

# CSU-LSAMP

California State University Louis Stokes Alliance for Minority Participation



## 2015 IMPACT REPORT



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## FOREWORD

On behalf of the California State University Louis Stokes Alliance for Minority Participation (CSU-LSAMP), it is my great pleasure to present this report on the 22-year history of the Alliance and its impact on broadening participation in STEM disciplines. CSU-LSAMP is an alliance of all 23 campuses of the California State University, which, since 1993, has been supported by grant funding from the National Science Foundation's Louis Stokes Alliance for Minority Participation program. CSU-LSAMP is both grateful for the generous funding provided by the NSF and proud to be a member of the National LSAMP community.

This report, which provides an update to CSU-LSAMP's 2011 Impact Report, outlines the success of our Alliance. Over the history of CSU-LSAMP, the number of STEM baccalaureate degrees awarded by the CSU to students from underrepresented minority groups has more than tripled. Our data show significant increases in persistence and graduation rates for CSU-LSAMP URM participants, demonstrating that our programs are helping to close the achievement gaps for underrepresented minorities in STEM. CSU-LSAMP participants are engaging in research on campuses, in national laboratories, and around the world, through international research experiences. More than 40% of students graduating from the CSU-LSAMP undergraduate program have gone on to pursue graduate-level STEM degrees, and some have already entered the professoriate. CSU-LSAMP has hosted twelve Bridge to the Doctorate cohorts, serving 152 students, supporting them through the Master's degree, and increasing their competitiveness for Ph.D. programs. Of course, the true indicator of success lies in the individual stories of our students, whose achievements and extraordinary potential serve as an inspiration for all. Some of those stories are featured within this report.

The National Science Foundation has made a substantial investment in CSU-LSAMP over more than twenty years. We believe that investment has been a wise one. Support from the CSU Chancellor's Office and from individual campuses provides a minimum of \$2 for every \$1 of NSF funding. CSU-LSAMP finds ways to support more students through leveraging existing campus services and other programs that offer exciting opportunities for our students. Completion of a bachelor's degree in STEM is estimated by the US Census Bureau to translate to an additional \$1M in work-life earnings for an individual. We estimate that CSU-LSAMP's efforts have resulted in an additional 7,000 students graduating with a STEM degree, collectively representing \$7 billion dollars in additional work-life earnings.

Finally, I would like to acknowledge the contribution of the many dedicated faculty, staff, and administrators, who have contributed over the years to the success of CSU-LSAMP and its students. Thank you!

Sincerely,

Lisa Hammersley, Ph.D.  
Lead Project Director, CSU-LSAMP, Professor of Geology, California State University, Sacramento

*Earlier this year we were deeply saddened to hear of the passing of Former Rep. Louis Stokes, who had such an important impact on civil rights and equality. This report is dedicated to his memory.*

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# CSU-LSAMP: A LEVERAGED INVESTMENT

**CSU-LSAMP provides a comprehensive set of academic support and professionalization activities to 3,000 STEM students per year by leveraging NSF's investment through additional financial support from the CSU Chancellor's Office and individual campuses, sharing of resources across programs, and institutionalization of high-impact practices.**

## TRIPLING THE NSF'S CONTRIBUTION

CSU-LSAMP has consistently been successful in leveraging the NSF's contribution into additional funds. With 23 campuses in the Alliance, this is extremely important, especially as we have transitioned into a program that emphasizes research experiences and professional development for students. The annual contribution of \$800,000 from the NSF is doubled by an annual allocation of \$800,000 from the CSU Chancellor's Office. This investment from the Chancellor's Office confirms the commitment of the CSU to the LSAMP model for student support. In addition, individual campuses support their campus-based programs through financial allocations, staff salary, and faculty release time. The level of campus-based support varies from one campus to another and has varied considerably over time as budgetary conditions in California have changed. However, we estimate that over the 23-year history of CSU-LSAMP, campus-based contributions have, at a minimum, equaled the \$800,000 per year provided by NSF. Thus, through the support of the CSU Chancellor's Office and individual campuses, CSU-LSAMP has been successful leveraging an additional \$2 for every \$1 provided by NSF, effectively tripling the baseline CSU-LSAMP budget.

## LEVERAGING RESOURCES & SERVICES

Over the 23-year history of CSU-LSAMP, new programs that provide academic support and research opportunities, some spurred by the success of LSAMP, have been developed on CSU campuses. In order to better leverage the resources of these programs and coordinate their efforts, many of our campuses have created central offices of student research or student academic support in which the LSAMP program is housed. This more collaborative approach to providing student academic support and professionalization allows those programs to leverage their resources and expand their reach. In addition, the CSU-LSAMP program on a number of our campuses is part of a larger consortium of programs that combine resources, share best practices, and coordinate joint activities.

## INSTITUTIONALIZATION

As described in this report, CSU-LSAMP has evolved over the years from a program that primarily supported lower-division students through supplemental instruction and summer bridge programs, to one that now also provides research opportunities, international opportunities and professionalization activities. This comprehensive approach to student development and success would not be possible if the Alliance campuses had not invested in the LSAMP model by institutionalizing activities shown by CSU-LSAMP to be highly successful.

## CSU MONTEREY BAY: AN EXAMPLE OF SUCCESSFUL LEVERAGING

CSU Monterey Bay joined CSU-LSAMP in 2004. From the outset, the program received tremendous support from faculty and campus administrators, and has had a lasting impact on STEM programs. The much-needed financial and programmatic support of STEM retention and graduation planted the seed for similar, grant-funded projects and STEM services in tutoring, course support, research, and internships. LSAMP's emphasis on graduate school preparation and undergraduate research has been particularly transformative for CSUMB. The program led to increased faculty support of undergraduate research and spurred development of graduate school preparation curricula and workshops. Ultimately, the success of the LSAMP program, along with other campus developments, led to the launch, in 2009, of the Undergraduate Research Opportunities Center (UROC), which, with CSU-LSAMP at its center, was the first centralized undergraduate research office in the CSU system. UROC, which began with a lean staff that was primarily grant-funded, now has 8 staff, five of whom are funded by the University, and houses a number of publicly and privately supported undergraduate programs. The campus also provides permanent office and classroom space in the university's library, which is the student hub of the campus.

# ECONOMIC IMPACT OF CSU-LSAMP

## ECONOMIC IMPACT OF NSF'S INVESTMENT IN CSU-LSAMP'S UNDERGRADUATE PROGRAM

One way to assess the economic impact of NSF's investment in CSU-LSAMP is to examine the economic benefit that is likely to accrue to students who, without the NSF's support of CSU-LSAMP, might not have completed a baccalaureate degree. It has been well established that average annual income and work-life earnings are positively correlated with level of educational attainment, and that differences in relative earnings by educational attainment have grown along with technological changes that require a more highly skilled and educated workforce. For example, the US Census, in its October 2012 report titled, "Work-life earnings by field of degree and occupation for people with Bachelor's degree: 2011" (available at: <https://www.census.gov/prod/2012pubs/acsbr11-04.pdf>), calculated "synthetic estimates" of work-life earnings over a hypothetical 40-year working life for holders of Bachelor's degrees in different disciplines employed in different occupations. This report showed that the average work-life earnings for holders of a Bachelor's degree in STEM is \$2.6M and, depending on occupation, can be up to \$3.0M. In the same report, the US Census shows the estimated differences in work-life earnings for different levels of education. The average work-life earnings for those with some college education are \$1.6M, meaning the added value of attaining a Bachelor's degree in STEM is approximately \$1M over a lifetime.

As noted later in this report, participation in CSU-LSAMP is associated with a substantially higher rate of baccalaureate degree completion. Therefore, an indicator of economic impact of NSF's investment in CSU-LSAMP is the added work-life income of students who might not have earned baccalaureate degrees were it not for their participation in CSU-LSAMP. Since its inception in 1993-94, CSU-LSAMP has served 23,360 students. Of those for whom tracking data is available (18,875), 7,999 earned STEM degrees, for a completion rate of 42 percent. Applying this completion rate to all 23,360 CSU-LSAMP participants suggests that 14,016 earned STEM bachelor's degrees by Spring 2015. Furthermore, evaluation of our project showed that CSU-LSAMP participants were twice as likely to complete their degree as non-participants. Thus, we can estimate that the impact of CSU-LSAMP is 7,000 additional Bachelor's degrees in STEM. It should be noted that this estimate does not include the additional CSU-LSAMP participants who graduated with non-STEM degrees and also does not include the additional work-life earnings of the 43% of CSU-LSAMP graduates who go on to graduate-level study. Thus we consider these estimates to represent a minimum.



To estimate the added earnings (and therefore, spending power) of the 7,000 students who might not have completed their STEM degrees, we simply multiply the number of students by the differential in earnings of those with some college education and those with a Bachelor's degree that is provided in the US Census report.

**7,000 additional STEM degrees x \$1,000,000 in additional work-life earnings = \$7 billion**

While the estimate of additional earnings as calculated above is hypothetical, it gives a sense of the magnitude of the economic impact that results when an investment is made in improving graduation rates. To date, the NSF has invested \$19 million in CSU-LSAMP. Our estimates above suggest that, at a minimum, the return on each \$1 of investment is \$368 in additional earnings of students who might not have earned STEM degrees were it not for CSU-LSAMP. The CSU has also made a large investment in this effort. If we consider the combined investment of \$57 million by the NSF, the Chancellor's Office of the CSU, and individual campuses, we see a return on each \$1 of investment of \$122 in additional work-life earnings.

# THE CALIFORNIA STATE UNIVERSITY



The California State University (CSU) was formed when the separate “California State Colleges” were brought together as a system by the Donahoe Higher Education Act of 1960. The campuses of the CSU include comprehensive and polytechnic universities and, since 1995, the California Maritime Academy, a specialized campus.

Today, with 23 campuses, over 460,000 students, and 47,000 faculty and staff, the CSU is the largest, the most diverse, and one of the most affordable systems of higher education in the nation.

Since 1961, the CSU has awarded more than 2.9 million bachelor’s, master’s, and joint doctoral degrees, including over 2.3 million baccalaureate degrees. Since 1975-76, about half of all baccalaureate degrees conferred in California have been awarded by the CSU. In 2013-14, the CSU awarded 103,637 degrees, including 85,063 baccalaureate degrees.

Over the past two decades, the number of under-represented minorities (URM) obtaining CSU undergraduate degrees more than tripled, growing from 9,108 in 1993-1994 to 30,792 in 2014-2015. Over the same time period, baccalaureate degrees awarded to Asian American students increased by 80% and the number of non-Hispanic White students earning baccalaureate degrees showed an overall decrease of 11%.

One out of every 20 Americans with a college degree earned it from the CSU.

The CSU awards about half of the bachelor’s degrees and a third of the master’s degrees granted in California

The CSU adds 100,000 alumni annually and this year will reach 3 million strong.

# ABOUT CSU-LSAMP

## HISTORY

Since 1993, the NSF’s LSAMP program has provided the California State University the impetus to bring its campuses together to develop a comprehensive and unified system-wide effort to increase the number of STEM baccalaureate degrees awarded by the system to students from underrepresented minority groups. The California State University-Louis Stokes Alliance for Minority Participation (CSU-LSAMP), has proven to be highly effective; and, with on-going funding and program support from the NSF, the Office of the Chancellor of the CSU, and participating campuses, the project has grown in size and evolved in its scope.

CSU-LSAMP initially included 18 CSU campuses, each associated with at least one California Community College partner. Since then, new campuses were added to both the system and to the Alliance, which currently includes all 23 of the universities of the CSU.

## CSU-LSAMP “PHASES”

The CSU has been fortunate to have been awarded NSF-LSAMP funding for five successive five-year project periods. Each project period has had somewhat different objectives and programmatic emphases, building upon the accomplishments of the preceding period(s).

In Phase I, the primary objective was to double the number of STEM BA/BS degrees awarded by the CSU to URM students. To accomplish this, the program emphases were on development of partnerships with community colleges, providing summer bridge programs for freshman-level students at both the 2-year and 4-year institutions, and academic excellence workshops in mathematics.

In Phase II, CSU-LSAMP set its focus on improving individual URM-STEM

student retention and progression to the baccalaureate degree by expanding academic support to a wider range of “gatekeeper” science courses for both freshman and sophomore-level students and improving the preparation of community college students for transfer.

By Phase III, many of the lower division practices and transfer bridges developed and supported by CSU-LSAMP were institutionalized. Therefore, in Phase III, the CSU-LSAMP program began to transition from a program that primarily supported lower-division students in introductory science courses and pre-transfer activities to a program that also served upper division students in research and other activities designed to motivate them to pursue graduate study. CSU-LSAMP’s attainment of Phase III status coincided with the introduction of the NSF-LSAMP “Bridge to the Doctorate (BD) Activity,” and CSU-LSAMP has been awarded 12 BD activities since then.

In 2008, CSU-LSAMP became a Senior-level LSAMP, and its objectives were again modified to build on past accomplishments in a manner that furthers the NSF’s goal of preparing a diverse, globally engaged scientific and technological workforce. As a Senior-level Alliance, the focus of CSU-LSAMP is on individual student persistence and progression to graduate study, institutionalization and dissemination of best practices, and expanding opportunities for student engagement in international activities.

Our current project, referred to as Senior-level II, continues the goals of the Senior-level I project. Recognizing the great differences between our campuses however, we reorganized our activities in such a way that individual campuses could tailor their programs to meet the needs of their students while still maintaining consistency across the Alliance. A deeper look at this approach is presented in the next section.

### Phase I (1993-1998)

Double the number of STEM baccalaureate degrees awarded by the CSU to URM students

### Phase II (1998-2003)

Improve individual URM-STEM student success and progression to the baccalaureate degree

### Phase III (2003-2008)

Improve aggregate student progression to graduate programs

### Senior-Level I (2008-2013)

Improve individual student persistence and progression to graduate study, and engagement in international activities

### Senior-Level II (2013-2018)

Continue to improve persistence and graduation rates and increase rates of progression to graduate study through research and international activities

# INSIDE CSU-LSAMP: A STRUCTURE THAT WORKS

**At the 23 unique campuses of the California State University system working together as an alliance, the needs of students are varied. In order maximize our impact, CSU-LSAMP has developed a structure that allows each campus to provide a set of activities that best meets the needs of their own students while also maintaining a strong Alliance identity.**

Just as no two LSAMP Alliances are identical, no two CSU campuses are the same. Whereas CSU-LSAMP has a common set of services and activities, the individual programs on the 23 participating campuses maintain a fair degree of autonomy in deciding how their programs are structured. Program size varies widely by campus, ranging from 20 participants to 500 participants per year. Administrative structure also varies widely; some programs are run by a single campus coordinator, whereas others are part of a larger unit that manages multiple programs (e.g. McNair or NIH-NIGMS training programs).

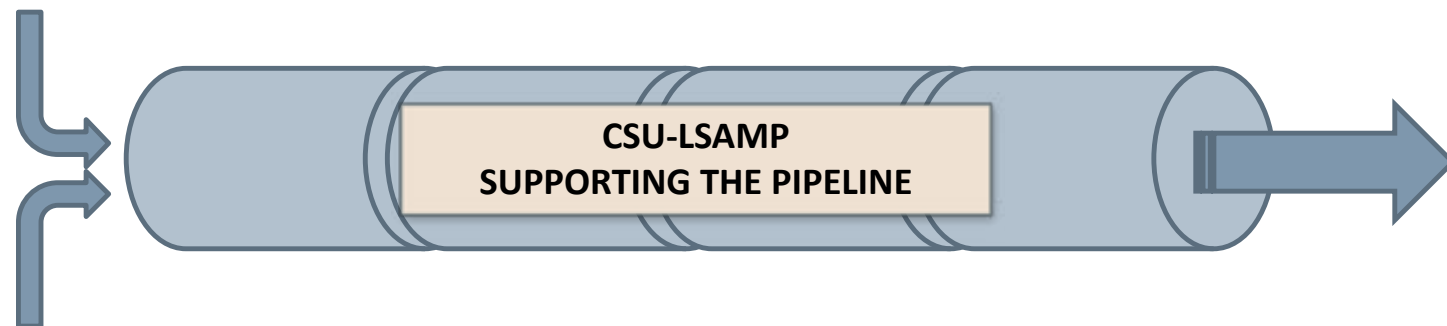
In that same vein, activity emphases and delivery modes vary by campus. So long as they adhere to a common set of program components designed to meet a common set of objectives, each CSU campus offers a slightly different version of the program that best suits their needs. Some campuses have chosen to provide an emphasis on providing academic support in “gatekeeper” courses and facilitating transitions with the primary goal of improving academic performance, persistence in STEM, and attainment of the baccalaureate degree.

Other campuses have chosen to emphasize engagement of students in research and other professional development activities with the primary goal of enhancing professional development and student competitiveness for, and success

in, advancing to graduate programs and professional careers in STEM.

Lastly, comprehensive programs with substantial activities at different stages in the pipeline, include academic support activities, transitional activities, and research and professional development activities, with the dual goals of (1) improving preparation/performance and persistence to baccalaureate degree; and (2) enhancing student competitiveness for success in gaining admission to graduate programs and careers in STEM.

Given the breadth and complexity of an alliance of 23 campuses, each allowed to offer a series of activities to meet their emphasis, there is necessity for a strong central office. The “lead institution” is responsible for administration, funding, data collection, evaluation and reporting. Alongside this, CSU-LSAMP has adopted a collegial decision making process, whereby campus coordinators meet annually to discuss programmatic elements and the common set of objectives. CSU-LSAMP also utilizes a Program Oversight Committee that meets quarterly to monitor the policies and procedures pertaining to campus budgets, data collection, and reporting. Program Oversight Committee members are selected by and from the 23 campus partner institutions, and are responsible for representing 4-5 campuses.



# IMPLEMENTING BEST PRACTICES

CSU-LSAMP offers a wide range of activities that serve students throughout their academic career. These activities fall under the five objectives described below. To accommodate variations in the types of activities that have been institutionalized on different campuses, and to better leverage project funds, CSU-LSAMP has adopted an approach that provides individual campuses flexibility in determining the range of activities to be supported by CSU-LSAMP funds. The range of activities provided by a campus reflects that campus’ particular emphasis. For example, a campus with an emphasis on academic support may primarily offer objective 1 and 2 activities whereas a campus with an emphasis on professional development may concentrate on objective 3 and 4 activities. All campuses are required to offer activities that fall under the common CSU-LSAMP objective.

<b>Objective 1-- Academic Support:</b> Supporting students in gatekeeper courses in STEM with the goal of improving student performance and persistence in STEM:	
Summer Bridge Programs in STEM Academic Excellence Workshops	Textbook Loan/Reimbursement Programs Other Academic Support Activities
<b>Objective 2 -- First Year or Transition Programs:</b> Supporting students as they transition into STEM disciplines with the goal of improving persistence in STEM:	
Orientation Programs Non-STEM Summer Bridge Programs First Year Programs for Freshmen and Community College Transfers	Other Transition Activities
<b>Objective 3 -- Research and International Activities:</b> Providing opportunities for students to engage in research, internships, and international activities, with the goal of encouraging continuation to graduate school and professional careers in STEM:	
CSU-LSAMP Supported Research Research Funded by Others	Internships International Experience
<b>Objective 4 -- Professional Development Activities:</b> Providing additional professional development and graduate school preparation activities with the goal of increasing the number of students entering graduate programs and professional careers in STEM:	
Presentation/Publication of Research Participation as Facilitators/Mentors	Graduate School Preparation Activities Other Professional Development Activities
<b>Common Objective:</b> On-going LSAMP student support and exposure to career and research opportunities in STEM with the goal of increasing persistence in STEM and enhancing interest in pursuing graduate study and professional careers in STEM.	
LSAMP Advising Communications Clubs & Cohesion Activities Attendance at Conferences (not presenting)	Exposure to Opportunities Material Support Seminars and Regular Meetings

# IMPACT OF NSF'S SUPPORT OF CSU-LSAMP

## PROVIDING A STRATEGIC FRAMEWORK FOR THE CSU'S EFFORTS TO BROADEN PARTICIPATION IN STEM

Although several of the campuses of the CSU had STEM support programs in place prior to the creation of CSU-LSAMP, most of these programs focused on specific disciplines and there was relatively little communication of best practices among the campuses. However, the NSF's support of the creation of an Alliance among the campuses provided the opportunity to expand, coordinate and leverage the expertise and resources of the campuses in a focused system-wide effort to broaden participation in STEM. Importantly, over the years, the NSF's vision for the LSAMP program and its expectations for successive "phases/levels" provided a strategic framework for the CSU's development and institutionalization of effective practices at progressively higher stages in the STEM pathway, from entry at the freshman and transfer levels to support of upper division students and advancement to graduate study.

## ENGAGING THOUSANDS OF STUDENTS FROM DIVERSE POPULATIONS IN STEM ENRICHMENT ACTIVITIES

CSU-LSAMP admitted its first group of participants in Summer 1994; and, as of Spring 2014 has enrolled 23,360 participants, including 19,765 students from underrepresented racial/ethnic groups. Data on the number of new students who were admitted to CSU-LSAMP in each project period is provided in Table 1. The racial/ethnic composition of the total population of CSU-LSAMP's participants is provided in Figure 1 below.

Table 1: Number of new CSU-LSAMP participants by URM Category for Phase I, Phase II, Phase III, Senior Level I, and year 1 of Senior Level II.

	Phase I 1994-1998	Phase II 1999-2003	Phase III 2004-2008	Senior Level I 2009-2013	Senior Level II Year 1: 2014	TOTAL
URM	4,296	5,330	5,566	3,602	971	19,765
Non-URM	285	1,622	207	660	186	2,960
Not Reported	58	478	13	71	15	635
TOTAL	4,639	7,430	5,786	4,333	1,172	23,360

Figure 1: Racial/Ethnic Composition of the total population of CSU-LSAMP Participants, 1994-2014

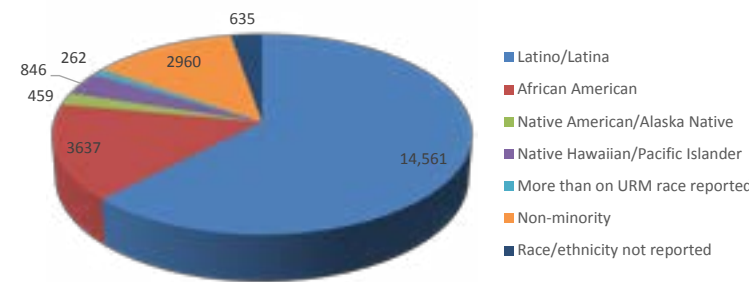
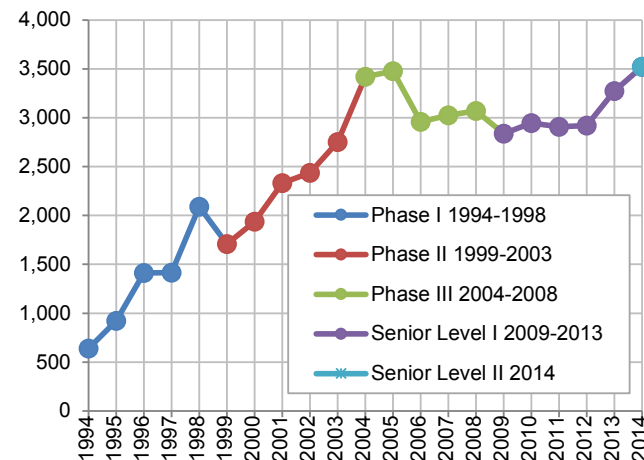


Figure 2: Number of CSU-LSAMP participants by year, 1994-2014



Since 1993-1994, thanks to combined funding support from the NSF's LSAMP program, the CSU Chancellor's Office, and participating campuses, CSU-LSAMP has engaged over 23,000 students in academic support and STEM enrichment activities. The number of participants served by CSU-LSAMP per year has more than quadrupled from 641 in 1993-1994 to 3,520 in 2013-2014. Beginning in Phase III, CSU-LSAMP transitioned from a program that primarily provided group activities for lower division students (e.g., summer bridge and academic excellence workshops) to a program with an increased emphasis on engagement of upper division students in mentored research and preparation for graduate study. Due to this shift in emphasis, the number of participants served annually decreased somewhat but has since grown to its current level of 3,500 per year.

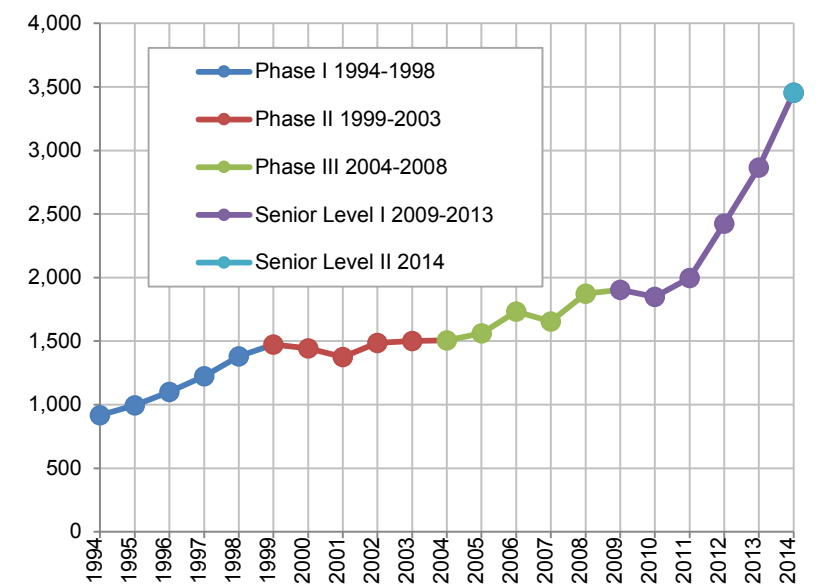
## CSU-LSAMP: SUCCESS WRITTEN IN THE NUMBERS

- Since 1994, CSU-LSAMP has served 23,360 participants, including 19,765 URM students
- The annual number of participants has increased more than fourfold, from 641 in 1994 to 3,520 in 2014
- From 1994 to 2013, CSU URM-STEM undergraduate enrollment increased 208%. STEM enrollment for non-URM students increased by only 23 % over the same time period
- From 1994 to 2013, CSU URM-STEM baccalaureate degree production increased 277%
- CSU-LSAMP participants are 1.2-1.8 times more likely than non-participants to remain enrolled in STEM disciplines
- CSU-LSAMP participants are two times more likely than non-participants to graduate with STEM degrees
- In 2014-15, almost 900 CSU-LSAMP students engaged in research on their own campuses, at national laboratories, and internationally
- In 2014-15, CSU-LSAMP students disseminated their research through journal articles (13), presentations at international conferences (4), presentations at national conferences (130), and presentations at regional conferences (119)

## INCREASING THE NUMBER OF STEM BACCALAUREATE DEGREES AWARDED BY THE CSU TO STUDENTS FROM UNDERREPRESENTED MINORITY GROUPS

The primary objective of CSU-LSAMP, since its inception, has been to increase the number of STEM baccalaureate degrees awarded by the CSU to URM students. Figure 3 shows the annual number of baccalaureate STEM degrees awarded by all CSU campuses to URM students from 1993 to 2014. From the beginning of Phase I, to the first year of the Senior Level II project, annual URM-STEM baccalaureate degree production almost quadrupled, from 917 in 1994 to 3,455 in 2014, and appears to be increasing steadily. Baccalaureate STEM degrees awarded by the CSU to non-URM students increased by 28 percent during the same period. Notably, the CSU awarded a total of 37,717 STEM BA/BS degrees to URM students from 1993-1994 through 2013-2014, and an estimated 6,439 of these degrees were awarded to CSU-LSAMP level-1 URM participants.

Figure 3: Number of baccalaureate STEM degrees awarded by the CSU to URM students, 1993-2014



# CSU-LSAMP: Closing the Achievement Gap

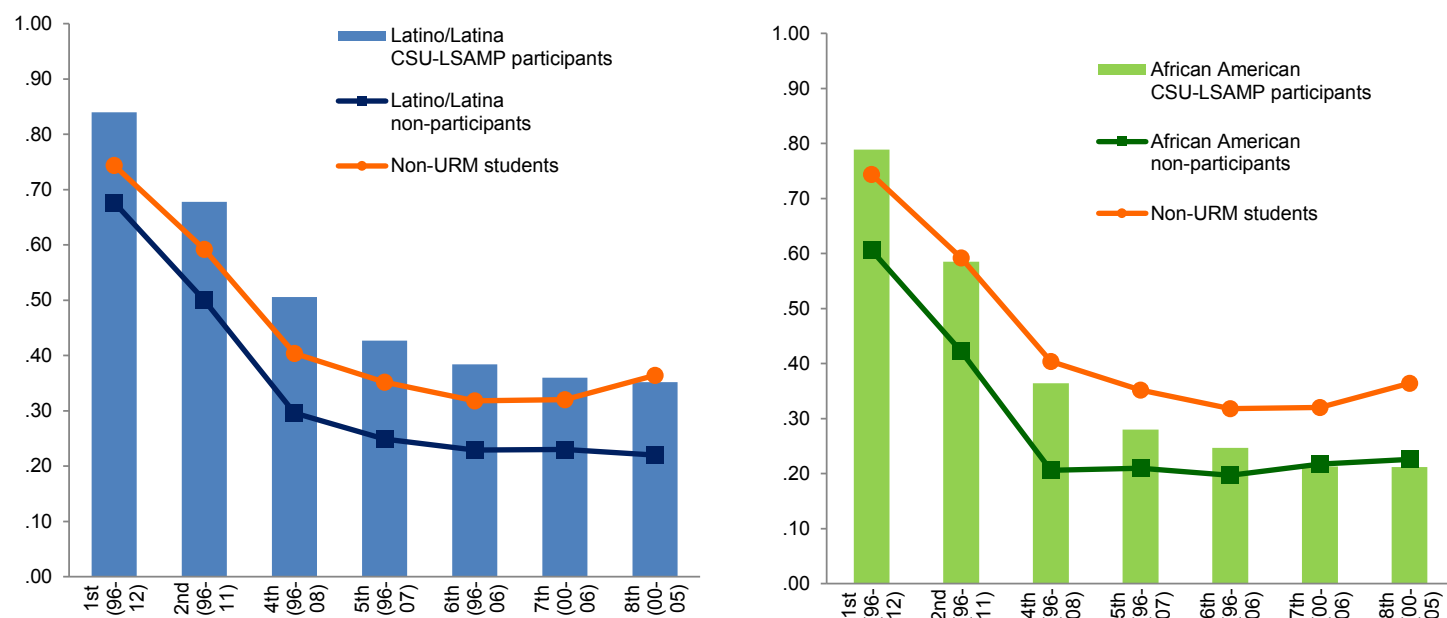
In the California State University, as in many colleges and universities across the nation, there are considerable gaps between persistence and graduation rates for URM and non-URM students. CSU-LSAMP works to close these gaps by increasing the persistence and graduation rates for participants. To assess the impact of CSU-LSAMP participation on persistence and graduation in STEM, the Institute for Social Research (ISR) at California State University, Sacramento (the project's evaluator) conducted longitudinal studies of annual cohorts of CSU-LSAMP Hispanic and African American participants with CSU benchmark cohorts for the period beginning in 1996-1997 and ending in 2013-2014. To enable comparison with CSU benchmark cohort data available from the Consortium for Student Retention Data Exchange (CSRDE), the CSU-LSAMP cohorts include only participants entering the CSU as first-time freshman with declared majors in STEM. Comparisons were not conducted for Native Hawaiian/Pacific Islanders because separate benchmark data from these groups are not available from CSRDE. Comparisons were not conducted for Native American and Alaska Natives since the small numbers in these cohorts are likely to produce unstable rates.

**The differences in first through seventh year persistence rates for Hispanic and African American participants and estimates for non-participants from these groups are substantial, ranging from 1.2 times higher for both groups in the first year to 1.8 times higher for African Americans in the 4th year.**

## IMPROVING PERSISTENCE OF URM STUDENTS IN STEM

The ISR study clearly demonstrates that participation in CSU-LSAMP is associated with improved persistence of Hispanic and African American students in STEM. Controlling for race and ethnicity, the differences in first through seventh year persistence rates for Hispanic and African American participants and estimates for non-participants from these groups are substantial, ranging from 1.2 times higher for both groups in the first year to 1.8 times higher for African Americans in the 4th year. In addition, Hispanic CSU-LSAMP participants had higher first through seventh year rates than all other comparison groups, including Asian and non-Hispanic white students. African American participant persistence also exceeded rates for non-URM students in the first year; and although rates fell below those of non-URM groups in the 3rd year, they were much greater than rates for African American non-participants. Comparisons of average persistence rates are provided in Figure 4 below. The averages summarize persistence rates across cohort years. The number of cohorts in each average necessarily vary and are noted.

Figure 4: Comparison of Latino and African American persistence rates



Sources: Longitudinal participant database constructed from WebAMP records matched to CSU ERS records. Non-participant and non-URM student data is from the ASD Consortium for Student Retention Data Exchange (CSRDE) Data for California State University.

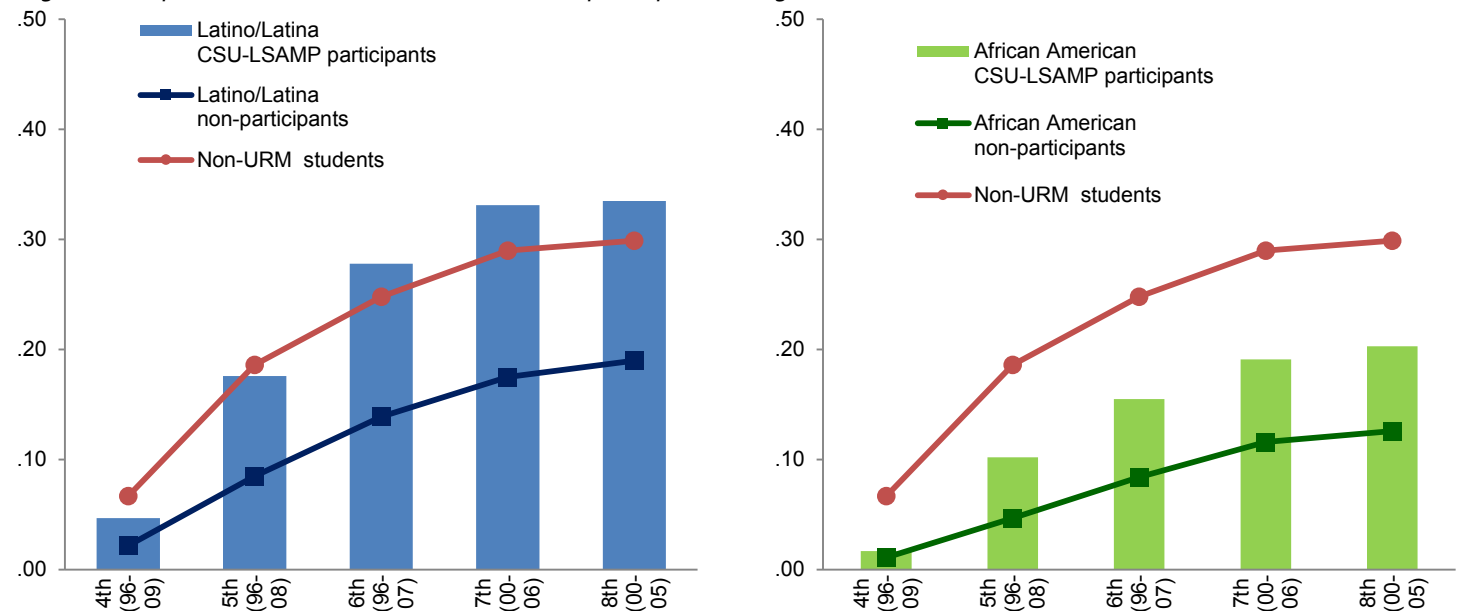
# the Achievement Gap



## IMPROVING GRADUATION RATES OF URM STUDENTS IN STEM

The ISR study shows that the “achievement gap” is narrowed substantially for Hispanic and African American students who are participants in CSU-LSAMP and that participant graduation rates have improved over time. Figure 5 compares graduation rates for Hispanic and African American participants with those of non-participants. The average four-year STEM graduation rate of Hispanic CSU-LSAMP participants is 2.1 times higher than that of Hispanic non-participants. Six-year graduation rates of Hispanic participants are 2.0 times higher than Hispanic non-participants. Importantly, for Hispanic participants, six-year graduation rates exceed rates for non-URM comparison groups. The average four-year graduation rate of African American participants is 1.5 times higher than that of African American non-participants. For African American students, the difference widens in the fifth and six years. Respectively, five and six-year graduation rates of African American participants are 2.2 and 1.8 times higher than those of African American non-participants. Although average graduation rates for African American participants are lower than for non-URM comparison groups, the gap is much smaller than the gap that exists for African American non-participants. For example, the average six-year STEM graduation rate of African American participants is 15.5% as compared to 22% for non-URM students, while the rate for African American non-participants is 8.4%.

Figure 5 Comparison of Latino and African American participant STEM graduation rates



Source: Longitudinal participant database constructed from WebAMP records matched to CSU ERS records. Non-participant and non-URM student data is from the ASD Consortium for Student Retention Data Exchange (CSRDE) Data for California State University.



## MOTIVATING AND PREPARING STUDENTS TO PURSUE GRADUATE STUDY AND RESEARCH CAREERS IN STEM

By the beginning of Phase III of CSU-LSAMP, many of the practices that were developed and supported by LSAMP in prior phases had been institutionalized, providing CSU-LSAMP the opportunity to transition from a program that primarily supported lower division students in introductory science classes and pre-transfer activities to a program that provides support for students at all levels and that places an emphasis on engaging upper division students in research and other activities designed to motivate and prepare them for graduate study. This change can be seen in figure 6, which shows the class-level of CSU-LSAMP participants in the final years of Phase II, Phase III, and the Senior Level I project. The class-level of participants in the first year of the current project is also shown. Specifically, in 2002-2003 (the end of Phase II), freshmen and sophomores comprised 62% of participants, whereas they now comprise only 22% of participants.

CSU-LSAMP's increased emphasis on research and graduate school preparation activities, starting in 2003, is reflected in increases in the number of CSU-LSAMP participants engaged in these types of activities over time (figure 7). The number of students participating in research has more than quadrupled since the start of Phase III, and has almost doubled over the past five years. The number of students attending conferences has more than tripled since the start of Phase III and almost doubled over the past five years, and the number of students participating in graduate preparedness activities has increased by 50%. Examples of outstanding student researchers can be found in the campus impact statements at the end of this report.

Figure 6: Change in class level of CSU-LSAMP participants

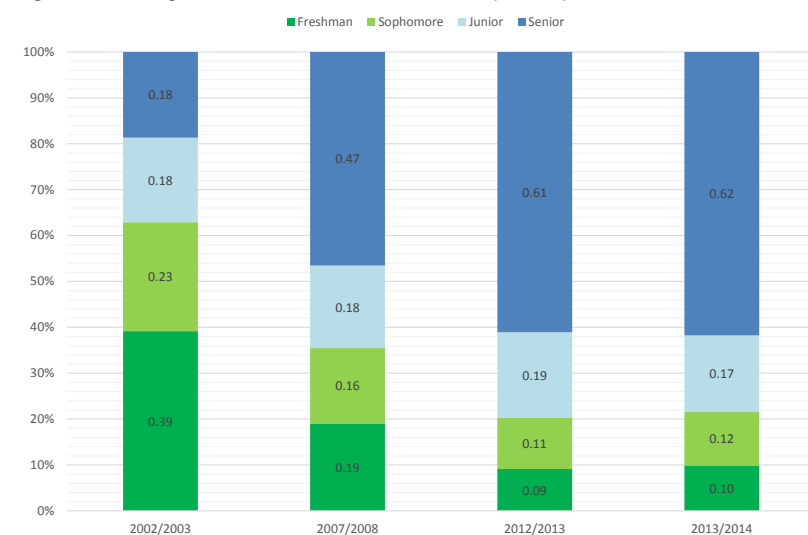
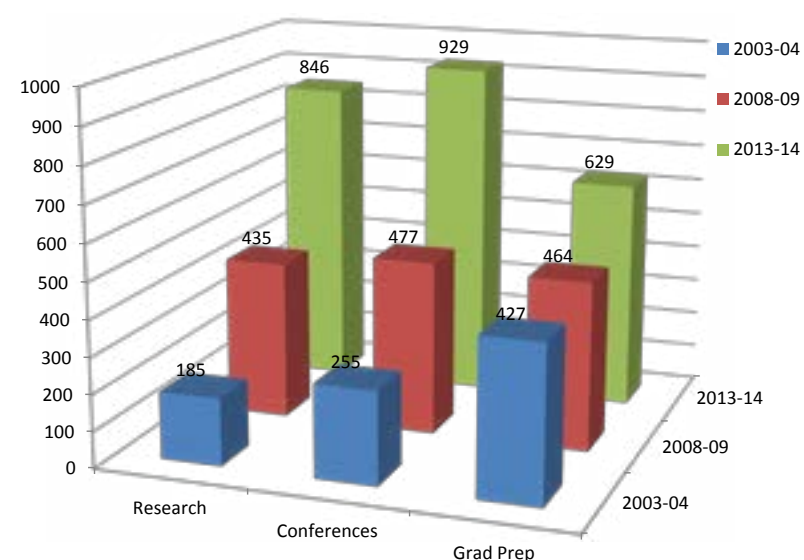


Figure 7: Participation in professionalization activities in the first year of Phase III, the first year of Senior Level I, and the first year of Senior Level II.



## INCREASING PROGRESSION TO GRADUATE STUDY

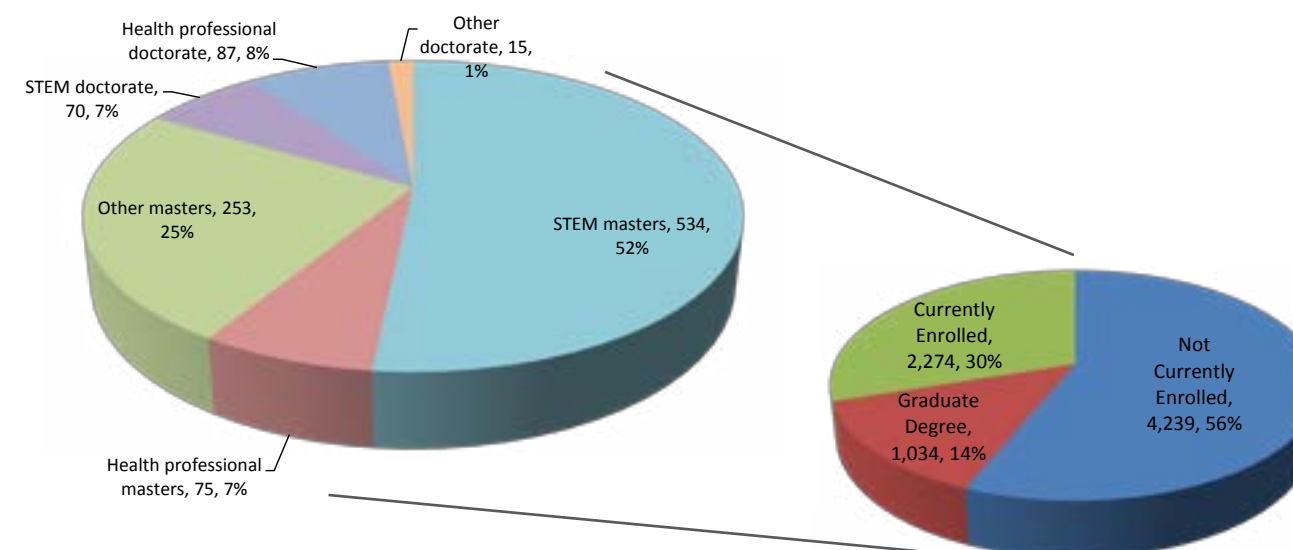
In Phase III, Senior Level I, and continuing in Senior Level II, the CSU-LSAMP program began to increase emphasis on serving upper-division students in research and other activities designed to motivate them to pursue graduate study and enhance their competitiveness. The Institute for Social Research (ISR) conducted a detailed analysis of the higher education persistence of students who participated in CSU-LSAMP between 2003 and 2014. Of the 11,291 participants during this period, ISR successfully obtained tracking information for 9,332 students, and the records showed that 6,122 of them (or 65.6%) graduated with a bachelor's degree. They also found that 43 percent of the graduates (2,652 out of 6,122) with tracking information available either earned a post-baccalaureate degree or are currently enrolled in graduate programs (Table 2). By applying the graduation rate to the 11,291 Phase III, Senior Level I, and Senior Level II participants, it is estimated that 7,407 students (66%) graduated with a bachelor's degree. This translates to an estimated 534 Phase III, Senior Level I, and Senior Level II participants who obtained a STEM Master's degree and 70 who obtained a STEM doctorate degree. It should be noted that many of these participants have not had enough time to complete their doctorate, so it is likely that the number of doctoral degrees will increase in the coming years.

Table 2: Post-baccalaureate enrollment and degree attainment for Phase III, Senior Level I, and Senior Level II participants.

	Phase III, Senior Level I, and Senior Level II participants for whom tracking information is available		Estimated number of Phase III, Senior Level I, and Senior Level II participants
	NUMBER	PERCENT	
STEM MASTERS	428	7.0%	534
HEALTH PROFESSIONAL MASTERS	60	1.0%	75
OTHER MASTERS	203	3.3%	253
STEM DOCTORATE	56	0.9%	70
HEALTH PROFESSIONAL DOCTORATE	70	1.1%	87
OTHER DOCTORATE	12	0.2%	15
CURRENTLY ENROLLED	1,823	29.8%	2,274
NOT CURRENTLY ENROLLED	3,470	56.7%	4,329
<b>TOTAL</b>	<b>6,122</b>	<b>100.0%</b>	<b>7,638</b>

Source: Longitudinal participant database constructed from WebAMP records matched to CSU ERS records

Figure 8: Post-baccalaureate enrollment and degree attainment for Phase III, Senior Level I, and Senior Level II participants.



# CSU-LSAMP in Academia

**Dr. Cecilia Zurita-Lopez**  
Assistant Professor, Department of Chemistry & Biochemistry  
California State University, Los Angeles  
CSU-LSAMP @ Cal State LA



**Dr. Eduardo Montoya**  
Associate Professor, Department of Mathematics  
California State University, Bakersfield  
CSU-LSAMP @ CSUB



We are proud of the fact that a number of former participants in the CSU-LSAMP undergraduate program have gone on to attain doctoral degrees and entered into academia as professors and directors of programs. We interviewed three CSU-LSAMP graduates about their experiences and their advice for current students.

## What impact did CSU-LSAMP have on you as a student and/or on your career path?

**CZL:** The LSAMP Program helped me make better career decisions. It provided a supportive environment where I could be proud of studying biochemistry. Even when my family didn't understand why I spent long hours in a lab or why I spent long hours studying, I had support from friends in LSAMP and the LSAMP coordinator.

**EM:** I enjoyed and performed rather well in the LSAMP math boot camp to the point that I tested into Calculus I and decided to pursue a degree in mathematics. Without this program, I likely would have not pursued a degree in mathematics.

**DA:** Participating in the CSULA LSAMP Program had a huge impact on my retention in Science. I had a very difficult time with math and had to take several courses twice in order to pass. I love(d) Biochemistry and without the tutoring from the LSAMP Program it would have been nearly impossible for me to pass the calculus courses required for the degree. Tutoring seems like a trivial thing to provide a student however, in my case it served to level the playing field and give me access to a field of science that might have been unattainable otherwise.

## What advice do you have for current CSU-LSAMP students?

**CZL:** To all current CSU-LSAMP Students: Don't let anyone discourage you from reaching your dreams. You were created with a purpose and this purpose is different from those of your family members. You naturally love the STEM disciplines, so follow what you love. Learn as much as you can and then in time, those family members who were constantly asking "when are you finally going to be done with school?" will be the first ones to brag about your great career!

**EM:** Make the most of every opportunity available.

**DA:** Beyond doing the work of a scholar, to have a successful career, it's important to take advantage of every opportunity presented to you and have a mentor (who has walked your path) that you touch base with regularly. The right mentor can be an incredible source of support and insight.

**Dr. Diana Azurdia**  
Associate Director, Graduate Programs in Bioscience  
University of California, Los Angeles  
CSU-LSAMP @ Cal State LA



## How do you feel CSU-LSAMP contributes to the broadening of participation in STEM?

**CZL:** LSAMP is critical for retention of our underrepresented minority students. Most of our CSU students come from humble families and are first-generation college students. If they are not first-generation, they are usually first-generation STEM students. Therefore, our students lack the proper educational and career development support structure at home. LSAMP encourages and supports our students so that they can persist in STEM disciplines.

**EM:** By providing support to students at various stages of their undergraduate studies, such as opportunities for engagement in undergraduate research activities or providing lower division or pre-first year students academic support, CSU-LSAMP is broadening participation in STEM by increasing the persistence, success, and retention of STEM students from underrepresented groups.

**DA:** As a beneficiary of the LSAMP Program and a former LSAMP Program Director, I know first hand about the incredible impact the program has on broadening participation across the nation. The LSAMP program levels the playing field for students who come from underrepresented groups by providing resources such as tutoring, professional development, research opportunities and much more. I believe the CSULA LSAMP Program does an incredible job of preparing students to go beyond the bachelors and I am forever grateful for the investment the program made in me.

## CSU-LSAMP IN ACADEMIA

**Alejandro Briseno (CSULA)**  
Ph.D., Chemistry, U of Washington, '08  
Assistant Professor, Polymer Science & Engineering  
University of Massachusetts, Amherst

**Corey Garza (CSULA)**  
Ph.D., Marine Biology, UCSB, '01  
Associate Professor, Division of Science and Environmental Policy  
California State University, Monterey Bay

**Michael Lipscomb (CSULA)**  
Ph.D., Immunology, U of Pittsburg, '09  
Professor, Biology  
Howard University

**Enrique Lopez (Fresno State)**  
Ph.D., Science Education, Stanford  
Assistant Professor, Science Education  
University of Colorado, Boulder

**Eduardo Montoya (CSUB)**  
Ph.D., Statistics and Applied Probability, UCSB, '09  
Associate Professor, Statistics  
California State University, Bakersfield

**Jose Nunez (CSULA)**  
Ph.D., Organic Chemistry, UCLA, '07  
Professor, Chemistry  
University of Texas, El Paso

**Candice Price (CSUC)**  
Ph.D., Mathematics, Univ. of Iowa, 2012  
Assistant Professor  
West Point Academy

**Kenneth Rodriguez (CSUDH)**  
Ph.D., Chemistry, Ohio State, '07  
Assistant Professor, Chemistry  
California State University, Dominguez Hills

**Suzanne Sindi (CSUF)**  
Ph.D., Applied Mathematics, University of Maryland, '06  
Assistant Professor, Applied Mathematics  
University of California, Merced

**Cecilia Zurita-Lopez (CSULA)**  
Ph.D., Biochemistry, UCLA, '11  
Assistant Professor, Department of Chemistry and Biochemistry  
California State University, Los Angeles

# INTERNATIONAL ACTIVITIES



With the start of Phase III in 2008, CSU-LSAMP added international research experiences as one of its objectives. Since then, **267 CSU-LSAMP participants (an average of 43 per year)** have had the opportunity to conduct research overseas. We have placed students in research on all continents except for Antarctica.

CSU-LSAMP provides opportunities for students to obtain international research experiences in a number of ways, including participation in international REUs, study abroad programs, and travel with an individual research advisor.

CSU-LSAMP also funds two international experiences per year. Offered by individual campuses, these programs are open to CSU-LSAMP participants from any of our Alliance campuses, providing an opportunity for our students to build a broader network of peers.

and availability of modern equipment, which leads them to think more carefully about their experiments and become more conscious of these issues when they return to their home campuses. The warmth of the Thai people leads to an ease in developing cultural awareness and students return with an increased awareness of political, social and economic issues unlike those that they would encounter in the USA or even Europe. The CSU-LSAMP Global Awareness program in Thailand increases the confidence of participants that they can be successful in research and post-baccalaureate programs.

## CSU-LSAMP RESEARCH EXPERIENCE IN COSTA RICA

Launched in 2011 and led by California State University Monterey Bay, the CSU-LSAMP Costa Rica program takes place in the rain forest of Volcán Tenorio National Park, the cloud forest of Monteverde, and

*The experience of living in a developing nation is invaluable in that the students return with an increased awareness of political, social and economic issues unlike those that they would encounter in the USA or even Europe.*

## CSU-LSAMP RESEARCH EXPERIENCE IN THAILAND

The CSU-LSAMP Global Awareness program led by California State University, Fullerton, emphasizes applied research, intercultural competence, and personal development. This program provides CSU-LSAMP students with a summer research experience working on projects with Thai faculty supervisors and students at Chiang Mai University (CMU) in Northern Thailand. Conducting research in a developing country like Thailand introduces students to new issues such as consideration of cost

the coastal environment of the Cabo Blanco Absolute Reserve. Participants are immersed in the rigorous study of tropical environments and biological diversity, statistics and research methods, current issues in conservation, and Costa Rican geography and culture.

Students receive instruction in the development of research questions, fundamentals of experimental design, sampling, hypothesis testing, and the responsible conduct of research. All students present their research at the end of the program and many have gone on to present their work at national conferences.

# CSU-LSAMP: Bridge to the Doctorate

To date, the NSF-LSAMP program has supported twelve CSU-LSAMP Bridge to the Doctorate Activities. San Francisco State served as the performance site for cohorts 1 and 4, CSU Northridge for cohorts 7 and 9, and Cal State LA for cohorts 2, 3, 5, 6, 8, 10, 11, and 12.

CSU-LSAMP has consistently found that the BD model it has developed, which provides support at the Masters level, is a highly effective strategy for recruiting, retaining, and advancing talented minority students who otherwise would be unlikely to pursue doctoral level study. CSU-LSAMP BD fellows include students with deficits in their baccalaureate credentials and others with competitive credentials for direct entry into Ph.D. programs, but who were otherwise unable or hesitant to do so. For these students, the Masters-level program truly serves as a “bridge” to doctoral-level study. Graduates of the CSU-LSAMP BD programs have matriculated into Ph.D. programs at some of the top institutions in the nation. Very few, if any, of these students would have been competitive applicants to these programs prior to taking part in the CSU-LSAMP BD program.

A total of 152 students have been participants in CSU-LSAMP BD activities, 143 (94%) of whom were students from historically URM groups. Eighty percent of participants have either earned a Master’s degree or are continuing in Master’s-level study. Of the 128 participants in the completed BD cohorts (cohorts 1-10), fifty percent have either earned a Ph.D. or are currently enrolled in Ph.D. programs. To date, 23 graduates of the CSU-LSAMP BD program have earned a Ph.D. and 4 have earned an M.D. Of these, 11 are continuing in postdoctoral research, 4 have entered the professoriate, and 4 are employed as physicians. Of the 42 BD fellows for whom the Master’s degree was the terminal degree, 76% are employed as STEM professionals.

We are especially proud of the success of the most recently completed cohort at Cal State LA (cohort 10). Of the 12 students who entered the program in 2012, all received an M.S., and 11 have been accepted into Ph.D. programs.

## MONICA A. DELGADO MORENO

Monica began her academic career at Cal State LA studying Microbiology. Part of the BD-V cohort, Monica continued her studies at Cal State LA under the guidance of Dr. Nancy McQueen with a research interest in the role of plasmids in antibiotic resistance among *A. baumannii* clinical isolates. After completing her M.S. in Biology in 2009, Monica was accepted into the UC Davis School of Medicine Ph.D. program in Immunology. Monica received graduate fee waivers; an NIH Initiative for Maximizing Student Diversity Fellowship; and a fellowship from the graduate group in Immunology. She received her Ph.D. in Immunology in 2014 and is currently a Postdoctoral Research Fellow in the Neurology and Neurological Sciences Department at Stanford University.



## VANESSA L. GONZALEZ



Vanessa began her academic career studying Marine Biology at UCLA. In her third year she received a Smithsonian minority undergraduate research grant to study mechanisms of reproductive isolation in sea urchins at the Smithsonian Tropical Research Institute in Panama. She was accepted into the Master’s program in Biology and BD Cohort III at Cal State Los Angeles to further pursue training in evolutionary biology and systematics with Dr. Patrick Krug. Toward the end of her thesis research, she received another research grant to study the evolution of bioluminescence in Caribbean members of the Cypridinidae (Myodocopida) at the Smithsonian Tropical Research Institute in Panama. After completing her MS degree in 2007, she entered the doctoral program at Harvard University, funded by the Graduate School of Arts and Sciences Graduate Student Fellowship, and earned her Ph.D. in 2013. Currently, Vanessa is a Research Bioinformatician, with the Global Genome Initiative at the Smithsonian National Museum of Natural History

## HENRY PAUL MARTINEZ

Paul participated in an NSF REU program at Cal State, Los Angeles when he was a student at Glendale Community College. He transferred to Cal State Los Angeles, and continued his undergraduate research in Dr. Carlos Gutierrez’ lab, working on synthesizing derivatives of the siderophore enterobactin as part of an effort to understand iron sequestration and transport by *E. coli*. In 2005, Paul was admitted to the MS Program and BD Cohort II at Cal State Los Angeles, where he continued to work in Dr. Gutierrez’ lab. Paul completed his MS in 2007, and was admitted to the Chemistry Ph.D. program at University of California, San Diego, where he joined Professor William Troglor’s research group. His doctoral research, which was supported by NSF-AGEP and NCI-ET CURE fellowships, focused on new inorganic materials for chemical biological and environmental sensing. He has already published some of his graduate work, including a study on an ultrasound contrast marker for breast cancer, which was featured as the cover story of the journal (*Med. Chem. Commun.* 2010 1, 266–270). Paul completed his doctorate in 2011, and currently is in a postdoctoral appointment at the Lawrence Livermore National Laboratories where he works on the development of sensors.



## COREY BAKER

Corey began his engineering studies at San Jose State University where he received the Hewlett Packard Scholarship. Corey entered the Master of Science program in Electrical Engineering at Cal State, Los Angeles in 2008 and joined BD Cohort VI. During his first year at Cal State Los Angeles, Corey served as Regional Chairperson for the National Society of Black Engineers. He also began to conduct research with Dr. Deborah Won at Cal State Los Angeles and worked on a separate project with Dr. Francisco Valero-Cuevas at the University of Southern California. Corey’s work with Dr. Won focused on neuron simulation data in matlab and varied tuning widths and angles of sorted and non-sorted populations to compare information loss. His thesis work with Dr. Valero-Cuevas titled, “Design and Implementation of a Non-Linear Dynamical System Replicating Spring Buckling Behavior,” focused on taking a linear motor and making it have non-linear behavior. The motor is to be used in place of a spring in Dr. Valero-Cuevas’ research to replicate the edge of instability of the nervous system. Corey earned his Ph.D. in Electrical Engineering at the University of Florida in 2015. He was a GEM Fellow and Intel Scholar, and was part of the Wireless Information Networking Group under the guidance of Dr. Janise McNair. Currently, Corey is a UC President’s Postdoctoral Fellow at the University of California, San Diego, Jacobs School of Engineering.



# CSU-LSAMP: LEADERSHIP

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# CSU-LSAMP: STATEWIDE OFFICE



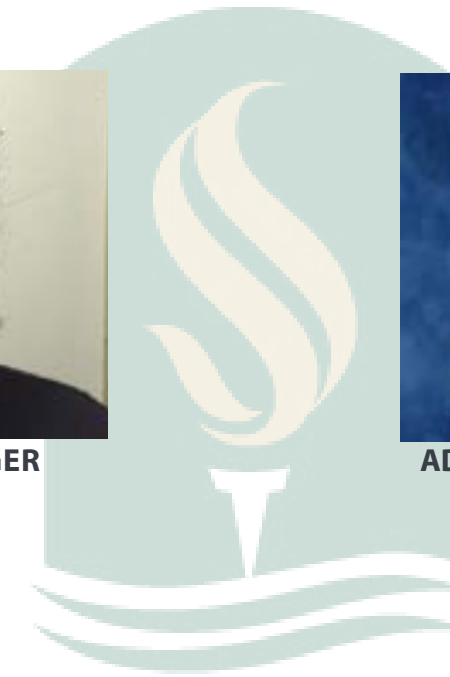
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# IMPACT STATEMENTS

In a state as diverse as California, it's no surprise that each campus of the California State University system is unique in terms of the makeup and needs of its student body. Campuses range widely in size from a student body of just 1,200 at CSU Maritime Academy to almost 39,000 students at CSU Fullerton. The California State University serves both large metropolitan areas such as Los Angeles and San Francisco, and rural areas such as Stanislaus and Humboldt counties. Eighteen of the 23 campuses in the system are designated as Hispanic Serving Institutions. The CSU-LSAMP Alliance is designed so that each campus can provide a set of activities that best serves the needs of its students while maintaining the central mission of broadening participation in STEM. The success and unique character of each of the individual campus LSAMP programs is due to the dedication and hard work of a team of LSAMP campus coordinators. Each campus coordinator has provided a statement of the impact of LSAMP on their campus. These statements are included in the following pages alongside the profiles of 2015 CSU-LSAMP PROUD scholars from each campus.





## California State University, Bakersfield

### IMPACT OF LSAMP

CSU Bakersfield has been a member of the CSU-LSAMP Alliance since its inception in 1994. One of the early accomplishments of the CSU Bakersfield LSAMP program was the development of academic excellence workshops (1-unit supplementary course) attached to each of the pre-calculus and calculus courses offered by the campus. These workshops have proven to be highly effective in improving student success not only in pre-calculus, but also in subsequent calculus courses. Due to its successes in helping students complete the pre-calculus and calculus sequence, the mathematics department began funding this course. During the more recent project periods, the LSAMP program at CSU Bakersfield has contributed greatly to expanding opportunities for undergraduate participation in STEM research on the campus. For example, this year, the LSAMP program at CSU Bakersfield has sent 7 students to graduate school, 2 of whom entered doctoral programs.



### OUTSTANDING RESEARCH & SERVICE/LEADERSHIP

#### IMELDA IBARRA • BIOLOGY



Imelda Ibarra is a Biology major with a concentration in Chemistry. For the past three years, Imelda has been on Professor Kathleen Szick's research team where they have been investigating cutaneous bacteria from *Pseudacris regilla*, which inhibits growth of amphibian and human fungal pathogens. Preliminary results of her work suggest that the bacterial isolates inhibit at least one of pathogens used in this study. As she continues her research, she aims to conserve the amphibian population and potentially create new antifungal antibiotics. Imelda has presented her research at various research conferences, such as the CSU Program for Education and Research in Biotechnology, and the Emerging Researchers National (ERN) Conference in STEM.

In addition to her research activity and coursework, Imelda has also contributed to her field by participating in the Global Brigades club at CSU Bakersfield, where she had the privilege of participating in three humanitarian trips abroad. Throughout the school year, she participates in school fundraisers to collect supplies and medications needed to provide the underserved communities of Honduras, Ghana, and Panama with free health care. As a way to motivate high school students to pursue the sciences, Imelda also worked as a student assistant for the CSUB REVS-UP summer program, a program designed to expose high school students to various scientific projects.

Overall, Imelda is a well-rounded student that plans to apply to a clinical laboratory science program and work with a clinical scientist while she awaits acceptance into a graduate program.



## Channel Islands CALIFORNIA STATE UNIVERSITY

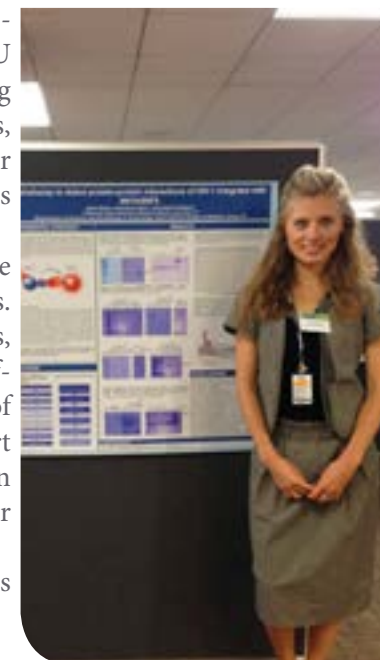
### OUTSTANDING RESEARCH & SERVICE/LEADERSHIP

#### ALINA MITINA • BIOLOGY

Alina combines a top-rate intellect with a passion for learning, an exceptionally positive personality, and impressive work ethic and motivation. She embraces the CSU Channel Islands CSU-LSAMP cohort model and the wider CI community ethic: mentoring younger students, volunteering to share her love of science and higher education at events, helping classmates with their work, and encouraging all through action and example. Her campus activities include serving a founding Peer Leader, as president of the Free Radicals (Chemistry Club) and the Mortar Board.

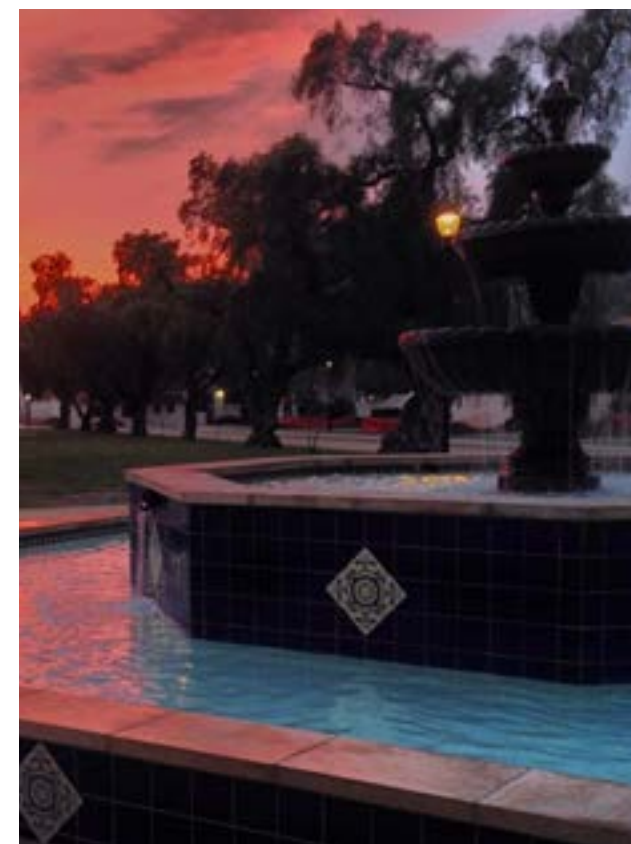
Alina, a Biology major and Chemistry minor, excels in research and academics. She earned a 3.98 GPA in a heavy STEM course load while winning prestigious scholarships. Her research engagement spans three summers and two academic-year research groups, including two prestigious NSF Research Experiences for Undergraduates. She explored diffusive transport of a small fluorescent solute into *Candida Albicans* biofilms at University of New Mexico's School of Medicine in 2013. In 2014, she joined a research group at the Albert Einstein College of Medicine, where she investigated protein-protein interaction between HIV-1 IN and SWI/SNF INI-1. She has presented at multiple conferences and is a co-author on one publication in preparation.

Alina speaks of always having goals, and always learning. Her next goal involves earning an M.D./Ph.D. in biochemistry and pursuing research in the biomedical sciences.



### IMPACT OF LSAMP

In the past few years CI-LSAMP has intentionally developed a strong cohort model: activities encourage students to support and encourage one another as they learn more about and prepare to succeed in graduate studies in STEM. CI-LSAMP seeks to identify talented STEM students facing educational barriers who should be encouraged to pursue graduate education. The size of the program is small so as to allow for intensive mentoring. Additionally, each LSAMP student participates in a significant faculty-mentored research project before graduating. CI-LSAMP has taken a leading role in creating events building the student research culture at CI. For instance, LSAMP developed the now annual Fall Student Summer Research Showcase, which celebrates students returning from away-from-CI paid summer research opportunities (typically Research Experiences for Undergraduates) and encourages other students to pursue similar opportunities: the third SSRS had over 80 participants. LSAMP also hosts ad hoc events such as *Sí se puede*, in which four Latina recent Mathematics Ph.D.s shared their stories through research talks, a panel, and dinner with students. Various CI-LSAMP features, particularly an emphasis on research and the culture of collaboration, were incorporated into CI's \$6 million HSI-STEM grant, and now benefit a wider swath of STEM students.



**OUTSTANDING ACADEMIC**

HENRY SANCHEZ • MECHANICAL & MECHATRONIC ENGINEERING



Henry's the oldest of four children to a single mother. He excelled in elementary and high school, especially science and mathematics. He was very curious about how things work. He was always taking things apart to find out more. In eighth grade, he wrote a paper on aerospace engineering. A friend of his helped him apply to college and the CSU-LSAMP Summer Calculus Boot Camp (SCBC). He attributes the SCBC with helping him develop a strong work ethic.

Before college, he thought that Mechanical Engineering was about cars and mechanics. He was thrilled to find out that it was much more. He also learned about Mechatronics through a fellow SCBC participant. He has had many leadership roles including chair of LTC academics, a coordinator of MESA days, and co-leader for Energy in the local Blitz Build, a charity event sponsored by the Engineering College to build rehabilitation housing. He was a Calculus II and III Academic Excellence Workshop facilitator, tutor for MESA, and reaches out to volunteer his time to tutor needy students.

Henry is looking forward to graduate studies and hopes that his research in wind-driven power systems with Dr. Alexander in the Mechanical Engineering Department will make him attractive to graduate schools. He is a leader for the Chico team in the Collegiate Wind Competition sponsored by the U. S. Department of Energy.

**IMPACT OF LSAMP**

The California State University, Chico, Louis Stokes Alliance for Minority Participation is part of the CSU LSAMP program promoting an increase in the number of minority students awarded bachelor's degrees in science, technology, engineering, and mathematics (STEM). Additionally, we promote their pursuit of postgraduate degrees. Our emphasis is in strengthening problem-solving skills and building proficiency in all academic areas. CSU Chico LSAMP is funded by CSU Chico, the College of Engineering, the College of Natural Sciences, the National Science Foundation, under cooperative agreement number HRD 1302873, and the CSU Chancellor's office.

Our goal is academic excellence through creating pathways to success for all our participants. We look for students who are excited by the prospect of contributing to the fields of science, technology, engineering, and mathematics. Students primarily enter our program through the annual Summer Calculus Boot Camp. We support students with texts, supplies, research opportunities, awards, graduate school preparation, and workshops for college credit.



**IMPACT OF LSAMP**

Dominguez Hills has a high percentage of socially and economically disadvantaged students, meaning that the resources of LSAMP are in great demand at the Dominguez Hills CSU campus. STEM students are introduced early to LSAMP resources through the academic excellence workshops in core STEM courses facilitated by upper-level STEM students, as well as through the annual LSAMP open house event. Upper-level STEM students who have decided to pursue graduate work are supported by LSAMP for research projects with faculty, international summer research projects, and conference attendance and participation. Research has included laboratory-based, theoretical and field research. CSUDH international programs include a very popular one in ecological research at the La Selva Biological Station in Costa Rica, as well as a more recently added program in Australia. LSAMP students from CSUDH have presented their work at conferences, and several have published their work in internationally recognized, peer-reviewed journals. The LSAMP program at CSUDH has also supported activities designed to assist students interested in attending graduate school. These include a GRE workshop, and a graduate school workshop where an expert professional leads the students through the mechanism of applying to graduate school and maximizing one's chance of gaining admission.



**OUTSTANDING ALUMNUS**

**JAIME PEREZ**  
**ECOLOGY & ENVIRONMENTAL SCIENCE**

Jaime Perez transferred to CSU Dominguez Hills in Fall 2011 from Riverside Community College as an Ecology and Environmental Science major.

Jaime comes from a traditional Mexican family, in which higher education was not a priority. Consequently, Jaime had to work to support himself financially. Despite these obstacles, Jaime performed exceptionally well in his classes and succeeded in graduating in Fall 2013.

During his time at Dominguez Hills, Jaime became interested in research and obtained more information through his advisors where he learned about international research opportunities that were offered through the Biology Department and the CSU-LSAMP Program. He conducted research in tropical biology and community ecology while an undergraduate. With the support of CSU-LSAMP, he conducted research during the Summer of 2013 at La Selva Biological Station in Costa Rica, in the laboratory of Dr. Terry McGlynn. Jaime conducted experiments to understand and predict how litter-dwellings ants in tropical rainforests are responding to changing light and temperature regimes in association with climate change. The following year, he was supported by a National Science Foundation international research experience grant to conduct research in an Australian government laboratory, in Darwin, to study how fire and carbon management affects biodiversity. He is now a Ph.D. student in Biology at Case Western Reserve University in Ohio, researching community ecology in the laboratory of Dr. Sarah Diamond. In March of 2015, Jaime was announced as a recipient of the 2015 National Science Foundation Graduate Research Fellowship.







### IMPACT OF LSAMP

At California State University East Bay, the focus of the LSAMP program has been to support faculty-mentored student research in STEM fields. Our program provides financial resources to students, many of whom would be unable to continue in school without that support. In addition, LSAMP provides students with funding to support their research as well as travel grants to professional conferences. This activity allows students to put their academic studies to practice in the research laboratory or field and provides access to the scientific method in a meaningful and contributory way. Our focus on student research provides opportunities to work closely with a faculty research mentor. This in turn encourages a strong and supportive mentor-mentee relationship to be forged. LSAMP students are provided opportunities to author and present findings at professional conferences and gain entrance into scientific and professional communities. Combined, these opportunities and experiences provide a strong STEM foundation to LSAMP students. It is expected that this activity will increase retention and graduation rates, support increased student academic achievement, and result in a greater proportion of students that pursue graduate studies.



### OUTSTANDING RESEARCH & SERVICE/LEADERSHIP ARACELY COBOS • PHYSICS

Aracely Cobos has been interested in Mathematics since high school, but with her first physics course she realized that physics was the ideal discipline for her, blending science and math. Currently, Aracely is a sophomore Physics major at CSU East Bay. Under the direction of Dr. Jennie Guzman, who is her CSU-LSAMP faculty research mentor, Aracely is studying atomic physics. Dr. Guzman says that Aracely is a fantastic student both in class and in the lab. Aracely is helping to construct a magneto-optical trap for strontium atoms to test the Spin-Statistic theorem. She believes that her participation in research has helped to connect the concepts she is learning in her classes and is preparing her for graduate studies. Aracely plans to pursue a career in education or research in atomic physics and optics.

Aracely is very active in her community and volunteers for the Hayward Chamber of Commerce. She credits her volunteer work with helping her to find her voice, network in the community, and an ability to connect with others. In High School, Aracely had an assignment where she had to write about a Latina role model in physics and found that there were very few women (especially Latina) in Physics. Now, looking for Latina role models in physics has become a personal interest. As she has begun to take more advanced courses, she finds that she is one of few women studying physics at the University. She hopes to encourage and empower other women to pursue STEM careers.

Discovery. Diversity. Distinction.



### IMPACT OF LSAMP

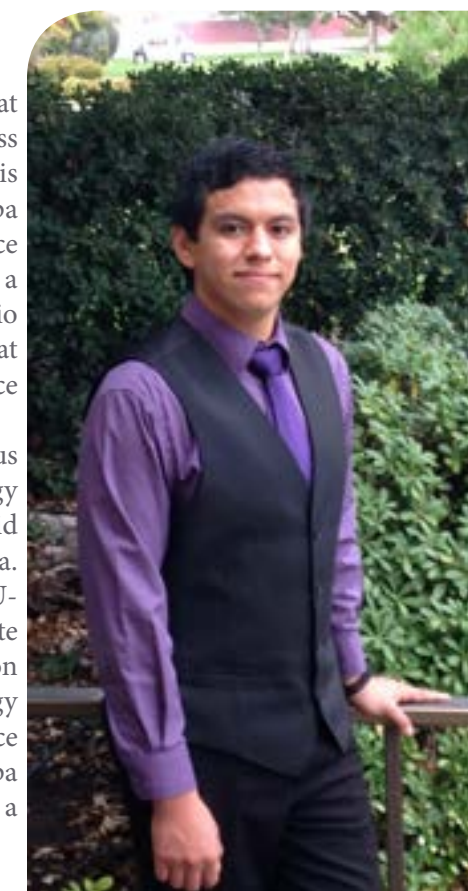
Fresno State has been a member of the CSU-LSAMP alliance since 1994. Academic Excellence Workshops (AEW) were established by the program early on and continue to make a positive impact. Academic Excellence Workshops (AEW) are workshops designed to help students reinforce their learning of subject material in “gatekeeper” science and math courses through facilitator-led sessions. These sessions emphasize group problem-solving and study techniques. Over the years, workshops have been offered in Calculus I and II, Inorganic Chemistry, Organic Chemistry, Physics, and Biology. An important component of the program is peer mentoring which creates a collegial and supportive environment for entering freshmen and first time transfer students. The peer mentoring component assists program students with the transition to university life and to maintain continuous contact with the program. Since 2004, 62 students have served as Peer Mentors. Additionally, the Fresno State CSU-LSAMP program has played a significant role in undergraduate research in the STEM fields, in collaboration with STEM faculty, 106 LSAMP students have participated in the year-round LSAMP Research Program since 2004. Furthermore, CSU-LSAMP has made a significant impact on the number of students who have been able to attend scientific conferences and graduate preparation activities.

### OUTSTANDING RESEARCH & SERVICE/LEADERSHIP ATAHUALPA CONTRERAS • BIOLOGY

Atahualpa Contreras is an undergraduate student pursuing a B.S. in Biology at Fresno State. A first generation college student, Atahualpa spent countless hours working in the agricultural fields of central California, which fueled his determination to attain a college education. After joining LSAMP, Atahualpa participated in the CSU-LSAMP Monterey Bay summer research experience in Costa Rica. There he studied soil characteristics of trails at Volcán Tenorio, a national park, to determine whether tourism along the main hiking trail toward Rio Celeste had an impact on the soil conditions. He presented his summer research at the 2014 Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference.

With the support of CSU-LSAMP, he is conducting research on campus under the mentorship of Dr. Joseph Ross in a Genetics and Developmental biology laboratory utilizing *Caenorhabditis briggsae*. His research is focusing on hybrid developmental delay utilizing AF16 strain from Japan and HK104 strain from India.

In addition to research, Atahualpa has been very involved in CSU-LSAMP, including serving on student panels encouraging students to participate in international research and serves as a program peer mentor to lower division students. He plays an active role in the Fresno State SACNAS chapter and Biology Club which includes visiting local elementary schools providing hands-on science demonstrations to encourage young students to pursue STEM fields. Atahualpa aspires to pursue a Ph.D. in Biology with an emphasis in genetics and continue a career in academia.

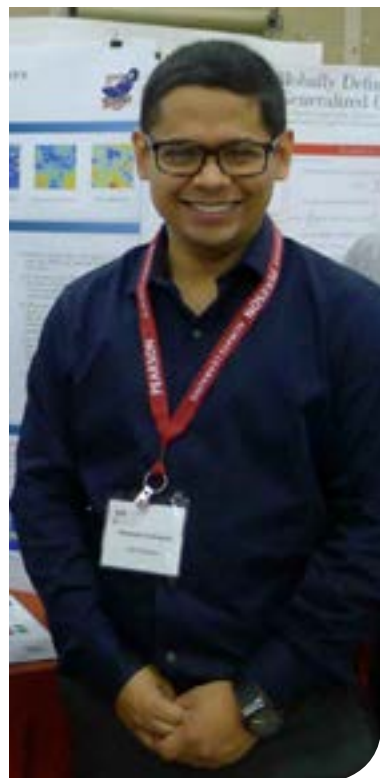




# CALIFORNIA STATE UNIVERSITY FULLERTON™

## OUTSTANDING RESEARCH

### ALEJANDRO CAMACHO • MATHEMATICS



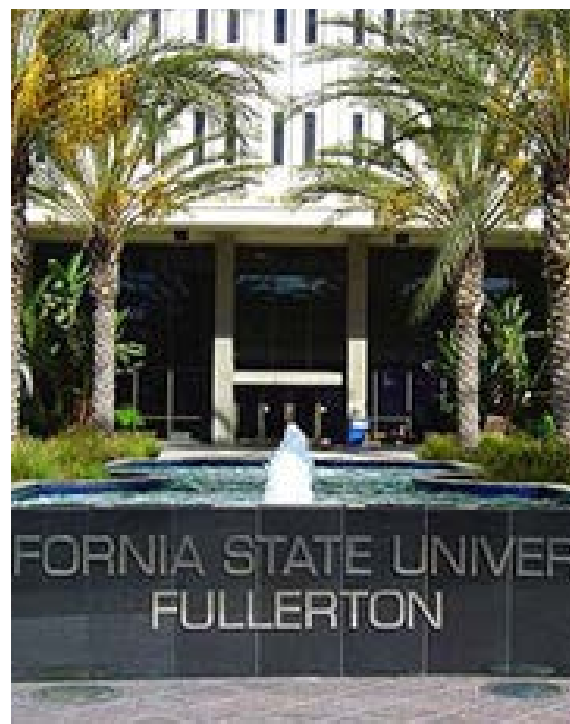
Alejandro Camacho started his college years at California State University, Fullerton by taking pre-calculus, not knowing he would eventually pursue a mathematics degree. As a first generation college student, he was unfamiliar with the numerous career opportunities such a major would provide. Alejandro is pursuing a career in industrial research, and in order to reach this goal, he is completing his degree in mathematics with a modeling and computational applied mathematics concentration. Alejandro has been able to apply the knowledge he has learned from the mathematics degree through an internship at Matrix Shafts where he used clustering algorithms to create a golf club that has become the fourth most popular golf club for the 2014 PGA Tour.

After joining the CSU-LSAMP program, Alejandro worked on a year-long research project that produced computer simulations to study different policing strategies to mitigate crime. He presented his results in oral presentations at the Southern California Conferences for Undergraduate Research and the CSUF NSM Interclub Council Research Symposium. He also presented posters at national conferences, including the Joint Mathematics Meetings and the Society for Advancement of Hispanics/Chicanos and Native Americans in Science. His research is currently in preparation for submission to an academic journal.

Upon completion of his degree, Alejandro will participate in the Research in Industrial Projects for Students program at UCLA. At this program, he will work on a project with an industrial sponsor, the Los Angeles Police Department. Alejandro plans to attend a Master's program in applied mathematics in the fall.

## IMPACT OF LSAMP

CSU Fullerton has been a member of the CSU-LSAMP Alliance since 1994. The major focus of the CSUF LSAMP program during Phases I-III was on improving the skills of incoming STEM students through a Summer Bridge Math Institute and Academic Year (AY) Workshops. Our early experience with AY workshops in Chemistry, Math and Physics ultimately led to the workshops being institutionalized and CSUF now serves as a CSU Center of Excellence for Supplemental Instruction. In Phase IV, the major focus at CSUF has been on increasing the preparedness of our students for graduate programs in STEM. The number of students engaged in basic research has steadily increased and using LSAMP funding, together with institutional support, CSUF directly supported the research activities of 23 students in the most recent year of funding with another 14 LSAMP students receiving research support from other sources. The CSUF LSAMP program has also taken a leading role in encouraging students to participate in international research experiences to gain global awareness.



# HUMBOLDT STATE UNIVERSITY

## IMPACT OF LSAMP

Humboldt State University has been a member of the CSU-LSAMP Alliance since its inception in 1994. One of the early accomplishments of HSU LSAMP was the development of supplemental instructional courses (SI's) offered to underrepresented and all students. After noting the increase in URM-STEM student achievement as a result of the supplemental and peer instruction students receive during the semester, HSU institutionalized the offering and financial support of SI's, and has continued to expand the number of sections offered each year in order to accommodate growing student need. Since early 2011, the CSU-LSAMP program at Humboldt State University has joined forces with the Indian Natural Resource Science and Engineering Program (INRSEP). Through HSU-LSAMP, INRSEP has been able to expand its academic support services. While the program maintains a focus on American Indian students, it now offers academic and research support to all underrepresented, low income, and historically disadvantaged students in STEM disciplines at HSU. The LSAMP program helps INRSEP to execute its key mission – to serve students by connecting them to research opportunities and STEM networks, providing academic and career counseling, assisting with entrance into graduate programs, and fostering an inclusive and supportive learning community within the INRSEP house.



## OUTSTANDING RESEARCH

### JILMA RACHEL GUINEA • WILDLIFE BIOLOGY



Jilma Rachel Guinea is a first generation college student, single parent, and Marine Corps Veteran who's pursuing a higher education to provide a better life for her son. She's an undergraduate at HSU majoring in Wildlife Conservation Biology/Applied Vertebrate Ecology.

In the summer of 2014, she participated in an NSF Research Experience for Undergraduates at the Raptor Research Center in Boise State University. Under Dr. David Anderson's guidance, she focused her research on forest attributes that Harpy Eagles select when choosing breeding habitats. Based on literature research, she drafted research hypotheses and proposed analytical methods. Rachel traveled to Panama's Darien rainforest, an area known for its rich biodiversity. She presented the results of this research at two local and two national conferences. At the October 2014 Society for Advancing Chicanos and Native Americans in Science (SACNAS) Conference, Rachel received an award for Outstanding Poster Presentation in Ecology/Evolution.

In summer 2015, Rachel participated in the San Diego Zoo's Institute for Conservation Research fellowship program. As part of the Institute's Applied Animal Ecology Division, under Dr. Jeanette Boylan's mentorship, Rachel conducted a study examining the effects of human disturbances on threatened Western Snowy Plovers. Rachel will present her research at SACNAS in October and will pursue an article publication.

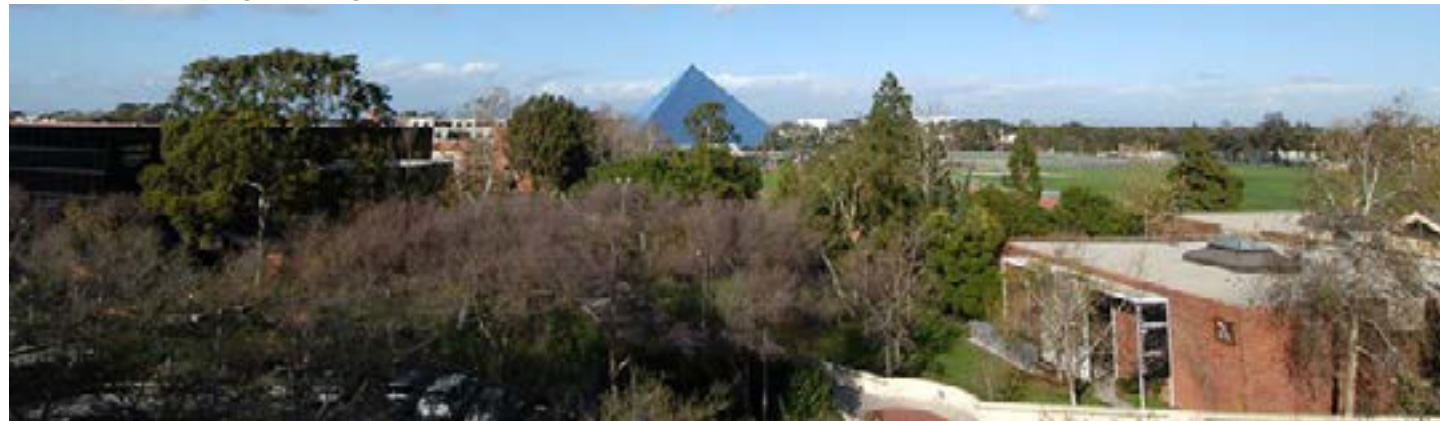
Rachel's future path will lead her to graduate school to pursue a graduate degree in Wildlife Ecology. With her unique life experiences, she also wants to become a mentor because she has a special potential to touch the lives of many people.



# CALIFORNIA STATE UNIVERSITY LONG BEACH

## IMPACT OF LSAMP

California State University, Long Beach, has been a member of the CSU-LSAMP Alliance since spring 1994. As the program has changed and grown, one of the commitments of CSULB to the LSAMP program is the development of partnerships with different entities on campus. Although housed in the College of Natural Sciences & Mathematics, the LSAMP program has worked to create open lines of communication for recruitment in the College of Engineering, which houses Engineering and Computer Science/ Engineering majors. CSULB-LSAMP has also partnered with the Geology Diversity Enhancement Program (GDEP), which has hosted LSAMP participants on field trips to Southern California locales to enhance classroom learning with real-world application. In recent years, increased focus on development of research experiences on campus has led to both a broadening of research participation and increased partnering with research based programs, such as the NIH-funded Bridges to the Baccalaureate and Maximizing Access to Research Careers (MARC U\*STAR) on campus. Over the last 5 years, CSULB LSAMP has taken students to ABRCMS, ERN, and SACNAS as part of an on-going effort to increase research experiences for our students. In addition, CSULB hopes to further increase the development of transfer student-specific programming.



### OUTSTANDING ALUMNUS HECTOR GOMEZ CHEMICAL ENGINEERING

Hector Gomez was part of the CSU-LSAMP undergraduate program at California State University, Long Beach and graduated with a B.S. in Chemical Engineering in May 2014. He conducted research in Dr. Mendez's lab, working with Dye-Sensitized Solar Cells. He was also a Promotor of STEM for the HSI-STEM Program for two years where he tutored and mentored undergraduate STEM students. Through his research and involvement with HSI-STEM, he was able to present his work at conferences including the Great Minds in STEM Conference and the Society of Hispanic Engineering National Conference. Upon graduation from CSULB, Hector received the CSU-LSAMP Bridge to the Doctorate (BD) Program Fellowship. He is currently attending California State University, Los Angeles as a BD Fellow, pursuing an M.S. in Mechanical Engineering. He is doing research in the Thermo-fluids lab where he is developing an optimal fuel cell configuration via mathematical modeling, finite element analysis (COMSOL Multiphysics), and optimization algorithms under Dr. Pacheco. Besides his academics and research, he assisted the Mechanical Engineering Department with programs, such as Preview Day, where he presented his work and encouraged incoming students to get involved in research and pursue a career in STEM.

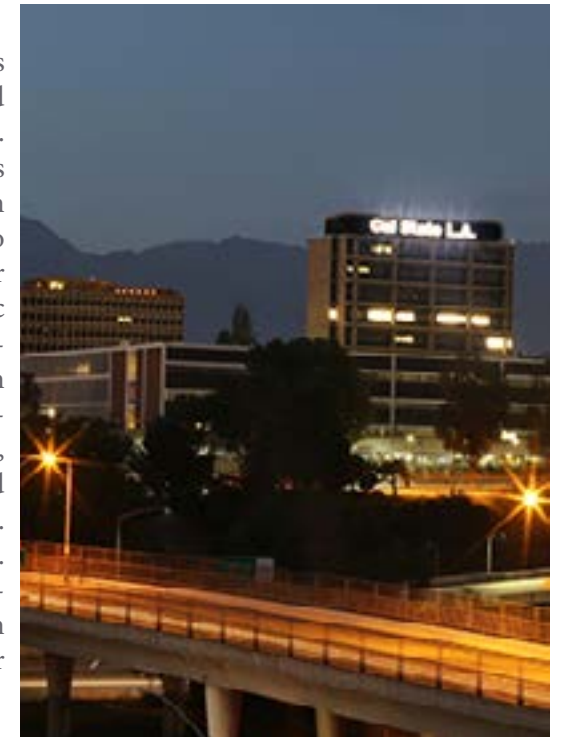


# CAL STATE LA

CALIFORNIA STATE UNIVERSITY, LOS ANGELES

## IMPACT OF LSAMP

Cal State LA has been a member of the CSU-LSAMP Alliance since its inception in 1994. CSU-LSAMP has provided numerous academic and professional development resources and opportunities for STEM students. Academic programs offered through LSAMP are designed to guide students toward STEM degree completion, and include a Textbook Loaner Program and Academic Excellence Workshops (AEWs). For LSAMP students who participated in these AEWs in 2014-2015, 96.6% of the grades were of a C or better compared to 81.6% of non-LSAMP students. In addition to academic resources, LSAMP provides information on research, internships and job opportunities in STEM-related fields. Students are encouraged to participate in research and present their research at conferences in both oral and poster format. Funding includes travel expenses, reimbursements for research supplies, as well as coordinating our Graduate School Preparation workshops designed to enhance their professional development and application to a PhD program. These workshops include GRE prep classes, applying for STEM-related Ph.D. programs, applying for graduate school fellowships, or applying for other external resources. For the graduating seniors in 2014-2015 who participated on these workshops, 40% entered a graduate program in STEM, while another 12% entered the STEM workforce.



### OUTSTANDING ACADEMIC, RESEARCH, & SERVICE/LEADERSHIP MARITZA SANCHEZ • MECHANICAL ENGINEERING

Maritza Sanchez joined CSU-LSAMP in Fall 2013 when she transferred from UCSB. In the year-long LSAMP Undergraduate Research Training Program, she focused in the laboratory of Dr. David Raymond on the development of a valid model for fracture formations in bones to aid forensic scientists on clearly diagnosing a cause. She participated in a 10-week research internship at UCSB in the laboratory of Dr. Carlos Levi, where she investigated the toughness of various compositions used for thermal barrier coatings on gas turbines and jet engines. In Summer 2014, she received an REU fellowship from Princeton University to conduct research in the laboratory of Dr. Jay Benziger, where she focused on understanding the physics behind water formation and movement in polymer electrolyte membrane fuel cells. She was accepted into the Northwestern University Materials Research Science & Engineering Center REU Program for Summer 2015. Maritza has presented her various research projects at several national conferences.

Martiza has maintained an overall GPA of 3.572 and a major GPA of 3.867, leading to scholarships and memberships in various honor societies. Her leadership and community outreach roles are demonstrated through her involvement with the Society of Hispanic Professional Engineers (SHPE). Every year she has participated in Noche De Ciencias, a program that teaches younger students about the STEM fields. Currently Maritza serves as the Region 2 Regional Student Representative (RSR) for SHPE. Her role as RSR is to oversee all the undergraduate SHPE chapters in southern California, Arizona, and southern Nevada.





# California State University MONTEREY BAY

Extraordinary Opportunity

## IMPACT OF LSAMP

CSU Maritime Academy joined the CSU-LSAMP Alliance in 2013, representing the final campus of the entire CSU to participate in LSAMP. In the few years since establishing a CSU-LSAMP presence on campus, the program has grown to more than 30 students in each of the last two years. The programs in engineering and marine transportation require strong academic support and mentoring, a major goal of CSU-LSAMP activities at Cal Maritime. In our brief history, we have graduated several students who joined the program as upperclassmen, going on to lucrative and rewarding engineering careers in both maritime and non-maritime related fields. Whenever possible, CSU-LSAMP aims to help support novel research by LSAMP participants in support of senior designed projects required as a capstone to their degree programs. CSU-LSAMP will continue to grow and further help maintain Cal Maritime's superior job-placement rate in STEM fields and provide support for students seeking careers in marine transportation and engineering.



## OUTSTANDING ACADEMIC & SERVICE/LEADERSHIP PHILIP HATCHETT MECHANICAL ENGINEERING



Philip Hatchett is a Junior working towards his B.S. degree in Mechanical Engineering at CSU Maritime Academy, while also being a part of the inaugural cycle of students working towards a newly offered minor in Mathematics. Philip carries one of the highest GPAs in the LSAMP program and has produced at the highest level throughout his engineering studies. He has proven to be a leader in the growing LSAMP program and has learned to be successful in the classroom by working with others in forming study groups for his higher-division engineering and math courses.

Philip gives back to the community in many ways, but has primarily dedicated himself to volunteer work through the CSU Maritime Academy Office of Community Engagement. He has earned multiple service ribbons and awards for his dedication and efforts to serve the community. Some of his many volunteer efforts have included mentoring elementary school children in an after-school program, participating in campus clean-up and beautification initiatives for the campus' waterfront, and helping out at a Vallejo community garden. He has shown especially enthusiastic dedication to Rebuilding Together Solano County, a non-profit that renovates homes for low-income veterans and seniors.

CSU Maritime Academy is proud to recognize Philip as a CSU-LSAMP PROUD Scholar for his academic achievements in challenging STEM coursework throughout his undergraduate career, and for his profound impact on serving the campus and surrounding community through volunteer work, community engagement and academic outreach.

## OUTSTANDING RESEARCH EMILY KING • MARINE SCIENCE



Emily King's ultimate academic goal is to pursue a doctoral degree in animal physiology, focusing on the direct effects of environmental variables on changes in gene expression. As a Marine Science major at CSUMB, she has excelled both academically, maintaining a 3.9 GPA, and in the development of several undergraduate research projects. Emily has been exceptionally successful at securing highly competitive research experiences that have allowed her to pursue her deep curiosity about how environmental change can impact the physiology of marine organisms. She cites her pivotal experience as a Duke University Marine Science and Conservation Scholar in 2014 as one of the many opportunities that helped her identify this passion for animal physiology. At Duke, Emily investigated the physiological response of fiddler crabs to changes in oxygen availability. Soon after, she traveled to Oregon State to conduct research into the role of physiological condition as a driver of larval flatfish settlement, which further solidified her interest in investigating the physiological responses to change. In Summer 2015, Emily continued to explore her interest in gene expression experimental techniques and made connections with potential graduate advisors while working with Dr. Jonathan Stillman of San Francisco State University and UC Berkeley, where she hopes to complete her doctoral studies. Emily has presented the products of these research collaborations at multiple research symposia, including SACNAS and the Association for the Sciences of Limnology and Oceanography (ASLO) international conference in Granada, Spain, receiving top honors for both presentations.

## IMPACT OF LSAMP

CSU Monterey Bay joined CSU-LSAMP in 2004. From the outset, the program received tremendous support from faculty and campus administrators, and has had a lasting impact on STEM programs. The much-needed financial and programmatic support of STEM achievement and retention planted the seed for similar, grant-funded projects and STEM services in tutoring, course support, research, and internships. LSAMP's emphasis on graduate school preparation and undergraduate research has been particularly transformative for CSUMB. The program led to increased faculty support of undergraduate research and spurred development of a graduate school preparation curriculum and workshops. The number of students going on to STEM graduate programs at institutions such as the University of California, Los Angeles and Texas A&M University has increased. Ultimately, the LSAMP program, together with other campus developments, led to the launch, in 2009, of the Undergraduate Research Opportunities Center (UROC), which is the first centralized undergraduate research office in the 23-campus California State University system. CSUMB continues to institutionalize LSAMP program elements through efforts such as the NSF-funded Council on Undergraduate Research Workshop on Institutionalizing Undergraduate Research for State Systems and Consortia.



# California State University Northridge

## OUTSTANDING SERVICE/LEADERSHIP MICHAEL PEREZ MECHANICAL ENGINEERING

Michael Perez served as the President for the Society of Hispanic Professional Engineers (SHPE) student Club. He was also President of Sigma Lambda Beta and a Tau Beta Pi initiate. His extracurricular activities also included being a cast member for TAKE XXIII, a CSUN freshman orientation performance to increase awareness of diversity and curb prejudice. He was a Salsa Libre Performer for 2 years and a Competitor (1 year), and he was on a 1st place regional college congress team.

Michael was awarded the C.R. and Ila Johnson Memorial Endowed Scholarship for Engineering Education. His senior design was the Human Powered Vehicle and he held the roles of Components lead and Assembly and Fabrication lead on a team that placed 6th overall, out of 36 schools. He was also part of a team which earned a Senior Design award.

Michael graduated Spring, 2015 and had multiple interviews for jobs. He was offered a position as a Petroleum Engineer in New Mexico, but instead accepted a position at Esterline Mason, Control Systems as a Mechanical Design Engineer.



## IMPACT OF LSAMP

LSAMP at Cal State Northridge has evolved and adapted to the unique needs of a changing population. It has grown to match the sharp increase of student enrollment in STEM majors and the accompanying growth in the diversity of the campus population. LSAMP has provided specialized programs and activities to engage and support historically underserved students and to help close the achievement gap in STEM. Activities include Academic Excellence Workshops and other activities fostering experience through research and professional development. CSUN-LSAMP encourages students to gain research experience under the mentorship of individual faculty members and to present work at national scientific conferences. Students have been supported at every level; from freshmen orientation by LSAMP mentors, to specialized advisement and tutoring, and finally graduate school and career preparation.



# CAL POLY POMONA

## IMPACT OF LSAMP

Science Educational Enhancement Services (SEES) and Maximizing Engineering Potential (MEP) programs serve as the backbone of the LSAMP program at Cal Poly Pomona. LSAMP is a preparation, support and engagement program serving historically underrepresented minority (URM) students in the STEM fields. It was established in 1994 to increase the retention and the number of URM students graduating from Cal Poly Pomona with degrees in the sciences and engineering. Currently, the program serves 300+ students. The program maintains a support structure comprised of various components, each of which address a barrier to success in college. LSAMP services include special faculty advisors, a peer mentoring program and a faculty-alumni-student mentoring program, paid fellowships for performing research with faculty, conference travel support, a science First Year Experience course for freshmen, Academic Excellence Workshops for high fail-rate classes, professional development workshops all year long, textbook loan library for lower and upper division STEM courses, a computer lab, community rooms, and socials throughout the year. All of these services have facilitated the success and retention of URM students within the sciences and engineering by providing multiple aspects of support under one comprehensive umbrella.



## OUTSTANDING ACADEMIC

### ELIZA HERNANDEZ • BIOLOGICAL SCIENCES

Eliza Hernández was a Biological Sciences major with an Option in Zoology and a minor in Chemistry at Cal Poly Pomona. She graduated in Spring 2015 with a 3.88 GPA. Her interest in environmental science has evolved throughout her undergraduate learning and led Eliza to pursue a career in environmental conservation to sustain biodiversity in Southern California. She plans to apply to graduate school to research anthropogenic impacts on Southern California ecosystems.

Eliza engaged in various undergraduate research experiences that focused on studying human impacts on local ecosystems. As an Environmental Toxicology Intern, Eliza had the opportunity to participate in research at the Pacific Coast Environmental Conservancy (PCEC) at CSU Long Beach under Jesus Reyes. She investigated and quantified chemical contamination in local marine habitats, as well as in resident organisms. After her internship, she continued to conduct research at Cal Poly Pomona that focused on nitrogen deposition, an anthropogenic impact unique to Southern California. Working with her research mentor, Dr. Erin Questad, she studied the effects of nitrogen deposition on arthropod communities and investigated how the deposition affected the litter decomposition of a native California grass versus that of an invasive grass. She performed research with the help of the SEES Research Apprentice Program funded by the Hearst Foundation, the Ronald E. McNair Scholars Program, and the Ernest Prete Jr. Environmental Science Student Research Fellowship. Winner of the prestigious Dr. Paul C. Hiemenz Scholarship, she was honored at the Hilda Solis Scholarship Dinner & Reception.





# SACRAMENTO STATE



## OUTSTANDING ALUMNUS

**ERIC GUERRA**

**ELECTRICAL & ELECTRONIC ENGINEERING**

**E**ric Guerra was a member of the third cohort of CSU-LSAMP students at Sacramento State, entering the program in 1996. A child of migrant farmworkers, Eric grew up picking fruit in the fields of northern California with his family members.

Coming from a background of poverty and hard work, he has been devoted to improving opportunities for others through a life of public service. While excelling as an engineering student, he was elected President of the Associated Students of Sacramento State, and also served as student trustee to the California State University. After graduating with a degree in electrical and electronic engineering, Eric entered the Assembly Fellows Program, which placed him as a staff member in the office of a California legislator. He earned a master's degree in Public Policy and Administration in 2008, and has served as staff, and chief of staff, for assembly members who share his values. He has put his background in electrical engineering to good use, working on legislation that advances alternative energy solutions. He wrote the landmark California Dream Act while working for Assemblyman Gil Cedillo, which has dramatically improved the quality of life for countless Californians.

Eric has served on the Sacramento County Planning Commission for five years, including two years as chair. He is president of the Sacramento State Alumni Association. Most recently, Eric was elected to the Sacramento City Council, representing the neighborhood he has lived in since his days as a college student.



## IMPACT OF LSAMP

**A**s a member of the CSU-LSAMP Alliance since its inception in 1994, the Sacramento State LSAMP Program has developed new programming while maintaining and institutionalizing interventions proven to improve student success. One notable achievement was the development of a two-semester pre-calculus series alternative to the traditional four-unit, one-semester pre-calculus course. This series is coupled with academic excellence workshops led by LSAMP students. Students who participate in the two-semester course earn grades 0.84 grade points higher than those in the traditional, one-semester course. This series has been proven to be highly effective in improving student success not only in pre-calculus, but also in subsequent calculus courses. In addition to student success in mathematics, Sacramento State LSAMP provides a variety of research opportunities for students at various stages of their academic career, such as the Introduction to Science Research (ISR) Program, Summer Research Scholars Program, and Academic Year Research Program. A highlight of the research programming offered is the three-week intensive summer ISR Program. This program serves as an entry point for a cohort of rising sophomores and juniors, who have little to no lab or research experience, to participate in authentic research under the supervision of a faculty research mentor.



## IMPACT OF LSAMP

**C**SU San Bernardino has been a member of the CSU-LSAMP Alliance since its inception in 1994. Currently CSU San Bernardino's LSAMP program emphasizes both, academic preparation and persistence, and professional preparation. The academic preparation/persistence emphasis was initiated in 1994 with the introduction of the Academic Excellence Workshops (AEW) for the major gateway courses in mathematics and science. The increased success of the LSAMP students participating in these workshops, led to the incorporation of the corresponding workshops to general chemistry and computer science courses. It also led to the implementation of similar workshops for all the mathematics courses. Since the year 2000, CSU San Bernardino LSAMP expanded its emphasis to professional preparation, becoming the main campus program providing information about STEM graduate schools. The CSU San Bernardino LSAMP program is also the most effective CSU San Bernardino program providing information and advice to students pursuing STEM research opportunities, both on campus and in other universities around the country.



## OUTSTANDING RESEARCH

**NICOLE LOPEZ • PHYSICS**

**N**icole Lopez is a sophomore at CSU San Bernardino, majoring in Physics. Her progress in LSAMP has been very swift. She joined the CSU-LSAMP program in the winter quarter of 2014, and immediately applied to research programs. She was admitted into the CREST research program for Spring 2014, and also participated in the PRISM program during Summer 2014. Since her freshman year she has been working under the mentorship of Dr. Tim Usher in the Physics department working on material science. Nicole presented her research at the 2015 Emerging Researchers National (ERN) Conference in STEM in February, and the Southern California Conference for Undergraduate Research (SCCUR) in 2014. Nicole has also attended the Lincoln Nebraska CREST conference in order to gain exposure to the research of the other scholars. In addition, she has presented her work to her peers. In summer 2015, Nicole received a summer internship with the NASA Armstrong Flight Research Center where she worked at their Aero institute. Nicole expects to publish the work on piezoelectric materials she did with her fellow lab partners in spring 2016. Nicole's career goal is to complete her Bachelor's degree and gain acceptance into a Ph.D. program.





# SAN DIEGO STATE UNIVERSITY



## IMPACT OF LSAMP

**S**DSU has been a part of the CSU-LSAMP Alliance since its inception. One of the strongest components of the SDSU LSAMP program has been its participation and collaboration with other STEM-based research programs housed within the College of Sciences in the Center for the Advancement of Students in Academia (CASA). It is through this collaboration that the university has institutionalized two key courses required for LSAMP program research participants: Research Colloquium in the Biomedical Sciences, that focuses on Health Disparities and Responsible Conduct of Research. These Courses were developed and are facilitated by the LSAMP, Bridges, MARC, and IMSD programs on campus but are open to all students. It is this collaboration that has facilitated the acceptance of well-prepared LSAMP students in to programs like MARC and IMSD (many of these students have gone on to receive the prestigious NSF Graduate Research fellowship). LSAMP has contributed to the increased number of underrepresented minority students who have successfully matriculated into graduate programs in the STEM fields.

## OUTSTANDING ACADEMIC & RESEARCH

ALICIA ZAMUDIO MONTES DE OCA • BIOLOGY & PSYCHOLOGY



**A**licia Zamudio Montes de Oca graduated summa cum laude in 2015 with a B.A. in both Biology and Psychology. She was selected as the outstanding graduate in the department of biology.

Through her participation in CSU-LSAMP and the Institute for Maximizing Student Development (IMSD) programs, Alicia began conducting research in the Cell & Molecular Biology laboratory of Dr. Ralph Feurer. Alicia became more involved in neuroscience and added a double major in biology. Alicia continued to conduct research in the Feurer lab and, in the summer of 2013, was selected as an intern at Massachusetts Institute of Technology in the Picower Institute for Learning and Memory. MIT researchers were so impressed with Alicia they asked her to return as a visiting student for spring and summer 2014. After returning to SDSU, Alicia was accepted into the prestigious SDSU Stem Cell Internship Program where she joined the lab of Dr. Jing Zhao at Sanford-Burnham Medical Research Institute. Throughout these research experiences, Alicia has had over ten research presentations, one submitted publication, and one in preparation.

Over her years at SDSU, Alicia has been an outstanding research scholar and excellent honor student. Alicia applied to 13 competitive Ph.D. programs in biology and biomedical science including MIT, Harvard, Stanford, UC Berkeley, etc. She was invited to 12 interviews and accepted to 10 programs. Alicia is excited to be attending MIT this fall in the Ph.D. program in Biology.



# SAN FRANCISCO STATE UNIVERSITY



## IMPACT OF LSAMP

**A**fter 15 years at SFSU, the CSU-LSAMP program has had a lasting impact on the College of Science and Engineering. Along with the Student Enrichment Opportunities (SEO) program, LSAMP has become a focal point for under-served students majoring in STEM disciplines. In addition to providing academic and material support to its participants, LSAMP has provided an incentive for faculty participation and collaborations. Faculty regularly re-direct students to the LSAMP program for peer networking, tutoring, and academic advising.

## OUTSTANDING RESEARCH & SERVICE/LEADERSHIP

PINGDEWINDE SAM  
PHYSIOLOGY

**P**ingdewinde Sam (Sam) is an exceptional young scientist and humanitarian. Sam's originally from Burkina Faso, a small developing nation in West Africa, which Sam says, is "a country with a future." Through a green card lottery, Sam came to the United States in 2008 without his family. Because people in Burkina Faso face a 9.1% infant mortality rate and a life expectancy of 56 years, Sam made the decision to help improve conditions in his home country. In 2011, Sam founded a non-profit organization, Teëbo, to fight poverty in Burkina Faso and improve and maintain the health of the Burkinabés through education and humanitarian work (<http://www.teebo.org>). Sam knew research was going to be required to address these problems so he sought research opportunities and secured a position in the laboratory of Dr. Linda Noble at UC, San Francisco. In the Noble lab, Sam used various instruments to assess motor performance and evaluate behaviors in mice to investigate the behavioral consequences of traumatic brain injury at adolescence. Their group demonstrated that age at time of injury should be considered when developing therapies for brain-injured children. The results of his work were published in PLoS ONE (Semple BD, Noble-Haesslein LJ, Jun Kwon Y, Sam PN, Gibson AM, et al. (2014) Sociosexual and Communication Deficits after Traumatic Injury to the Developing Murine Brain). Sam received his B.S. in Physiology from SFSU in spring 2015 and began graduate work at Johns Hopkins University in Fall 2015 while continuing his work with Teëbo.





## IMPACT OF LSAMP

Over 250 STEM majors at SJSU are part of LSAMP. These students and many other SJSU students benefit from LSAMP-funded activities which include Academic Excellence Workshops (AEW), Summer/Winter Preparation Courses, Research and the Graduate School Preparation Seminar (GSP). SJSU's LSAMP works in close collaboration with NIH MARC, NIH RISE and NSF S-STEM programs making our program very research oriented. The AEW and Preparation Courses, which are open to all students, serve two purposes: they provide much needed support for gateway courses and the facilitators often develop a strong interest in academic careers, expressing a desire to continue to Ph.D. degrees. The GSP Seminar has helped many students at SJSU learn about advanced degrees in STEM, funding and research opportunities on and off campus. Over 50 SJSU URM and non-URM students who participated in this activity are currently in STEM PhD programs, 23 of these are former AEW facilitators. Since 2009 our GSP and LSAMP students have obtained thirteen NSF Graduate Research Fellowships, one DOE Graduate Fellowship and one Gilliam Fellowship. In addition we have six students who have been funded through LSAMP Bridges to the Doctorate Programs.

## OUTSTANDING ALUMNUS CHRISTIAN ESPINOZA MATERIALS ENGINEERING

Dr. Christian Espinoza received his B.S. degree in Materials Engineering from San Jose State University in May of 2009. He received his Ph.D. in Materials Science and Engineering from the University of Illinois at Urbana-Champaign in May of 2014. His thesis is titled "Design and Fabrication of Ceramic Beads and Laminated Composites for the Study of Stress Wave Mitigation." His research was funded by the Department of Defense (DoD) under the Multidisciplinary University Research Initiative (MURI) and the Graduate Research Fellowship Program of the National Science Foundation (GRF-NSF).

Dr. Espinoza's professional experiences include working with Engineers without Borders. He spent several weeks in Guatemala working to improve water quality for local villagers ("Guatemala Biosand Water Filter Project"). Results included designing and conducting an instructional program to teach Guatemala villagers about the benefits of using the biosand water filter. He then participated in developing and installing three prototypes to repair biosand water filters. Dr. Espinoza also has held several internships throughout his education including: testing carbon nanotube composites at NASA Ames Research Center; developing new synthesis processes for ablators at Boeing Materials and Process Technology; and analyzing the microstructure of complex ceramics for Fiberlite Technologies, Inc.

He is currently employed as an advanced Engineer/Scientist at Owens Corning in Ohio working on hybrid composites for the automobile industry. In his free time, Dr. Espinoza serves as a mentor for students in the educational pipeline through the Society of Hispanic Professional Engineers and Scientists (SHPE).



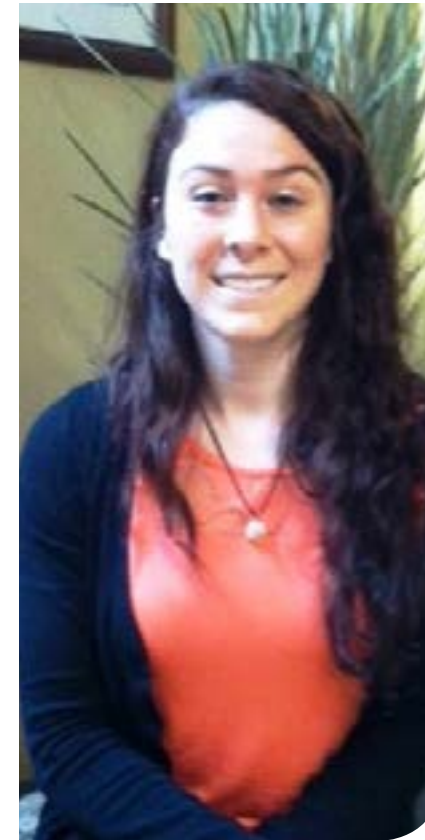
## IMPACT OF LSAMP

The Cal Poly San Luis Obispo LSAMP Program has been part of the CSU-LSAMP Alliance since Fall 2008 and provides advising, community-building activities, professional development opportunities, and financial assistance to support successful transitions to Cal Poly and to careers in STEM fields. The Cal Poly SLO LSAMP Program was awarded a 2014 President's Diversity Award. In 2014-15, 143 students participated in the Cal Poly SLO LSAMP Program, 75% of whom were from underrepresented minority groups. Of the 78 students who joined the program in 2014-15, 54% are first generation college students. During the 2014-15 academic year, the program served 54 community college transfer students and supported student travel to attend multiple national conferences, including sending 26 students to the conferences of the Society of Hispanic Professional Engineers (SHPE) and the National Society of Black Engineers (NSBE). Students presented their undergraduate research in multiple venues, including the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) and the Annual Conference and the Annual Biomedical Research Conference for Minority Students (ABRCMS). Five students studied, interned, or volunteered internationally in STEM fields.



## OUTSTANDING ALUMNA NICOLE PERETTI • BIOMEDICAL ENGINEERING

Nicole has earned recognition as Cal Poly, San Luis Obispo's Outstanding Alumna because of her tremendous academic success and her ongoing dedication to the CSU-LSAMP program. Nicole recently graduated with a 4.0 in the Biomedical Engineering Master's program at Cal Poly. She participated in a CSU-LSAMP Global Awareness Experience at the Innsbruck Medical University Genetics Lab in Austria in 2012, and identifies this as the first stepping-stone to her success today. Not only did she meet a life-long friend through this experience, but the research she did in Austria opened doors to future presentations and networking. For example, Nicole presented her Austrian research on protein expression in liver function at both ABRCMS and ERN, and was invited as a guest speaker at an ERN International STEM Research Collaboration Session in 2012. As a result of the connections she made at these ERN presentations, Nicole was offered an off-campus summer research opportunity at Duke University in the Laboratory for Psychiatric Neuroengineering in 2012. This research experience was supported by a Sally Cassanova Pre-Doctoral Scholarship. During her summer research experiences at Duke University, Nicole received an invitation to participate in a one-year research internship at the Alberto Santos Dumont Association for Research Development Clinical Neuroscience Lab in Brazil. When she returned to Cal Poly to finish her graduate studies in 2014-15, Nicole reconnected with the LSAMP program to share her success story in a panel discussion where she motivated other students to participate in undergraduate research and international experiences.







# California State University SAN MARCOS

## OUTSTANDING ALUMNUS THEO CROUCH II • COMPUTER SCIENCE



Theo Crouch II is an African-American veteran completing his second year as a doctoral student in Quantitative and Systems Biology at the University of California, Merced. Theo is performing research with Dr. Fabian Filipp in the Systems Biology and Cancer Metabolism Group at UC Merced on the differential mapping of transcriptional coactivation in prostate cancer.

Theo transferred from Palomar College to California State University, San Marcos, at which time he became a CSU-LSAMP Scholar. He graduated with a Bachelor of Science degree in Computer Science from CSU San Marcos in 2013. While an undergraduate at CSU San Marcos, Theo conducted research in the genetics research laboratory of Dr. Denise Garcia. His research focused on computationally analyzing biological data sets using Serial Analysis of Gene Expression (SAGE) to facilitate scientists' discovery of differentially expressed immune response genes. In Dr. Garcia's laboratory he incorporated his computer science expertise to study *Litopenaeus stylirostris*, western blue shrimp, as a model specimen for the innate immune system. In addition to his research, Theo was the founding student president of the local chapter of the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) and was an active member in Phi Theta Kappa, an International Honors Society.

Theo is a recipient of the 2015 National Science Foundation fellowship in Life Sciences- Bioinformatics and Computational Biology in recognition of his excellence in research.



## IMPACT OF LSAMP

CSU San Marcos joined the CSU-LSAMP alliance in 2008. Outreach and recruitment efforts have increased awareness of our program and we have grown from 12 students in 2010 to more than 200 in 2015, all working to complete degrees in science and technology. Through LSAMP, an increasing number of students have become aware of careers in the STEM disciplines. LSAMP has also contributed to the increase in student participation in mentored research at CSU San Marcos and in STEM summer research programs around the world. We have a record number of students presenting original research at conferences, both at the local and national levels. The success of LSAMP at CSU San Marcos has contributed to increasing numbers of STEM students applying to, and being accepted to, prestigious graduate schools across the nation and internationally. In addition, former LSAMP students have been recognized with fellowships from universities, scientific organizations, and the National Science Foundation. LSAMP students from CSU San Marcos are becoming the new face of science and leaders in their respective disciplines.

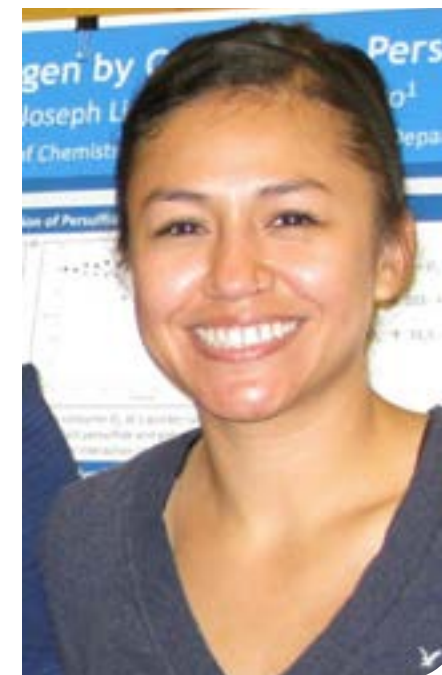


## IMPACT OF LSAMP

CSU-LSAMP has had a positive impact on Sonoma State University. It has helped increase the diversity of the student body by providing financial and academic support to underrepresented students, thereby helping to improve the retention and graduation rates of such students. LSAMP provides research stipends averaging \$1800 to promising students, allowing them to gain experience in independent research and helping to prepare them for graduate study. Four Sonoma State LSAMP participants have participated in International research experiences in Thailand and Costa Rica, and all four participants reported that the experiences were life-changing, providing exposure to foreign cultures and providing opportunities for future international research collaborations. Additionally, the Academic Excellence Workshops that began with LSAMP funding are now fully institutionalized and provide all Sonoma State students with valuable supplemental training.



## OUTSTANDING RESEARCH KIMBERLY TREVINO • CHEMISTRY



Kimberly Trevino is originally from Fresno, CA. She began her undergraduate education as a kinesiology major with an intention to become a physical therapist but switched to chemistry after she became interested in exploring chemical methods for medicinal purposes. She joined Dr. Carmen Works' research team in the summer of 2012, working on the biological effects of chromium. In the summer of 2014, she began researching the quantification of a photo carbon monoxide releasing molecule using a binuclear rhodium(II) compound. Kim also participated in the CSU-LSAMP Global Awareness Program in Thailand where she researched computational methods studying HIV integrase enzyme. She has enjoyed being a supplemental instructor as well as a chemistry tutor. Kim graduated in the spring of 2015 and accepted an offer to the UC Davis Ph.D. program in chemistry with a Bradford Borge Fellowship. She is especially grateful for the support from CSU-LSAMP, the McNair Scholars Program, and the SSU chemistry department.

## OUTSTANDING ALUMNUS EDGAR CAMPBELL • BIOLOGY

Edgar Campbell is from the Central Valley of California and stuck close to home for his undergraduate education by attending CSU, Stanislaus. He became a Biology major during his sophomore year. Edgar's hard work in his biology courses led him to Washington University in St. Louis where he was selected to participate in The Genome Institute's Opportunities in Genomic Research 2011 summer research program. Edgar worked in the Siteman Cancer Center in the lab of Dr. Matthew Walter where he investigated the U2AF1 mutation's role in blood cancers. He learned a lot from his first lab experience and returned the next summer to continue the project, working in the lab of Dr. Timothy Graubert developing an assay to detect and measure a drug's efficacy in modulating the effect of the U2AF1 mutation in hematopoietic cell. His results earned the 1st place award in the undergraduate poster competition at the 2013 Emerging Researchers National Conference in STEM.

In 2013, Edgar graduated from CSU, Stanislaus and almost immediately boarded a plane to France. He participated in a two-month NSF international REU in the city of Grenoble. Edgar worked at the European Molecular Biology Laboratory (EMBL) in the lab of Dr. Ramesh Pillai. When the REU was finished, Edgar was invited to remain at EMBL. He ultimately remained in France for 18 months. His work resulted in a co-first author publication in RNA. Edgar will pursue his Ph.D. in Chemical and Systems Biology at Stanford University School of Medicine.



## IMPACT OF LSAMP

CSU Stanislaus has been part of the CSU-LSAMP alliance since 1995. Our participants come from all six STEM disciplines in the College of Science (Biology, Chemistry, Computer Science, Geology, Mathematics and Physics). The current focus of the program is professional development and preparation for graduate school. Our monthly meetings and regular communications introduce students to graduate school, types of programs, the application process, and the opportunities they can pursue on and off campus in order to develop competitive applications. We encourage and facilitate student participation in faculty mentored research activities including research internships on our campus, REUs around the country and internationally. Over the past three years, on average 43% of our students have presented research at conferences, 26% have been CSU-LSAMP student research interns, and 10% have done summer REUs (2-3 of these students per year in international programs). During this time 38% of our graduates have gone on to pursue graduate degrees in STEM, 20% have gone on to graduate school in the teaching or health professions, and 17% have entered the STEM workforce.



# ACKNOWLEDGMENTS

## THE CSU-LSAMP COMMUNITY: PAST AND PRESENT

Producing a report of this type would not be possible without drawing upon the work of the entire CSU-LSAMP community, past and present, whose efforts have contributed to the substance of the report in myriad ways, including program development and implementation, data production and project evaluation, project administration, fiscal management, and (of course) funding and advocacy. In the listings of the state-wide leadership and Campus Coordinators provided on pp 32-34 and in the pull-outs below, CSU-LSAMP acknowledges the contributions of many of the individuals and groups that are currently associated with CSU-LSAMP. It is equally important to acknowledge those whose shoulders the current project stands upon. Since the number of individuals who have served CSU-LSAMP is too extensive to name them all here, we can only say that we recognize and greatly appreciate their contributions. This being said, we would be remiss if we did not expressly acknowledge the members of the team who envisioned and wrote the initial "AMP" proposal for the CSU. That team included: the late Dr. Frank Collea, then Director of Research and Sponsored Programs at the Chancellor's Office, who spearheaded the effort; Dr. Paul Fonteyn, then Dean of Graduate Studies and Interim Director of Development at San Francisco State University and currently President at Green Mountain College in Vermont; Dr. Ralph Mills, then Assistant Vice Chancellor for Research and Sponsored Projects at the Office of the Chancellor; and Dr. Philip Garcia, Director of Analytical Studies at the Office of the Chancellor, who has continued to serve CSU-LSAMP by providing system-wide data and reports and as a liaison with the Chancellor's Office. We would like to acknowledge San Francisco State University, which served as the lead institution for the first two project periods and express our great appreciation for the leadership provided by Dr. Alfonso (Rick) Ratcliffe, Dean Emeritus of Engineering at CSU Northridge, who served as Principal Investigator for Phases I and II. Finally, we would like to acknowledge Dr. Juanita Barrena, Co-PI and Lead Project Director for Phases III and IV of CSU-LSAMP, and lead author of the 2011 Impact Report. Under the guidance of Dr. Barrena, CSU-LSAMP grew to include all 23 campuses of the CSU and more than doubled the number of students served per year. Her guidance and leadership have been invaluable to the entire CSU-LSAMP community and in particular to those of us in the Statewide Office. Dr. Barrena's passion for, and understanding of the mission of LSAMP is most clearly demonstrated by her leadership in the production of the national LSAMP video (*LSAMP: Aiming High and Making a Difference*).

## DATA SOURCES FOR THE CSU-LSAMP SYSTEM REPORT

This report draws heavily from data compiled and analyzed by the Institute for Social Research (ISR) at California State University, Sacramento, the project's evaluator, and presented in annual and special reports prepared for CSU-LSAMP by Valory Messier, under the direction of Dr. David Barker. The primary data sources accessed by ISR for these reports include: the LSAMP Annual Survey (WebAMP), maintained by ICF Macro International, which includes participant information and activity data collected annually from participating campuses; degree and enrollment reports from the CSU Office of Analytics Studies; the CSU Electronic Records System, the centralized reporting system for all CSU campuses, maintained by the CSU Office of Analytical Studies, which includes individual student-level information on matriculation, enrollment, and degrees awarded within the CSU; The National Student Clearing House, an electronic registry that includes individual student-level information on enrollment and degrees awarded nationally for subscribed colleges and universities; and the Consortium for Student Retention Data Exchange, which produces annual retention and graduation studies for STEM and non-STEM disciplines for members of the consortium.

## GRANT AND CONTRACT ADMINISTRATION

University Enterprises, Inc. (UEI), an auxiliary of California State University, Sacramento, under the direction of Mr. Jim Reinhart (Executive Director) and Ms. Monica Kauppinen (Director of Contract and Research Administration) is the grantee for the CSU-LSAMP NSF award. In light of the size and complexity of the CSU-LSAMP project, which involves disbursements to and monitoring of expenditures at 23 campuses, CSU-LSAMP is especially grateful to the grant management team assigned to the project not only for their high level of fiscal expertise but also for their exceptional understanding of and commitment to the goals of the project. This team is led by Ms. Minnie Chabot, Grant Management Specialist, and includes Mrs. Angela Lorenzo-Billings, Grant Administration Specialist.

# CSU-LSAMP

California State University Louis Stokes Alliance for Minority Participation

## 2015 IMPACT REPORT