STAIRSTEP Named Recipient of a Texas Higher Education Star Award

The STAIRSTEP program at Lamar University has recently been awarded the Texas Higher Education Coordinating Board STAR award. This award recognizes programs that have made exceptional contributions to closing the gaps in student participation, student success, academic excellence, and/or research. STAIRSTEP was one of 8 finalists from over 50 nominations state-wide. All finalists were recognized and winners were announced at an awards luncheon in Austin on November 22, 2013. This is a significant achievement for all the hard work and accomplishments from our students, faculty, and administration. For more information on the Star Award, visit the website: http://www.thecb.state.tx.us/index.cfm?objectid=B85D3943-CAA5-CA55-8F80C6BC6A78848C

STAIRSTEP is recruiting, retaining and transitioning students to STEM degrees and careers

From its inception in January of 2009 through spring 2013, 86 undergraduates participated in the STAIRSTEP program. This includes 17 African Americans, 7 Hispanics, and 4 Native Americans. Over 89 percent of the participants have been retained in their STEM major.

STAIRSTEP participants have had much higher GPAs in their major classes than cohorts of students from prior years (3.18 vs. 2.71). They have also dropped far fewer classes (2.21% vs. 10.25%). Assessment shows that students perceive the program as having a significant impact on their growth and progression towards achieving the learning objectives of their discipline.

Through numerous outreach activities, STAIRSTEP undergraduates and faculty mentors have exposed thousands of middle school, high school, community college students and their parents to the benefits and opportunities afforded by degrees in STEM.

The number of first time in college freshmen enrolling in the five STAIRSTEP disciplines increased from 39 in the fall of 2008 before STAIRSTEP started to 77 in the fall of 2012, an increase of 97%, despite two increases in entrance requirements. This far exceeds the growth of 10% seen in non-STEM disciplines during the same period.
Undergraduate majors in the five STAIRSTEP disciplines grew from 255 to 385, an increase of 50%. This far exceeds the growth of 9% in non-STEM disciplines during the same period.

Our goal is to transition at least 80% of our graduates within 6 months of graduation. Eight of the 33 STAIRSTEP students who have graduated thus far received their degrees in May of 2013. Of the 25 STAIRSTEP students who graduated 6 or more months ago, 88% have successfully transitioned within that time frame. Ten of the 25 are pursuing graduate study in STEM. Thirteen of the 25 are working in STEM fields for Texas employers that include ExxonMobil, CoreLabs, INVISTA, Schlumberger, and several school districts, in petrochemical, chemical engineering, environmental, oil/gas offshore operations, STEM education, and other STEM fields. Some are pursuing graduate study while working. Some of our graduates are teaching physics, math, geology and science in high schools in Beaumont, Baytown, Hamshire-Fannette, Texas City, and Alpine, Texas.

All of the faculty mentors are very proud of our STAIRSTEP students’ achievements.

Will STAIRSTEP be sustained?

STAIRSTEP has been supported by a grant from the National Science Foundation. Funding will end at the end of August, 2014. We are currently seeking ways to sustain the program without NSF funding. If you have ideas on how to sustain the program please contact one of the STAIRSTEP faculty mentors. If you would like to make a financial contribution to the STAIRSTEP program please see the last page of this newsletter.

Did you know that...

The Beck Fellowship is one of the most prestigious awards that an undergraduate student at Lamar can receive. One of the 2013 Beck receipients was Chemistry STAIRSTEP student Crissie Vandehoef who performed research at NIH in Bethesda, MD this last summer. This fall one of the 2014 Beck Fellowship receipients was Physics STAIRSTEP student Keeley Townley-Smith who will work at the National Institute of Standard and Technology (NIST) in Gaithersburg, MD next summer. (We aim high!)

WAY TO GO!

STAIRSTEP Faculty Advisors/Co-PIs (*PI)
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Computer Science (CS)

The Fall 2013 CS STAIRSTEP team (see photo) includes left to right standing: Sean Smith, Bradley Williams, John Tyler, and Matthew Williamson; and seated: Billy Newman, Kaitlin Stevens, and Casey Cole.

Demetrius Taylor (below), LU computer science senior and STAIRSTEP Webmaster, won third place in the international undergraduate student research competition at the 44th annual ACM Technical Symposium on Computer Science Education March 9, 2013, in Denver, Colo. The annual symposium, sponsored by the Association for Computing Machinery’s Special Interest Group on Computer Science Education, is the premiere showcase for computing education in the United States.

By presenting his poster entitled “Enabling a resource limited robot to formulate complex plans,” Taylor (left) was selected as a finalist and went on to the next round, an oral presentation of his research. As a finalist, Taylor was invited to submit a paper on his research to the ACM’s Student Research Competition Grande Finals. His paper is posted on the ACM SRC website at http://src.acm.org/2013/DemetriusTaylor.pdf.

Billy Newman, STAIRSTEP CS senior and President of Upsilon Pi Epsilon, the computer science student honor society, has established a mentoring program for computer science undergraduates. Participating senior members of UPE are each mentoring several underclassmen.

Billy Newman and Kaitlin Stevens, STAIRSTEP CS junior, each received an ASCENT scholarship. The ASCENT program provides scholarships for juniors and seniors majoring in computer science or mathematics at Lamar University. Billy presented his ASCENT research entitled, “Classification in Machine Learning using Dynamic Receptive Fields in a Radial Basis Function” at the 2013 Texas STEM Conference on October 5.

Billy Newman presented his McNair research entitled, “Classification in Machine Learning using a Radial Basis Function Kernel in a Support Vector Machine” at the McNair Scholars Research Symposium on November 18.

The team has participated in many outreach activities this year, including participating in several road shows at local school and college fairs, tutoring fellow CS students, and helping in the Computing Fundamentals I lab. This semester Sean Smith helped Boy Scouts earn badges in computers and programming at a local Badge Fair. We hope to continue this work with the Scouts and other community organizations in the future.
The Spring 2013 STAIRSTEP team for the Department of Earth and Space Sciences (ESS) was composed of Chris Maldonado, Ijeamaka Okechukwu (I.J.), Royce Abshire, and Aaron Ramirez. The team finished acquiring GPS measurements on preexisting survey markers in SE Texas to determine subsidence rates in the region. They presented their initial results at the South-Central Geological Society of America meeting in Austin, Texas in March. In addition to the research, the team attended a research seminar on 3D visualization of the seafloor, offshore California by Dr. Rikk G. Kvitek, Professor at California State University, Monterey Bay. They also helped with a variety of outreach events both on and off campus.

During this past summer, I.J. worked on an internship at the University of Texas at Austin’s Jackson School of Geosciences. Her research involved using hydrogen and oxygen isotopes in leaf and stem waters to help understand climate change.

The Fall 2013 STAIRSTEP team is seen in the team picture and is composed of (from left to right) Patrick Taylor, Aaron Ramirez, Brett Skinner, Victoria Lang, Chris Maldonado, and Ijeamaka Okechukwu. This Fall semester the students started a new phase of research related to the Subsidence Study in SE Texas. This research involves measuring the acceleration of gravity very precisely at the survey markers that were previously measured with GPS. These measurements help surveyors better understand the true elevation of the survey markers above or below the geoid datum, which is a surface that sea level would follow if it was allowed to move inland. It will also add to the gravity database in Texas and allow for better subsurface interpretation of geology in the area. The students were also involved in a significant amount of outreach this Fall with a week of high school college fairs that were held at a variety of locations for numerous high schools throughout SE Texas. The responses from the ESS students were very positive and a large number of high school students wanted more information about the Geology program at LU. Patrick Taylor and a former STAIRSTEP student, Christine Gartner also helped a troop of Cub Scouts obtain their Geology academic pin and belt loop.

A special congratulation goes out to Christine Gartner for being awarded the SIPES scholarship from the Society of Independent Professional Earth Scientists. Christine had to compete with both graduate and undergraduate students, and was only the second undergraduate student to win the award in the history of the scholarship.
The Physics STAIRSTEP group in Fall 2013 was comprised of Sara-jeanne Vogler, Jacob James, Jose Castro, Keeley Townley-Smith, Susan Salazar, and Dr. Cristian Bahrim (in photo from left to right). In May 2013, four Physics STAIRSTEP students have graduated with BS degrees from Lamar: Bryan Neal, Jessica Plaia, Spencer Wigginton, and Aaron Weatherford. In Fall 2013, three Lamar alumni and former STAIRSTEP students started graduate studies: Michael Hennigan (cohort 2011) was accepted in the MS Medical Physics program at the University of Nevada – Las Vegas, Nick Lanning (cohort 2012) was accepted at the Louisiana State University, and Christopher Lee (cohort 2012) joined the University of Texas at San Antonio, while keeping an engineering position at the Syracuse Research Corporation.

They all stay in close contact with Lamar and their former department. Nick Lanning visited Lamar on Oct. 4th to present a Career Forum titled “How to increase chances of success when apply to grad schools?” and gave a talk at the S-STEM conference organized at Lamar, on Oct. 5. Recently, Michael Hennigan wrote us about his great experience at the University of Nevada “I am very interested in the field of medical imaging and luckily that is the specialty of my professor I work with. I think the STAIRSTEP program prepared me well for such research.”

On April 26, Ms. Sara-jeanne Vogler (left) was selected to represent the UG research done at Lamar, at the “Undergraduate Research Day at the Capitol”, in Austin, an event organized every two years by the Council of Public University Presidents and Chancellors. The paper entitled the “Analysis of Atomic Emission Spectra with Applications in the Study of our Universe” was presented in front of policy makers, faculty from various schools across the state, and students, in the rotunda of our State Capitol.

Recently, on Oct. 10-12, 2013, two PH STAIRSTEP students, Keeley Townley-Smith and Sara-jeanne Vogler have participated to the Joint Spring 2013 Meeting of the Texas Sections of the American Physical Society, AAPT and Zone 13 of the APS, hosted by the UT Brownsville with a poster titled “Analysis of Atomic Spectra with applications to solar measurements”. A short abstract was published in the Bulletin of the American Physical Society, vol. 58, No. 10 (2013), D1.00003. Prior to this conference, Sara and Keeley have participated to the S-STEM conference organized by Lamar, where they gave a talk about light and its applications.

On October 25, Ms. Keeley Townley-Smith became a 2014 Beck Fellow recipient for her project on atomic spectroscopy which she intends to develop as part of her internship at the National Institute of Standard and Technology (NIST) in Gaithersburg, Maryland during the summer of 2014.

Physics STAIRSTEP students Jose, Jacob, and Bryan got the opportunity to discuss with Dr. John Mather, a senior astrophysicist at the U.S. Space Agency’s (NASA) Goddard Space Flight Center in Maryland and also, the 2006 Nobel Prize recipient in Physics, while at the Quadrennial Physics Congress (see photo). Dr. Mather, who was listed among Time magazine’s 100 Most Influential People in The World and one of 25 most influential people in space sciences, talked with our students about NASA’s most recent major project, the setting up of the James Webb Space Telescope, for which he is the project scientist. The telescope is projected to be launched in space around 2018.
The chemistry STAIRSTEP team consisted in the fall of Seniors Kristeena Ingram, Allison Perdue, and Crissie Vandehoef and Junior Stephen Tanton. (left to right) The 2013-2014 academic year will be a very exciting time for current and recent students in the chemistry STAIRSTEP program as several students will be graduating. Three members of the current team are dedicating a significant portion of their time this semester to investigating the chemistry job market, researching graduate schools, and making the tour of MD/PhD interviews.

Crissie was awarded one of the 2013 Beck Fellowship in the Fall 2012 semester. This summer she traveled to Bethesda, MD and performed research at the National Institutes of Arthritis and Musculoskeletal and Skin Diseases at the National Institutes of Health (NIH) under the direction of Robert Colbert, MD, PhD. (right) Her research involved understanding the underlying molecular and cellular mechanisms responsible for the pathogenesis of spondyloarthritis, a disease that Crissie has herself. In addition to the invaluable laboratory experience, she learned how to “think like a scientist”. “I learned how to read journals, how to question the work reported by others, and how to design an experiment. I really feel like I’ve crossed the line from a science student to a scientist.” Crissie is currently interviewing for MD/PhD programs across Texas.

Allison Perdue worked in the lab of Dr. Cai (University of Houston) this summer after hearing his speak at a Chemistry Research Seminar here at Lamar during the Spring semester. Upon her return, Allison said “I want to go to graduate school now more than ever. I know I can do it and I know that this is really what I want to do.” Kristeena Ingram will be receiving her degree in chemistry in December of 2013 and she said that this semester has been especially “eye-opening”. “This semester I learned a lot about resume writing, applying for graduate schools, researching and applying for jobs, professional networking, and all the details about what I have to think about after college. I never realized how much there was to know, but I’m really glad that STARSTEP was there to ‘force’ me to learn about all these things.” Both Kristeena and fellow STAIRSTEP student Allison Perdue (graduating May 2014) are planning on attending graduate school in the Fall of 2014.

The newest member of the team, Stephen Tanton, is already taking advantage of his STAIRSTEP experience and has an impressive agenda for gaining experience in the next year. Over the winter break, Stephen will be volunteering in Nicaragua with VIDA Volunteer (http://vidavolunteertravel.org/), a medical humanitarian organization. This time will be very valuable as he continues to prepare for his application towards medical school. Following the STAIRSTEP activities that included resume writing, interviewing skills, Career Forums, and Linkedin seminars, Stephen interviewed for and was offered a paid summer internship for 2014 at Huntsman. He said “I never realized how much STAIRSTEP would help me in all these different areas outside the classroom.”

We wish Crissie, Allison, Kristeena, and Stephen the best of luck and great success in everything that they do!
The Spring 2013 STAIRSTEP team for the Department of Mathematics (MA) was composed of Katie Bryant, Cody Worth, Brittany Cashi, Icy Koo, Phillip Buchanan, and Mercedes Coleman. Several team members work on outreach projects, including interviewing mathematicians and and using these interviews to make an outreach slide show for MA and creating a 'Six-Degrees of Separation from Kevin Bacon' poster to display at outreach events. Other students investigated the properties of the G-graph of a group. Current research problems include: the G-realizability of a graph, determining the connectivity of a G-graph, and using paths in a G-graph to factor group elements. This area of research reinforces concepts in Graph Theory, Combinatorics, Abstract Algebra, and Statistics while exploring applications in Computer Science, Electrical Engineering, and other areas of Mathematics. The team hosted two STAIRSTEP research seminars in MA and participated in several outreach events throughout the semester.

Katie Bryant graduated with her B. S. degree in May of 2013. Icy Koo participated in an internship at Chevron Phillips in the Summer of 2013, while her remaining four team members conducted research on the campus with their mentor, Dr. Jennifer Daniel.

In the Fall of 2013, Audrene Edwards, Melanie Bransford, and Jonathan Hodges joined the MA team. Junior Brittany Cashi attended the Texas Undergraduate Mathematics Conference in October 2013 and delivered the presentation “On G-Graphs for a Group.” She is also an ASCENT Scholar and recipient of the 2012 Annie Sue Green Scholarship. She is a founding Member and Treasurer of Sigma Theta Chi Phi. She is also active in the LU Math Club and Sign Cardinals American Sign Language Club, and serves as the Student Government Association representative for the Mathematics Honor Society Pi Mu Epsilon.

Senior Cody Worth attended the Lamar S-STEM conference at and the Texas Undergraduate Mathematics Conference (both in October 2013). At each meeting, he delivered the well-received presentation “Applications of Linear Algebra and Graph Theory in Video Games.” He is an ASCENT Scholar, and is active in the LU Math Club, Computer Science Honor Society Upsilon Pi Epsilon, and Mathematics Honor Society Pi Mu Epsilon. Cody is pursuing a dual degree in Mathematics and Computer Science.

Senior/First year graduate student Mercedes Coleman is an inaugural member of the Lamar University Mathematics Department's Fast-Track program. Mercedes will complete her Bachelors and Masters in 5 years and is currently taking her first two graduate courses. Mercedes talked at both the Lamar S-STEM conference and the Texas Undergraduate Mathematics Conference in San Antonio this Fall about her research on the Diameter and Girth of G-Graphs. Mercedes is an Ascent Scholar, a McNair Scholar, and a National Alliance Math Scholar. She is also an active member of the LU Math Club and serves as the Vice President for the Mathematics Honor Society Pi Mu Epsilon.
Highlighting our Graduates

Students who have participated in the STAIRSTEP program and graduated from Lamar University have gone on to a wide variety of areas including pursuing advanced degrees, educating the future in our public school systems, the oil and gas industry, and many other exciting areas. Below are just a few of our STAIRSTEP students who are now applying the skills and knowledge they gained at Lamar. What a way to STEP up!

1. **William Ware** – received a B.S. in **Physics** and a B.S. in Electrical Engineering in 2012 – pursuing a Ph.D. in EE at Purdue, “<STAIRSTEP> prepared me in becoming a more skilled scientist and preparing me for graduate school. Without STAIRSTEP, I do not think I would have had the skills to do as well as I did in classes or be able to present my ideas to others. I cannot imagine myself succeeding in graduate school without the STAIRSTEP program.”

2. **Kristopher Farmer** – received a BS. in **Geology** Aug, 2010 – currently a science teacher with the Alpine Independent School District in Alpine, Texas, and pursuing a M.S. in Geology at Sul Ross State University, “The STAIRSTEP Program is one of the main reasons that I have become a teacher. Putting on science days for these kids and interacting with them made me realize a passion for getting the next generation excited about STEM degrees and opportunities. ... The training I received during my time with the STAIRSTEP Program has given me an advantage of the other graduates <in pursuit of the M.S.>... This includes defining a research topic, getting the necessary permits together and how to structure research trips.”

3. **Nick Brandes** – received a B. S. in **Geology** in May, 2012 – works for Schlumberger, “In the first year alone I had more one on one time with my professors than any other student. ... When everything was said and done I had five papers in two and a half years. I learned more in that time than I ever would have in just classes alone ... I would not have my current job without the work I did in STAIRSTEP or the guidance from my professors.”

4. **Robert Holman** – received a Ph.D. in **Physics** Aug, 2010 – teaching physics at Ross Sterling High School in Baytown, Texas, “Stairstep is hands down the most influential part of my entire college career. ... teaching and demonstrating physics in community outreach in the program moved me to become a high school physics teacher. Now I inspire generations of progress in my field just as it was instilled in me. I love my profession, have great confidence in my abilities, and I owe what I have to Lamar University and Stairstep.”

5. **Judson Ward** – received a B.S. in **Computer Information Systems** (CIS) Dec. 2012 – working as a Technical Consultant for Enterprise Services, at Hewlett Packard in Plano, Texas, "My experience in STAIRSTEP was incredibly beneficial. It improved both my technical and interpersonal skills, and helped me learn to articulate my thoughts through both written and spoken mediums. The experience, and the way that I gained it, would not have been available through another medium."
6. **Michael Soniat** – received his B.S. in Chemistry in May 2010 – is a 4th year graduate student at University of Texas Southwestern currently pursuing his Ph.D. in Molecular Biophysics. “... the chemistry STAIRSTEP program greatly influenced me as a scientist... allowed me to perform research as undergraduate, which not only helped me learn how to think, question, and design experiments like a scientist but also amplified my interest in the scientific field... allowed me the opportunity to mentor younger students by doing outreach projects, which is something that I am still currently doing in graduate school... STAIRSTEP is an exceptional program that allows students to get involved and to gain skills that will be required to succeed in future scientific endeavors.”

7. **Jessica Gillispie** – received her B.S. in Chemistry in May 2013 (in addition to degrees in physics and chemical engineering) – is a Drilling Engineer at Shell in Houston, TX. “I enjoyed my time with STAIRSTEP and was able to gain valuable experience working with a team, and doing technical presentations and technical papers. Spending time with the other members of the team was the best art of STAIRSTEP. Drilling engineering was an area I had very little knowledge about, and have since learned a great deal, with much more still to go. My time at STAIRSTEP helped me with becoming comfortable talking to others about technical topics and how to properly make and present technical presentations.

8. **Gerardo Rodriguez** – received his B.S. in Mathematics in December 2010 – is a Geometry teacher at Westbrook High School in Beaumont, TX “... the STAIRSTEP program provided me a network of resources, which includes fellow peers and professors. Knowing that there are others with the same interest is encouraging, because it makes the program more fun, but also allows us to grow together as students. I think that this is important for the retention of students in the program, because it makes a nice transition from classroom to research, especially when you are joined with other students with similar interests/backgrounds. Also, the support of the professors is invaluable, because without their guidance, students would be lost.”

9. **Lucas Castle** – received his B.S. in Mathematics in the May of 2012 – is currently in the Mathematics PhD program at North Carolina State University - his mentor’s alma mater “STAIRSTEP served both as an inspiration and a springboard into pursuing graduate studies in mathematics. I attribute my acceptance in part to the STAIRSTEP program, and am greatly appreciative to have had the opportunity to participate in the program. I hope that the experiences and atmosphere provided by the program will serve to strengthen my graduate school career and future as a mathematician. ... STAIRSTEP provided me with ample opportunity to engage in research, opened doors to other research experiences and graduate school, and served to help me discover where my research interests lie.”
The generosity of alumni and friends of Lamar University has been an important part of our success. Private funds are critical to our mission. They enable us to assist students in fulfilling their dreams of a quality education as well as provide funds to take advantage of opportunities of excellence that are simply not able to be provided by traditional funding. Every dollar contributed is valued and needed. We thank you for considering a gift to the College of Arts and Sciences or to the department of your choice.

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