LSAMP


# PACIFIC NORTHWEST LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

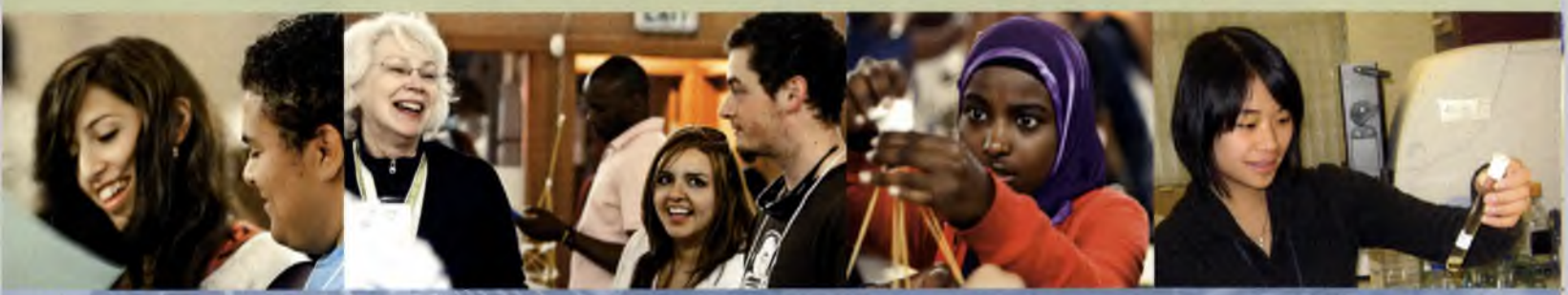
# IMPACT 2011

This STEM Project is made possible through the National Science Foundation, Pacific Northwest Louis Stokes Alliance for Minority Participation grant # 0901996.

# Table of Contents







# Welcome

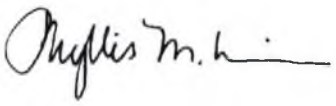
In the fall of 2009, colleges and universities in the three-state region of Washington, Oregon, and Idaho launched the Pacific Northwest Louis Stokes Alliance for Minority Participation (PNW LSAMP) with funding from the National Science Foundation (NSF). The Alliance was structured to enable educators and advocates from science centers, pre-college programs, community colleges, and four-year institutions to leverage their resources and existing relationships to increase minority participation in science, technology, engineering, and mathematics (STEM) majors. While PNW LSAMP has only been in existence for two years, the impact of this collaborative venture on broadening participation in STEM, institutional transformation, and economic development in the three-state region has already been substantial.

As the nation itself is projected to become more diverse in the coming decades, population projections indicate that high school graduates in Idaho, Oregon, and Washington will become significantly more diverse by 2014–2015.[1] In less than ten years, the percentage of underrepresented students graduating from public high schools in Washington is expected to increase from 14% to 22%, in Idaho from 10% to 14%, and in Oregon from 12% to 24%. While almost all of the growth will be attributable to changes in the Hispanic/Latino population, by 2015 the three-state region is projected to produce 10,000 more underrepresented high school graduates than it produced in the 2004–2005 school year.

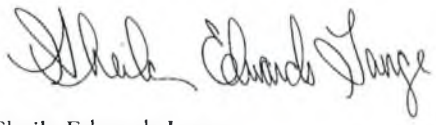
The projected demographic shifts present an extraordinary opportunity for colleges and universities in the three-state region to greatly increase the diversity of students earning STEM degrees. Each state has committed substantial resources to efforts to increase degrees granted in STEM as part of economic development initiatives, and PNW LSAMP has become a critical partner in those efforts.

In this report, we share information about PNW LSAMP impact, programs, institutions, and exceptional students. We invite you to contact us for more information, and we welcome your participation and support for this new alliance.

Sincerely,



Phyllis Wise
*Provost and Executive Vice President, University of Washington*
*Principal Investigator, PNW LSAMP*



Sheila Edwards Lange
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*Project Director, PNW LSAMP*

[1] WICHE. Knocking at the college door: Projections of high school graduates by state and race/ethnicity, 1992–2022. 2008. Boulder, CO: Western Interstate Commission for Higher Education (WICHE) Public Policy and Research

Photos, l to r: Justin Chi, Dawn Wiggin, Courtesy of PSU

# Impact of Pacific Northwest Louis Stokes Alliance for Minority Participation

The concept of bringing together an alliance that includes professionals from different institutions to work collaboratively on broadening participation in science, technology, engineering, and mathematics (STEM) is one that at first glance may seem counterproductive. After all, many of these institutions compete for the same students and resources, so working together could be threatening to individual interests. What we have experienced in the Pacific Northwest Louis Stokes Alliance for Minority Participation (PNW LSAMP) is that by working together on shared goals and priorities, each institution is able to be more productive. Although it is a relatively new alliance, the impact of the PNW LSAMP on regional STEM initiatives, students, participating institutions, and faculty has been remarkable.

The three states in the PNW Alliance are all invested in STEM education as a way to stimulate economic growth, and participating institutions are a critical part of those initiatives. Oregon businesses and civic leaders have invested significant resources in the development of three signature research centers in STEM related fields—one in nano and microtechnologies, one in translational research and drug development for infectious diseases, and one in bioeconomy and sustainable technologies. Idaho is home to several high-tech manufacturing companies and has invested significantly in the emerging field of renewable energy. Washington has expanded its strong aerospace industry and diversified by investing significantly in biotechnology and information technology industries. Higher education institutions in each state have been urged by legislators and business leaders to increase the production of diverse talent at the undergraduate and graduate levels who can work in these high demand industries.

The PNW LSAMP goal of increasing STEM degree production is perfectly aligned with regional goals. The growth in underrepresented populations in the region presents a great opportunity for the PNW LSAMP to contribute significantly to the region's ability to produce talented graduates who will work in these high demand industries. In Washington, the PNW LSAMP staff have been influential in shaping a new statewide STEM center in partnership with industry and government leaders. The new initiative prominently features increased pathways as one of its four levers for increasing STEM degree production, thus mirroring one of the three Alliance priorities, which focuses on increasing pathways to college while strengthening interest in STEM careers.

The impact of the Alliance on student recruitment and retention in STEM has already shown great promise. Student participants report that their commitment to STEM careers has increased as a direct result of participation in LSAMP programs. The Alliance has increased the number of underrepresented students participating in undergraduate research and provided the means for them to present their research at national and regional meetings. Further, the multi-institutional retreat has given students the encouragement and skills to be campus leaders. Many of them are now prominent leaders of STEM student societies and organizations that contribute to both their academic and social integration into their disciplines.

The multi-institutional retreat is just one example of the cooperation between institutions that is now happening due to the Alliance. Participating institutions routinely share best practices and seek out speakers from other campuses to assist with their programming. The Mathematics, Engineering, and Science Achievement (MESA) community college program in Washington State (a key PNW LSAMP partner) serves as a model for the development of a similar program in Oregon. Coordinators consult on a regular basis about how to improve the program, best support students socially and academically, and engage faculty members in LSAMP activities.

Stronger engagement with faculty has been one of the unanticipated impacts of the PNW Alliance. At the first annual conference, Alliance staff members shared information about how to best work with faculty members as they seek to address the broader impacts requirement for NSF grants. As a result, each campus has had great success with faculty members including support for an LSAMP student in their research proposals. Faculty members have also agreed to serve as speakers at bridge programs and workshops. It is fairly common for faculty members to seek out LSAMP staff and ask for advice and input on their broader impacts section. While this engagement with faculty members has resulted in additional resources for the LSAMP program, it has also allowed us to strengthen student relationships with faculty members. We know from the literature that these relationships between students and faculty are critical in STEM, and do much to increase student recruitment and retention.

This report shares specifics about the PNW LSAMP activities and outcomes observed in the two years that the Alliance has been together. It opens with an overview of priorities, includes data on enrollments and degrees produced by Alliance campuses, and includes snapshots of the five participating four-year institutions.

*"LSAMP has given me the confidence to pursue a scientific career."*

Photo: J J Wright

Photos: l to r: Courtesy of UW, Courtesy of SMDEP, ©2011 www.photos.com, Courtesy of BSU, ©2011 www.photos.com

# Overview of PNW LSAMP Priorities

The Pacific Northwest Louis Strokes Alliance for Minority Participation (PNW LSAMP) is a consortium of five institutions—Boise State University (BSU), Oregon State University (OSU), Portland State University (PSU), University of Washington (UW), and Washington State University (WSU). The consortium also includes community colleges, science centers, and other programs. The Alliance's goal is to *nearly double* the number of science, technology, engineering, and mathematics (STEM) bachelor degrees granted to underrepresented minority (URM) students in the consortium universities. The PNW LSAMP will develop and strengthen programming by meeting these objectives:

- Increasing pathways to college for URM students while strengthening their interest in pursuing STEM careers.
- Creating a culture and community of success for URM STEM majors to improve retention and graduation rates.
- Encouraging URM STEM majors to participate in undergraduate research experiences.

To achieve these objectives, the Alliance implements strategies such as recruitment activities and open houses, tutoring and peer learning, career guidance and professional development, graduate school preparation, social events, and facilitating opportunities for undergraduate research. The PNW LSAMP has made notable progress in building alliances, collaborating among campuses, creating a welcoming climate for URM students in STEM, and increasing student access to research opportunities. Other components of the PNW LSAMP include regional annual conferences (with alternating locations within the five cooperating universities), summer Bridge Programs, a website for easy and accessible information and resources, and an LSAMP Center where students can study, receive tutoring, and be mentored.

# Expanding Pathways to College

PNW LSAMP partners recognize the importance of providing pathways for URM students to be successful in STEM. LSAMP staff members on each campus have collaborated with pre-college outreach programs and developed strategies to communicate with incoming freshmen and transfer students with an interest in STEM. Activities to expand pathways include college admission workshops, K–12 presentations, and transfer student workshops and orientation programs. Table 1 below summarizes PNW LSAMP-sponsored activities and events that relate to increasing pathways to college, by university and year.

## Outreach Efforts

Alliance partners have increased their outreach to high school and community college students. The five universities have hosted events specifically for high school students, introducing them to STEM communities and resources on each campus. The PNW LSAMP is also building relationships with local community colleges to help facilitate transfer pathways. Starting with one campus in Year 1, and expanding to three campuses in Year 2, the Alliance held transfer student sessions for new LSAMP students. At both the 2010 and 2011 PNW LSAMP annual conferences, sessions were offered for transfer students and faculty/staff to increase awareness of particular challenges experienced by URM STEM students transferring to four-year universities. In addition, the Washington State MESA has begun to provide technical assistance to Oregon State MESA to support the establishment of a MESA Community College Program in Oregon.

Table 1. PNW LSAMP Activities: Pathways, Years 1 (2009–10) and 2 (2010–11)

| Increasing Pathways to the University | BSU | | OSU | | PSU | | UW | | WSU | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 |
| Outreach at/to local high school students | X | X | | X | X | X | | X | X | X |
| Outreach at/to local community college students | | | | X | | | | X | X | X |
| Conferences | X | X | X | X | X | X | X | X | X | X |

SOURCE: PNW LSAMP Activities Worksheets provided by Program Coordinators, May 2011

> *"LSAMP has made me aware of various opportunities and support that I didn't know existed."*

Photo: J J Wright

# Culture and Community of Success

The PNW LSAMP works to transform the culture and community for STEM students to one that is welcoming and committed to student success. PNW LSAMP staff actively seek partnerships to enhance program coordination and access to services for URM students with an interest in STEM. Each year, PNW LSAMP sponsors a series of activities and events on partner campuses.

## LSAMP Study Centers

An integral part of URM STEM retention is creating a culture and community of success. With this in mind, each Alliance partner has established a dedicated study center where LSAMP students can congregate, get current information, and study together. Three institutions offer computer and printing services at their LSAMP centers. Other services available at some of the LSAMP centers include tutoring, workshops, and textbook lending libraries. This institutional commitment of campus space has contributed to community-building for URM students.

## Hosting Events

Table 2 (next page) summarizes PNW LSAMP-sponsored activities and events held at each Alliance institution during the first and second years of the grant that relate to building community and a culture of success.

Table 2. Years 1 (2009–10) and 2 (2010–11) PNW LSAMP Activities: Community

| Building Community & Culture of Success | BSU | | OSU | | PSU | | UW | | WSU | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 |
| Summer Bridge | | | | X | | X | | X | X | X |
| Career awareness activities | X | X | X | X | X | X | | X | X | X |
| Peer mentoring | | | | X | | X | | X | X | X |
| Non-peer mentoring | X | X | | | | | | X | X | X |
| Peer tutoring | X | X | X | X | | X | | X | X | X |
| Non-peer tutoring | X | X | | | | | | X | X | X |
| Peer study group(s) | | X | | X | X | | X | | X | X |
| STEM academic advising | X | X | | | | | X | X | X | X |
| Conferences | X | X | X | X | X | X | X | X | X | X |
| LSAMP Summer Retreat | X | X | X | X | X | X | X | X | X | X |
| GRE training/preparation | | | | | | | | X | | |
| LSAMP Student Advisory Board | X | X | X | X | X | X | X | | X | X |
| LSAMP Faculty Advisory Board | X | X | X | X | X | X | X | X | X | X |
| LSAMP Social Networking Events | X | X | | X | X | X | X | X | X | X |
| LSAMP Recognition and Awards Ceremonies | X | X | | | | X | | X | | |
| Graduate school admission support | | | X | X | | X | | X | X | X |
| LSAMP Orientation for Freshmen | X | X | | X | X | X | | X | X | X |
| LSAMP Orientation for Transfer Students | X | X | | X | X | X | | X | X | X |
| Skills building workshops and seminars | X | X | | X | X | X | X | X | | |
| Summer Academic Enrichment (not Bridge) | | | | | X | X | | | | |
| Connect students with mentors in industry | X | X | | | | | | X | X | X |

SOURCE: PNW LSAMP Activities Worksheets provided by Program Coordinators, May 2011

Photos: 1 to r: Courtesy of OSU, Courtesy of OSU, Courtesy of PSU

## Summer Bridge Programs

The creation of summer bridge programs and orientations specific to URM STEM students helps welcome incoming freshmen and transfers. In the first year of the grant, only one institution held a summer bridge program for LSAMP students; during the second year, four of the five partner institutions hosted summer bridge programs. Two of the universities (OSU and UW) partnered with their colleges of engineering to co-host bridge programs for STEM students. OSU offered a ten-day program with 20 URM students, and UW provided a four-week bridge program to 38 students, 15 of whom were LSAMP affiliates. Both programs offered intensive math preparation and problem-solving mini courses, introduced students to local faculty and their research, and hosted a variety of community-building activities. WSU hosted a four-day bridge program specifically for LSAMP affiliates, introducing 42 students to campus resources, faculty, and services available to URM STEM students.

## LSAMP-Specific Orientation Programs

All partners offered LSAMP-specific orientation programs. In 2010, 30 UW students attended an LSAMP Welcome Event to meet STEM faculty and staff. At WSU, LSAMP co-hosted numerous orientation events with WSU's Team Mentoring Program, including socials, workshops, and field trips for new students; roughly 80% of these students were LSAMP eligible. The other universities—PSU, OSU, and BSU—all maintained an LSAMP presence at orientation programs targeting new students in general and STEM students specifically.

## Building Community on Campus

Throughout the academic year, Alliance partners hosted numerous activities and events aimed at creating a climate of success and strengthening the LSAMP community at each campus. In 2009–2010, in addition to orientation or bridge programs, each campus hosted between two and eight activities aimed primarily at building community among URM STEM students. Activities included LSAMP faculty and student socials, STEM career information and planning sessions with guest speakers, networking workshops, and recognition and award ceremonies.

## Building Community with the Alliance

The PNW LSAMP has made community building across campuses an integral part of its annual conference. Student and faculty feedback from the 2010 conference indicated a strong desire for more networking and community building opportunities across campuses. In response, the 2011 annual conference provided more time for networking with other STEM students, faculty, staff, and research centers. In addition, structured social activities in the evenings were formally incorporated into the conference schedule.

Photos: l to r: Courtesy of UW Making Connections, Courtesy of PSU, ©2011 www.photos.com, Courtesy of WSU; below: Justin Chi

## LSAMP Student Retreat

In an effort to help students build an LSAMP community across the Alliance universities, PNW LSAMP offered a summer retreat; 37 students attended the first year, and attendance increased to 62 students the second year. The retreat goals are to:

1) provide community building for all students in the PNW LSAMP so that they see themselves as a regional as well as a campus community.
2) enable the development of new community building strategies that give LSAMP students a voice and mechanism to effect positive change.
3) hone the leadership skills of LSAMP students and foster an extended cohort experience that counters the isolation that may be experienced on their individual campuses.

In the past two years, students and staff reported that it was a transformative experience that contributed to a sense of belonging and leadership development for students.

## Greater Social Identification

In addition to academic support, the growing visibility of PNW LSAMP on campuses has led to a greater social identification for the affiliated students, contributing to a stronger sense of belonging and a feeling that their institutions are committed to their success. For example, BSU had a "Legacy Gala" event at the end of the first year that introduced the BSU community to LSAMP and helped the LSAMP students feel acknowledged and valued.

# Undergraduate Research

Participation in research at the undergraduate level has been shown to play a critical role in engaging and motivating students to enter STEM degree programs. PNW LSAMP members facilitate student access to critical research experiences early in their undergraduate programs in a variety of ways.

## Hosting Workshops

Coordinators offered workshops to inform students about the numerous research opportunities available to them. Workshop activities ranged from preparing students for the Research Experiences for Undergraduates (REU) application process to familiarizing them with expectations of conducting research, from providing stipends to support student research to hosting researchers on campus. Table 3 (next page) summarizes activities and events that relate to increasing access to undergraduate research.

## Promoting Research Opportunities

The PNW LSAMP Alliance helps connect URM STEM students to faculty and labs that offer opportunities to conduct meaningful research. In its first year, PNW LSAMP funded stipends for 45 students to conduct undergraduate research on their campuses. Information about internship and research placements at national laboratories was distributed to LSAMP students on all campuses. Each LSAMP annual conference features a student research symposium; the 2011 conference, "Getting Jump Started in Research," had a strong undergraduate research focus. As of August 2011, 133 PNW LSAMP students had participated in undergraduate research at their home institutions or elsewhere (see Table 4, next page).

## University-Specific Programs

WSU provides a week-long summer program, Cougar Undergraduate Research Experience, for freshmen and transfer students to help them develop the skills needed for independent research, followed by a mentoring program. Participants are then encouraged to apply for the Auvil Fellowship, which provides funding for a student to work with a faculty mentor on a research project. LSAMP at WSU has also collaborated with the Team Mentoring Program, which provides twenty $750 research scholarships to underrepresented groups in STEM (most of them LSAMP affiliated students).

One large-scale PNW LSAMP research activity was the UW's creation of a program for community college students, the UW LSAMP Community College Summer Research Fellowship program. Offered in the first year, the fellowship program supported a core component of the PNW LSAMP grant—to attract future transfer students to the field of research. After completing the program, all the students indicated that they were satisfied with their research projects and the support they received from their mentors. The majority of students indicated that the best parts of their experience included being part of a research team, flexible hours, and interactions with faculty, graduate students, and other undergraduates. More than half of the students noted that their participation in the program increased their interest in careers in science, engineering, and research.

Table 3. Years 1 (2009–10) and 2 (2010–11) PNW LSAMP Activities: Undergraduate Research

| Expanding Research Opportunities | BSU | | OSU | | PSU | | UW | | WSU | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 | Yr1 | Yr2 |
| Research related skill-building workshops and seminars | X | X | | X | X | X | X | X | X | |
| Conferences | X | X | X | X | X | X | X | X | X | X |
| Research with faculty on campus | X | X | X | X | X | X | X | X | X | X |
| Research internships off campus | X | X | X | X | X | X | X | | | |

SOURCE: PNW LSAMP Activities Worksheets provided by Program Coordinators, May 2011

Table 4. Number of University Students Participating in Undergraduate Research

| | Research Site on Campus | Research Site Off Campus | Research Site Not reported | Total Students |
|---|---|---|---|---|
| BSU | 14 | 1 | 0 | 15 |
| OSU | 11 | 3 | 1 | 15 |
| PSU | 7 | 8 | 0 | 15 |
| UW | 56 | 13 | 6 | 75 |
| WSU | 13 | 0 | 0 | 13 |
| PNW Alliance | 101 | 25 | 7 | 133 |

SOURCE: PNW LSAMP March 2011 Alliance Data Forms

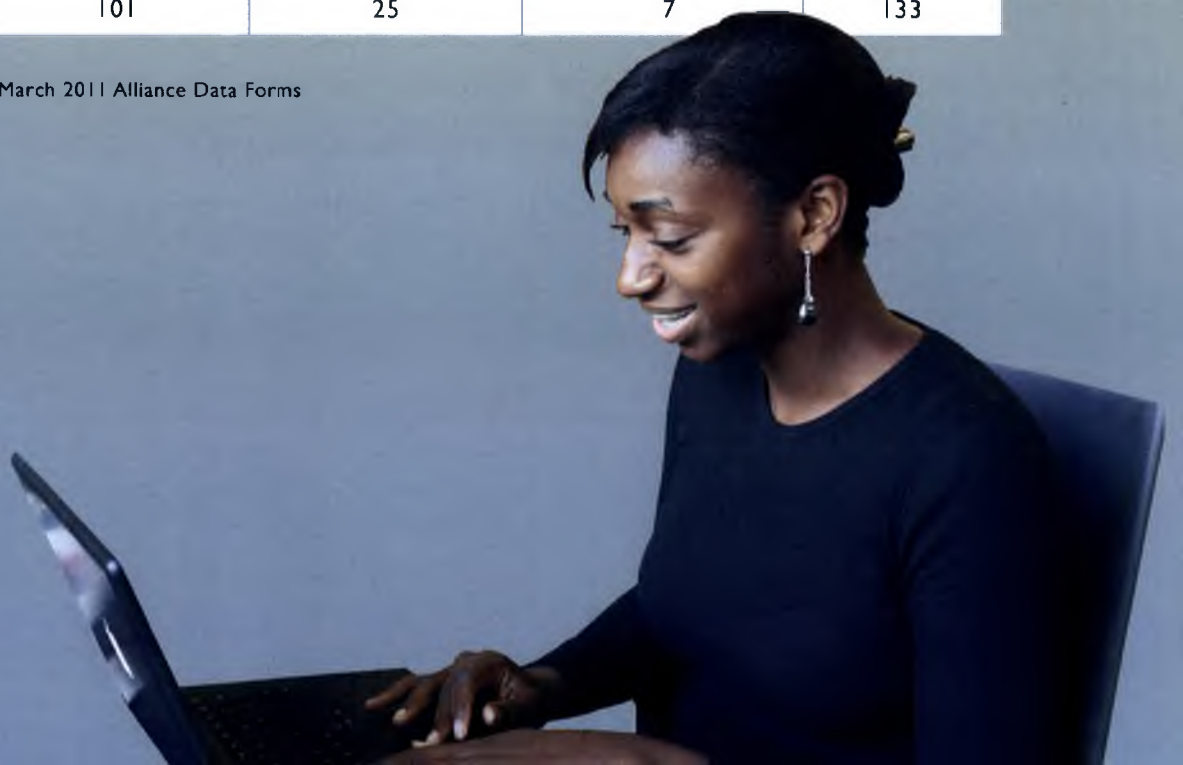


Photo: Dawn Wiggin

Photo: J J Wright

# Institutional Data

PNW LSAMP uses institutional-level data to monitor its progress toward increasing bachelor degrees earned by URM students. Annually, enrollments are examined to determine where program emphasis needs to be placed—on recruitment or retention. Degrees are monitored annually to see if the Alliance is on track to reach its overall target of 625 bachelor degrees granted to URM students in STEM by the end of the grant period.

## URM STEM Enrollment

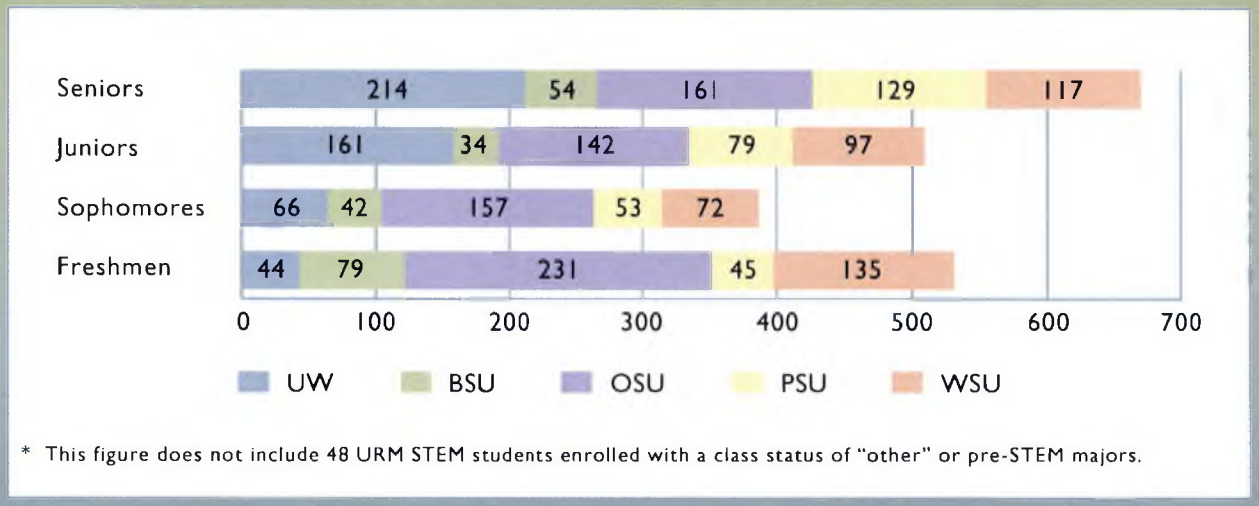
Table 5 (next page) provides an overview of STEM URM undergraduate enrollment, by university, for the first year of the PNW LSAMP grant. Across the Alliance, URM students comprise from 7% to 9% of all STEM enrollments at each university. As of Fall 2009, a total of 2,160 URM students were enrolled in STEM majors at Alliance institutions.

Figure 1 (next page) shows URM STEM enrollments broken down by class and institution. As each university has different policies regarding when a student may declare a major (note that all "pre-majors" are counted as non-STEM by the NSF WebAMP reporting system), it is difficult to discern a firm trend line among URM STEM enrollments across classes. However, these data demonstrate a substantial pool of potential URM STEM graduates over the next four years, suggesting that both retention and recruitment efforts will remain important components to the PNW LSAMP's success.

Table 5. PNW LSAMP STEM Enrollment, by university—2009

| | STEM URM | STEM non-URM | STEM Total | URM/STEM % |
|---|---|---|---|---|
| UW | 488 | 5,716 | 6,204 | 7.9 |
| BSU | 222 | 2,231 | 2,453 | 9.1 |
| OSU | 723 | 8,803 | 9,526 | 7.6 |
| PSU | 306 | 3,300 | 3,606 | 8.5 |
| WSU | 421 | 4,491 | 4,912 | 8.6 |
| Total | 2,160 | 24,541 | 26,701 | 8.1 |

SOURCE: PNW LSAMP 2010 WebAMP Data




* This figure does not include 48 URM STEM students enrolled with a class status of "other" or pre-STEM majors.

SOURCE: PNW LSAMP 2010 WebAMP Data

Figure 1. PNW LSAMP URM STEM Enrollment, by class and institution—2009

*"LSAMP has been very beneficial for the completion of my degree. There have been times when I've felt like giving up. But with the support from LSAMP staff and students, I believe that I can complete my degree."*

## URM STEM Degrees

The primary goal of PNW LSAMP is to increase the number of URM students who graduate in STEM disciplines at the baccalaureate level to 625 in 2014 (nearly double the number granted in 2009–2010). Table 6 (next page) shows STEM degree data from the first year of the grant, 2009–2010. Degrees granted to URM students represented a small proportion of total STEM degrees awarded, ranging from 5% to 7.5% at each university, or 6% Alliance-wide.

The percentage of STEM degrees awarded to URMs (6%) is slightly lower than the proportion of URM students enrolled in STEM (8%). While these numbers represent different cohorts, and therefore cannot be read as an indicator of attrition, the discrepancy may point to the need to continue to bolster efforts at retention for URMs. As these data represent only the first year of the grant, careful tracking of both the proportion of STEM degrees awarded to URMs and non-URMs and the proportion of URMs who earn degrees (STEM and non-STEM) will provide important indicators on progress toward meeting the goal of doubling STEM degrees granted to underrepresented students.

## Intra-Alliance Differences

Alliance partners with more fully developed URM STEM-related infrastructures contributed larger numbers of URM STEM degrees than those universities that are just establishing dedicated study centers and programs. In 2009–2010, UW granted more than one-third (37%) of the STEM degrees awarded to URMs in the PNW Alliance. OSU awarded 29%; WSU and PSU awarded 13% and 16%, respectively; and BSU awarded 5% (see Figure 2, next page).

Photo: J J Wright

*"LSAMP has given me the assurance that there is someone who is ready to listen to my concerns and is willing to help me get over my obstacles in trying to achieve my goals."*

Table 6. STEM Bachelor's Degrees, by university—2009–2010

| | STEM URM | STEM non-URM | STEM Total | URM/STEM % |
|---|---|---|---|---|
| UW | 119 | 1,720 | 1,839 | 6.5 |
| BSU | 15 | 222 | 237 | 6.3 |
| OSU | 94 | 1,477 | 1,571 | 6.0 |
| PSU | 42 | 517 | 559 | 7.5 |
| WSU | 51 | 959 | 1,010 | 5.0 |
| Alliance | 321 | 4,895 | 5,216 | 6.2 |

SOURCE: PNW LSAMP 2010 WebAMP Data

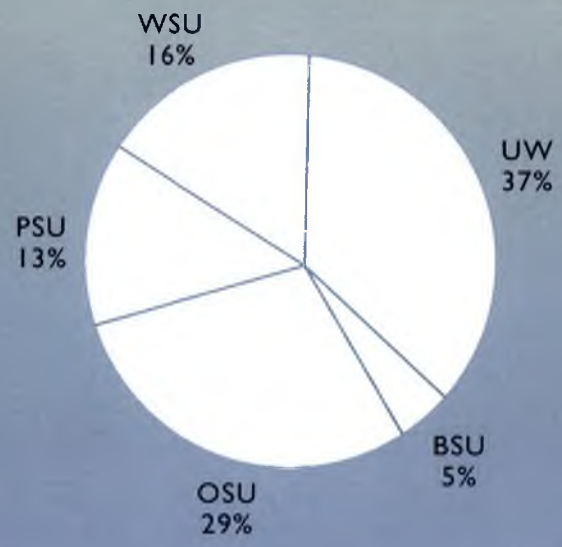



Figure 2. PNW LSAMP URM STEM Degrees, by institution—2009

Photo: J J Wright

# PNW LSAMP Affiliated Students (Direct Participants)

## Diversity among URMs

All partner universities employ institutional data on students' race, ethnicity, and major from their registrar or institutional research offices to determine eligibility to participate in the PNW LSAMP program. During the first year of the grant, 454 eligible undergraduate students chose to affiliate with the PNW LSAMP program. Table 7 (next page) summarizes undergraduate LSAMP affiliates in Year 1, broken out by ethnicity, race, and gender. Slightly more than half (55%) were women; 56% were Hispanic or Latino, 15% were non-Hispanic, and 30% did not report their ethnicity. Students identifying as Black, Alaskan Native, American Indian, or Hawaiian/Pacific Islander comprised 27% of the first year affiliates, and an additional 7% reported multiple racial categories. White and Asian students comprised 2%.

## URM STEM Enrollment by School

The majority (62%) of the first year's registrants were UW students; 15% attend OSU; and BSU, PSU, and WSU each contributed between 6% and 10% of affiliates (see Figure 3 next page).

> *"LSAMP has provided a community within the STEM fields and has strengthened the bond between the underrepresented students (without exclusion)."*

Table 7. PNW LSAMP Students by Ethnicity, Race, and Gender, 2009–2010

| | Hispanic | | | Non-Hispanic | | | Ethnicity Unknown | | | Total Students |
|---|---|---|---|---|---|---|---|---|---|---|
| | Males | Females | Total | Males | Females | Total | Males | Females | Total | |
| American Indian | 0 | 0 | 0 | 7 | 6 | 13 | 10 | 9 | 19 | 32 |
| Alaskan Native | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 3 |
| Asian | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 3 | 3 | 7 |
| Black | 0 | 0 | 0 | 18 | 9 | 27 | 19 | 48 | 67 | 94 |
| Hawaiian/ Pacific Islander | 0 | 1 | 1 | 5 | 6 | 11 | 2 | 10 | 12 | 24 |
| White | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 2 | 4 |
| Race Not Reported | 130 | 120 | 250 | 1 | 4 | 5 | 0 | 0 | 0 | 255 |
| Multiracial— minority | 0 | 1 | 1 | 1 | 3 | 4 | 10 | 19 | 29 | 34 |
| Multiracial— non minority | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Total | 130 | 122 | 252 | 32 | 35 | 67 | 44 | 91 | 135 | 454 |

SOURCE: PNW LSAMP 2010 WebAMP Data

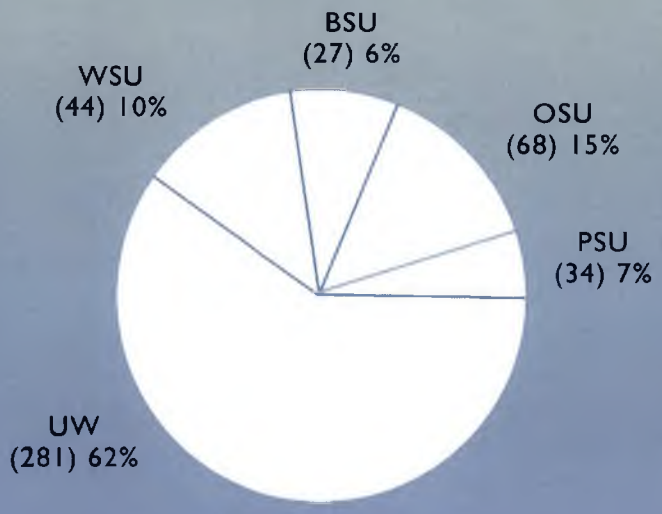



Figure 3. PNW LSAMP Students by Institution, 2009-2010

# Boise State University

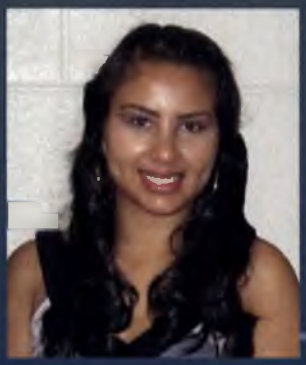
Boise State University is Idaho's metropolitan research university and the largest university in the state. It is located in the state's capital city and largest hub for government, business, health care, industry, and technology. Boise State has been successful in attracting talented students throughout the region and providing university access to capable students who might otherwise not attend college. The university offers a range of departments, programs, and services that promote STEM diversity. The university has a strong program of undergraduate research as part of projects funded by EPA, NSF, DOE, NASA, Micron Technology, Hewlett Foundation, and many other partners, as well as an annual undergraduate research conference with at least 300 to 400 student presenters. Other strategies include Residential Living and Learning Communities (RCs) (the Engineering RC is filled to capacity): two active NSF S-STEM scholarship programs for engineering and computer science majors; an Academic Support and Advising program that includes extensive STEM tutoring, supplemental instruction and other enrichment; a vibrant Cultural Center; extensive Service Learning course components; and a Disability Resource Center. K–12 STEM outreach brings more than 13,000 young people and their families to the campus each year. There is a strong partnership with the Discovery Center of Idaho and many other activities that support STEM education.

Boise State's participation in PNW LSAMP has helped the university guide and integrate the support services provided to students. Boise State University LSAMP has collaborated with programs, departments, colleges, and faculty through its home in the Boise State STEM Station. The STEM Station is the central location/"clearinghouse" for STEM students. It is unique because it houses many NSF programs and supports all STEM students and faculty. Boise State LSAMP worked with other campus programs and departments to form a Summer Research Community that involved 90 students and 15 faculty and staff this past year. It is also leading the institutional effort to create a summer bridge for STEM students that is competitive rather than remedial. LSAMP is expected to play a larger role in the new program, which will be implemented in summer 2012.

During the 2009–2010 academic year, Boise State enrolled 222 underrepresented students in STEM, and 60 of them are active in the LSAMP program. Program participants engaged in research, attended the PNW Annual Conference, and took advantage of tutoring programs offered by LSAMP. Nine Boise State students participated in the LSAMP Undergraduate Research Experience during summer 2011, and four presented their posters at the Summer REU poster session. Boise State had one student whose abstract was selected for the Emerging Researchers National Conference in Washington, DC, and two students received EPSCOR grants to conduct research with faculty. Three Boise State students are featured on the next page.

# Boise State Featured Students

**Lejmarc Snowball** is a sophomore, majoring in Materials Science and Engineering. He transferred from Adirondack Community College in New York. Lejmarc works in Dr. Bill Knowlton's Nano-Scale Materials and Device Group, where his research project is to synthesize end thiolated DNA origami nanotubes decorated with gold nanoparticles and investigate the attachment of thiols strands connected at the ends of the nanotubes to gold electrodes. Lejmarc was on the Dean's List for spring 2010 and is a Norm Dahm Scholarship recipient for spring 2011.



**Martika Flores-Ramos** is a junior, majoring in Civil Engineering. She works in Dr. Peter Mullner's Research Group conducting tests in the grain growth research of nickel, manganese, and gallium, to analyze data and create technical reports. Her current project involves optical imaging and observation of grain boundaries within the samples. Martika is a recipient of the College Assistant Migrant Program Scholarship (2009–2010), National Science Foundation Scholarship (2009–2012), Lightfoot Foundation Scholarship (2010–2012), CMEO First Generation Scholarship (2011–2012), Hewett V. Shad Engineering Scholarship (2011–2012), and Idaho Space Grant Scholarship (2011–2012). She is an active member of the Civil Engineering Club, Secretary of the Society of Women Engineers, Treasurer of Engineers Without Borders, Treasurer (2010–present) of Society of Hispanic Professional Engineers, a former member of the Engineering Residential College, and she served as a Engineering mentor for incoming students 2009–2011.

Photos: Courtesy of students

**Eva Amouzougan** is a senior with a triple major in Biochemistry, Molecular and Cell Biology, and French. She is working with Dr. Henry Charlier and Dr. Kristen Mitchell on regulation of carbonyl reductase activity by aryl hydrocarbon receptor ligands. Eva plans to attend medical school and would like to become a medical scientist, do clinical work, and conduct biomedical research at a hospital. She is a McNair Scholar and in 2010 she received the Society of Toxicology Undergraduate Education Program Perry J. Gehring Travel Award, NIH-INBRE (IdeA Network of Biomedical Research Excellence) Summer Research Fellowship Award, CMEO Award (Center of Multicultural and Educational Opportunities Student Achievement Award), and her research poster won third place at the 27th Regional Annual Pacific Northwest Association of Toxicology meeting in Corvallis, Oregon. In spring 2011, she received the Society of Toxicology Perry J. Gehring Diversity Student Travel Award and was recognized at the 50th Annual Society of Toxicology Conference on March 6–10, 2011, in Washington, DC.

# Oregon State University

Oregon State University (OSU) is the state's largest public research university. A land grant university, OSU is one of only two universities in the country to have Land Grant, Sea Grant, Space Grant, and Sun Grant designations. The university has a deep commitment to increasing diversity and providing support for all students. In 2003, the Office of Community and Diversity (OCD) was created to assist in promoting cultural diversity, awareness, and sensitivity throughout the campus community. It provides programs, services, and activities to promote cultural identity within a multicultural environment, and encourage and support cooperative and collaborative relationships within the university community and the university's external stakeholders. The OSU LSAMP program has partnered with OCD and other campus programs to provide wrap-around services to underrepresented students with an interest in STEM.

Oregon State has strong STEM academic programs, and the LSAMP program has enabled the university to strengthen pre-college outreach and recruitment, deliver mentoring, develop a new summer bridge program, and enhance orientation programming for entering students. The inaugural year of the summer bridge program was so successful that a second bridge cohort has been added. Bridge participants were designated as leaders for the College of Engineering's First Year Orientation Program, thus the program gained visibility with incoming students and the campus community.

There were more than 800 underrepresented students with an interest in STEM enrolled this past academic year, and 200 of them were actively engaged with the LSAMP program. The LSAMP Student Center serves as a student lounge and study area and hosts various math, chemistry, physics, and matlab tutoring programs as well as academic coaching. There are computers available for student use, snacks donated by the OSU College of Engineering, and a textbook lending library. Each incoming URM student is invited to join a peer mentoring program and is introduced to opportunities to participate in a paid undergraduate research experience as early as freshman year. Student professional chapters of the National Society of Black Engineers and the Society of Professional Hispanic Engineers are supported, and attendance at regional and national conferences is encouraged.

Multiple OSU LSAMP students are the recipients of prestigious university scholarships, and they participate in PNW LSAMP conferences and retreats. Three OSU students are featured on the next page.

*"LSAMP gave me a better understanding of the STEM fields and the opportunities that come with them. Many of the opportunities I have now I would not have gotten without my connection to LSAMP."*

# OSU Featured Students

**Nicholas Curcio** is a junior in the Environmental Science program, and a two time recipient of the Monsanto Agriculture Technology Scholarship from the OSU College of Science. He is currently working on research within silica dynamics with Dr. Julie Pett-Ridge in the Crop and Soil Science Department. Nick's academic interests in climate change, sustainability, and conservation are a result of his upbringing in the Hawaiian Islands. Nick will be serving as an LSAMP mentor this fall to incoming freshman in the STEM fields.

**Camila Matamala-Ost** (Environmental Science) is currently a junior and working on research in the H. J. Andrews Experimental Forest with two OSU Faculty Mentors, Dr. Tom Dietrich and Dr. Steven Highland. Her academic and career interests include research in effective methods of restoration of native plant communities as well as organizing community efforts to restore native plant communities. Camila has received many OSU scholarships during her time on campus and is serving as an LSAMP mentor this fall to incoming freshman. She has also served in various mentor roles through programs focused on outreach and recruitment of middle school students.

Photos: Courtesy of students

**Marlon Mejia** (Civil Engineering) met President Obama through recognition of OSU LSAMP's Intel Engineering Summer Scholars Bridge program last February. Currently a sophomore, Marlon is working with Dr. Jason Ideker on research focused on the environmental sustainability of concrete production. He is a recipient of an LSAMP Research Stipend, Vice President of the OSU National Society of Black Engineers, and Peer Leader for LSAMP Bridge programs.

# Portland State University

Portland State University (PSU) is the largest and the most diverse among the Oregon University System campuses. PSU LSAMP has actively targeted and recruited potential LSAMP students from among PSU partners which include the Portland Public Schools, the Beaverton and Hillsboro school districts, Oregon MESA, Portland Community College, the Saturday Academy, and Northwest Science Expo System.

The PSU LSAMP program is well-aligned with the university's Student Success initiative to improve student outcomes and graduation rates. The LSAMP program serves as an "umbrella for student success" in both the College of Liberal Arts and Sciences and the Maseeh College of Engineering. Prior to LSAMP, the institution had no program to serve the specific needs of underrepresented students with an interest in STEM. LSAMP has led to the creation of the Scholars for Success in STEM (S3) Bridge program and has strengthened connections to Admissions, University Studies, and the Office of Diversity and Multicultural Services; its programming and activities provide a conceptual model for a proposed campus STEM Center. It has also served as a catalyst for a new STEP grant proposal involving community college partners.

PSU enrolled 306 underrepresented students with an interest in STEM, and 96 of them were affiliated with LSAMP during the past academic year. Since its launching, the program has tripled the number of LSAMP students applying for summer research experiences. Seventeen students were placed in research experiences this summer, including two at the Pacific Northwest National Laboratory, one at a NASA research site, and two at Bonneville Power Administration. Two PSU LSAMP students are featured on the next page.

> *"I learned that research is not a big thing that has to take years, but it can be something small that you can work on for a month and still be successful and see results."*

# PSU Featured Students

**Mondell Wells** is a senior working towards a Bachelor of Science degree in Mechanical Engineering. Combining his early affinity for mathematics and his exceptional musical talents, his graduate degree will focus on acoustics, noise, and vibration. As a Ronald E. McNair scholar, he earned a Summer Undergraduate Research Internship at the Pacific Northwest National Laboratory in Richland, Washington, and presented his work at the McNair Research Symposium in Portland, Oregon. He will continue a second research experience in the Wind Energy and Turbines Lab at the Maseeh College of Engineering and Computer Science this fall. He has served as an integral part of the LSAMP Advisory Board, and is Vice President of the PSU Student Chapter of National Society of Black Engineers.

Photos: Courtesy of students

**Martin Rodriguez** arrived at PSU having taken every high school science class offered. Indeed, his early passion for space travel and research earned him the title, "Science Student of the Year." An Honors student, he will earn a Bachelor of Science degree in Physics and intends to pursue a graduate degree that will prepare him for a position with NASA. To that end, he was selected for a NASA summer research experience in Baltimore, Maryland. He is also a Ronald E. McNair Scholar and recently completed a research study, "The effects of perforations on capillary driven flows in tubes." An integral part of the LSAMP Program at PSU, Martin has served on the Student Advisory Board since its inception and is a member of the Physics Club. He has demonstrated his commitment to community service in numerous ways, most recently by mentoring underrepresented high school students. He is currently studying at the University of Lyon in France after which he will resume his studies at PSU.

# University of Washington

The University of Washington (UW) ranks among the top 20 doctoral granting institutions in the country. In 2010, UW was the recipient of more than $1.4 billion in research funding. The UW is home to a number of undergraduate STEM outreach programs and its academic colleges and departments have excellent reputations for undergraduate research. The LSAMP Learning Center at UW has become the hub for diversity in STEM and undergraduate research programs on campus. It serves as a catalyst for STEM programs to collaborate on outreach to prospective students, support undergraduate students, and host career development and graduate school preparation workshops. It is also a community space where students can gather for social community building activities, work on academic course work, and attend various presentations on STEM related topics.

In 2011, the UW LSAMP program launched a website geared towards students, faculty, industry and community partners. The new website offers a place where individuals can gather information about LSAMP events, locate undergraduate research announcements, review a comprehensive list of UW STEM programs, and discover ways to become involved with the program.

In addition to the LSAMP Learning Center and website, UW LSAMP has been very active with student programming. In 2009–2010, the UW enrolled almost 500 underrepresented students with an interest in STEM. More than half of those students are affiliated with the UW LSAMP Program. UW LSAMP affiliates participated in a number of activities that fostered their sense of community and expanded their knowledge about STEM. UW LSAMP hosted, collaborated, and promoted an estimated 40 activities and courses this past academic year, including the PNW LSAMP student leadership retreat; STEM Bridge; presentations from LSAMP partners such as NASA, UW Undergraduate Research Program, IMSD Program, Summer Medical and Dental Exploration Program (SMDEP); STEM Career Panel; Pacific Northwest National Laboratories (PNNL); and STEM Faculty Coffee Hours.

The UW program had 75 underrepresented students participate in research during the 2010–2011 academic year. Many of them attended and presented their research at regional and national conferences including: the spring PNW LSAMP Conference (10 undergraduates, 16 community college students), Global Health Conference (2 students), American Astronomical Society Conference (2 students), SACNAS Conference, and American Association for the Advancement of the Sciences Emerging Researchers National Conference, which was held on February 24–26, 2011 in Washington, DC (eight undergraduate presenters).

UW LSAMP students have received national recognition for their work in STEM. One UW LSAMP student received the DuPont Award for her outstanding research presentation in microbiology at the SACNAS National Conference. The student was selected out of 922 presenters, and was the only UW undergraduate who received this award. Another UW LSAMP student was awarded the 2010 Merck Science Initiative Award that includes up to $25,000 in scholarships. Three UW LSAMP students are featured on the next page.

# UW Featured Students

**Klondy Karina Canales** (Junior, Intended Microbiology & Music) was born and raised in Portland, Oregon. Latin American by Honduran heritage, Klondy is the first to go to college in her family and is determined to earn an MD/PhD in the future. She is in the UW Honors program and a Gates Millennium Scholar. She has participated in four summer research programs: Apprenticeships in Science and Engineering, Oregon Health and Science University Behavioral Neuroscience (2008); UW GenOM Program, Diabetes (2009); Yale University STARS program, Microbiology (2010); and Johns Hopkins University Summer Internship Program, Pathology (2011). Klondy has presented her research at the SACNAS Conference in Anaheim (October 2010) and was awarded The DuPont Award for Outstanding Research Presentation in microbiology, and at the Emerging Researchers National Conference in Washington DC, in February 2011. Klondy is an active member of Al-Shifa, a student run clinic for undeserved communities, LSAMP, Latino Medical Student Association, Society for Advancement of Chicanos and Native Americans in Science, SSS-STEM, and University Christian Fellowship. She currently works as a student ambassador for the Office of Minority Affairs & Diversity.

**Yuriana Garcia** (Sophomore, Bioengineering & Global Health) is originally from Royal City, a small town in eastern Washington. She is the oldest of four children and the first to go to college in her family. Yuriana enrolled at the UW in fall 2010 with financial help through scholarships, including the Costco Diversity Scholarship, Nelson Faria Scholarship, and a Washington Apple Education Foundation scholarship, presented at the Emerging Researchers National Conference in Washington DC, in February 2011. Currently she is working for PATH. Outside of school, Yuri is a member of Education without Borders, Latino Medical Student Association, and Society for Advancement of Chicanos and Native Americans in Science (SACNAS). She enjoys networking at LSAMP events and meeting new people.

**Edison Amah** (Senior, Aeronautics and Astronautics Engineering) is focused on research in computational fluid mechanics, studying the simulation of flow over a cylinder. Edison is a member of various academic organizations, including LSAMP and the National Society of Black Engineers. He is a McNair Scholar, National Action Council for Minorities in Engineering Scholar, Costco Scholar, and Boeing Scholar. He plans on earning a doctorate in Aeronautics with a specialty in propulsions and fluids. He looks forward to developing a program in the future that will assist low-income youth who have a passion for aircraft and expanding their knowledge within the field.

Photos: Courtesy of students

# Washington State University

Washington State University (WSU) is one of the nation's 50 leading public research institutions. WSU actively seeks diversity in its student body and has relationships with several minority serving institutions. Students from underrepresented groups admitted to WSU programs leading to bachelors degrees in engineering, computer science, mathematics, and the physical sciences are invited to a no-cost, five-day bridge program prior to the beginning of the fall semester. Freshmen underrepresented students in these majors are invited to participate in mentoring programs designed to transition them to college life. Sophomore and transfer students are invited to participate in the Team Mentoring Program designed to connect them with faculty and upper division students to ease the transition to certification in a STEM major. A living-learning community for the STEM disciplines is available for students who benefit from common STEM courses, tutoring, and science and engineering events. Retention of students in all of these programs is better than for students who are not involved. Thirty hours per week of free tutoring services in mathematics, physics, chemistry, computer science, and foundation engineering courses are available to lower division undergraduate students in the College of Engineering and Architecture.

In 2009–2010, WSU enrolled 421 underrepresented students with an interest in STEM, and 100 of them are affiliated with the LSAMP program. WSU-affiliated students served as hosts for the PNW LSAMP Annual Conference, participated in the PNW LSAMP Student Retreat, and founded a SACNAS chapter. The WSU program more than doubled the number of underrepresented students conducting undergraduate research this past year compared to the first year of the program.

WSU LSAMP students have been recognized with prestigious campus awards, including a NSAS Scholarship, the LeRoy Nosbaum Scholarship, and two recipients of the Auvil Fellowship. Two WSU scholars are featured on the next page.

*"I learned that I have to be more organized, be a better communicator, conduct a lot of my own research to build a better foundation, accumulate more information on the kind of research in which I am participating. I can be very shy at times so it would benefit me to relax and ask more personal (but not invasive) questions so I can establish friendships with those with whom I'm working side by side."*

# WSU Featured Students

Rafael Hernandez, a junior in Mechanical Engineering, has been offered an assistantship with his current faculty mentor, if he chooses to stay at WSU for graduate school. Rafael's research project, "Thermal Acoustic Instabilities in Resonators" is currently being funded with the help of the LSAMP student funding. He is the recipient of an Auvil Fellowship award and a NASA Scholarship.

Shantel Martinez recently earned her Bachelor of Science in Bioengineering and is continuing as a graduate student in wheat molecular genetics in the Department of Crop & Soil Sciences. Her undergraduate research was funded by the LSAMP program and resulted in a published paper in *Materials Science and Engineering.* Shantel has given workshops for other LSAMP students on how to develop research posters. This is something she knows well, as she was recognized with a $300 prize in WSU's Undergraduate Research Poster Competition.

Photos: Courtesy of students

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*"LSAMP has given me direction and motivation to finish college. I appreciate all of the guidance. My internship experience was invaluable in helping me reinforce that I had chosen the correct major for me, and I absolutely loved working and doing research. I definitely want to stay involved with research as long as possible."*

Photo opposite page: J J Wright


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