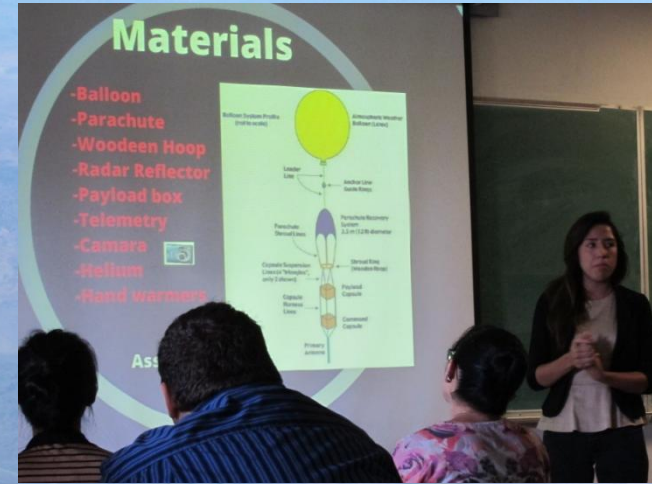
PERMANENT PROGRAM



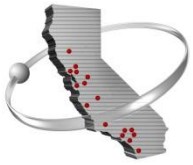
San Diego MESA Alliance Research Academy: Summer 2014



PERMANENT PROGRAM



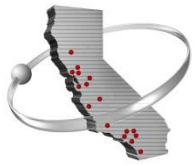
San Diego MESA Alliance Research Academy: Summer 2013 (Year 2)



PERMANENT PROGRAM

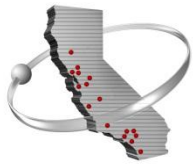


San Diego MESA Alliance Research Academy: Summer 2014 (Year 3)



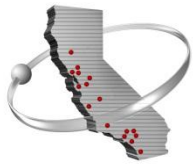
GROWTH

- RFP Released
- Introduce to other parts of CA
- Selected two proposals
- Ran Spring and Summer 2014



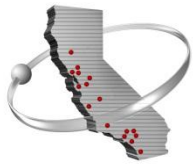
ORANGE COUNTY: CLIMATE IMPACT ASSESSMENT USING SATELLITE OBSERVATIONS





LOS ANGELES: SOLAR ENERGY & PLANETARY EXPLORATION

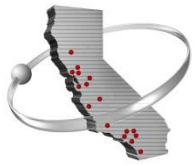




SUMMARY

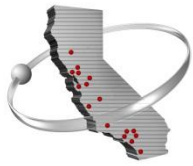
Program	Dates
Pilot SDMA Program	Summer 2012
Permanent SDMA Program	Summer 2013 & 2014
Spin-Offs	Orange County & Los Angeles 2014

Demographics	
101	Students
86%	Underrepresented
93%	First to Graduate College
66%	Subsidized Lunch



SUMMARY

Partners	
Community Colleges:	
San Diego	San Diego City College (MSI)
San Diego	Southwestern College (MSI)
Orange County	Santa Ana College (MSI)
Los Angeles	Los Angeles City College (MSI)
Los Angeles	Pasadena City College (MSI)
Los Angeles	Rio Hondo College (MSI)
Universities:	
San Diego	San Diego State University (MSI)
Orange County	Chapman University
Los Angeles	CSU Los Angeles (MSI)



IMPACT

Longitudinal Tracking

All are still students (too soon to graduate and join workforce)

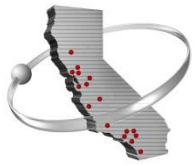
All are studying STEM

Several have graduated and transferred to university for advanced STEM degrees

Their feedback was extremely positive on how the program benefited them

Students are inspired and prepared to participate in research and continue studying in STEM fields

Students share their experience with the broader community (STEM ambassadors)



RECENT FEEDBACK

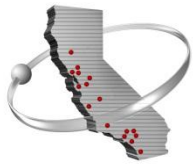
“Doing this program helped me see the bigger picture of why I am learning what I am learning. I was able to apply what I was learning to real life situations and not just reading it in a book. It motivated me to keep going and eventually, I would be able to put my knowledge in use.”

“Yes! I am a junior transfer student at UCI and am pursuing a degree in the STEM field and am seeking to obtain a graduate level degree in the field. The experience itself was a great opportunity that enabled me to expand my horizons and that is why I am deeply thankful! “



“Yes, I am using the information I learned on the projects we worked on to use with younger students to inspire them to pursue science as a future profession.”

“It has definitely helped my pursuit of an engineering degree. It solidified several ideas regarding electricity, helped me improve my hands on skills, and showed me how to create formal lab reports.”



PEOPLE BEHIND THE PROGRAM

California
Space Grant
HQ:



John
Kosmatka



Tehseen
Lazzouni



Becky
Howard

San Diego
MESA
Alliance:



Gustaaf
Jacobs



Theresa
Garcia



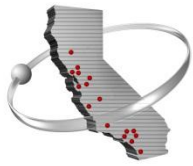
Rafael
Alvarez



Raga
Bakhiet



Daniel
Nelson



NASA SPACE GRANT WEBSITE

The screenshot shows the NASA website interface. At the top, there are navigation links for NEWS, MISSIONS, MULTIMEDIA, CONNECT, and ABOUT NASA. Below these is a search bar and a row of links for 'For Public', 'For Educators', 'For Students', and 'For Media'. The main content area features a large photograph of a group of students in a laboratory setting, gathered around a table with various equipment. Below the photo is a social media sharing bar with icons for Facebook, Twitter, Google+, and others. The article text reads: 'California Space Grant San Diego MESA Research Academy Takes Off! Community college students attended a one-week research academy where they were introduced to laboratory research supported by the California Space Grant Consortium. This was the first time these students had conducted university lab research.' Below the text is an 'Image Credit' line and a 'Download Links' section with three links.

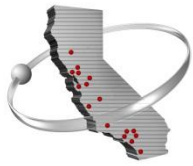
California Space Grant San Diego MESA Research Academy Takes Off!
Community college students attended a one-week research academy where they were introduced to laboratory research supported by the California Space Grant Consortium. This was the first time these students had conducted university lab research.

Image Credit: Courtesy of the California Space Grant Consortium

Download Links

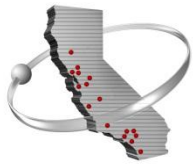
- Full view
- 1920x1080
- 1600x1200
- 1366x768

http://www.nasa.gov/offices/education/programs/national/spacegrant/SG_Arduino/#.VDLXUmdWSp



USA TODAY SPACE GRANT ARTICLE

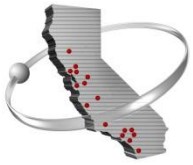




PLANS

- Continue San Diego MESA Alliance Research Academy and track students' progress
- Solicit additional Community College-University Lab Research proposals through the MCCC





QUESTIONS?

