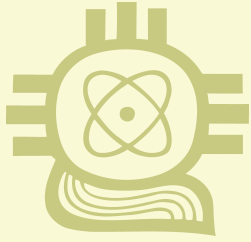


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FALL 2007

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SACNAS News Staff

Lin M. Hundt, Senior Editor
 Jenny Kurzweil, Senior Editor
 Kelli Williams, Marketing and Advertising Sales
 Dina Clark Design, Graphic Design
 Mary Girouard, Copy Editor

Contact the Editors

Phone: 877-SACNAS-1, ext. 226 or 227
 Email: jenny@sacnas.org
linhundt@sacnas.org
 Mail: SACNAS, P.O. Box 8526
 Santa Cruz, CA 95061-8526

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Letter from the President

Aaron Velasco, Ph.D.



PRESIDENT'S MESSAGE: SUSTAINABILITY

SACNAS has a mission to help assist and push minority students through the educational pipeline. We want to see young people start kindergarten and finish off with a doctoral degree. In college, many minority students struggle to find money to support their education and their research. The money must be constant (sustained) in order to achieve success. As a postdoc or professor, sustainability is achieved through continuous grant writing to fund research and attain tenure. Do you have to be money-hungry and sacrifice your personal values in order to be successful? Absolutely not! However, to be successful in your science education and career, you need to develop and sustain financial resources.


As an undergraduate at the University of California, Los Angeles, I applied to and used just about everything (scholarships, federal financial aid, part-time work, etc.) ... and I needed every penny! Today, despite rising tuition costs, there are research opportunities, internships and professional conferences, like SACNAS, that abound with unique financial resources.

At the University of California, Santa Cruz, they paid me to earn my Ph.D.! However, they did pay peanuts, and when personal expenses came up unexpectedly, I was financially drained. Getting your own money in college can make you a free agent and remove pressure from your advisor to fund you. I had a three-year scholarship specific to my university, and later obtained a Dissertation Year Fellowship from the Ford Foundation. The three-year award allowed me to change advisors and kept me from having to rely on the department or my advisor for funding.

Another perk of being a free agent is that your résumé gets a facelift, looking sharp and strong for the future.

At the tail end of the educational pipeline, financial sustainability involves writing outstanding grants, doing excellent research and publishing results. These skills build up your credentials to continue on. As a faculty member, I must generate my own funds for my research and research assistants. Grant writing can be intimidating, especially when a good success rate is anywhere from 10 to 20 percent, which means that for every 10 proposals written, you get one or two funded. This can be maddening when the review system seems flawed. However, grant writing can be extremely rewarding when patience, persistence, openness to constructive criticism and confidence in success prevail. Always rely on your peers and mentors for support.

In sum, financial sustainability has different meanings, depending on where you find yourself in the educational pipeline. Talking and learning about financial opportunities during your academic and professional careers is key to your success in science. Undergraduates need to look up to those ahead in the pipeline to learn how to navigate in rougher waters, and those at the end of the pipeline will need great writing skills and phenomenal research to get funding and be successful. Take time to look back at the pipeline and offer assistance to those who might need help. We are all in this together and remember that SACNAS is also there to help!



Aaron Velasco, Ph.D.
SACNAS President

BY
JENNY
KURZWEIL

SUSTAINING A CAREER IN THE SCIENCES

DR. RICHARD A. TAPIA recounts the story of a colleague who left a position as a mathematics professor to start a venture capital company. The former professor went on to make more than a billion dollars last year—approximately 10,000 times the average salary of a tenured full professor.¹ Would Tapia, knowing what he does after more than 40 years in the profession,

become a venture capitalist if he could do it all over again? He laughs and says, “It’s easy to get passionate over making a billion dollars a year! But, honestly, I wouldn’t trade what I am doing now for a position that makes that much money.”

Tapia, who has had a stellar academic career, is one of only six Hispanic university professors in the history of Rice University, where he is the Maxfield-Oshman Professor in Engineering in the Department of Computational and Applied Mathematics. Over the course of his career, he has directed 39 doctoral students and won many awards, including being the first Hispanic elected to the National Academy of Engineering. Reflecting on his career, he notes, “I always have had with me the awareness that I was choosing a profession because

I loved it. I really felt like it would make me happy, and not because of money, but for a love of the work itself.”

An annual influx of funding, beyond what Rice provides, including nine months of salary, lab and office space, is required for Tapia to conduct his research and fund his students. Although Tapia now has considerable expertise in the area of funding as well as good resources to support his many activities, he knows that this is not usually the case

for young professors just beginning their careers. Tapia maintains that in the scientific world, the money that a scientist brings in on his or her own equals power—and promotion. “At universities you only get paid nine months out of the year, so you have to do something for those other three months. It is critical to get research funding to cover summer salary if you are trying to build a research career, gain visibility, and get promoted through the academic ranks.”

The rigorous grind of scientific research and the cutthroat competition for the all-important career-building funding are well-known trials of a life in academia. But Tapia and other underrepresented minority scientists argue that these challenges are a bit more fraught for faculty of color, who are often simultaneously negotiating issues of workplace parity, coming up against pedigree problems in funding dissemination, and acclimating to a foreign culture of competition, self-promotion and money.

Education: The First Step to Sustaining a Career

Issues surrounding money, or lack thereof, have shaped the decisions of many scientists of color. Dr. Eric Jolly, Cherokee, knew that education was his ticket to a different life. “Education,” he says, “is a liberating force in human development. It gives us greater control of our environment, it gives us greater influence in our communities, and it increases our prospects economically.”

The first in his family to attend university, Jolly, who is now the president of the Science Museum of Minnesota, had a hard time convincing his parents that college was the right choice. “They were supportive,” he says, “in a way of supporting something they didn’t fully understand.” Jolly financed school through scholarships and modest loans. He says, “It was very hard for them to imagine that I would ever earn enough to pay off the loans because jobs are not guaranteed just because you have a degree. I think the larger challenge was for my father to understand why I wasn’t working and earning money.” Jolly’s father argued that his son would make more money working full-time and building a career in a union post than he would by going to school. That all changed, however, when Jolly went on to attend graduate school. “My graduate stipend was actually more than my parents’ combined income.”

Similarly, from early on, Dr. JoAnn Trejo knew that education would lead to an economic stability that she did not experience in her fami-



ABOVE
Dr. Richard Tapia, the Maxfield-Oshman Professor in Engineering at Rice University, chooses a passion for science over money.



LEFT

Dr. Eric Jolly, president of the Science Museum of Minnesota, urges scientists to strike a balance between service and research.

ly as a child. "Getting an education," she says, "was the only route I knew that would allow me to make more money to have a better life." Trejo, now an associate professor of pharmacology at the University of North Carolina at Chapel Hill (UNC), grew up harvesting produce for extra money in the fields outside of Stockton, California. She financed her education through scholarships, grants and fellowships, knowing that although her family was supportive, they wouldn't be able to help her out financially.

Jolly and Trejo both attended public universities as undergraduates and graduate students, as did Tapia, who says, "You don't have to go to Stanford or Harvard or Rice, for that matter. You can get a very good education if you are ready to take advantage of what is offered you. I have no shame about going to community college. In fact, I have a lot of pride about it." Tapia stresses that although being in debt can be intimidating, taking out small loans to make it through good public universities is well worth it. In his opinion, however, borrowing large amounts of money to finance a private undergraduate education is misguided. "Taking out massive loans to go to Stanford when you got into Berkeley? I have no sympathy for that!"

A Question of Pedigree

Choosing between two top schools like Stanford or the University of California, Berkeley, is an unusual predicament for any student, and especially rare for a minority one. National Science Foundation (NSF) research shows that out of the top 20 universities enrolling Native American and Hispanic students, only a few are considered tier 1 universities and even then, the numbers of minority students at these institutions are extremely low. According to a 2002 report, the NSF showed that out of the 20 top schools enrolling Hispanic graduate

students in science and engineering, only six were ranked in the top 30 universities as designated by *U.S. News & World Report*, with an average of about 110 graduates among the schools. The numbers for Native Americans are significantly lower—only four of the schools are ranked in the nation's top 30, and the average number of Native American science and engineering graduates is 7.5.^{2,3}

This lack of attendance at tier 1 universities presents a problem for young scientists of color searching for jobs and funding. Trejo observes, "If you look at where faculty at top universities trained as students, 99.999 percent of them trained at tier 1 universities. In order to increase the number of minority faculty at these institu-

"...at first glance, it seems like there is plenty of money to go around."

tions, you have to increase minority students' access to research and educational opportunities there. Personally, I don't think we are doing enough about this. I think that there is a lot of rhetoric but then the institutions are not held accountable for increasing the number of minority faculty at their universities."

If lack of graduate students of color at top universities leads to a lack of minority faculty at these same institutions, Tapia asserts that this affects the amount and type of funding that minority scientists will receive at the institutions where they do end up training and teaching. He says, "In funding at the national level, from the NSF and National Institutes of Health, there is a pedigree problem. The pedigree problem is that these agencies fund schools like the MITs [Massachusetts Institute of Technology] and Stanfords and Berkeleys very well. So, if you come in from a school that has a very good reputation in terms of research, you probably have a better chance of getting your research money. But, if you are in a school that doesn't have that kind of opportunity, a minority-serving school, you are up a creek. Forget it."

But pedigree issues in federal scientific funding dissemination are subtle, especially because, at first glance, it seems like there is plenty of money to go around. The 4,140 universities and colleges in the U.S. receive \$22.7 billion of federal dollars per year (42.5 percent of the annual \$53.4 billion allocated by Congress for science and technology research) with life sciences holding the lion's share of 52 percent and engineering coming in a far second at 16.6 percent.^{4,5} With over 240,200 science and engineering doctorate holders in academia, the figure whittles down quickly, especially for those not involved in life science research—and those not at top research institutions.⁶ Thus, academic scientists often

RIGHT

Dr. JoAnn Trejo, professor of pharmacology at the University of North Carolina, acknowledges that the culture of competition in the scientific world can take some getting used to.



feel as though they are scrambling to join in the race for funds, or struggling to keep up once they are in.

Dealing with the Culture of Money

Trejo acknowledges that this culture of competition and money in science took a lot of getting used to. She says, "In the Latino community, we are here to help each other out. It is not comfortable to be competitive with each other, to try and be better than your siblings or family members." Trejo has adjusted; she had to in order to be competitive to support her research and her career.

She has picked up a few strategies over the years, including that the key to getting funding, especially if you are not at a top institution, is networking. "Science is a big community," Trejo says, "and the scientific community is basically a business. You have to know the right people, build coalitions with colleagues, and play the political game." While UNC is a high-ranking university (the Department of Pharmacology ranked number one in NIH extramural funding for 2005), Trejo makes a deliberate effort to be part of the larger scientific community by sitting on review committees for grant selection. "We read piles of grants," she says, "and the truth is eight out of 10 should be funded but only two out of 10 will get the money. The difference between those grants is really so marginal. It comes down to who knows who and if this somebody that we know has a history of doing good science."

Trejo also tries to foster a spirit of collegiality rather than the traditional aggressive self-promotion. She says, "If women in particular are aggressive and outspoken, they are seen as misbehaving. What I try to do is to have a happy medium where I self-promote

but in a very dignified way by being rigorous about my work and publishing in well-respected journals." She tries to bypass competition by befriending colleagues, "because those are people that

will eventually read your grants and review your manuscripts." When asked to write a review, for example, rather than do so as a single author, she will ask a respected peer to collaborate.

Furthermore, Trejo works to build collegiality on a national level by sitting on the Women's Cell Biology Committee for the American Society for Cell Biology. She loves it. "Being in a room with all women who are extraordinarily intelligent is amazing. The way they work, the way issues are discussed, is very different from my home department, where it is very male-dominated."

Parity Beyond Pedigree

Just as Trejo searches for like-minded community outside the parameters of her home institution, Jolly reflects that there are

similar searches for community within the schools themselves, and minority faculty often become the hub of activity. When Jolly was on the faculty at the University of Nebraska, Native American students continually sought him out to counsel and coach them through school. As a Native American faculty member, he was frequently asked to be a guest speaker and sit on committees. However vital these activities are to fostering minority student retention, Jolly reflects that "the effort that a young faculty member puts into that which is important to their own well-being and that of minority students does require time that is not in the lab building their résumé. These aren't necessarily the activities that help build tenure."

While underrepresented faculty are often asked to give more service than majority faculty, Jolly contends that this work is not fully recognized in most systems which evaluate performance based on different measures of success.

Moreover, Jolly believes that too often underrepresented faculty members feel that they have to fight a perception by majority faculty that something other than research (i.e., affirmative action) got them their positions.

These factors lead many underrepresented minority scientists to choose to serve their community directly by working at Hispanic-serving institutions or Tribal colleges. Generally, such schools do not pay on the scale of major state-funded or private institutions, nor do they have a reputation for garnering large sums of federal research dollars. Jolly says, "This is a choice that we make and it does come at a cost."

To sustain a successful career in the sciences, Jolly urges young faculty to strike a balance between service and research, and to deeply consider their passions before making a career move. Tapia agrees: "Don't go to a teaching institution and try to become the world's best researcher. Become an incredibly effective teacher instead. By the same token, don't go to a research institution and try to become the world's best teacher. You can't do both and that is a hard reality."

Going Beyond the Bounds of Comfort

When facing key career issues like funding, pedigree and parity, many minority scientists have to grapple with a different reality than they are used to. Future and sustained career success often hinges on whether a minority scientist can acclimatize to a new material culture or not. As a young faculty member, Jolly found himself well beyond the bounds of comfort in dealing with not only the world of high-finance scientific funding, but daily concerns such as credit cards and

"...faculty of color are often simultaneously negotiating issues of workplace parity, coming up against pedigree problems in funding dissemination, and acclimating to a foreign culture of competition, self-promotion, and money."



appropriate workplace attire. "When I grew up," he says, "these weren't things I thought about. Much of what I experienced early on in my career wasn't simply a stress between my family or my community and my work, it was a steep learning curve about things which my colleagues really understood that I didn't. Like knowing how to value a pension fund when I never even imagined having one."

And, Jolly says bluntly, "You are not going to get promoted if you show up for the interview wearing sneakers, but I had real trouble justifying shopping anywhere other than Wal-Mart." Jolly had to adapt quickly to what happens when your closet is full of clothes that require dry cleaning because that wasn't something he learned at home.

Crossing into the mainstream world of money was difficult for Jolly because he realized that he was transcending cultures in ways that challenged how he felt connected to his own community. He overcame these hardships in slow, small steps with help from a few trusted friends in whom he could confide. There was fear, and some humorous moments, but eventually he learned that he had to be willing to occasionally make mistakes.

A Passion for Science

In spite of the treacherous waters one must navigate to sustain a scientific career, Jolly, Trejo, and Tapia share a deep passion for their work—and perhaps this is the true secret of success. Jolly argues that passion is where the true power lies, not in money or funding or conventional achievements. He says, "If you follow what you have a passionate interest in, then you'll rise to the top. If you're in an area of study only because you imagine improving your financial situation, not because you also love the field, then you'll never reach the top of the game." ■

Jenny Kurzweil is a senior editor at SACNAS News.

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University of California, San Diego Mathematics Job ad for 2007-2008

The Department of Mathematics at the University of California, San Diego, is seeking outstanding candidates to fill approximately 6 tenure track/tenured positions to start July 2008. The level for the large majority of these positions is at the Assistant Professor level, however, one or two positions are available for distinguished mathematicians with exceptional research records of the highest caliber.

Applicants for all positions must possess a Ph.D. and should have outstanding accomplishments in both research and teaching. We encourage applications from any area of pure mathematics, applied mathematics, or statistics. Level of appointment will be based on qualifications with appropriate salary per UC pay scales. To receive full consideration, applications should be submitted online through <http://www.mathjobs.org/> by November 1, 2007. For further instructions and information, see <http://www.math.ucsd.edu/about/employment/faculty>.

In compliance with the Immigration Reform and Control Act of 1986, individuals offered employment by the University of California will be required to show documentation to prove identity and authorization to work in the United States before hiring can occur. UCSD is an equal opportunity/affirmative action employer with a strong institutional commitment to the achievement of diversity among its faculty and staff.

All applications should include the following items:

- 3 Reference Letters
(Writers should upload their reference letters to mathjobs.org or send them under separate cover; at least one letter should address teaching experience in some depth.)
- 1 Cover Letter
- 1 Curriculum Vitae
- 1 Publications List
- 1 Research Statement
- 1 Teaching Statement, and optionally a statement about contributions to diversity

SCIENCE ON A SHOESTRING

How to Stock Your Shelves with Free and Inexpensive Science Materials

By Sandy Watson, Ph.D.



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MOST OF US HAVE EXPERIENCED the frustration of limited school-science budgets, and many of us have had to resort to repeatedly dipping into our own personal funds to finance the material needs of our classrooms. Certainly there are some items, such as chemicals and safety equipment, that must be ordered from science-education supply companies, but there are many other items that can be acquired at little or no cost to the teacher or school system. With a little time and effort, you can start the school year with adequately stocked science-supply shelves.

Before beginning your search for materials, check to see if your school has a policy governing the use of items that have been donated or obtained from nontraditional sources (such as local businesses). Double-check your budget for the year and review your school's reimbursement policy before spending any of your own money. Also, take a look through the laboratory activities you have done in the past and want to repeat, and create a list of materials for each activity. If you are looking for low-cost labs to substitute for more expensive activities, Figure 1 lists websites where labs that use inexpensive materials can be found. Peruse those sites and see if anything appeals to you. Save the labs that you feel you could duplicate and add the necessary materials to your supply list. Figure 2 is a sample list of inexpensive and free science supplies

that you can send home to parents with a request for donations. This list can also be posted in the teachers' lounge.

Great places to begin your search for classroom supplies are yard sales, garage sales and flea markets. Be sure to take your list with you and be prepared to dig through boxes. Some people will place a box of toys out and it will be up to you to search through it for balls, marbles, toy cars and other items on your list. Once they learn you are a teacher and are looking for items to use with your students, many people will discount the price of some items or even donate them. I once obtained a large box of more than 150 brand-new amber dropper bottles at no cost from a yard sale when I mentioned I was a teacher and planned to use them in class.

Everyday items often found at yard sales can also be used in the science lab. If you need a class set of mortars and pestles, but find them too expensive, search for metal spoons at yard sales. The back of a metal spoon works very well as a grinding tool. (Use a piece of wax paper to grind on.) Hot plates are also often found at garage sales. I have six that I use and all were purchased at yard sales (none for more than a couple of dollars). Consider picking up plastic storage containers to store your materials in. I have found that square plastic food containers are great for holding small items such as marbles, balloons and toy cars. Many larger storage bins with lids and handles can be found at these sales at bargain prices. Yard sales are unpredictable; you never know what you might

Figure 1. Science lesson plan websites

- *Discovery School*
<http://school.discovery.com/lessonplans/physci.html>
- *Life science and biology lesson plans*
www.accessexcellence.org/AE/AEC/AEF/
- *Educator's Reference Desk*
www.eduref.org/cgi-bin/lessons.cgi/Science
- *Eisenhower National Clearinghouse*
www.enc.org/weblinks/lessonplans/science
- *Academy Curricular Exchange*
<http://ofcn.org/cyber.serv/academy/ace/sci/high.html>
- *ProTeacher Science and Technology*
www.cloudnet.com/~edrbass/edsci.htm#biology
- *TeachersFirst Lesson Plans*
www.teachersfirst.com/matrix.htm
- *Physics Lesson Plans*
www.iit.edu/~smile/physinde.html
- *Hotchalk's LessonPlansPage*
www.lessonplanspage.com/ScienceJH.htm

Figure 2. Free and inexpensive science materials list

- Toy cars (velocity)
- Marbles (velocity)
- Balloons (to show air has mass or capture yeast gas production)
- Metal spoons (mortars)
- Plastic containers (storage)
- Hot plates (heat)
- Pots (to heat water)
- Aluminum pie pans (various uses)
- Magnifying glasses
- Balls (gravity and energy transfer)
- Heavy items such as fishing weights and large bolts (density)
- Tubs to hold water (density)
- Dropper bottles (pH experiments and biological stains)
- Colored pencils, crayons and markers (for drawing activities)
- String
- Rulers, compasses (rulers can be used as marble ramps)
- Craft supplies (for creative projects)
- Magnets
- Simple tools (screwdrivers and tweezers)
- Flashlights (light and color)
- Baby-food jars and other small containers (volume)
- Aquarium supplies
- Science books
- Clay (to hold burning candles to observe chemical change)
- Candles (birthday and larger)
- Measuring cups and spoons
- Disposable cups and plates
- Playing cards (for probability lessons)
- Pot holders

discover. My prize find was a digital scale in great working condition that cost me only a dollar.

Other resources for science materials include local businesses such as hardware stores, film developing centers, newspaper offices, large corporations, medical clinics, doctors' offices and bait shops. It is always a good idea to bring your school identification card and/or a letter from your school principal on school letterhead. My local hardware store offers discounts to teachers and free services. For example, when I needed a set of ramps, I asked my local hardware store to cut a set of eight three-foot-long sections of pine. They also routed out a groove in the center of each plank (for a marble to roll along) at no charge. We only had to pay the cost of the wood itself and that was at a discount. The entire set of eight ramps ended up costing less than \$25, quite a savings over the \$95 per ramp listed in my science supply catalog. In such cases, a thank-you card is also a good idea.

There are numerous uses for film canisters in the science classroom. These can be obtained free of charge from most film development centers. I asked the film development center in a local grocery store to start saving the canisters for me, and they were more than happy to do so. Once a month, I stop by and pick up a large box filled with canisters that I share with the entire science department. A local newspaper office donates the blank end-rolls of newsprint to area teachers. These end-rolls are available in various widths and are great to use for many types of activities.

Many physicians are willing to donate anatomical and physiological posters and models and old medical journals to science teachers. Medical clinics are another resource for science materials. I obtained a set of old x-rays (with patients' identifying information removed) from one clinic that I used when I taught the human skeletal system. My classroom windows worked great as light boxes when I taped the x-rays directly to them.

I found another source of materials in a local pulpwood mill that housed a chemical laboratory. They periodically donated a large supply of chemical laboratory glassware such as distillation tubes, specimen bottles, graduated cylinders, test tubes and beakers. Of course, donated glassware must be thoroughly cleaned, sterilized and inspected for cracks and chips before use by students.

I also frequently drop by the local bait shop to pick up night crawlers, crickets and minnows to use in my biology classes. The local butcher is a great source for free animal organs, such as pig hearts, lungs, kidneys and eyes, for in-class dissections.

One of the laboratory investigations that I use requires friction blocks, rectangular sections of wood with sandpaper attached to one side and an eyehook at one end. They cost \$5–10 each when purchased from a science-education supply

catalog. Instead of buying friction blocks, I made my own set. I noticed that workers at a local construction site had amassed a large pile of wood blocks of various sizes and were preparing to burn them, so I stopped by and asked if I could have some. I sanded down the rough edges, purchased a set of eyehooks, and screwed one into an end of each block. Instead of gluing sandpaper to the blocks, I have students drag the blocks across sheets of sandpaper set on top of the lab table. (One student holds the sandpaper in place, or it can be secured with masking tape.)

Online auction houses such as eBay are another source of potentially cheap science materials. I recently purchased a dozen brand-new spring scales for \$5. These scales sell for over \$6 each in science supply catalogs. I have also purchased microscope slides and coverslips, a model of a frog and other items at steeply discounted prices from these online auction sites. At my school, we have found it much cheaper to buy common household items used in laboratories (such as sodium chloride, ammonia, baking soda, cornstarch and vinegar) in bulk from local discount warehouses rather than pay the prices charged by commercial supply houses.

Teaching science *can* be costly, but it doesn't always *have* to be. Start your collection adventure now and you could soon be running out of storage space. ■

Sandy Watson (sandy-watson@utc.edu) is an assistant professor of science education at the University of Tennessee at Chattanooga.



LEE BITSÓÍ

Native Ambassador

By Meredith Conatti

Growing up in the Navajo Nation sparked my early interest in science. On Navajo land, when you look up at the sky at night, it feels like you can see the entire universe. When I was a kid, I used to wonder what was up there and what the stars were about. I was introduced to science by my mother, who is a rug weaver. I would watch her take different plants, sands and minerals to dye or brighten the yarn. When I helped her, I was actually watching the work of a chemist and ethno-botanist in addition to the work of an artist, though I didn't know it at the time. I would also ask her questions about the stars and she would tell me some of the traditional Navajo stories about the heavens. It wasn't until much later that I realized

LEFT

Dr. Bitsóí in his office at Harvard University.

there were parallels between Western science and the Native worldview of what our place was on the planet and within the universe.

I grew up in a small community called Naschitti in New Mexico. My biological father passed away when I was very young and my mother raised me and my three older brothers and three older sisters on her own. Although she didn't graduate from high school, her experiences with school made an impression on her. She realized the importance of education and she instilled the value of it in us early on. I remember her telling us to get up and get ready for school every morning before she left for work.

By the time I was in high school, I had a full-fledged interest in science. I attended several summer programs in engineering and other sciences. After high school, I attended New Mexico State University,

community on a daily basis. I talked with my advisor about my interests and he told me that I should pursue a career that would be personally fulfilling. That's when I decided that I wanted to become an academic or financial aid advisor in student services and work specifically with Native American students.

I finished my undergraduate work in child development and family relations at the University of New Mexico and I began to work as a financial aid advisor. I knew I wanted to get a master's degree to further my career and I only applied to one school—the Harvard Graduate School of Education. Ferlin Clark, who is the president of Diné College, the Navajo Nation's tribal college, had gone there and encouraged me to attend. At Harvard I earned my degree in administration, planning and social policy. When I graduated, I continued working in administration and financial aid at Dartmouth College. Eventually, I returned to Harvard Uni-

For me, genomics and bioinformatics complement what my community has known about the world for centuries without erasing our knowledge.

where I majored in industrial engineering. I was on a great track until I got to differential equations and calculus. One day, after the semester was over, I realized I didn't understand how relevant calculus was going to be in my life, especially in terms of serving my com-

munity. I worked with the Native American Program. This spring, I completed my Ed.D. in higher education management at the University of Pennsylvania.

Currently, I am the director of minority training in bioinformatics and genomics at Harvard University. My

SACNAS Biography Project

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position allows me to combine my education in college administration with my appreciation for science and my desire to help minority students. In my position, I find resources at various institutions so that an undergraduate, post-baccalaureate or even a Ph.D. will have a fulfilling academic experience. Sometimes a minority student may be the only student of color in a lab. It's important to be able to connect these minority students with each other in a department or university so they don't feel so isolated. I also work with scientists to develop workshops to introduce genomics and bioinformatics to high school and undergraduate students.

For me, genomics and bioinformatics complement what my community has known about the world for centuries without erasing our knowledge. I have not allowed Western education to change my identity—my education only enhances who I am as a person. In fact, my education has led me to fully appreciate and understand even more the rich base of scientific knowledge in the Navajo community. I saw, through my mother's work that we already have an idea of what science is about; it just has never been part of academia because all of our histories and traditions are passed down orally. In my work, I hope to bridge the Western and Navajo scientific traditions, since each complements the other. Other communities of color also have their own traditional bases of knowledge; it is just a matter of finding what the connection is to modern science and moving forward with this enhanced worldview.

I hope that I can serve as an example for other Native American students: You can be Native American and attend a school like Harvard. You can study sciences like genomics and bioinformatics without forgetting the traditions of your community. The balance between old and new, tradition and science, is one you must set for yourself. ■

Meredith Conatti is a recent graduate of the University of California, Santa Cruz, in the Department of Literature. She is currently a graduate student in library science at San Jose State University and serves as the administrative assistant for SACNAS.

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An Expensive Investment: *How to Go to College Without Going Broke*

By **Nancy Rocha**

BEFORE I MOVED north from the San Fernando Valley to attend the University of California, Santa Cruz (UCSC), my parents and I attended a financial aid workshop at my high school during the summer. When they realized that it would cost close to \$24,000 a year to attend UCSC, the looks on their faces were unforgettable. It was a mix between an upset stomach and confusion. My mother determined that the figure was too high and searched out one of the speakers at the event to find out the “truth.” The financial advisor explained to my mother that while that was the correct figure for the cost of attendance, there were many options to decrease that amount: financial aid, grants, scholarships and part-time employment.

The Stay Home Campaign

Even with that information, my parents launched an official campaign to get me to stay home for college. They kept asking me why I was moving out. Why did I not want to go to school close to home and save money, to avoid loans and debt? Despite their questions, I knew that I wanted to move out and be on my own, make mistakes and learn from them, and experience life away from my usual norm. Accepting that my parents had good reasons why I should stay home and knowing that financially it would not be easy, I always kept in mind that I was investing money in my education. Education is something that can never be taken from me and it will pay off when I have a career and financial stability. The overwhelming feeling of joy and pride that I felt when I received the acceptance letter in the mail was enough to convince me that I had to go to UCSC no matter what. The thought of moving away and successfully achieving a college degree was the only thing on my mind and, because of my stubborn personality, nothing was going to stop me!

Convincing my parents that moving away was the best thing for me was very difficult. Since I am the first in my family to go to col-

lege, it was hard for them to understand the reasons why I chose to do it. As the time came closer for me to leave, I just assured them every day that they had nothing to worry about. I kept repeating, “I will be fine! I will come back a better person!” But, their uncertainty and worry made the summer before I left challenging, and I started contemplating changing my plans and staying home. However, I knew that I would not be happy if I settled for anything less than the best education I could get, and I believed that UCSC could offer me much more overall.

Si Se Puede! Making College Possible

Understanding where parents are coming from when they disagree with your plans is quite difficult because we expect our parents to support us in whatever we do. Coming from a close-knit Mexican family, I fully understood why they tried to convince me to stay home. They want nothing but the best for me and part of this means they want me to avoid future debt. The ongoing issue about money between my parents and me is not pleasant at all, but I have learned to not let the stress get to me and do the most I can to be financially stable.

There are many different financial resources available that can help anyone to pursue a higher education. The best thing I can do as a student is to avoid debt as much as possible by maintaining good grades for higher grants, working part-time and applying for as many scholarships as possible. Here are a few tips I have learned:

Accepting that my parents had good reasons why I should stay home and knowing that financially it would not be easy, I always kept in mind that I was investing money in my education.

RIGHT
Nancy Rocha
in a relaxed
moment during
her summer
break.



Loans, scholarships and financial aid. While it is best to avoid accruing too many loans, there are many different companies that offer a variety of payment plans and interest rates. Furthermore, there are parent loans, better known as Federal Parent Loan for Undergraduate Students (PLUS), which give parents or a legal guardian the option of taking out a loan to pay for their child's education. This and other resources are available with the completion of the FAFSA Financial Aid Application, which must be completed every year in order to receive aid. In my case, to avoid involving my parents in my financial issues, any loan I received was under my name because the last thing I wanted was to give my parents another bill to pay in the future.

Stretch your free aid as far as possible. Keep in mind that universities often give a larger amount of money than you will actually spend—if you are frugal. Their assumptions about what a normal student spends throughout the school year may be much more than what you budget for yourself.

Work-study. A great way to be financially stable during college is to get a part-time job. The federal work-study program enables you to earn money toward college expenses by working on campus, in the government or in selected nonprofit agencies serving the community. A monthly paycheck (based on an hourly wage) can also be used for any additional expenses you might incur.

Growing Up

The stress caused by money is something that is a constant burden on me because it is scarce and I have to manage it carefully. Despite our differences in opinion, my parents have noticed that I have become a better person, someone independent and capable of managing money responsibly. I do not regret the decisions I have made thus far. I have grown tremendously as a person and the opportunities that have come my way through attending UCSC have been great. My parents have accepted the fact that I have made a life for myself in Santa Cruz and that I have changed for the better.

I cannot wait to see where life takes me in the future, but for now I am content with where it has brought me. Taking the financial risk

and moving away from home has made me more independent and determined. I have learned to always keep an open mind, voice my opinions and, most importantly, learn from my experiences, both good and bad. Financially, my college experience has been challenging, to say the least. In spite of this, I find it important to maintain an optimistic outlook and focus on my studies as an undergraduate, so I can finish strong and become successful. ■

Nancy Rocha begins her third year at UCSC this fall, majoring in sociology with a minor in education. She has worked with SACNAS for a year through the campus work-study program. Nancy hopes to become a high school counselor in order to inform and encourage students to pursue higher education (and serve as a resource for parents as well).

RESOURCES

Resources on loans, scholarships and financial aid:

- **Free Application for Federal Student Aid (FAFSA)**
Application and resources for filling out the application for federal aid.
www.fafsa.ed.gov
- **Student Aid on the Web**
The U.S. Department of Education's site for information about grants, loans, work-study and tax credits for education and how to apply for them.
www.studentaid.ed.gov
- **PLUS Loans**
Parent loans that fund the entire cost of an education.
www.parentplusloan.com
- **Next Student**
Online resource for loans, scholarships and general student financial advice.
www.nextstudent.com
- **Fast Web**
Online scholarship database.
www.fastweb.com

Resources on creating student budgets:

- **Further Your Education**
Basic budgeting information and advice for students. www.furtheryoureducation.com/transfer/life_at_four_year/create_budget.shtml
- **Wells Fargo**
Advice from Wells Fargo on creating a student budget.
www.wellsfargo.com/student/money/budget
- **About.com: Financial Planning**
Budget worksheet for students.
<http://financialplan.about.com/od/moneyandcollegestudents/l/blcollbudget.htm>

Resources on work-study:

- **Mapping Your Future**
Information about federally funded work-study programs.
www.mapping-your-future.org/paying/workstud.htm

Viewpoint features distinguished SACNAS mentors, honored annually at the National Conference, who respond to questions from students regarding research, graduate school, internships, etc.

Featured Mentor:

DONNA NELSON, PH.D.



ABOVE
Dr. Donna Nelson conducted groundbreaking studies on the participation of women and minorities in the sciences.

SN: *Any tips on money management when federal assistance funds are reduced?*

DN: The main suggestion I have to offer is always live within your means and try to borrow as little as possible so you don't have a big debt when you graduate. There are many instances of credit card companies coming on to campuses and signing students up for credit cards. Many students are not used to dealing with credit cards and the next thing you know, they wind up 12, 15, 20 thousand dollars in debt, depressed and overwhelmed by the amount they owe. Certainly stay away from the credit cards and if you really

feel like you need loans, go through a regular student loan program or perhaps get a loan from a family member.

SN: *It is often difficult for the families of first-generation college students to understand the importance of a higher education, and they often complain about how expensive it is. What advice would you give students to help communicate to their parents the benefits of pursuing a higher education?*

DN: Education is essential. Getting a college degree today is equivalent to getting a high school education 30 or 40 years ago. To have a nice future with opportunities and the capability to reach one's full potential, you must get a degree. If you can't convince your parents about the necessity of a college education, then you might ask one of your advisors on campus to speak to your parents—to involve them as much as possible in your education. Your parents won't learn to understand your desire for education if they don't have the opportunity to hear about it, or better yet, observe it. Have them visit you on campus. Encourage them to attend "family days."

Of course, another way to win your parents over is to make great grades so that they will see that they are really

getting a return for their investment. If you make good grades, you'll be more likely to get grants instead of loans. But be careful! Don't try and rush through school by taking too many classes. You won't be able to focus on each class and you will be competing against students who are enrolled in fewer classes. If your grades get too low, you can lose your grant or loan. Even if it takes an extra semester to finish school, only enroll in as many classes as you can handle and succeed in.

SN: *What do graduate schools look for the most: leadership skills, extracurricular activities, test scores, grades, letters of recommendation and/or community service? What guidance can you give me when it is time to apply to graduate school?*

DN: In applying to graduate school in the sciences and engineering, you have to have research experience and evidence of this comes through a letter of recommendation. I have heard some professors say that they have been happier with a solid B student who knows how to do research than an A student with no research experience. A student who has successful research experience is often well-organized, responsible, and capable of going into a lab, taking on a project and seeing it all the way through to completion. So, the talent that one looks for in graduate students is really different from what one is looking for among undergraduates. Bottom line: Demonstrate that you are capable of doing research. Many times there are courses that are offered in which the student does research for the professors. It can be a directed reading, or even an independent study, but it will be some sort of research in the lab. This sort of experience, and especially if you can get

your name on a publication, shows that you really made a significant contribution and participated to a level where you deserved to have your name on the paper as a co-author. That would really be a feather in one's cap in applying for graduate school! ■

Dr. Donna Nelson received the 2006 SACNAS Distinguished Scientist Award. She is an associate professor of chemistry at the University of Oklahoma. In addition to her research on developing a new synthetically useful technique for gathering mechanistic information on addition reactions of alkenes, she has conducted a number of crucial studies related to the participation of women and minorities in the sciences, student learning, and factors influencing student retention in the sciences. She is delighted that her son Christopher Brammer received his B.S. in chemical engineering last May. If you have additional questions, please contact Dr. Nelson at djnelson@ou.edu.

To submit a question for a Viewpoint mentor, contact editors@sacnas.org.





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How to Start Your First Lab: The Roots of Career Sustainability

By **Martin Farias, Ph.D.**



I HAVE BEEN THROUGH Hurricane Katrina, a dissertation defense and multiple cross-country moves. Starting my laboratory ranks up there with these traumatic events! Imagine walking into an empty room knowing that your entire career depends on you turning it into a laboratory. Several things run through your mind: “Where do I start? Am I ready for this? What was I thinking?!” Of course, you have other things to balance: a full teaching load, university service and family (in my case, a wonderful wife and three children).

Imagine walking into an empty room knowing that your entire career depends on you turning it into a laboratory. Several things run through your mind: “Where do I start? Am I ready for this? What was I thinking?!”

But, starting your own lab can be less stressful if you begin preparing early.

I am currently an assistant professor in the Department of Pharmaceutical Sciences at the Texas A&M Health Science Center, Irma Lerma Rangel College of Pharmacy, in Kingsville, Texas. It’s the first professional school in south Texas and I am the first Hispanic pro-

fessor to be a part of this history. Why do I mention this? Because being a new professor at a new school adds extra stressors. We are all starting from scratch, a very different experience than working in an established university. Despite these challenges, my laboratory is almost complete, even with the hefty workload of being a first-year, tenure-track faculty member. In this article, I present what I have gleaned through the trials, errors and experiences of starting my own lab. I want to share my thoughts on entering academia and establishing a laboratory, where time and timing are critical!

YOUR GRADUATE/ POSTDOCTORAL YEARS

Start planning your lab now!

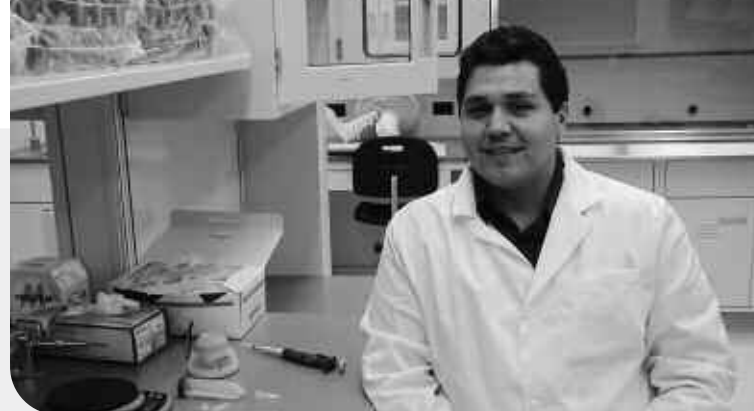
Although this may sound premature, getting an early start in planning your lab is the smartest thing you can do for your career. It will save you time and pain, and land you a job. Start by listing your major areas of research interest during your graduate and postdoctoral years. Peruse the literature, create ideas, and find gaps in knowledge that are interesting to you. This will help you immensely because coming up with the idea can be the most difficult part of research. This process takes time, research, thought and interaction with fellow scientists. I urge you to start now. And it never hurts to ask your mentor, “Can we try this experiment?”

Learn how to use new techniques and equipment. Once you begin to get an idea of what you will research, start learning about the equipment and research techniques. Then, take appropriate classes or workshops to learn about these techniques and this equipment. The more tools you have, the more problems you can solve; I was once told by a mentor that a toolbox is better full than empty. Having this knowledge will also make you very marketable as a scientist. Remember, you have plenty of time at this point, so make use of it. The benefits will be enormous!

Establish a grant record. While you are figuring out research questions and techniques to use, begin to establish a grant record to show that you can compete for funding. Start looking for graduate or postdoctoral grants that pertain to your research. Excellent grant resources at this stage include NIH National Research Service Awards, National Science Foundation grants and Ford Foundation grants. Your grant record will also make you competitive when faculty position

RIGHT

Dr. Martin Farias, III, gets right to work in his new lab at TAMHSC, Irma Lerma Rangel College of Pharmacy.



committees are looking at your curriculum vitae or reviewers are looking at your grants. For postdocs in particular, obtaining grants can be the impetus for funding preliminary data projects that you will continue as a faculty member.

JOB INTERVIEW AND OFFER

All good things must come to an

end. I speak of your graduate and postdoctoral training. So, let the job search begin! After applying for a few positions, you finally get an interview several months later. What do you do now?

Do your homework! This is when all timidity goes out the window. Besides creating a well-prepared talk and behaving like a scientist, you should ask every question under the sun during the interview. Here are a few:

- What will my teaching load be?
- How much lab space will I have?
- What is the amount of startup funds that I will receive?
- What is the deadline to use my startup funds?
- Will I have technicians and students available?
- When do you want the lab to be up and running?
- Are there any grant-writing and preparation resources available to new faculty?
- When am I expected to obtain my first grant?
- How large should the grant be?
- What is the tenure process like?
- Can you give me the guidelines for the tenure process?
- Will I have a faculty mentor?

You can write a laundry list of questions. The point here is to be thorough. Know exactly what you are getting into

and decide if the resources offered will help you be successful. Once you deem the offer satisfactory (or excellent), get it all in writing. Please do not do this alone: Use mentors to help you formulate questions and provide input on this decision. Mentors will have good insight.

Contrary to popular belief, you do not need grant funds to get a job. However, a chairperson will tell you that it is easier to hire a funded, productive scientist than one who is not. Of course, coming in with a grant is not always possible. In that case, knowing what you will research and having clear aims and plausible grant sources can help you land the job.

YOU GOT ACCEPTED: NOW GET TO WORK!

You get a call a few weeks later. You got the job! You have done your homework and you have decided the position is for you. Now what? Make a plan for your success. Indra Reddy, dean of my college, says, "Failure to plan is planning to fail." So, plan your laboratory! This is

when the prep work in your graduate and postdoctoral years pays off because you will already have an idea, aims and a list of the equipment you will need. Moreover, if you were very smart (and sometimes lucky) you already have preliminary data from your previous laboratory. The questions that would have haunted you have already been answered. Now you can focus on stocking the lab and performing experiments. Gabriel Navar, past president of the American Physiological Society, once told me that busy work will keep you busy, but work that leads to manuscripts will get you published. You will need those for tenure. So get to work! ■

Dr. Martin Farias III is an assistant professor of physiology at Texas A&M Health Science Center (TAMHSC), Irma Lerma Rangel College of Pharmacy. Current funding for his laboratory comes from startup funds, a TAMHSC research and development grant, and department core facility funds.

POSTDOC & BEYOND RESOURCES

For overall career development:

■ **Science magazine's online journal Science Careers**
An exhaustive resource that includes articles on résumé building, grant writing, interviewing, networking and job applications.
http://sciencecareers.sciencemag.org/career_development

■ **Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty**
An online publication produced by the Burroughs Wellcome Fund and the Howard Hughes Medical Institute that provides a step-by-step guide to obtaining and sustaining a faculty position.
www.hhmi.org/resources/labmanagement/

For grant-writing tips:

■ **Grant writing at the National Institutes of Health (NIH)**

A directory of grant-writing guides put out by various NIH institutes.
http://grants.nih.gov/grants/grant_tips.htm

■ **The Craft of Grant Writing workbook**

A comprehensive workbook to assist investigators in writing grants. This valuable workbook covers every phase of the proposal preparation process.
<http://opd.tamu.edu/the-craft-of-writing-workbook>

■ **For a glimpse into funding opportunities at NIH and the National Science Foundation (NSF):**

- <http://grants1.nih.gov/grants/index.cfm>
- www.nsf.gov/funding/

Perspectives is a forum for postdocs, junior faculty and young professionals to share peer-to-peer insights and form community networks.

COULD YOU, WOULD YOU, SHOULD YOU DO A POSTDOC?

*Tips on Decision Making,
Applying and Interviewing
for the All-Important Postdoc*

BY CHRIS BLAGDEN, PH.D., AND IVONNE VIDAL PIZARRO, PH.D.

SO YOU'VE WRITTEN YOUR DISSERTATION

and successfully defended your thesis. Now what? Are you headed for a career in industry? Academia? Where do you see yourself in 5 to 10

years? How do you want to use your Ph.D.? Time spent seriously pondering these questions will better direct the next stage of your career.

Be aware that what you want to accomplish with your professional life may not actually require postdoctoral experience. The only career path that generally requires postdoctoral experience is the academic track. However, this is not true in all disciplines. Remember that only around 25 percent of Ph.D.s in science, technology, engineering and mathematics will actually take the postdoc route. (Nearly 45 percent have definite employment, 28 percent are seeking employment and 2.5 percent have unknown plans.)¹ For several other career paths, such as becoming a scientist in the pharmaceutical industry, having some extra research experience can be a bonus, but it is certainly not essential. If your career trajectory requires a postdoc, then here are some suggestions to consider:

Don't ever underestimate the importance of schmoozing. Network, network, network. When you think you have finished, network some more. Spend as much time as you can during your Ph.D. education talking to everyone you meet at

seminars, meetings and other events. You never know when and where a networking opportunity will open up. In other words, don't be shy! You may be talking to not only one of your future mentors, but people who could serve as references or put you in touch with good professional contacts. These people can have ideas on what will be hot areas of study over the coming years, what tools and skills you should be looking to acquire to pursue a line of investigation, and what other useful "outside the box" suggestions you may not have previously considered.

Keep your options open. Make sure your postdoc will provide you with the liberty to explore your career options. Although an aca-

Where do you see yourself in 5 to 10 years? How do you want to use your Ph.D.?

demic postdoc at a university research institution is the most common place to carry out your training, an industry postdoc may be more suitable if your career trajectory leads you in that direction. If you are interested in the industrial sector, research postdoctoral opportunities carefully, since some companies do not guarantee positions with them following a postdoc or put rigid term limits on the length of time you can do a postdoc with them.

On the other hand, if teaching is in your future, you need to obtain teaching experience. Keep in mind that if you work as a postdoc in a medical school, or a small privately funded research institu-

tion, it may be difficult for you to get into the classroom. There are greater research opportunities at a medical school because they have more resources, and the benefit to working with a small privately funded research institution is that you'll get to know most folks there. But, either institution may make it difficult for you to teach because they may not be willing to release you from the bench to participate in teaching work, which wouldn't further the research you are funded to carry out. The principal investigator would have to be someone who is committed to mentoring you and helping you to develop the skills to further your career goals. Regardless of your career interests, make sure your mentor is aware of them and is prepared to actively support you.

Think about your research. Where do you want to take your research? You can acquire new skills and training by doing a postdoc in an area totally unrelated to your graduate studies. Or you can use your postdoc as a springboard to a slightly different area of the same field. If your advisor is amenable, maybe you'd like to continue along the same lines as your graduate work. (In this case, be sure to demarcate what in your project is portable and what work needs to remain with your graduate advisor.)

After you decide what area of research you want to work in, identify appropriate laboratories. Remember, geographical location may be important to you. Finally, in deciding which lab to apply to, make sure you conduct a literature search; if the lab's publication rate is slow, as a postdoc, yours will be too.

Prepare the perfect application. Polish your writing skills! Write and/or update your curriculum vitae (CV). Prepare personalized cover letters. For editorial help, take advantage of the career services office on your (or your alma mater's) campus to prepare these documents. Also, don't forget to publish! Make sure you have your studies written up and out the door, since you will have less time to focus on them once you leave your graduate laboratory. Remember, publications are the currency of academia.

Obtain strong letters of recommendation. Your thesis committee members should serve as a good starting point. Be sure to ask your advisor and three other faculty members for strong letters of recommendation. Get copies of their CVs from them to help you prepare your own CV and to determine whether this is someone from whom you would want a recommendation. Give them plenty of time to prepare a well-crafted letter.

Interview in person. Make sure you get an invitation to interview in person. Never accept a postdoctoral position solely on the basis of a telephone call. You want to take advantage of the opportunity to meet all the members of the lab in person.

Prepare for the interview by putting together a strong presentation. Since you'll essentially be preparing your thesis presenta-

tion, this should be easy. The difference is that at an interview, your audience may not be as familiar with you or your advisor's work. So, you may need to provide more background. Be ready to answer questions; this is a very important part of your presentation. Finally, practice, practice, practice to make sure your presentation will be spot-on. Nothing favors that outcome more than repetition. Ask your advisor and fellow graduate students to sit in on a practice session and provide you with feedback. Consider giving your presentation at a joint lab meeting or as an oral presentation at a conference (the SACNAS National Conference, for example) ■.

Drs. Chris Blagden and Ivonne Vidal Pizarro met through their work for the National Postdoctoral Association. Chris did his postdoc at New York University School of Medicine. He is currently an associate program director at SciMed and can be reached at cblagden@scimedny.com. Ivonne did a brief postdoc at the University of Pennsylvania and is now a program administrator and scientist at the American Association for Cancer Research. She can be reached at vidal@mail.med.upenn.edu.

1. Survey of Earned Doctorates, "Doctorate Recipients from United States Universities—Summary Report 2005." Available at www.norc.org/NR/rdonlyres/2E87F80C-82F6-4E26-9F78-CA4C6E0B79C6/0/sed2005.pdf.

Cardiovascular Behavioral Medicine Postdoctoral Research Fellowships

One- to three-year mentor-based program with opportunities for formal didactic work in:

- psychophysiology
- cardiovascular disease/pathophysiology
- principles of behavior and behavior change
- research methods and statistics
- ethics and academic survival skills

For application guidelines and program details, visit www.wpic.pitt.edu/behavioralmedicine.

Contact riegnerag@upmc.edu.



University of Pittsburgh

■ **Luis R. Alicea**, a SACNAS member since 1999, was accepted to the Department of Mathematics, Science and Technology in the Teacher College at Columbia University in New York City for fall 2007. He will pursue a master of arts in secondary science education in chemistry with a focus on grades 7-12.

■ **Dr. Almaris Alonso**, a recent Ph.D. recipient from the University of Massachusetts Amherst and a former member of the SACNAS Board of Directors, received the first annual Women Who Make a Difference Award. The award is sponsored by the Women of Color Leadership Network and publicly honors women who are successful in their fields and who have worked closely with women of color.

■ **Georgina Bermudez**, who graduated with a B.E. in biomedical engineering in May 2004, is currently completing a M.S. in biomedical engineering at City College of CUNY. She plans to pursue a second M.S. in teaching at Queens College.

■ **Dr. France Córdova**, former chancellor at the University of California, Riverside, and keynote speaker at the 2003 SACNAS National Conference, was recently appointed president of Purdue University in West Lafayette, Indiana.

■ **Dr. Ricardo Cortez** was promoted to full professor in the Department of Mathematics at Tulane University in New Orleans, Louisiana.

■ **Mr. Oscar Espinoza**, a science educator at Roosevelt Middle School in Compton, California, was one of two faculty advisors for the school's team that participated in the Seventh Annual MESA USA National Engineering Design Competition. Roosevelt Middle School placed first in the competition with a trebuchet (catapult-like device) that could perform two distinct tasks.

■ **Dr. Roberto Garza** was promoted to full professor in the Department of Chemistry at Pomona College in Claremont, California. Dr. Garza is the first Mexican National (he has dual citizenship) to achieve such academic status in the history of Pomona College.

■ The book *Flor y Ciencia: Chicanas in Science, Mathematics, and Engineering* won a bronze medal at the 2007 Independent Publisher Book Awards. A total of 2,690 national entries came from all 50 U.S. states, eight Canadian provinces and 17 countries overseas. *Flor y Ciencia*, edited by **Norma E. Cantú**, features the stories of SACNAS members **Drs. Elma Gonzalez, Aida Hurtado, Diana Marinez, Cleopatria Martinez, Lupita Montoya, Elvia Niebla, Elisa Ruiz, Maria Elena Zavala and Martha Zuñiga.**

...continued on page 25



Meet the New Ph.D.s of SACNAS

Almaris N. Alonso, Ph.D.

aalonso@microbio.umass.edu

Ethnicity: Puerto Rican

Degree Conferred: Ph.D. in microbiology (May 2007)

Institution: University of Massachusetts Amherst, Department of Microbiology
Dissertation Title: Biofilm Formation and Cellulose Degradation in the Life Cycle of the Cellulolytic Actinomycete *Thermobifida Fusca*
Thesis Advisor: Susan B. Leschine
Research Interests: Biofilm and mycelial pellets formation by filamentous and cellulolytic microbes, extracellular polymeric substance characterization, microscopic analyses (e.g., SEM, TEM and SCLM), cellulases gene expression during biofilm formation on cellulosic substrates

Current Position: Currently applying for a postdoctoral fellowships and research scientist positions.

Pedro Barba, Ph.D.

barba@egr.msu.edu

Ethnicity: Hispanic

Degree Conferred: Ph.D. in electrical engineering

Institution: Michigan State University, Department of Electrical and Computer Engineering

Dissertation Title: S-Parameter Extraction of Inhomogeneously Filled Waveguides

Thesis Advisor: Dr. Leo Kempel

Research Interests: Computational electromagnetics and solid state electronics

Current Position: Visiting assistant professor in the Department of Electrical and Computer Engineering at Michigan State University

Lee Bitsóí, Ed.D.

bitsoi@fas.harvard.edu

Ethnicity: American Indian (Navajo)

Degree Conferred: Ed.D. in higher education management

Institution: University of Pennsylvania, Graduate School of Education

Dissertation Title: Native Leaders in the New Millennium: An Examination of Success

Factors of Native American Males at Harvard College

Thesis Advisor: Dr. Marybeth Gasman

Research Interests: Increasing access to higher education for minority students

Current Position: Director of Minority Training in Genomics/Bioinformatics, Department of Molecular and Cellular Biology, Harvard University

Jeanette P. Brown, Ph.D.

jeanettepbrown@gmail.com

Ethnicity: Mexican American

Degree Conferred: Ph.D. in immunology (May 2007)

Institution: University of Colorado Health Sciences Center, National Jewish Medical and Research Center

Dissertation Title: Arhgef1 Is Required by T Cells for the Development of Airway Hyperreactivity and Inflammation

Thesis Advisor: Dr. Raul Torres

Research Interests: Immunology, translational research

Current Position: Third-year medical student at the University of Colorado Health Sciences Center

Shakira Franco, Ph.D.

sfranco@nsph.harvard.edu

Ethnicity: Puerto Rican

Degree Conferred: Ph.D. in epidemiology and environmental health

Institution: Harvard University, School of Public Health

Dissertation Title: The Influence of the Social and Physical Environment on Child Health

Current Position: Research fellow at the Harvard School of Public Health

Leonel Gomez, Ph.D.

leonel.gomez@exxonmobil.com

Ethnicity: Latino

Degree Conferred: Ph.D. in geological sciences

Institution: Department of Geological Sciences, Jackson School of Geosciences, University of Texas at Austin

Dissertation Title: Characterization of the Spatial Arrangement of Opening-Mode Fractures

Thesis Advisor: Dr. Randall Marrett

Research Interests: Evolution of natural opening-mode fractures in rocks during folding, influence of diagenesis on quantitative attributes of fracture networks

Current Position: Senior research geologist at the Upstream Research Company of Exxon Mobil Corporation

Daniel R. Howard, Ph.D.

daniel-howard@utulsa.edu

Ethnicity: Native American (Cherokee and Shawnee)

Degree Conferred: Ph.D. in biology
Institution: University of Tulsa, Department of Biological Sciences
Dissertation Title: Reproductive Behavior in *Gryllotalpa major* Saussure (Orthoptera: *Gryllotalpidae*): The Influence of Environmental and Physiological Factors on Lek Spatial Plasticity
Thesis Advisor: Dr. Peggy S.M. Hill
Research Interests: Insect ecology with an emphasis on communication and behavior, evolution of orthopteran neural adaptations, GIS technology in biodiversity surveys and habitat modeling
Current Position: National Science Foundation postdoctoral fellow at the University of Toronto, Scarborough and Victoria University, Wellington, New Zealand

Vivian Colon Lopez, Ph.D.

vcolon@umich.edu
Ethnicity: Puerto Rican
Degree Conferred: Ph.D. in epidemiology
Institution: University of Michigan, School of Public Health, Department of Epidemiology
Dissertation Title: Nativity and Age at Migration in Relation to All-Cause and Cardiovascular Mortality Among Older Mexican Americans: An Examination of Social, Cultural and Biochemical Pathways
Thesis Advisor: Dr. Mary N. Haan
Research Interests: Immigration and cardiovascular risk; socioeconomic, environmental and cultural determinants and their association with cardiovascular risk among older immigrants
Current Position: Assistant professor, University of Puerto Rico, Medical Sciences Campus, Centro de Investigacion y Evaluacion Sociomedica

Geanncarlo Lugo-Villarino, Ph.D.

gelugo@ucsd.edu
Degree Conferred: Ph.D. in immunology
Institution: Harvard University, Division of Medical Sciences, Department of Immunology
Dissertation Title: The Role of the Transcription Factor T-bet in Dendritic Cells
Thesis Advisor: Dr. Laurie H. Glimcher
Research Interests: Developmental immunology
Current Position: Postdoctoral fellow at the University of California, San Diego, in the section of cell and developmental biology

Jose Angel Pacheco, Ph.D.

jalucero@miners.utep.edu
Ethnicity: Latino (Puerto Rican)
Degree Conferred: Ph.D. in biological sciences

Institution: University of Texas at El Paso, Department of Biological Sciences
Dissertation Title: The New World Thief Ants of the Genus *Solenopsis* (Hymenoptera: Formicidae)
Thesis Advisor: Dr. William P. Mackay
Research Interests: Ecology, behavior, taxonomy and systematics of Hymenoptera, especially ants and bees
Current Position: Postdoctoral fellow at the University of Colorado at Boulder

Mark H. Palmer, Ph.D.

mpalmer@ou.edu
Ethnicity: Native American (Kiowa Tribe of Oklahoma)
Degree Conferred: Ph.D. in geography
Institution: University of Oklahoma, College of Atmospheric and Geographic Sciences, Department of Geography
Dissertation Title: Creating Indigital Peripheries: The Bureau of Indian Affairs, Geographic Information Systems, and the Digitization of Indian Country

Thesis Advisor: Dr. Robert A. Rundstrom
Research Interests: Geographic information systems and society, natural resource management, North American Indians, earth systems science (human dimension)
Current Position: Postdoctoral fellow in earth system science program combining geoscience and American Indian knowledge systems at the University of Oklahoma, College of Atmospheric and Geographic Sciences

Kathryn Perez, Ph.D.

keperez@duke.edu
Ethnicity: Chicana (Mexican American)
Degree Conferred: Ph.D. in biology
Institution: University of Alabama, Department of Biological Sciences
Dissertation Title: Selected Topics in Invertebrate Conservation
Thesis Advisor: Dr. Chuck Lydeard
Research Interests: Evolutionary biology
Current Position: SPIRE postdoctoral fellow at Duke University



COMMONWEALTH FUND / HARVARD UNIVERSITY



FELLOWSHIP IN MINORITY HEALTH POLICY

At the Harvard Medical School - Boston
 Applications now accepted for a 1-year, full-time fellowship beginning July 2008. Program prepares physicians for leadership positions in minority health policy and public health. Incorporates intensive training in health policy, public health and administration. Will complete academic work leading to a master's degree at Harvard School of Public Health. Full graduate program includes courses, seminars, leadership forums, practicum, site visits and mentoring by senior faculty and public health leaders.

The Fellowship also offers the MPA degree at Harvard's John F. Kennedy School of Government to physicians who already have an MPH.

Qualifications - BC/BE required, experience with minority health issues, interest in public policy and public health, and U.S. citizenship.
Salary/Benefits - \$50,000 stipend, master's degree tuition, health insurance, travel for professional meetings and site visits.
Application Deadline - January 2, 2008

Contact
 Joan Y. Reede, MD, MPH, MS
 Dean for Diversity and Community Partnership
 Harvard Medical School
 164 Longwood Avenue, 2nd Floor, Boston MA 02115-5818
Phone: (617) 432-2922 **E-mail:** mfdp_cfuf@hms.harvard.edu
Web site: www.mfdp.med.harvard.edu

 **Underrepresented Minorities and Women are Encouraged to Apply** 



SPOTLIGHT ON

SACNAS CHAPTERS

The SACNAS Chapters Program provides students and faculty with an important means to build a SACNAS community outside of the once-a-year national conference. Since the first chapter opened in 2003, an average of eight new chapters have been chartered each year, including a high school chapter in 2004 and a K-12 educator chapter in 2006. There are now 41 SACNAS chapters across the U.S. and Puerto Rico with members ranging from high school students and teachers to professional staff and faculty.

By examining how various chapters function, corresponding to their relative years of development, SACNAS has identified three main factors of chapter success in the areas of member retention, fundraising, leadership development and chapter activities:

Three keys to SACNAS chapter success:

- Advisor participation
- Established chapter governance
- Campus and community relationships

ADVISOR PARTICIPATION

The success of thriving SACNAS chapters can be attributed to the degree of participation of the chapter advisor. The role of the faculty or staff advisor, a requirement of SACNAS chapters, is to provide mentoring and moral support in addition to helping maintain the chapter's governance. Advisors offer a range of assistance, such as providing meeting space, helping train and guide newly elected chapter officers, lending

advice in event planning, facilitating networking opportunities on campus with other departments, and providing stability through the annual academic cycle of incoming and graduating members. Because of the extent of support needed to run and sustain a chapter, groups with multiple faculty or staff advisors often experience more success than chapters that rely on one advisor alone.

For the last two years, the SACNAS chapter at the University of California, Santa Barbara (UCSB), has incorporated four advisors to support chapter governance and membership. Ofelia Aguirre and Griselda Velazquez serve as staff advisors through the California NanoSystems Institute while Dr. Ken Millett and Dr. Hector Cenicerros serve as faculty advisors from the Department of Mathematics. Each works with the chapter to provide structure and consistency in activities, leadership training and support with fundraising.

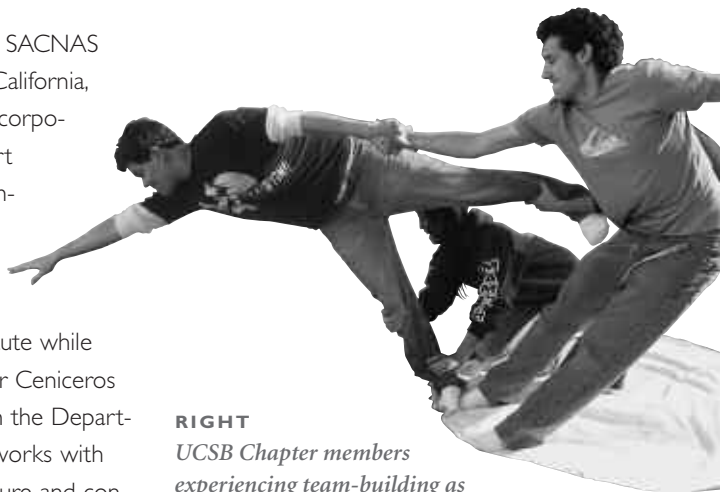
The SACNAS chapter at Colorado State University (CSU), chartered this year, has two advisors. Christine Paguyo is the staff advisor and Arelene Nededog serves as the faculty advisor. The chapter also created a Faculty Advisory Board that includes 13 faculty members representing natural sciences, engineering, and veterinary and biomedical sciences. Chapter president Michelle Przybyzi states that the goals for creating the Faculty Advisory Board were "to connect SACNAS students with internships and research experiences [and] increase recruitment by reaching students

that may not respond to emails or posters on campus."

Both the UCSB and CSU chapters have experienced exceptional membership growth and steady funding, the initial and ongoing success of which they attribute to the strength of their advisor teams.

ESTABLISHED CHAPTER GOVERNANCE

Newly formed chapters typically start with the necessary ingredients of enthusiasm, creativity and vision. However, without a plan for establishing structured governance,



RIGHT
UCSB Chapter members experiencing team-building as part of their leadership training.

newly formed chapters can easily experience burn-out by the start of their second year, with chapter officers doing everything for a waning membership.

Chapters at the University of Texas at El Paso (UTEP), San Diego State University (SDSU) and the University of California, Santa Barbara, have worked hard to create models of governance that sustain chapter structure independent of the changes in leadership that can result when officers graduate or advisors leave for new positions. These chapters have created systems of management that include consistently

scheduled meetings; the creation of project-focused committees; year-long programs that include campus events, community service and research presentations; and overlap in officers' terms to ensure leadership training and preparation for newly elected officers.

All three chapters have incorporated structures to maintain records of their complex management strategies to ensure that the lessons they have learned are transmitted over time. In addition, their chapter governance models support flexibility to test different tools for increasing their success. To address member retention, for example, UCSB has incorporated a point system for members. Chapter member participation is monitored and rewarded with points accumulated by participating in chapter activities. The points allow members to qualify for research opportunities, funding to cover SACNAS conference registration and membership, and mini-scholarships that cover costs of books or school materials.

CAMPUS AND COMMUNITY RELATIONSHIPS

Student organizations that choose to remain independent of other campus groups, departments and programs, or that only have members within one discipline, often face challenges. They are more likely to experience a sense of isolation, find recruiting an uphill climb, and have a hard time attaining consistent attendance at events. SACNAS chapters have recognized that keys to success on all fronts are the relationships the chapter builds on campus and in the larger community. These relationships have resulted in annual event partnerships, increased mentoring and research opportunities in diverse departments, overall chapter visibility, and new funding opportunities.

Dr. Almaris Alonso, past president of the University of Massachusetts Amherst (UMASS) SACNAS Chapter and founder of the Myriam Rosario Burgos (MRB) SACNAS Chapter, has created opportunities for both chapters through relationship-building. An estimated \$13,000 was raised for both chapters through relationships with private donors, Sandia National Laboratory and the Arecibo Observatory. The UMASS SACNAS Chapter has also been able to help start three new SACNAS chapters in 2007 at Springfield Expeditionary Learning School, the University of Turabo and the University of Puerto Rico in Mayagüez.

GROWING OPPORTUNITIES

With the start of the 2007–2008 school year, SACNAS chapters are at an exciting juncture. There is no question that the number of SACNAS chapters will continue to grow. The question of chapter longevity and quality is now at the forefront. By examining how chapters function at each year in their development, SACNAS can highlight chapters' successes. To support chapter growth and leadership potential, SACNAS will host a major chapter event on Friday, October 12, at the 2007 SACNAS National Conference. The Chapter Extravaganza will be an opportunity for vital exchange of the keys to chapter success. SACNAS invites all members of the community to take part in this event to contribute to new chapters' success, revitalize veteran chapters threatened by inactivity and elaborate upon the successes of the SACNAS Chapters Program.

For more information about SACNAS chapters, contact Tanya Beat, program manager, at (831) 459-0170, ext. 241.

Community News continued...

■ The book *Ay Mija! Why Do You Want to Be an Engineer?* by **Edna Campos Gravenhorst** won an honorable mention at the International Latino Book Awards. The book, second in a series, profiles successful Latina engineers to inspire young math and science students.

■ **Mr. Michael Kevin Hernandez** graduated from the University of Miami with a degree in applied mathematics and meteorology. His senior thesis was titled *Reanalysis of Hurricane Katrina Over South Florida*.

■ **Dr. Norma Neely**, a science instructional facilitator at the NE Regional Professional Development Center and member of the SACNAS Board of Directors, earned a spot as a participant in the "International Polar Year: Research and Educational Opportunities in Antarctica for Minorities" (IPY-ROAM initiative) at the University of Texas at El Paso. The initiative offers the opportunity for university students and high school teachers to learn more about the polar regions and travel to Antarctica to acquire firsthand experience in field-based research and Antarctic system science.

■ **Dr. Cordelia Ontiveros**, a life member of SACNAS, has been named associate dean in the College of Engineering at California State Polytechnic University, Pomona. As associate dean, she is responsible for academic programs and student services. Dr. Ontiveros received her Ph.D. in chemical engineering from Princeton University.

■ **Dr. Alberto Roca**, an assistant project scientist in the Department of Molecular Biology and Biochemistry at the University of California, Irvine, received the Living Our Values Award in recognition of his contributions to the postdoctoral community. The award honors members of the UC Irvine employee community whose actions best embody the university's values of respect, intellectual curiosity, integrity, commitment, empathy, appreciation and fun. Dr. Roca designated the \$1,000 award to SACNAS.

■ **Ms. Jamie Thomas**, a sophomore at Oklahoma City University, was selected to work at the National Heart, Lung and Blood Institute of the National Institutes of Health through the Washington Internships for Native Students program.

■ **Dr. Aaron Velasco**, SACNAS president and associate professor of geology at the University of Texas at El Paso (UTEP), recently received funding for the IPY-ROAM initiative. IPY-ROAM is the "International Polar Year: Research and Educational Opportunities in Antarctica for Minorities" program hosted by UTEP. Dr. Velasco serves as co-principal investigator.

In memory of

DR. ALBERT V. BAEZ

November 15, 1912—March 20, 2007

BY GEORGE CASTRO, PH.D.



ABOVE
*Albert Baez, Ph.D.,
Research Physicist*

Dr. Baez was a distinguished physicist, educator and humanitarian, and one of the first Latinos to receive a Ph.D. in science in the U.S. He was born in Puebla, Mexico, and came to the U.S. at the age of two. He was raised in Brooklyn, New

York, where his father was a minister. He received a bachelor's degree from Drew University in 1933, a master's degree from Syracuse University in 1935, and a Ph.D.

degree from Stanford University in 1949, all in the field of physics.

At Stanford, Baez was a pioneer in the development of reflection x-ray optics; later, while teaching at the University of Redlands, he developed the first Fresnel Lens that was capable of focusing x-rays. These lenses, called zone plates, are the primary focusing elements in today's highest resolution x-ray microscopes.

Dr. Baez was the first director of science education at the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and he was a former chairman of the Commissions on Science Education for the American Association for the Advancement of Science. Among his many awards, Dr. Baez was honored by SACNAS for being an excellent role model in physics for Chicano and Native American scientists. The Hispanic Engineer Achievement Award and Conference honored him by establishing the Albert V. Baez Award for Technical Excellence and Contribution to Humanity.

Dr. Baez, a longtime SACNAS supporter, gave the keynote address at the 1992 SACNAS National Conference in San Antonio, Texas. Titled "An Environmental Ethic: Respect and Affection for the Earth," his talk inspired many of us in

SACNAS and brought us great pride to know that we had such a brilliant and caring scientist in our community.

I had the honor of working with Dr. Baez on an experiment that he had wanted to do for over 40 years. The research involved an idea that Dr. Baez conceived when Dennis Gabor published his landmark paper on holography in 1947. Dr. Baez thought that Gabor could have shown the three-dimensional aspects of holography by a simple experiment. The laser was discovered in 1964, almost 20 years later. Three-dimensional effects that could be produced with split laser beams were easily demonstrated and they were the dramatic effect that finally ignited the field of holography. Dr. Baez thought that this effect could also be demonstrated without split light beams if one illuminated a semi-transparent object from a single coherent light beam emanating from a pinhole source. This experiment was finally performed by Dr. Baez and myself at the IBM Almaden Research Center in the early 1990s, and a paper was published on the experiment in the *American Journal of Physics* in 1999. Dr. Baez had realized his dream of doing and publishing the results of this experiment after wishing to do so for over 40 years!

To the general public, Dr. Baez was also known as the father of the singer and pacifist Joan Baez and Mimi Farina, the founder of the humanitarian organization Bread and Roses. In his later years, Dr. Baez created *Vivamos Mejor/USA*, an organization that provided technical and educational assistance to a cooperative in Xalapa, Mexico, that used environmentally friendly coffee-growing procedures and a weaving cooperative for unemployed women.

Dr. George Castro, past president of SACNAS, was a research scientist and manager at the IBM Almaden Research Center in San Jose, California, for 27 years. He then became an associate dean of the College of Science at San Jose State University for nine years until his retirement in 1994. He is currently the volunteer director of an after-school hands-on science program for teenage youth in east San Jose and the part-time director of a program that helps Latino students from a community college in east San Jose (Evergreen Valley College) to transfer and succeed at San Jose State University.

Assistant Professor – Analytical Chemistry

The Department of Chemistry and Biochemistry at Auburn University invites applications for a tenure-track, 9-month position in analytical chemistry, including bioanalytical chemistry. Duties include teaching at the undergraduate and graduate levels and developing a vigorous, externally funded research program. A Ph.D. in chemistry (with an emphasis in analytical chemistry) and at least one year of postdoctoral experience are required. The candidate selected for this position, which begins in August, 2008, must meet the eligibility requirements to work in the United States on the date the appointment is scheduled to begin and must be able to communicate effectively in English. Minorities and women are encouraged to apply. Applicants should submit curriculum vitae, statements of research plans and teaching philosophy, and have three letters of reference sent to:

Analytical Chemistry Search Committee,
Department of Chemistry and Biochemistry,
Auburn University, AL 36849-5312

Review of applications will begin October 8, 2007 and continue until the position is filled. Auburn University is an Affirmative Action/Equal Opportunity Employer.

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PROFILE DENNIS LAMENTI



Discipline: Astronomy
Ethnic Background:
 Zuni/Navajo
Education Level or Year in
School: Graduate student
Institution: Indiana University

Research Abstract: My current research is developing a target list of nearby bright stars taken from Hipparcos Catalogue. This list will be used for science observations with two Fiber High Resolution Echelle (FHIRE) spectrographs that are under construction at Indiana University (IU). One is for use on the 3.5-m WIYN telescope, and the second (FHIREBot) is for use on IU's 1.25-m robotic telescope (Spectrobot) in the Morgan-Monroe State Forest, north of campus. This list will contain all luminosity classes and will be used to develop a digital spectral database. This uniform database of spectra will allow the systematic determination of stellar properties, including temperature, radius, surface gravity, detailed composition, and projected rotational velocity across the HR diagram. The spectra will have sufficient resolution to allow studies of some line profiles and to recognize double-line spectroscopic binaries.

What struggles have you faced in your education and/or research, and how did you overcome them?

My deepest struggles always seem to come from within. I have a lot of fears—people will find out how dumb I really am, feelings of not belonging at university, fearing that I will not measure up, and anything else my mind can come up with! This has led to feelings of isolation and hesitating to ask questions so as not to make myself vulnerable to criticism. I have not thoroughly overcome this; rather, it is an ongoing process. Sometimes I will call home or talk to a friend or an elder about what is going on, or let a specific worry or problem go in a ceremony. It is not so much that my friends or the ceremonies hold answers, but it begins the process of letting go.

I have also found that I am really not alone, and that everyone struggles—it's part of being human. Loneliness actually reared up when I first moved to graduate school at this huge institution, though I overcame this quite easily. Once I saw that I was lonely, not depressed, I started accepting the many invitations that came my way. Participating in activities helps get me "out of myself." This is also an ongoing process!

I am also an older student, many years senior to other graduate students in my department. Of course, just being older, there are some obvious challenges (such as physical

endurance, with many late nights. Then there are the social and peer contexts that I thought needed to be addressed. But what I have come to learn is, just like at any other age, just be yourself. For me, that has not always been easy!

How is research at the graduate level different from when you were an undergraduate?

Most importantly, in terms of my graduate coursework, I understand so much more of what is going on. This can be a double-edged sword because, although I understand more of what is going on, this deeper understanding can lead to more questions and more work. (I also have a tendency to make things more difficult than they have to be!)

In graduate school, students are also much more responsible for their projects than in undergraduate research—almost all of the work is leading toward a degree and/or publication. Another big difference is that a lot more time is spent on research than on classes. Also, I feel a deep sense of ownership about my work. My undergraduate research was with a large collaboration and, being a student at a major laboratory, it was intimidating to have to go to my PI about this and that. At the Indiana University astronomy department, I have a research advisor who is incredibly approachable and I feel like what I really am—a collaborator.

PROFILE OTAKUYE CONROY, PH.D.



Discipline: Environmental Engineering
Ethnic Background: Ojala Lakota
Highest Degree Earned: Ph.D.
Career Stage or Professional Title:
 Postdoctoral Fellow
Institution: University of Arizona,
 Department of Soil, Water and
 Environmental Science

Research Abstract: The demand for potable water in the arid southwestern United States is placing a burden on the local water supply. Aside from wastewater discharge by treatment plants into the Santa Cruz River; located in Tucson, Arizona, it runs dry most of the year. In addition, the groundwater table level is shrinking at an alarming rate. Alternative sources of water used to alleviate the shortage include CAP (Central Arizona Project) water and recharged secondary effluent. Secondary wastewater effluent contains a measurable amount of human hormones and other endocrine disrupting compounds not treated by conventional methods. Aquatic wildlife living in such conditions have been showing signs of endocrine disruption i.e. male fish acquiring female attributes. Alkylphenols (detergent by-products), 17 β -estradiol and estrone (female hormones), and the birth control pill hormone 17 α -ethynylestradiol (synthetic hormone found in the birth control pill) are responsible for the noted abnormalities. My research studies how hormones and hormone mimics persist and degrade in the environment.

How has your cultural background influenced the area of science you have chosen to work in?

In my community, formal education has always been encouraged, dating back to my ancestors Chief Smoke and Chief Red Cloud. My parents have always told me that I can be anything I want to be, and that it is important to give back to your community in any manner. Growing up, we did not have indoor plumbing and we had to haul buckets of water from the local well. This is common among most families living on the Pine Ridge Indian Reservation. I chose to pursue environmental engineering particularly because of the variety of research topics that are applicable to issues affecting underdeveloped areas, including water and soil contamination, sanitation development, and regulation. In addition, I love to teach and would like to have a career at a college/university serving a large Native American population.

What are the skills and/or personal attributes that you find most vital to pursuing this line of research?

First, discipline and determination allowed me to complete graduate school, although there were times I thought about leaving my program. Environmental science and engineering requires a broad education. I have taken courses in microbiology, analytical chemistry, differential equations, hydraulics, engineering design and endocrinology, to name a few. I have found it is important to develop problem-solving as well as memorization skills, and to know when to use each one.

My graduate research involved measuring human hormones and pharmaceuticals in wastewater treatment plants and receiving waters. My research as an engineer in Los Angeles involved seeking treatment options to remediate odor coming from wastewater treatment plants. Both topics deal with human waste, wastewater, and other unappealing things. There is some risk to working in this area; however, the disposal of wastewater and solids is an incredibly important issue, and I have always kept an open mind about it.

Also, it is essential to be able to present information to the general population in non-scientific terms and to develop public-speaking skills.

How did you make your decision to work as a project engineer rather than pursue a career in academia?

I have always wanted to be a research professor at a top university. I have spoken with professors in well-established programs and received two different pieces of advice. One, since my area of specialty is environmental engineering, I needed to obtain a professional engineering license. Two, I needed to complete a postdoc position in order to demonstrate my grant-writing and research skills beyond a Ph.D. program.

Since I have completed my doctorate in engineering, I am only required to have 1–2 years of engineering experience in most states. I have completed my experience in the state of California, which qualifies me to take the engineering exam. Having done that,

I realized I missed the hard-science research I have been doing for so many years. My training is in chemistry and it is important to keep up with the current research trends to stay competitive in academic research. I will be starting a postdoc position in the Department of Soil, Water and Environmental Science at the University of Arizona in fall 2007.

PROFILE **GABRIEL A. MONTAÑO, PH.D.**



Discipline: Biochemistry/
Nanotechnology

Ethnic Background: Chicano

Highest Degree Earned:
Ph.D.

Professional Title: Technical
Staff Member

Institution: Los Alamos National
Laboratory, Center for Integrated Nanotechnology

Research Abstract: My primary research interests are in the area of biological and bio-inspired membrane assemblies. Along with an interdisciplinary research team at Los Alamos National Laboratory, I am currently investigating such phenomena as membrane and membrane protein dynamics, as well as biological responses to nanomaterials. Research includes investigating membrane protein structure-function dynamics in membrane receptor proteins as well as photosynthetic light-harvesting complexes. Current investigations from the biomaterials perspective are looking at mechanistic responses of nanomaterials interacting with biological structures, including lipid membranes and model protein systems. Other research focuses on creating bio-inspired and bio-integrated assemblies. Various functionalized synthetic materials such as fullerenes and conjugated polymers are assembled along with lipid membranes to mimic biological functions such as long-lived charge separation and for various sensor applications.

What is the most valuable advice you have received from someone during your career?

The best advice I've received is something that I truly live by and is multifaceted. The most important thing is to do what you love. If you love your work, it will show. The level of work and commitment will be indicative of your love. If you love your work, results will naturally come. The second component is to know what you know, and recognize what you do not know. There truly are no dumb questions. But sometimes in science, and I'm sure in every profession, there are times when one doesn't know something. Instead of seeking clarification, they simply try to move on without a true understanding. This can snowball very quickly and leave an individual in an impossible situation. It's okay to not know something—that's what learning is all about!

...continued on page 30

Science in Action continued...

What advice would you give a student who is considering a research career in government?

For students interested in performing their research at an institute such as a national laboratory, I would suggest performing an internship sometime during their educational career. As with any career choice, there can be advantages and disadvantages to working at a national lab. It comes down to a matter of preference. Having been trained through the university system, knowing what it is like to continue on that path can be a bit more obvious than an area such as a national lab. Likewise, a national lab is not directly comparable to industry. In many cases, the national lab has similarities to both the university and to industry.

However, the best way to actually experience this is to spend some time at one. Many national labs such as Los Alamos National Laboratory have extensive student programs, including summer internships. Any student interested should actively apply for such an opportunity. This goes beyond simply filling out an application online. The competition for these spots is rigorous, so it is in the best interest of the student to try and find scientists in the national lab who will actively push their application. ■

DIRECTOR OF DIVERSITY, EDUCATION, AND OUTREACH FOR NSF CATALYSIS CENTER AT THE UNIVERSITY OF WASHINGTON (Seattle)

The Center for Enabling New Technologies in Catalysis (CENTC) seeks a Director of Diversity, Education, and Outreach (DEO) programs. The DEO Director will develop, oversee and coordinate efforts in DEO for CENTC.

Full details of the position are found at

<http://www.washington.edu/jobs>,

(select Staff Jobs and search for Req #34935).

This position can be filled by one individual, or has the potential to be split between two individuals, for the purpose of job sharing. Priority may be given to applications received by October 1, 2007. Direct email inquiries to rothen@chem.washington.edu. CENTC and UW are committed to building a culturally diverse staff and strongly encourage applications from female and minority candidates, AA/EOE.



Director, Center for Biomedical Informatics National Heart, Lung, and Blood Institute Department of Health and Human Services National Institutes of Health (NIH)

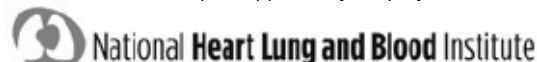
The National Heart, Lung, and Blood Institute (NHLBI) at the National Institutes of Health (NIH) is seeking a strategic-minded scientist with expertise in research informatics and information technology who will bring significant experience in a research environment to operate in an intellectually challenging Federal biomedical research institution engaged in a national research program to understand, treat, and prevent heart, lung, and blood diseases and sleep disorders throughout the world.

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Application Process: Salary is commensurate with experience and a full package of Civil Service benefits is available including retirement, health and life insurance, long term care insurance, leave and savings plan (401K equivalent). Send your application package including: CV, bibliography, and two letters of recommendation to the National Institutes of Health, attn: Alesha Hopkins, 31 Center Drive, MSC 2490, Bldg 31A, Room 5A16, Bethesda, Maryland, 20892-2490. For further information, please contact Ms. Hopkins by email: hopkinsa@mail.nih.gov or telephone (301) 594-4910. Your application package should be received by September 17, 2007. All information provided by applicants will remain confidential and will only be reviewed by authorized officials of the NHLBI. All information provided by candidates will remain strictly confidential and will not be released outside the NHLBI search process without a signed release from candidates.

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FACULTY POSITION ANNOUNCEMENT

The Department of Dental Hygiene at Eastern Washington University is seeking applications for a 9 month full-time, tenure-track position beginning September 2008 at the level of Assistant Professor.

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Ms. Lisa Billich, Assistant Professor
Department of Dental Hygiene
Eastern Washington University
310 N. Riverpoint Blvd. Box E
Spokane, WA 99202
lbillich@mail.ewu.edu

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Department of Dental Hygiene

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SACNAS News Resource Listings provide the minority scientific community with access to the most current career advancement opportunities.

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Employment

University of California, San Diego, Department of Mathematics

The University of California, San Diego, is seeking tenure-track/tenured positions in the Department of Mathematics to start July 2008. Applicants must possess a Ph.D. and should have outstanding accomplishments in both research and teaching. In compliance with the Immigration Reform and Control Act of 1986, individuals offered employment by the University of California will be required to show documentation to prove identity and authorization to work in the U.S. before hiring can occur. UCSD is an equal opportunity/affirmative action employer.

More Information:
www.math.ucsd.edu/about/employment/faculty

Mathematical Sciences Research Institute, Deputy Director & Associate Director

Applications are invited for positions of deputy director and associate director at the Mathematical Sciences Research Institute (MSRI). The appointment will be for a term of at least two years starting August 2008. Applications will be considered starting November 1, 2007. MSRI is an equal opportunity employer.

More Information:
www.msri.org/about/jobs/ddad

The Harvey Mudd College, Chemistry Department, Assistant Professor

The Harvey Mudd College Chemistry Department invites applications for a tenure-track appointment at the assistant professor level to begin August 2008 or 2009. Applicants must have Ph.D. degree. Applicants with expertise in any sub-discipline of chemistry will be considered. Send inquiries to Dr. G. William Daub, Department of Chemistry, Harvey Mudd College, Claremont, CA 91711.

More Information:
Bill_Daub@hmc.edu

Computer Science at Virginia Tech, Department Head

Computer Science at Virginia Tech (www.cs.vt.edu) invites applications for department head. CS@VT is part of the College of Engineering (www.eng.vt.edu), Virginia's premier engineering school. Virginia Tech is a comprehensive research university, with almost \$300M/year in research, and with more than 26,000 students. Salary is competitive and commensurate with experience. Virginia Tech is an EO/AA institution. Applications must be submitted online to <https://jobs.vt.edu> for posting 070739.

More Information:
Ed_Fox,fox@vt.edu

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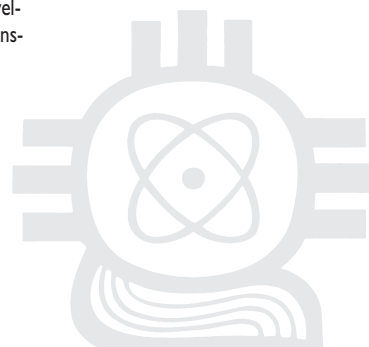
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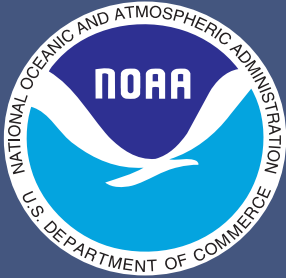
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More Information:
webdev.med.upenn.edu/contribute/postdoc/UPENNSOMBiomedicalPostdoctoralProgramsRACDAAapplication.shtml





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Geophysical Fluid Dynamics Lab - Princeton, NJ

Meteorology and Physical Science

Great Lakes Environmental Research Lab - Ann

Arbor, MI Physical Science, Oceanography and Ecology

National Severe Storms Lab - Norman, OK

Meteorology and Electronics Tech

Pacific Marine Environmental Lab -Seattle, WA

Oceanography, IT Specialist and Physical Science

For More Information

NOAA Research EEO Office

Phone: 303-497-6439/6732/6731

Website: <http://eoe.boulder.noaa.gov>

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