

## **California Space Grant Consortium Strategic Plan (2010 – 2014)**

### ***Introduction and Consortium Management Structure***

The California Space Grant Consortium (CaSGC) is California's implementation arm of the congressionally mandated (Public Law 100-147) NASA National Space Grant College and Fellowship Program. The CaSGC received Space Grant designation in 1989 and is administered by its Lead Institution, the University of California, San Diego (UC San Diego).

The Space Grant College and Fellowship program in California has expanded its impacts each year with Program Element projects at affiliate member institutions. The CaSGC is presently comprised of the following higher education affiliate members:

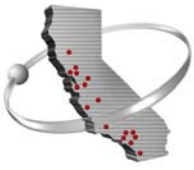
- UC Berkeley
- UC Los Angeles
- UC Santa Cruz
- San Diego State
- CSU Los Angeles
- Stanford University
- CSU Fresno
- Pomona College
- Azusa Pacific Univ.
- Sonoma State Univ.
- UC Davis
- UC San Diego
- UC Riverside
- CSU Sacramento
- CSU San Bernardino
- Santa Clara University
- San Jose State
- Univ. of San Diego
- Caltech
- UC Irvine
- UC Santa Barbara
- CSU Long Beach
- CalPoly-San Luis Obispo
- Univ. So. California
- San Diego Com. College Dist.
- CalPoly-Pomona
- Astro Soc. of Pacific
- SD Supercomputer Ctr

**The CaSGC VISION: To inspire and educate the next generation of aerospace scientists, engineers, and managers.**

**The CaSGC 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 scientific and technical Enterprises to the educational community and the general public.**

**CaSGC Objectives** that relate to the Congressional directives, NASA's Strategic goals, and the aerospace-related needs of California are:

- To develop and maintain a network of institutions of higher education throughout California with interests and capabilities in aerospace science, engineering, and technology.
- To recruit and train aerospace professionals, especially women and under-represented minorities, for careers in aerospace science and engineering. A primary focus of this effort is student-mentor projects which provide an effective way to:
  - Translate space-related research results for education and public use;
  - Train and retrain the aerospace workforce;
  - Build education and research infrastructure;
  - Provide undergraduate scholarships and graduate fellowships;
  - Outreach to under-represented groups (women & minorities).



- To promote a strong science, mathematics, and engineering education base from elementary through university levels that meets NASA’s Education Enterprise established Education Program Operating Principles.
- To encourage interdisciplinary education and training, research, and public service programs related to aerospace. To encourage collaborative development programs among universities, industry, and federal, state, and local governments.

The organizational and administrative structure of the CaSGC has the Consortium Headquarters Office (Principal Investigator – Dr. John Kosmatka, California Statewide Director - Dr. Michael Wiskerchen) at UC San Diego. Each affiliate member institution has a designated campus director that coordinates CaSGC Programs of the affiliate campus and also takes responsibility for documenting and reporting program results.

The newly implemented FY 2010 CaSGC organizational structure is shown in Figure 1 below. This management structure not only stimulates active and continuous involvement of all of the CaSGC affiliates but also allows for the lead institution management to focus on forming strategic partnerships with other private-public institutions, to develop other funding sources, maintain a strong focus on the national Space Grant goals and objectives, and make sure the CaSGC impacts are aligned with the needs of NASA and California.

### CaSGC Organizational Structure

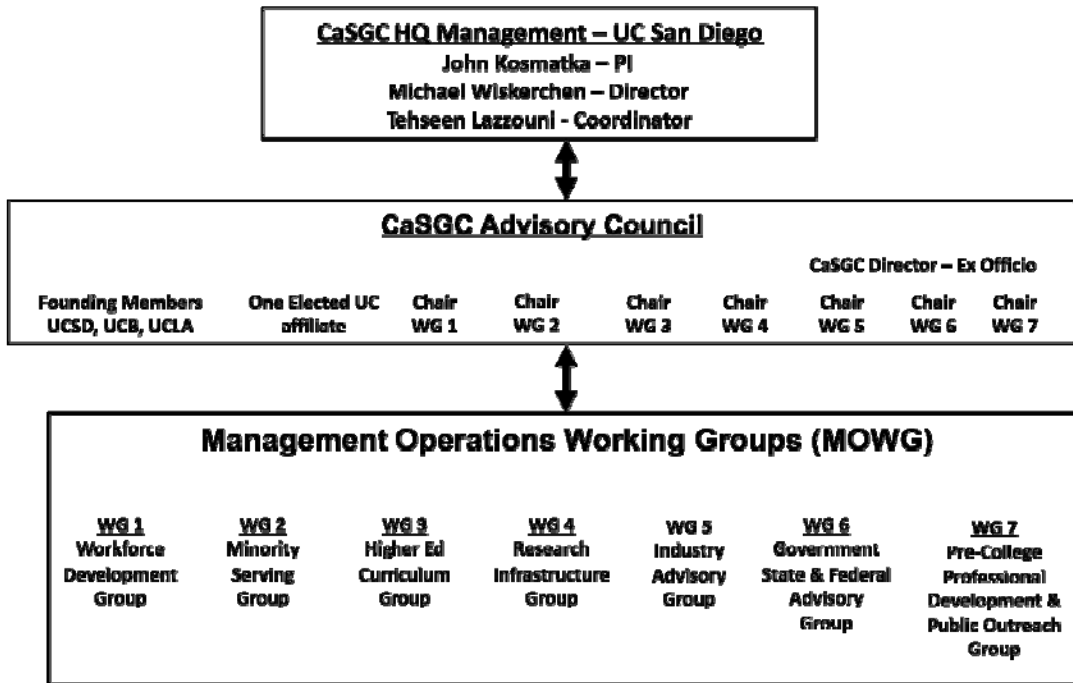
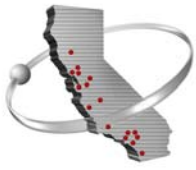


Figure 1. FY 2010 CaSGC Management Structure

The 2010 – 2014 CaSGC Strategic Plan is a living document that attempts to expand and implement programs that “build, sustain, and effectively deploy the skilled, knowledgeable, diverse, and high-performing workforce needed to meet the current and emerging needs of



California, the nation and its citizens. The CaSGC's Strategic Plan and aerospace human capital strategies are linked to NASA's overall Mission, Vision, core values, goals, and objectives. Students involved in CaSGC's aerospace-related programs will be engaged in the unique environment of the nation's aerospace mission and made aware of aerospace-related career opportunities that exist throughout NASA and its partners in industry and higher education.

The CaSGC five-year Strategic Plan (2010 – 2014) is developed with the following **SMART guidelines** in mind. Each task will be focused on "**Specific**" goals with "**Measurable**" results. The goals and objectives are deemed "**Appropriate**" if formulated to respond to NASA's, Congress's, and California's educational and Human Capital needs. Each FY 2009 task will be structured to be "**Realistic**" in terms of personnel and budgetary resources and schedule ("**Time-Specific**"). The CaSGC Strategic Plan is focused in such a way as to address the unique aerospace education, workforce, and research needs of California and NASA.

### CaSGC SMART Guidelines for NASA Education Outcomes

The CaSGC is implementing an integrated program that strategically invests direct and matching resources to ensure consistency and alignment with the objectives of the Space Grant program and the NASA Office of Education. The CaSGC Program Element efforts will address the three primary NASA Education Outcomes:

**Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals through a portfolio of investments.**

The CaSGC has established SMART goals relating to NASA Education Outcome 1 Objectives:

Objective 1.1. Faculty and Research Support at the Higher Education level

Objective 1.2. Student Support

Objective 1.3. Student Involvement in Higher Education

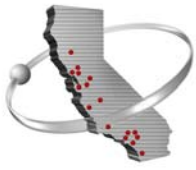
Objective 1.4. Course Development in Higher Education

Objective 1.5. Targeted Institution Research and Academic Infrastructure

#### Objective 1.1: Faculty and Research Support

CaSGC has focused its **SMART goals** and resources in the following areas:

- **Providing Space Grant funded research Fellowships/Scholarships in partnership with CaSGC affiliates in support of selected research projects – Target goals for underrepresented students is 36% for minorities and 56% for females, based on NCES data for California;**
- **Partnering with the research university affiliates in NASA-related research programs whereby Space Grant provides management and coordination resources linking students and faculty from various affiliate campuses – Target goal of 10 programs per year;**
- **Facilitating teaming arrangements between CaSGC affiliates on NASA Mission Directorate-related research programs -- Target goal of 5 programs per year;**



- **Facilitating and managing research project teaming between CaSGC affiliates and NASA Centers and industry – Target goal of 5 programs per year;**
- **Coordinating and managing student/mentor and faculty research experience programs at NASA Centers – Target goal of 5 programs per year.**

The outcomes for the last four bullets would include project reports for all projects facilitated and coordinated by the CaSGC. These reports will identify the participating partners, the objectives of the projects, outcomes, and future opportunities generated.

### **Objective 1.2: CaSGC Student Support -- Fellowship/Scholarship/Internships**

This Program Element is the highest priority within CaSGC's Strategic Plan and has been structured with the purpose of responding to NASA's Strategic Human Capital Implementation Plan.

**Annual Fellowship / Scholarship/ Internships Funding Goal:** Program Element Total Budget (Space Grant & other funds) is planned to allocate at least 25% of the Fiscal Year CaSGC budget).

**Annual Fellowship / Scholarship / Internships Awards Goal:** Annual student awards will be greater than 110 (Space Grant & other funds – Based on annual Space Grant budget of \$700,000) with at least 50 awards from Space Grant funds.

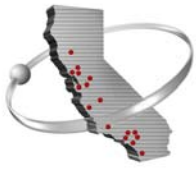
- **Fellowship / Scholarship / Internships Awards to Underrepresented Students Goal:** CaSGC has set an aggressive SMART goals for participation of underrepresented groups to 36% for minorities and 56% for females, based on NCES data for CA.
- **Involvement of Minority Serving Institutions (MSI) in the Fellowship / Scholarship / Internships Programs:** CaSGC MSI affiliates will actively participate (at least 80% of MSI affiliates) in the management, execution, and operation of the Fellowship / Scholarship / Internships Program.

### **Objective 1.3: Student Involvement in Higher Education – Student/Mentor Workforce Development and Undergraduate Research Experiences**

#### **CaSGC SMART Goals for Student Involvement in Higher Education:**

- Engage all active CaSGC affiliates in higher education Human Capital Programs,
- Reach or exceed the goals for involvement of underrepresented students (36% for minorities and 56% for females, based on NCES data) in these STEM-related projects,
- Increase the involvement of MSI affiliate institutions in every aspect of these programs so that at least 80% of MSI affiliates are involved in the programs,
- Lead institution management will provide facilitation and coordination resources to assist in forming partnerships between the CaSGC affiliates and NASA Centers, industry, and universities,

### **Objective 1.4: Course Development – STEM disciplines.**



One of the highest priorities of the CaSGC is to develop an effective aerospace learning environment that has both curricular excellences as well as hands-on skill development. Each of the CaSGC affiliates contributes to both areas throughout California. This CaSGC Strategic Plan, recognizing the breadth and depth of existing aerospace-related science and engineering curricular programs on the affiliate campuses, sets the following **SMART goals**:

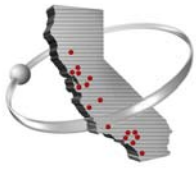
- **Provide “seed” funding (5% of CaSGC budget) that creates partnerships between the CaSGC and the affiliate campuses to encourage aerospace-related engineering and science curricular development and dissemination,**
- **CaSGC will provide the facilitation, coordination, and networking management resources for these curricular efforts while continuing to define the aerospace-related university-level educational needs of California and NASA,**
- **CaSGC will place an emphasis on the involvement of MSI affiliates in these curricular development and sharing efforts,**
- **The metrics CaSGC will use to determine goal achievement are the number of aerospace-related engineering and science courses we have impacted. If the number of courses is 5 or more, this SMART goal will have been achieved.**

#### **Objective 1.5: Targeted Institution Research and Academic Infrastructure**

The aerospace-related research infrastructure in California is immense in terms of number of projects funded by many sources other than Space Grant. Therefore, the CaSGC focuses its limited resources on facilitating and coordinating a part of the educational and “Human Capital” aspects of that large and diverse research infrastructure. CaSGC Research Infrastructure funding is derived from the Consortium-Wide Fellowships/Scholarships, State-wide Undergraduate Research Opportunity Program, and STEM Pipeline Affiliate Projects budget line items. With this in mind, CaSGC has focused its **SMART goals** and resources in the following areas:

- **Providing Space Grant funded research Fellowships/Scholarships in partnership with CaSGC affiliates in support of selected research projects – Target goals for underrepresented students is 36% for minorities and 56% for females, based on NCES data;**
- **Partnering with the research university affiliates in NASA-related research programs whereby Space Grant provides management and coordination resources linking students and faculty from various affiliate campuses – Target goal of 10 programs per year;**
- **Facilitating teaming arrangements between CaSGC affiliates on NASA Mission Directorate-related research programs -- Target goal of 5 programs per year;**
- **Facilitating and managing research project teaming between CaSGC affiliates and NASA Centers and industry – Target goal of 5 programs per year;**
- **Coordinating and managing student/mentor and faculty research experience programs at NASA Centers – Target goal of 5 programs per year.**

The outcomes for the last four bullets would include project reports for all projects facilitated and coordinated by the CaSGC. These reports will identify the participating partners, the objectives of the projects, outcomes, and future opportunities generated.



***Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.***

The CaSGC provides a small, but targeted, amount of funding (approximately 5% of NASA Space Grant budget) to the Pre-College area that emphasizes partnerships between CaSGC affiliates and state, federal, and non-profit institutions that have programs for professional development of pre-service and in-service educators in the formal and informal educational arenas. These targeted projects present NASA-related content into pre-college arena along with providing a valuable interface and the between the university level students and faculty and the precollege teachers and students.

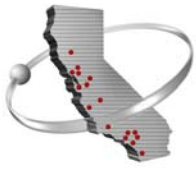
The CaSGC has set a path for a small precollege involvement (from a NASA Space Grant funding perspective) that has the Consortium playing an aerospace STEM-related coordination and facilitation role (management time) to the organizations on each of the affiliate campuses that have primary responsibility for precollege curriculum development, teacher education, outreach, and assessment. The CaSGC has a definitive set of program objectives for the Pre-College area:

- **Provide an active interface between the affiliate institution's pre-service and in-service professional development programs and the NASA education and research resources with an emphasis on underrepresented minorities,**
  - Qualitative Metric 1: Creation of a list of campus contacts for both pre-service and in-service professional development programs at all CaSGC affiliate campuses for dissemination of NASA education and research resources.
  - Qualitative Metric 2: Track announcements of programs communicated to this list to know how much CaSGC has provided to the community.
- **Actively partner with affiliate campus programs that focus on encouraging underrepresented pre-college students (minorities and women) to select STEM careers.**
  - Qualitative Metric 1: Creation of a list of campus contacts for underrepresented pre-college student programs at all CaSGC affiliate campuses for dissemination of materials to encourage students to choose STEM.
  - Qualitative Metric 2: Track announcements of programs communicated to this list to know how much we have provided to the community.
- **Partner with and participate in the STEM State and National Standards activities to provide an interface to NASA programs and educational content,**
- **Encourage and engage CaSGC Scholarship/Fellowship recipients to partner with K-12 educators in their local communities to entice students to pursue STEM careers.**
- **The metrics associated with the Pre-college Program Element are the documented number of active programmatic interfaces with affiliate campus programs described in the four areas above.**

***Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission.***

The CaSGC provides a small but directed budget for Outcome 3 (approximately 1% of the Space





Grant Funds). These directed efforts of the CaSGC affiliates focus on a definitive set of program objectives:

- Provide Informal Education information between NASA's Research Programs and Missions and Education Offices and the California informal education community to increase learning, educate students, educators, and the general public on aerospace-specific STEM content areas, with special attention to diversity issues involving the nation's future STEM workforce
  - Qualitative Metric 1: Creation of a list of informal education providers, including museums, science centers, and NASA centers in California and provide information to that list.
  - Qualitative Metric 2: Track announcements of programs communicated to this list to know how much we have provided to the community.