



California Space Grant Consortium MESA¹ Community College Laboratory Research Experience

Announcement Released: March 6, 2015
Proposals Due: May 1, 2015
Performance Period: May 25, 2015 – August 25, 2015²

Introduction:

Funded by NASA, the California Space Grant Consortium is seeking to create university laboratory research experiences for students attending California community colleges that are part of the MESA Community College Program (MCCP). The objectives are to:

- Encourage and prepare students in associate degree programs for advanced Science, Technology, Engineering and Math (STEM) degrees and careers and
- Increase participation of underrepresented minorities and females in STEM.

Background:

Founded in 1989 as part of the National Space Grant College & Fellowship Program, the California Space Grant Consortium (CaSGC) is headquartered at the University of California, San Diego (UC San Diego) with the following Vision and Mission:

Vision: To inspire and educate the next generation of aerospace scientists, engineers, and managers.

Mission: To serve as a crosscutting and integration agent in California to bring the aerospace-related content, technical expertise, and application environment of NASA's Mission Directorates to the educational community and general public.

CaSGC research and student-mentor activities are conducted at our 28 affiliate institutions³ with the following program emphases:

- Aeronautics: Manned and Unmanned Aircraft and Rotorcraft, Rockets, Lighter-Than-Air Vehicles
- Astronautics: Launch Vehicles, Payloads, Planetary Landers, Near-Space Ballooning
- Robotics: Land/Sea/Air
- Green Energy: Wind Turbines, Photovoltaics, Fuel Cells
- Physical Sciences: Environmental Science, Earth System Science, Remote Sensing, Global Climate Change, Space Sciences, Astronomy and Astrophysics
- Outreach: Engagement of STEM Middle-School Teachers, Summer STEM Opportunities for Secondary Students, Community College Engagement

¹ [MESA: Mathematics, Engineering, Science Achievement](#); administered by the University of California Office of the President.

² Official end date of the five-year NASA Grant funding this program: Grant #NNX10AT93H; CFDA #43.001.

³ Affiliate listing can be found at http://casgc.ucsd.edu/?page_id=27



Description of Opportunity:

Purpose:

- To encourage and prepare students in associate degree programs for advanced STEM degrees and careers;
- To increase participation of underrepresented minorities and females in STEM; and
- To enhance the MCCC by providing the opportunity to apply skills developed in the MCCC to a regional university laboratory research environment.

Proposers:

- Proposal opportunity is open to California community colleges that have an MCCC and to California universities;
- Proposal must include one or more regional MCCC partners⁴ and one regional university partner;
- At least one of the proposing partners must be an HSI⁵;
- Project must be **jointly** between the MCCC(s) and the local university (PI can be from either the MCCC institution or the local university). It is suggested, but not required, that the university partner have a MESA Engineering Program that completes the MESA pathway for the region.
- Multiple proposals from one institution (different PIs) may be submitted.
- Proposals from groups previously funded under this opportunity are encouraged, however proposals from groups not previously funded under this opportunity will receive higher priority in the selection process.

Eligible Program Participants:

- Students must be U.S. citizens, in accordance with NASA requirements for distribution of student awards.
- Students must be members of the MCCC, which includes attendance in MCCC Academic Excellence Workshops.
- Students should be selected for the program on the basis of academic merit and recommendation by faculty or MESA staff.

Projects:

- Hands-on research projects for this program could be existing research projects or those developed specifically for this program.
- Projects can be in any STEM field⁶, with preference given to NASA-relevant topics⁷, and should promote interdisciplinary teaming.

⁴ Involving multiple MCCC partners may be helpful to some MCCPs in identifying enough students for the opportunity.

⁵ HSI: Hispanic Serving Institution—an institution where total Hispanic enrollment constitutes a minimum of 25 percent of the total enrollment.

⁶ This program is inspired by a project developed by the San Diego MESA Alliance (SDMA) and sponsored by the California Space Grant Consortium: The SDMA Research Academy. This program was successfully piloted in 2012 and repeated in 2013 and 2014. Students in groups of four to five worked on the following seven hands-on STEM projects:



Project Award and Timing:

- An award of \$10,000 will be provided to a joint community college-university team to conduct a series of five to six Saturday Academy Laboratory Research Experiences in which a cohort of 20 MCCP students will participate. The MCCP students can be from one or multiple MCCP campuses.
- The Saturday Academy Laboratory Research Experiences should be run during Summer 2015 over a series of five to six Saturdays, with each session lasting approximately 6 hours. Ideally this should be over a series of consecutive Saturdays.
- The Saturday Academy Laboratory Research Experiences should take place on-site at the university partner.
- Students should be in groups of five to ten students per research project.
- The curriculum for the Saturday Academy Laboratory Research Experiences is at the team's discretion based upon the needs of the students and research project, but should include the following elements:
 - Introduction to the research process;
 - University laboratory tours;
 - University library presentation on conducting literature reviews;
 - University admission procedures including programs for transferring from community colleges;
 - Project specific: Theories and governing equations involved in the research;
 - Project specific: Experimental methods;
 - Project specific: Data acquisition and analysis;
 - Student presentations: On final day to the entire cohort covering research experiences and lessons learned; and
 - Student presentations: In summer session or fall semester to students at their respective community colleges through presentations organized by the MCCP.

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1. High Altitude Balloon Project
 2. Aircraft Wing Structural Dynamics
 3. Mixing and Flow Control in High Speed Combustors
 4. Sensorimotor Prosthetic Hand (robotics project)
 5. Dynamics of Flame Spread in Microgravity
 6. Arduino Computer Fabrication and Programming
 7. Bulk Metallic Glass (materials science project)

To view the 2012 SDMA pilot project and student presentations please visit <http://casgc.ucsd.edu/?p=2868>.

To view the 2013 SDMA project please visit <http://casgc.ucsd.edu/?p=4278>.

To view the 2014 SDMA and 2014 MCCP Laboratory Research Experience projects please visit http://casgc.ucsd.edu/?page_id=5820.

⁷ NASA-relevant topics may be found at the NASA Mission Directorate websites:

- Aeronautics Research: <http://www.aeronautics.nasa.gov>
- Human Exploration and Operations: <http://www.nasa.gov/directorates/heo/home/index.html>
- Science: <http://science.nasa.gov>
- Space Technology: <http://www.nasa.gov/directorates/spacetech/home/index.html>



Funding:

- The award will be sent to the institution of the Principal Investigator, who may be at either the university or the community college where the MCCP resides.
- The \$10,000 budget must include student scholarships of approximately \$250-\$300 per MESA community college student (for 20 students). The remaining budget may be spent on materials and supplies, scholarships/stipends for graduate students/faculty/staff⁸ to run the program. Official cost sharing is not requested for this award however the development and implementation of this project may require resources over and above the award.
- No indirect costs are allowed.

Proposal Submission:

Proposals Must Include the Following Elements:

- 1) Cover Page: Include proposal title, principal investigator name and contact information.
- 2) Proposal Main Body. Please use Times New Roman 12-point font with a minimum of 1” margins. Proposal must be brief, six pages or less (page count does not include cover page, budget, letters of commitment, or fiscal agent information):
 - a) Project Abstract
 - b) Key Staff and Partners
 - c) Project Goals and Description, including:
 - i) Detailed curriculum outline;
 - ii) Types of hands-on research projects to be provided. From the cohort of 20 students there should be five to ten students and a graduate student mentor per project;
 - iii) How the students will be selected (should be a combination of first and second year MESA community college students).
 - iv) Description of facilities students will have access to at the university; and
 - v) Estimates of the diversity of students in your project.
 - d) Evaluation and Communication Plan—proposal should include pre- and post-project assessments to determine effectiveness of the project in encouraging students to choose STEM careers. Proposal should also include a plan for post project presentations as well as other means for effective dissemination of results (web, social media, and conference presentations, for example).
 - e) Timeline/Schedule
 - f) Letters of Commitment from both the university and the MCCP co-PIs offering time, students, and facilities for the program.
 - g) Fiscal Agent Contact Information (where the award will go, if proposal is funded).
- 3) Budget Narrative and Details:
 - a) All students, faculty, and staff receiving Space Grant funds must be U.S. citizens.
 - b) Scholarships should be between \$250 and \$300 per student for the 20 MCCP students.

⁸ Anyone, whether students, faculty, or staff, receiving Space Grant funds must be a U.S. citizen.



- c) No indirect costs may be charged, however scholarships/stipends for graduate students/faculty/staff to run the program may be included.
- d) No equipment may be purchased with Space Grant funds however materials & supplies to conduct the project should be included.

Proposals Will Be Evaluated on the Following Criteria:

- Clarity of Project Plan and Curriculum
- Commitment to Diversity & Inclusion
- Interdisciplinary Teaming in Hands-On Projects (bonus points for open-ended real-world science and engineering projects that are NASA-relevant)
- University Facilities & Staffing (faculty or student mentors) for Program
- Evaluation and Communication Plan
- Student Selection Plan (Should be a combination of first and second year students)
- Historical Success with MCCP Students Entering University STEM Degree Programs.

Additional Notes:

- The Principal Investigator for the proposed project is responsible for the overall safety of the project and the California Space Grant Consortium will not be held responsible for any damage or injury as a result of project implementation.
- Proposers agree to document outcomes and respond in a timely manner to California Space Grant Consortium requests for information.
- Proposers agree to assist the California Space Grant Consortium in longitudinally tracking students in this cohort.
- Questions about this solicitation may be directed to:
Tehseen Usman Lazzouni, tlazzouni@ucsd.edu, (858) 534-2472.

Please Submit Proposals via Email to:

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