



*Advancing  
Hispanics/Chicanos  
& Native Americans  
in Science*

# SACNAS NEWS

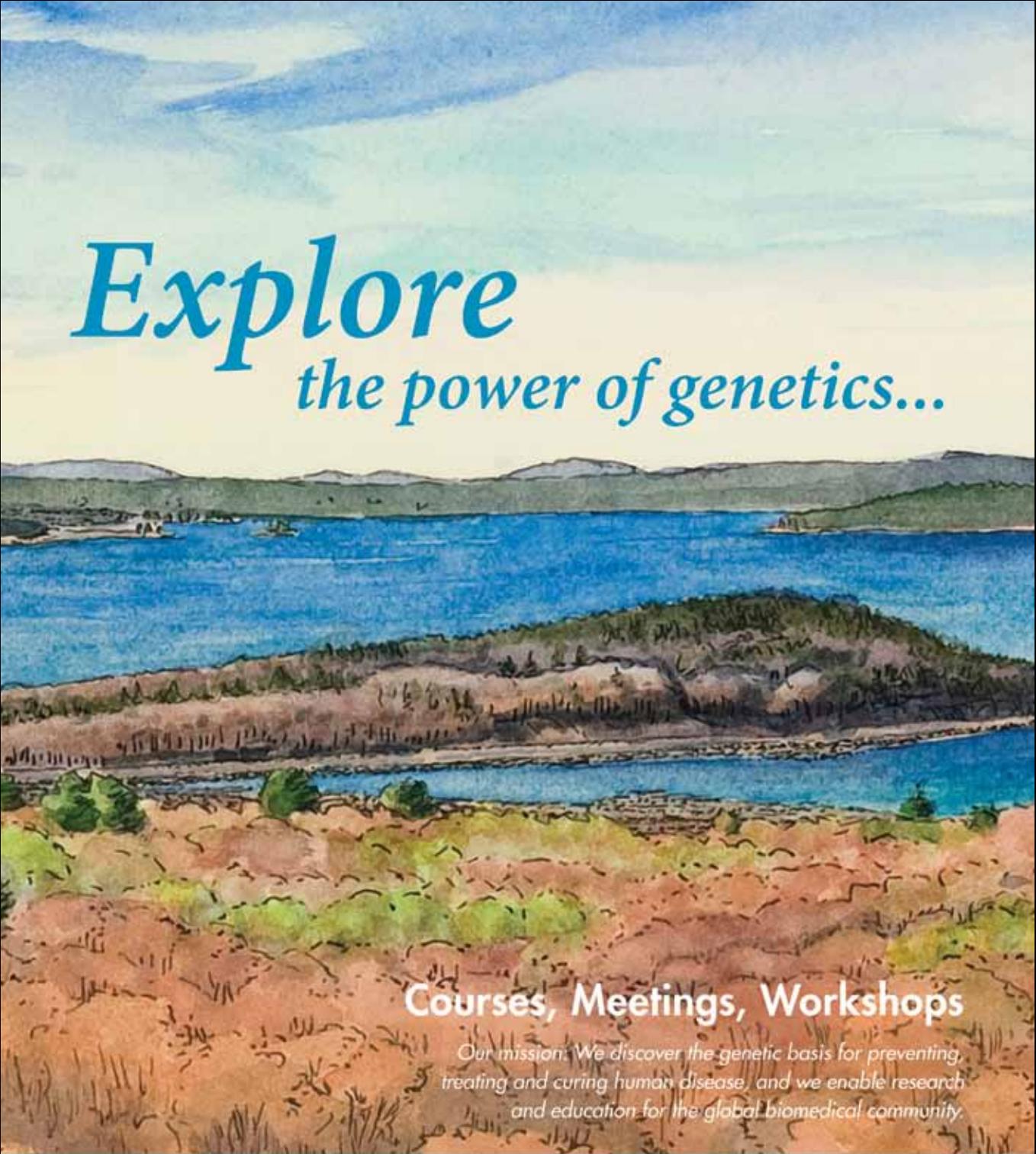
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#### SACNAS News

The SACNAS News, published two times a year, explores current issues within the minority scientific community, celebrates the achievements and contributions of members, and provides resources for academic and professional development.

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*Summer/Fall 2010*  
 Theme: Transformation to a Scientific Attitude

**Deadlines**  
*Interest in Article Authorship/Queries:*  
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*Article and Community News Submissions:*  
 May 28, 2010

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*For submission guidelines visit:*  
[www.sacnas.org/sacnews.cfm](http://www.sacnas.org/sacnews.cfm)

#### Cover Art

*Planet Earth Warming*  
 by Colleen Appleton Critcher  
*Planet Earth Warming* expresses my deep concern for the state of our planet. Global climate change is perhaps the single greatest worldwide

problem that we will face in our lifetime. My earth paintings are symbolic of the turmoil that I envision is rapidly approaching.

*Colleen Appleton Critcher is an abstract painter from Florence, S.C. Her unique work is inspired by the natural world and reflects her interests in philosophy and astronomy. She is sometimes referred to as the "circle painter."*

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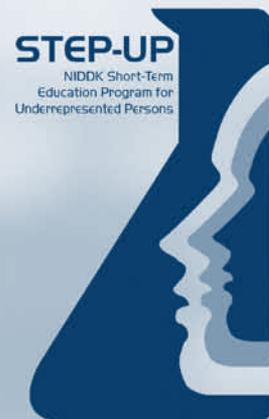
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# Message from the SACNAS Leadership



## SACNAS TRANSFORMATION: BROADENING OUR REACH

By **Judit Camacho and  
Jose Dolores Garcia, PhD**

both SACNAS and our partner organizations. We are expanding our web-based resources to include online tutorials, videos, and job/opportunities listings. Furthermore, we are in the middle of a significant renovation of our Internet services, which the board of directors authorized this year. To better serve our Native American community, we are working to coordinate SACNAS outreach to Tribal colleges and expand our award-winning SYNAPSE (Supporting Young Native Americans to Pursue Science Education) program from our pilot Utah program to institutions nationwide.

We are on the move with many more developments, including our second annual Summer Leadership Institute in partnership with the American Association for the Advancement of Science (AAAS), which is scheduled for July 2010; a growing chapter program; expansion of regional SACNAS meetings; and the 2010 SACNAS annual conference, which will be held jointly with the Society of Mexican American Engineers and Scientists (MAES). These efforts will lead to a complete transformation of SACNAS' national profile, while making sure that every action adheres strictly to the original mission and goals of the society: advancing Chicanos/Hispanics and Native Americans in science.

Besides increasing direct services, the SACNAS policy initiative aims to advance the SACNAS mission on a national level. In addition to Dr. Robert Barnhill, our vice president for science policy and strategic initiatives, we have recently appointed Mr. John Christensen as the first ever SACNAS fellow for science policy. Also, at the SACNAS Board of Directors meeting recently held in Washington, D.C., we were able to visit various federal agencies, including the National Science Foundation and the National Institutes of Health (NIH), where we had the privilege of meeting with Dr. Francis Collins, the director of NIH.

Most important of all, SACNAS' transformation is being directed by our members. Your opinions, ideas, and engagement are moving us forward. Please lend *your* voice to this exciting movement to change the face of science, technology, engineering, and mathematics (STEM) in this country. Email or call, and connect with your SACNAS Board of Directors and the SACNAS staff!

**SACNAS HAS BEEN VERY SUCCESSFUL** at expanding its horizons. While the mission of SACNAS has not changed—we are a society of scientists dedicated to the advancement of Chicanos/Hispanics and Native Americans in science—our vision as to how to actualize this mission is being expanded. We are moving beyond having the annual national conference be the primary vehicle for helping our members, to providing a much wider venue of year-round opportunities, publications, and web-based materials that our members can use in advancing their scientific careers. Amidst these new activities, our annual national conference is still an important and essential element in our mission. In fact, at the 2009 conference in Dallas this past October, we had the largest attendance ever—nearly 3,000 participants!

The landscape for helping our members advance their educations and careers in science has changed dramatically during the last 12 months. For example, we now have much stronger ties to several scientific societies such as the American Chemical Society and an array of math organizations.

These strategic alliances have been forged to enable our members in those disciplines to have broader networks and access to programs and services of

LEFT  
*Dr. Jose Dolores  
(J.D.) Garcia,  
SACNAS  
president, and  
Judit Camacho,  
SACNAS execu-  
tive director,  
pictured at the  
2008 SACNAS  
National  
Conference.*

BY  
CASSANDRA  
BROOKS

# RESILIENCY IN THE FACE OF CLIMATE CHANGE

**GLOBAL CLIMATE CHANGE IS HAPPENING** more rapidly than scientists had predicted and is already impacting communities around the world, according to the Intergovernmental Panel on Climate Change. The developing world, including many of the 370 million indigenous people worldwide<sup>1</sup>, will bear the bulk of the anticipated effects of climate change.

Sea-level rise threatens to bury coastal and island communities. Crop failures and reduced agricultural productivity will only increase hunger, malnutrition, and disease. Natural disasters, such as droughts, floods, and forest fires, will only increase.

Yet, a large proportion of those of us living in developed countries go about our day-to-day lives mostly immune to climate change and its impact on daily

or seasonal cycles. Some of us may notice slight changes in the weather, complaining about extreme storms or unusual heat or cold. But we can easily slip inside the comfort of our heated and air-conditioned homes, and then set about preparing dinner with the food we bought at the market and making tea with fresh water from the tap.

Those who subsist off the land or live in poverty-stricken communities aren't so fortunate. For thousands of years, subsistence communities have depended on specific and regular seasonal cycles for growing food, hunting and gathering, life-sustaining activities that are now in disarray because of climate change. Moreover, as we saw with Hurricane Katrina, those living in poverty, which includes

almost a quarter of all Hispanics and American Indians<sup>2</sup>, suffer the most severe consequences of extreme weather and natural disasters.

While indigenous and minority communities face the greatest threats from climate change, we should bear in mind that we've also survived thousands of years of social, environmental, and cultural changes. Many communities have endured by living in the same place for thousands of years. Others have immigrated and survived in poor urban centers, adapting to a new world and maintaining cultural resiliency through the stories of their grandparents.

*The long-term presence and adaptability of indigenous peoples and minority communities may provide lessons of resiliency that the world can learn from.*

Around the world and here in the U.S., these communities have observed the most recent environmental shifts from climate change and have called for action and support. These requests should be heeded, not only for the sake of indigenous groups and their land, but also for the welfare of global humanity. The long-term presence and adaptability of indigenous peoples and minority communities may provide lessons of resiliency that the world can learn from.

## CHANGING WINDS

Earlier this year, an international radio show called "A World of Possibilities" featured Shagire Shano Shale, an Ethiopian elder who spent his entire life as a farmer. He described the changes invoked by climate change, as translated by Wolde Gossa Tadesse, a native of the Gamo Highlands of southwest Ethiopia and a program officer with the Christensen Fund, a group dedicated to preserving, sustaining, and enriching cultural and biological diversity.

"He said the winds have changed course. The winds are not blowing the way they used to. The rains are not coming at the



Photo: Mayumi Fujio

Photo: Mayumi Fujio



Photo: Mayumi Fujio

PAGES 4 AND 5

*The Christensen Fund supports many activities in the sacred lands of Ethiopia's Rift Valley, including environmental public advocacy, conservation, and support for indigenous artisans. These photos were taken at the Gamo Highland region in the village called Chencha, which is at the foot of a sacred mountain.*

right time. It rains in the dry season and it's dry in the rainy season, and thus the pastures are not growing enough grass," Tadesse says.

As Shale's account demonstrates, subsistence communities in Ethiopia can no longer depend on growing their crops in sync with the natural rhythms of their environment. "They've been used to thousands of years of predictable weather," says Tadesse. "They are now trying to keep up with and anticipate the rhythm of this new erratic weather, but have not fully succeeded because it's so unpredictable and they need to understand the new pattern more."

### **RISING WATERS**

As shifts in rainfall cause problems in inland communities, rises in sea level threaten to spoil freshwater communities and displace entire coastal communities. "Already Aboriginal people in the gulf peninsula region of Queensland have noted sea level rising high enough to begin contaminating the fresh water supplies," says Henrietta Marrie, born and raised in the Aboriginal community of Yarrabah, southeast of Cairns in Queensland, Australia, and also a program officer for the Christensen Fund. "Many of the nearby islands are becoming so inundated with water that it's creeping into their homes and cemeteries." People have already had to build their houses higher off the ground on some small islands in the Torres Straits, she says. And if it continues, the communities on these small islands are going to have to be relocated altogether.

We are hearing these stories from indigenous communities all over the world. Erratic weather patterns are wreaking havoc on traditional agriculture for food and medicinal crops. Wildlife and plant species that have sustained communities for thousands of years are disappearing or moving to more suitable habitats. Meanwhile, new and often ecologically destructive species are invading. Glaciers are melting in the Andean and Himalayan mountain communities, bringing a deluge of water in the short term, and dwindling supplies for the long term. From the melting permafrost in the Arctic to the rising sea levels around Caribbean and Pacific island communities, climate change will force people to move off their ancient homelands to find more stable ground.

...continued on page 6

## *Gathering for Action*

### **INDIGENOUS PEOPLES' GLOBAL SUMMIT ON CLIMATE CHANGE**

In early 2009, hundreds of indigenous people representing 80 different nations from around the globe came together in Anchorage, Alaska, for the Indigenous Peoples' Global Summit on Climate Change. During the weeklong summit, participants openly discussed the drastic impact that climate change is having on their communities and brainstormed about adaptation and mitigation plans based on their traditional knowledge and practices. Moreover, they crafted a declaration and action plan to submit to the United Nations Convention on Climate Change that took place in Copenhagen, Denmark, in December 2009. The plan demands that indigenous peoples be considered in the next international treaty.

"While the Arctic is melting, Africa is suffering from drought and many Pacific islands are in danger of disappearing, indigenous peoples are locked out of national and international negotiations," says Jihan Gearon of the Indigenous Environmental Network. "We're sending a strong message to the next UN Framework Convention on Climate Change this December in Copenhagen, Denmark, that business as usual must end, because business as usual is killing us."

...continued on page 7



Photo: Thomas Seligman

**ABOVE**

*A dancer at the Thousand Stars Music and Dance Festival in Arba Minch, a city in southern Ethiopia. The festival, supported in part by the Christensen Fund, encourages the practice, preservation and development of traditional dance, songs, artistic and cultural expressions, and various ceremonies of the more than 50 indigenous nations, nationalities and peoples of the Southern Nation, Nationalities, and People's Region (SNNPR) of Ethiopia.*

## ANCIENT WAYS OF COPING

Climate change threatens to bring about unprecedented environmental calamities and challenges for many indigenous communities who have been living off the land and surviving for millennia. They've developed coping and adaptive strategies, however, that may ensure their long-term resilience.

"Indigenous systems and cultures have gone through a series of shocks and changes over a long time which have reorganized their communities," says Enrique Salmón, a Rarámuri from northern Mexico and an assistant professor at California State University, East Bay. "These shocks can lead to advances in their knowledge, innovations and learning."

Those who survive over millennia have often done so by melding their traditions with new cultural or environmental influences. To adapt while living in diverse or extreme environments, indigenous communities have survived by developing practices such as seed saving, low-impact irrigation, soil maintenance, encouragement of species diversity, and creation of microhabitats, Salmón explains. For this reason, he says, "Part of our resilient food future may be found among ancestral agriculture. Small-scale ancestral fields on the Colorado Plateau (like on the Hopi and Navajo reservations) and in other bio-culturally diverse regions represent the human ability to raise food in the strictest conditions."

Yet this knowledge about how to find and grow food is often tied into language and other cultural traditions. If traditional knowledge, which is largely stored in native languages, disappears, then many native communities may not be resilient enough to withstand upcoming climate change shocks, Salmón emphasizes. In so many communities, native language is only spoken by a small percentage of the people, and the young people aren't learning it. "It's traditional knowledge and language that remind us of our connection to the landscape and how we are supposed to behave on it," Salmón says. These factors lie at the heart of resiliency in the face of climate change.

## PAVING A PATH FOR CULTURAL RESILIENCY

To help indigenous peoples maintain their resiliency, groups such as the Christensen Fund help to encourage and support traditional livelihood systems around the world. "Our goals are not to solve the widespread challenges indigenous people are facing at the moment, because we are too small of a foundation to do so," Tadesse says. "But we try to help support those traditions they value, those same traditions that have sustained them through the generations."

The Christensen Fund works with local grassroots organizations to help indigenous communities maintain their own resources and environment in ways they know and deem appropriate while coping with the enormous impacts of climate change. They support a host of community-based projects ranging from encouraging agro-biodiversity practices (e.g., helping people manage their own rangelands for grazing animals) to maintaining local traditional governance systems, rituals, music and food festivals, as well as helping to protect sacred landscapes. "We help communities cope with the changing world without losing those important traditions they've maintained over the centuries," Tadesse says.

In Australia, Henrietta Marrie says many indigenous people are coping with climate change slowly and looking at community-based solutions to dealing with adaptation in the region. "And that's really the best way to move forward," she says. The communities she works in demonstrate so much determination and



Learn more about the resources mentioned in the article and find further information about indigenous communities facing climate change at [www.sacnas.org/sacnewsResources.cfm](http://www.sacnas.org/sacnewsResources.cfm)

enthusiasm to take action. She says, "It's inspiring for me to help empower them and let them be more self-determining."

### **A VALUE FOR THE WHOLE WORLD**

Just as biodiversity leads to long-term ecological resilience and sustainability, cultural diversity holds the same promise for humanity. The African Rift area (which runs north from Syria down through most of eastern Africa), is a varied ecological landscape with diverse animal and human life. "You have many, many traditions there," Tadesse says. "In one corner of Ethiopia alone, you have some 60 languages." And with each language comes different ways of life, with hunter-gatherers, small-scale farmers, highland and lowland cultivators, and farmers who raise livestock sharing the land. Each group has their own political, economic and spiritual systems, and the group members form intricate relationships, each providing something different to the other, from food products to medicinal herbs. "This interdependence between people has resulted in the diversity of governance, relationships and traditions on the landscapes," Tadesse says. "And it has kept the many languages, cultures and landscapes vibrant and alive. As a result there is unparalleled diversity and ecological balance and natural beauty."

We have forgotten so much because of our dependence on technology, Tadesse explains. "We don't use hand tools anymore or practice conservation of seeds. We don't know how and when so many of the plant species should be put in the ground. Understanding this wealth of knowledge these communities and groups have may be the key to our survival in a world that constantly threatens its own future."

### **LOOKING INTO THE FUTURE**

Climate change is happening, but the severity of its effects rests largely on how much the global human population takes action to reduce their carbon emissions. Perhaps for now, most of us can continue turning up the air conditioning on those record-breaking hot summer days. We can still buy whatever food we fancy from the store and we have an adequate supply of clean, fresh water. But this abundance won't last forever. The effects we've seen in indigenous communities will penetrate and threaten our industrial agricultural practices and our freshwater supplies. Sea levels will continue to rise and the millions of people living in large coastal cities like New York, Los Angeles, and San Francisco will find themselves forced to relocate to higher ground, just as small island communities are already experiencing. Let us act deliberately and learn how to persist and adapt from those who still live close to the land. Let us reduce our global carbon emissions to ensure resiliency for all who are native to this earth. ■

*Cassandra Brooks, Abenaki, is a freelance science writer and a recent graduate of the Science Communication Program at the University of California, Santa Cruz.*

<sup>1</sup> Statistics from the World Health Organization  
[www.who.int/mediacentre/factsheets/fs326/en/index.html](http://www.who.int/mediacentre/factsheets/fs326/en/index.html)

<sup>2</sup> Statistics from the United States Census Bureau  
[www.census.gov/hhes/www/poverty/poverty.html](http://www.census.gov/hhes/www/poverty/poverty.html)

### **Gathering for Action continued...**

The summit was hosted by the Inuit Circumpolar Council, assisted by United Nations University. **For more information, visit [www.indigenoussummit.com/servlet/content/home.html](http://www.indigenoussummit.com/servlet/content/home.html).**

### **NATIVE PEOPLES, NATIVE HOMELANDS**

In fall 2009, just weeks before United Nations delegates met in Copenhagen, native people gathered for the second "Native Peoples, Native Homelands" meeting at the Mystic Lake Casino Hotel in Prior Lake, Minnesota. In this collaborative four-day workshop, led by Daniel Wildcat of Haskell Indian Nations University and Winona LaDuke of Honor the Earth, participants examined the impacts of climate change and extreme weather variability on native peoples and their homelands from cultural, spiritual, and scientific perspectives. "Climate change impacts indigenous peoples first and foremost," LaDuke said in the "Native Peoples, Native Homelands" press release. "We will be in a very difficult position as indigenous peoples if we do not act now to build resilience in our communities."

The workshop took place a decade after the first "Native Peoples, Native Homelands" workshop and arose in response to the 2009 U.S. national assessment of global climate-change impacts, which did not include an in-depth consideration of American Indians, Alaska Natives, or Native Hawaiians, or their lands. The goal of the workshop was to develop immediate response and adaptation actions, as well as proactive recommendations to ensure the survival of indigenous communities in the midst of global climate change. "This means shifting the energy paradigm so that we develop efficiency and produce our own clean energy, and it means growing our own traditional varieties of food," LaDuke says. "It means returning to self-sufficiency by creating energy and food sovereignty that can provide a bright future for the generation yet to come."

**For more information, visit [www.nativepeoplesnativehomelands.org](http://www.nativepeoplesnativehomelands.org).**

# THINKING TOOLS, SCIENCE CURRICULA, AND CULTURAL LEARNING:

## *Does the Disconnect Promote Poor Performance by Minorities in STEM Subjects?*

By Norman Lownds, PhD; Kenneth Poff, PhD; Michele Root-Bernstein, PhD; and Robert Root-Bernstein, PhD



### IT IS COMMON KNOWLEDGE THAT

Latino and Native American students tend to do poorly on standardized tests of mathematics and science achievement, and minorities in general are substantially underrepresented in science-related fields. Nobody knows why or what to do about it. We think we may have stumbled upon clues as to both causes and cures, so let us take you on our serendipitous journey to insight.

Ten years ago, two of us (R. Root-Bernstein and M. Root-Bernstein) wrote a book called *Sparks of Genius* (Houghton Mifflin, 1999). The book proposes that there are 13 non-verbal, non-mathematical “thinking tools” that creative people in all disciplines, including the STEM subjects, use for problem solving. These tools are observing, imaging, abstracting, pattern recognition, pattern forming, analogizing, body thinking, empathizing, dimensional thinking, modeling, playing, transformational thinking, and synthetic thinking.

In our modern society, we often tell students to observe, abstract out important information, and find patterns in classroom material, but we rarely teach them how to do it. We expect them to imagine in their minds what they’ve seen, and to manipulate it, but we don’t explain how to learn or practice these skills. We all have had the experience that when something doesn’t make sense, we get a headache or an uncomfortable feeling in our gut, yet we never teach our students to pay attention to how they feel as a clue to a problem—or its solution. We may tell them to make models, and we may have models sitting around our classrooms, but we don’t teach modeling. *Sparks of Genius* was an attempt to get at the mysterious, personal, idiosyncratic, and often sensual ways of thinking that provide us with ideas worth exploring and communicating.

Research for that book made clear that successful scientists such as Albert Einstein, Richard Feynman, and Barbara McClintock (among many others!) all seemed to realize the importance of such embodied, pre-logical thinking. Each of these scientists stated that no scientist thinks in formulae, but rather in physical feelings and sensual images

that are used to empathize with the subject of study in order to play around with how it might behave under different imaginary conditions. The resulting insights are necessarily non-symbolic, embodied, subjective, personal, and intuitive, and must therefore be transformed into publicly communicable forms such as mathematics, words, or diagrams, only in an explicitly secondary process. The translation process from personal ideation to public formulations is never discussed in our STEM curricula, let alone taught through formal lessons. These oversights hobble the intellectual potential of our students and metaphorically “put the cart before the horse.” All too often, we teach our students communication skills but not how to have ideas worth communicating.

Some years later, the other two of us (Lownds and Poff) decided to see how many of these “thinking tools” are actually embedded in science teaching and textbooks. After all, if the very best scientists use the entire range of “thinking tools,” then we would hope that students of science are formally drilled in their use. So Lownds, Poff, and some colleagues analyzed two of the most widely used college biology textbooks.

The results were discouraging. Only six of the tools were regularly mentioned or used in illustrations in the texts: observing, abstracting, imaging, recognizing patterns, dimensional thinking, and synthesizing. These were also the only tools used in the prob-

lems and exercises at the ends of chapters; the vast majority of practice questions involved pure memorization. Transformational thinking and modeling were rarely employed or described in either of the textbooks and were never illustrated or practiced, while body thinking, empathizing, playing and transforming were never even mentioned.

So much for the methods and insights of Einstein, Feynman and McClintock!

Spurred on by the realization that the best practices of the best scientists are being ignored in our textbooks and curricula, three of us (Lownds, R. Root-Bernstein, and M. Root-Bernstein) have recently created a group to perform a formal study of the “thinking tools” in science education. Our group currently consists of ourselves and 13 honors undergraduates at Michigan State University. We are looking at enough science textbooks over the next year to yield a statistically valid sketch of how “thinking tools” are actually employed in some representative science curricula.

All of this brings us to the low success rates of Latino and Native American students in STEM subjects. As part of their research, Lownds and Poff have gathered anecdotal evidence that Native American and Latino students are more likely than Whites to be enculturated to think synthetically, empathetically, and with “whole body” feelings. For many native peoples, every thing, whether living or not, is imbued with a natural spirit that can only be understood when the individual is in harmony (through empathy, emotion, and bodily sensations) with the rest of society and with all of creation. While such thinking should be an advantage in understanding complex, holistic systems such as embryology and ecology, it is largely antithetical to the reductionist-mechanist philosophy that currently dominates the sciences and the teaching of science.

We believe that it is important to undertake formal studies to determine whether different cultural belief systems promote or discourage forms of thinking that determine success in science. Such studies are particularly important in light of our contention that the most creative science is done by people who explicitly use the sets of thinking tools rejected by the reductionist-mechanist philosophy, but which are ingrained in the cultural thinking of many minority students.

Wouldn't it be ironic if it turns out that minority students are actually better prepared to think

**“In our modern society, we often tell students to observe, abstract out important information, and find patterns in classroom material, but we rarely teach them how to do it.”**

creatively in science despite their apparent handicaps when it comes to thinking the way science curricula expect them to think? In the end, it may not be our students who need to adapt to our curricula, but our curricula that need to change to incorporate creative thinkers. Latino and Native American students may be two groups that benefit the most. ■

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Questions may be directed to: Prof. Douglas Lauffenburger, Head, Department of Biological Engineering, MIT 16-343, 77 Massachusetts Avenue, Cambridge, MA 02139 or [lauffen@mit.edu](mailto:lauffen@mit.edu).

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photo: Alan Magayne-Roshak

## DR. CARMEN AGUILAR

### *Biochemist and Geobiologist*

By Cassandra Brooks

ABOVE

*Dr. Aguilar in her lab at the University of Wisconsin. Dr. Aguilar married her husband, also a scientist, in the middle of the Sargasso Sea in the North Atlantic while on a research cruise. They had a big dinner on the research vessel, and the captain of the ship officiated the vows.*

**GROWING UP IN MEXICO CITY**, I was surrounded by the enticing world of music, art, museums, and movies. But my family and I also explored the natural side of the city, discovering different parks, lakes, and rivers in and around the area.

My father worked in the electronics business and had to travel a lot, so we often went with him, including many wonderful trips to Acapulco. We'd always spend time at the seashore, looking at all the marine life, and enjoying the beauty of the land. At home, I had a chemistry set that included a microscope. I put everything I could under that lens—onions, bird wings, starfish I found at the beach.

I was insatiably curious—the kind of student who asks 50,000 ques-

The first semester of college was very challenging. I had to work to support myself through school, so I taught English classes to kindergartners. But I was extremely determined. I was the first one in my family to get a college degree and everyone was always supportive.

I grew up in a very close family, surrounded by parents, two younger brothers, and a large extended family. I lost my mother when I was only 14 years old and it was one of the hardest things I've ever been through. Being with just my father and brothers felt lonely at times, but I had really close friends who helped me throughout. I had to grow up pretty fast, but I dealt with it by doing a lot of extracurricular classes, like studying the French lan-

*“I was insatiably curious—the kind of student who asks 50,000 questions.”*

tions. In high school I had a wonderful biology teacher who patiently put up with me and my questions about why this and why that. Finally, one day my teacher said, “If you really like biology and chemistry so much, why don't I take you to one of the classes at the university?” I was so excited! I went with her to an animal physiology class at the National Autonomous University of Mexico (UNAM) in Mexico City, which was a completely different world from high school. That is the day when I decided to go to university. I chose UNAM because it was one of the only schools at the time in Mexico that offered biology.

guage and Hawaiian dancing.

In addition to family support, my mentors encouraged me. Antonio Lazcano and Lynn Margulis transformed my life. Lynn used to tell me, “You have to apply for this course!” In doubt, I would respond, “I don't know if I am going to be accepted.” Then she said something to me that I will never forget: “If you don't apply, how will you ever get in?” My conversation with Lynn has now become my motto with my own students: “If you do not apply, you cannot get in!”

I stayed on at UNAM and got a master's degree in biology. By then I was teaching college-level classes to support

# [www.sacnas.org/biography](http://www.sacnas.org/biography)

myself, but I also sold cheesecakes and chocolate cakes to make money on the side. So it really “took the cake” to get my master’s degree!

I knew that I wanted to expand my research for my PhD work and I was looking at interdisciplinary sciences, such as biogeochemistry, in which the study of biology, geology, and chemistry come together so the scientist can understand the interactions of different elemental cycles. I went to a lecture given by Ken Nealon, who was then at the Scripps Institution of Oceanography. I was so inspired by his talk on biogeochemistry and bioluminescence that I went up to him afterward, told him I wanted to work in his lab, and he told me to apply. Later, Dr. Nealon called to tell me that I could study with him, but he was moving to the University of Wisconsin–Milwaukee.

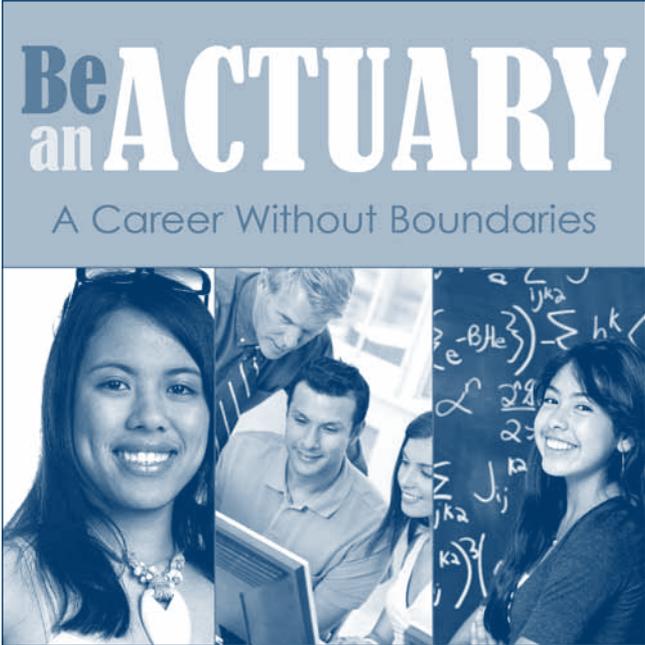
Going to Wisconsin for my PhD was one of the hardest things I have ever done. I had to leave everything behind. I packed my suitcase and off I went. I arrived in Milwaukee on a very cold day in winter; it was pretty crazy and shocking. Everything was completely different to me—the weather, the language, the social structure, the way people ate, the way people related to each other. I spoke English, but I was not really fluent. That first year I almost quit, but I am not a quitter, so I pushed on (with the help of my advisor and my best friend, Cecilia). By the time I got my PhD, I had become very proficient in English, biogeochemistry, and American culture!

After obtaining my PhD working on the biogeochemistry of manganese in Oneida Lake, New York, I was a postdoctoral fellow in two different laboratories: the Carnegie Institution of Washington, D.C., and the Institute of Marine Science (University of North Carolina at Chapel Hill). The aim of the research was to study the effects of atmospheric deposition (rain) in the open ocean and I even had the opportunity to experience a hurricane while at sea!

Now I am an associate scientist at the Great Lakes WATER Institute at the University of Wisconsin–Milwaukee. I still work in the fields of biogeochemistry and microbiology, looking at the interaction of microbes and their environment. I currently work on the effects of invasive species, like zebra and quagga mussels, on the food web, particularly phytoplankton in Lake Michigan. I investigate how they are colonizing different areas and what effect it has on the local aquatic environments. Furthermore, we have been investigating the changes in Lake Michigan due to climate change, the impacts of which are felt at fisheries and primary production. ■

I love my job because I get to do so many different things. I have had the opportunity to work in the Sargasso Sea, Guaymas Basin in the Gulf of California, Yellowstone Lake in Wyoming, and Lake Michigan. Some days I am in the laboratory analyzing samples or looking under the microscope, while other days I am out in the field. We often take our research vessel *Neeskay* (which means “pure, clean water” in Ho-Chunk language) out on Lake Michigan to collect water, animals, and sediment cores to take back to the lab. I am very passionate about my job, because I am getting to do all the things I loved to do while I was growing up, but now I get paid for it! The best thing is to study hard, learn your English and math, and don’t give up on your dreams! ■

*Cassandra Brooks, Abenaki, is a freelance science writer and a recent graduate of the Science Communication Program at the University of California, Santa Cruz.*



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# Studying Climate Change Through the Clouds

By Anthony Brown

**ACCORDING TO MY PARENTS**, I have been ready to be a meteorologist since I was a toddler. Apparently, I used to sit in my room and watch the clouds. My interest in meteorology has not waned: I obtained my undergraduate degree

in meteorology from the University of Oklahoma, where I am now a master's degree student in that field.

It is an important time for the discipline of meteorology because of the urgency of climate change, which has

become a very popular topic

both among the general public and within the scientific community. Both experts and non-experts alike have opinions and beliefs about

what climate change is and how it will affect life on this planet. It is my job as a scientist to test the validity of the matter and attempt to mitigate the possible effects of a changing climate. The evidence strongly suggests that the earth's temperatures are warming; however, the effects of a warmer planet are still under dispute. It is wise to develop methods of mitigation in the event that a warmer planet causes catastrophic changes in rainfall distributions.

## Water Management Research

Through a cooperative partnership with the University of Oklahoma, the National Severe Storms Laboratory (NSSL) sponsors my research. I am under the advisement of Dr. Suzanne Van Cooten (Chickasaw), a hydrometeorologist at NSSL. My master's research involves taking rainfall data from rain gauges and combining that data with rainfall estimates obtained from Doppler radar. The locations I will

be studying are Arkansas, Colorado, Kansas, Louisiana, Missouri, New Mexico, Oklahoma, and Texas during the month of May for the years 2002-2008. This research will have the goal of improving quantitative precipitation estimates (QPE) and it will also be used for applications related to water management. Both of these have important roles in mitigating the possible effects of climate change.

A consensus belief about climate change is that so-called weather extremes will occur more frequently. Droughts and floods would become more severe. It is also possible that areas of desert will expand. It is important to begin preparations for this possible scenario. With this data set, improved QPE can help forecasters improve flood warnings by reducing false alarm rates and warning time. This improved QPE data would be incorporated into hydrological models, which are important to water management.

It is likely that in the future, water usage will increase. In some areas, this increased usage will be coupled with a reduced water supply. This data set can lay a foundation to help mitigate the adverse effect of less water. It can also be used to help plan ways of taking excess water from flood events and storing that water for periods of drought.

Dr. Van Cooten has plans to use this data for an aquifer recharge project that is sponsored in part by the Chickasaw Nation of Oklahoma. The aquifer of interest is the Arbuckle-Simpson aquifer in south-central Oklahoma. The goal is to collect runoff so that it has time to penetrate the soil and recharge the aquifer. If successful, this project could be implemented on other aquifers across the nation.

As a Native American, I consider it important for me to benefit my native community. I am honored that I am working on a project that will be beneficial to another tribe, particularly a tribe that is known for its prominence and willingness to help its members and the general public. As part of the Native American culture, I feel that it's extremely important to protect the environment and the community. With this project, I am helping to preserve the ideals of my ancestors, even if it is benefiting a tribe different from my own.

## Future Goals

When I complete my master's degree (and therefore this research), my goal is to continue my education toward a PhD. With a PhD, I will be viewed as a more credible scientist in this field and will open myself

**"It is my job as a scientist to test the validity of the matter and attempt to mitigate possible effects of a changing climate."**

up to more research and career opportunities. My top choice is to pursue a PhD in meteorology at the University of Reading in Reading, England. My intention in getting a graduate degree from another country is to give myself an international perspective of meteorological studies. I chose the University of Reading because of its strong ties to the University of Oklahoma and for its meteorology program. The other option I am considering is to get my PhD in either civil engineering or geography at the University of Oklahoma so as to have a diversified, interdisciplinary degree. The more diversified a person's skill set, the more marketable he is to a potential employer.

After I complete school, I hope to use my meteorological knowledge to help in the mitigation of meteorological disasters, whether that's in the form of research or operations (i.e., forecasting). I would also like to contribute to my tribe, since they have granted me scholarships, which are available to all tribal members. I do not want to be a tribal member who only takes; I want to be someone who also gives back.

### **Advice for Other Cloud Watchers**

My advice to other students is to not give up. If you decide that you no longer want to pursue your current field of study, think hard about it, and change majors if you need to before quitting. Most sciences are not easy, but if you want something bad enough and are persistent, you can succeed. I have had several trying semesters (including this fall semester), but my persistence has paid off. It is also okay and not unusual to be unsure about what you want in your future, regardless of your age. I know I want to study weather, but as to the particulars of what I want to research or where I want to work, I am far from figuring that out. Family, friends, and mentors are important to have in life. Without their continual encouragement and advice, I know I would have given up by now. ■

*Anthony Brown is a master's degree student at the University of Oklahoma and a researcher at the National Severe Storms Laboratory. He can be reached at [anthony.brown@noaa.gov](mailto:anthony.brown@noaa.gov).*



### **ABOVE**

*Watching clouds through data collection. Anthony Brown at his desk at the National Severe Storms Laboratory.*



*Learn more about programs and opportunities for students interested in meteorology and climate change at [www.sacnas.org/sacnewsResources.cfm](http://www.sacnas.org/sacnewsResources.cfm)*



*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:

## R. DEBORAH OVERATH, PhD

**Q: How do I interview a potential graduate school? What questions should I ask of the department? The graduate students?**

First, have a good idea of the area (or areas) within your discipline that you want to study. Next, via the Internet, find out what schools have strong programs in those areas. Potential mentors are more important than the school or even the department. Look for website information on course requirements and faculty and student research activity. Look for published articles by your potential advisors, as well as from past and present students in that lab. Once you have conducted thorough research, then you're ready to contact the potential advisors by email.

You should carefully consider what you put in the initial email. For example, you should tell the potential advisor why you are interested in his/her program and research and ask if he/she is accepting students. If possible, visit the school and the lab or labs you are considering.

Ask the potential mentor if you may contact his/her current graduate students. Then ask the students these same questions. You may also want to ask to talk to students from other labs in the same program to find out the reputation of that advisor and lab.

Some potential questions:

- How long does it take the average student to complete the degree you will be seeking?
- How much and what kind of financial support (e.g., stipends and tuition waivers), as well as support for purchasing research supplies, is available? Are there time limits on this support?
- Are students given the opportunity to present their work locally, regionally, and/or nationally?
- What space and facilities are available for your use as a student?

**Q: How do I know if a graduate advisor will be a good mentor? If it doesn't work out, what should I do?**

Choosing an advisor can be tricky. Start by considering the type of mentor with whom you could work best. Would you prefer someone very "hands-on" (always in the lab or field with you), someone who is "hands-off" and lets you figure things out for yourself, or someone in between? While you are talking to graduate students in the programs you are considering, ask them what their mentors are like. Ask also about lab dynamics: Does this mentor encourage collaboration or competition? You should then consider whether you would thrive and be successful in that environment.

If you are already in graduate school and things aren't working out, how bad of a match is it? Are you learning the research and related

skills you need, but just not getting encouragement and other advice? If this is the case, consider finding other mentors (e.g., scientists you meet at the SACNAS National Conference) to provide what is lacking. In fact, having more than one mentor can be very beneficial. Sometimes outside mentoring will not be enough; you may need a different mentor. Look for someone who can advise you on the best course of action for your particular situation and institution (e.g., the graduate coordinator for your program). You may want to change major advisors or you may want to change departments or, more rarely, schools. Two years into my PhD program, I decided I did not have a good mentor match for me and switched advisors and departments. Fortunately, my stipend funding was not tied to a particular department, so I was able to make this change easily.

**Q: My GPA is 2.5 and I believe that is not going to get me into graduate school. I really want to go to graduate school. What should I do?**

You are correct that this GPA will not be high enough for admission to many graduate schools. However, your complete package (GPA, GRE scores, research experience) is important. If you have shown a steady improvement in your last year or two, that can also make a difference. For example, our graduate programs consider the last 60 credit hours alone in addition to overall GPA. If you have other experiences and talents you can showcase, you should still apply. Contact potential advisors and explain your situation. If you are interested in earning a PhD, try master's programs first. You can establish the track record you need by being successful at that level. If you cannot find such a program, you may want to take some time off from full-time school. If possible, look for work related to what you want to study in graduate school. Then, take a few courses at the graduate level, as a non-degree-seeking student. Finally, talk to faculty at your school about other potential local options that will help you build a record of success. ■

*Dr. R. Deborah Overath received the 2008 SACNAS Distinguished Undergraduate Institution Mentor Award. She is an assistant professor of biology in the Department of Life Sciences at the College of Science and Technology at Texas A&M University—Corpus Christi. She can be reached at [deborah.overath@tamucc.edu](mailto:deborah.overath@tamucc.edu).*

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**JULY 8:**

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**JULY 9:**

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**JULY 19-23:**

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**JULY 20:**

SACNAS National Conference abstracts deadline (summer program students)

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## Postdoc Opportunities in Climate Change Research

By Meg Austin

THERE IS AN URGENT NEED for cross-disciplinary climate change research that includes many different academic disciplines and engagement from diverse communities. Although the atmospheric and related sciences have traditionally drawn white males to the field, there are a number of postdoctoral programs that are actively seeking scientists from diverse backgrounds to take part in climate change research. These include opportunities to conduct research and also to help decision makers develop policies and tools for climate change adaptation and mitigation.

The **Visiting Scientist Programs (VSP)** at the University Corporation for Atmospheric Research (UCAR) in Boulder, Colorado, manages three fellowship programs for federal agencies that focus on climate research and its application.

For 20 years the **Climate and Global Change Postdoctoral Fellowship Program** has been training the next generation of climate researchers, many of whom have become leaders in the field. This NOAA-funded program attracts outstanding recent PhDs in the sciences relevant to the NOAA Climate and Global Change Program, which is a program that focuses on observing, understanding, modeling, and predicting the climate system on seasonal and longer time scales. Postdoctorates are paired with host mentors at U.S. institutions to work in an area of mutual interest.

NASA funds the **Heliophysics Postdoctoral Fellowship Program** to train researchers in the emerging field of heliophysics science. This field embraces all aspects of the sun-earth connection and includes many of the basic physical processes that are found in the solar system and the universe. Two major topics of focus are the science of space weather and of the sun-climate connection. This program also pairs postdoctorates with hosting scientists at institutions throughout the U.S. Typically, applicants have communicated with prospective hosts prior to writing their project descriptions.

**Postdocs Applying Climate Expertise (PACE)** is a national fellowship program that matches recent climate research PhDs with decision-making and resource management institutions. Each postdoctoral fellow is paired with two hosts, one from a climate research institution and one from the decision-making institution. ■

*Meg Austin is director of the Visiting Scientist Programs office at the University Corporation for Atmospheric Research, a position she has held for over 16 years. She can be contacted at [austin@ucar.edu](mailto:austin@ucar.edu).*



## The Human Side of Climate Science

By Ernesto Muñoz, PhD

**BY THE TIME** this column is published I will have started collaborating with scientists at the Los Alamos National Laboratory (LANL) in New Mexico. I never imagined I would be doing climate research in affiliation with such a prestigious laboratory. As an entering undergraduate student, I was only partly attracted to traditional “bench” science. But the field of climate science provided an opportunity to match my quantitative interests with my interests in the environment and in science-making.

Back during my undergraduate years, my learning of science from chemistry and physics classes was nicely complemented by my learning of the evolution of science from social sciences courses. The physical science courses were limited to learning about physical phenomena and their corresponding equations. However, in courses that discussed epistemology and sociology of science, I learned about the scientific process as one embedded in, and therefore relative to, a historical context. We learned about how science evolves—about the stumbles and non-

LEFT

*Dr. Ernesto Muñoz getting ready a small-size CTD rosette. The CTD (conductivity, temperature, depth) instrument is used by oceanographers to record salinity (through conductivity), temperature and pressure at different depths. The surrounding bottles (in the picture) collect water at different depths, later analyzed to validate the CTD measurements.*

linear progress of scientific advancements. Writings from thinkers such as Immanuel Kant, Thomas Kuhn, and Lev Vygotsky were influential on my motivation to participate in scientific research. Ultimately, these studies helped me see the human side to science—the fact that science is a human endeavor.

Once I had this broader historical perspective of the physical sciences, I was motivated to pursue a career in the field. At this time I was becoming increasingly aware of the interdisciplinary nature of the geosciences. Growing up in Puerto Rico, I enjoyed many different ecosystems, and I also lived through various tropical storms and hurricanes. Being exposed to such diverse ecosystems and complex phenomena, I became interested in having a profession related to the environment, the atmosphere, or the ocean.

Once I decided to pursue an education in climate science, I experienced my first summer of undergraduate research at the Brookhaven National Laboratory in Long Island, New York. In subsequent summers I did climate-related research as part of the Significant Opportunities in the Atmospheric and Related Sciences (SOARS) of UCAR. These research experiences were pivotal to my early growth as a climate researcher.

Eventually I entered the graduate program in Atmospheric and Oceanic Science

...continued on page 32

## Reconstruction of Rainfall Variability in the Yucatan Peninsula During the Last 1,500 Years: Implications for the History of the Classic Maya Civilization

**By Martín Medina-Elizalde, PhD**

The decline of the Classic Maya civilization was complex and geographically variable, occurring over an approximately 150-year interval known as the Terminal Classic Period (TCP, A.D. 800–950). Paleoclimate studies based on lake sediments from the Yucatán Peninsula (YP) lowlands suggested that drought was prevailing during the TCP and likely an important factor in the disintegration of the Classic Maya civilization. In light of the evidence from lacustrine records suggesting decades of severe drought in the YP, the long 150-year socio-political decline of the Classic Maya civilization represents a conundrum. As a NOAA/UCAR postdoctoral fellow I have produced, in collaboration with colleagues from the University of Massachusetts, New Mexico, Albany, and California, a rainfall record from the Yucatan Peninsula spanning the last 1,500 years. This reconstruction was produced from a stalagmite, a cave calcium carbonate deposit, which recorded precipitation in the proportion of two forms of oxygen, or oxygen isotopes. A direct calibration between stalagmite oxygen isotopes and rainfall amount offers the first quantitative estimation of rainfall variability during the TCP, indicating that a series of eight droughts struck the YP during this time. These droughts occurred during major depopulation events of Classic Maya kingdoms and city-states, such as Calakmul and Tikal. The new stalagmite record reveals that climate variability at this time was more complex than previously suggested, and that perhaps the decline of the Classic Maya civilization lasted 150 years because the TCP droughts were short-lasting, in contrast to previous suggestions, and because the wet intervals between these droughts provided moments that allowed the civilization to “catch its breath,” thus prolonging its demise. ■

*Dr. Martín Medina-Elizalde is a NOAA Climate and Global Change Postdoctoral Fellow hosted at the University of Massachusetts. His research is an excellent example of the cross-disciplinary and cross-cultural nature of climate change research.*



**Learn more about programs and opportunities for postdocs interested in climate change research at [www.sacnas.org/sacnewsResources.cfm](http://www.sacnas.org/sacnewsResources.cfm)**

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

# FROM THE PILLARS TO THE PRIVATE SECTOR: PERSONAL INSIGHTS FOR A SUCCESSFUL TRANSITION FROM ACADEMIA INTO INDUSTRIAL SCIENCE

BY GREG VILLAREAL, PHD, AND IVONNE VIDAL PIZARRO, PHD

**THERE ARE SOME MYTHS** and cultural biases against pursuing a scientific career in industry rather than academia. In spite of some common advantages to working in industry (including monetary rewards and job package options), there is also clearly some trepidation surrounding the loss of academic freedom and a decrease in peer-reviewed journal publications. Rather than having to ponder what life may be like in the private sector, readers can learn from these career accounts written by SACNAS members who hold doctoral degrees and have made the choice to work in industry.

## **From Academia to Industry**

Many scientists transition from an academic postdoc to a career in industry once they have published the results of their graduate and postdoctoral research. Vladimir Ramirez-Carrozzi, PhD, a research scientist at Genentech Inc. (South

San Francisco, California), successfully transitioned into industry from a five-year postdoc at the University of California, Los Angeles (UCLA). Near the end of his postdoc Dr. Ramirez-Carrozzi had a difficult time deciding between industry and academia since he knew he would find both rewarding. He explained the reasons why he eventually chose industry: "I felt that after graduate school and an academic postdoc, I wanted to challenge myself and use my scientific skills to understand human disease. Industry has the resources and framework to use this knowledge and directly ease human suffering." Once this decision was made, Dr. Ramirez-Carrozzi utilized two fundamental tools from his postdoc to obtain the elusive industry job interview: (1) strong scientific publications with several high profile papers and (2) a strong recommendation from his postdoctoral advisor to his colleagues at Genentech.

Dr. Ramirez-Carrozzi still uses protocols acquired in academia to drive his own research goals and

contribute to other projects and teams within Genentech. He shares, "Research could someday result in novel therapeutics to alleviate human disease. I truly enjoy my job because of this! It makes every small finding very exciting, and this reward is bigger for me than the strong financial benefits."

## **Right into Industry**

On the other hand, some scientists advance into industry straight out of graduate school, as did Greg Villareal, PhD,



## For those seeking a transition into industry, our interviewees offer several suggestions:

1. Participate in a summer internship in the private sector.
2. Use your network, including all your mentors (undergraduate, graduate, and postdoc) to identify industry colleagues and let them know of your progress.
3. Introduce yourself to industry scientists at poster and other networking sessions at professional organizational conferences.
4. Collaborate with scientists in industry as a graduate student or a postdoc.
5. Convert your curriculum vitae to a résumé and prepare a strong cover letter.
6. Upload your résumé to job boards and apply!

who transitioned after graduate school at UCLA to an associate scientist position at a small start-up biotechnology company, Galenea Corporation (Cambridge, Massachusetts). For five summers Dr. Villareal participated as a teaching assistant (TA) in the “Neurosystems and Behavior” course at the Marine Biological Laboratory in Woods Hole, Massachusetts. As a TA, he set up scientific equipment that “utilized methods for electrophysiology and live cell imaging.” This phrase was used in his online résumé posted on the Society for Neuroscience job site (NeuroJobs). It caught the attention of a manager at Galenea who queried this phrase while searching for candidates on job boards—a common practice for hiring managers looking for candidates to fill a position that requires special skills such as electrophysiology, imaging, and protein formulation. The idea of applying his fundamental neuroscience background to developing potential therapeutics for schizophrenic patients attracted him to Galenea. Although Dr. Villareal often worked on weekends, like many individuals in start-up companies, most industry positions follow a five-day, 45-hour work week. Although this is more work time than the average job on “Main Street USA” requires, it is significantly less office/lab time than that commonly required in academia.

In order to successfully transition into the private sector, Dr. Villareal advises networking with science colleagues, familiarizing yourself with companies sharing your interests, uploading your résumé to company websites, and using job boards such as monster.com and biospace.com. He also strongly encourages scientists to “continuously update their résumés and cover letters; have these materials critiqued for errors, grammar, and logical transitions by colleagues; and have mentor/s confirm that the résumé and cover letter are an accurate representation of the individual as a scientist and a person.” Other tips: the career services office at an alma mater may offer curriculum vitae/résumé editing services for its alumni, and Procter & Gamble offers a “Creating a Winning Résumé” session at the SACNAS conference to help with this process.

### **A PhD Matters—Especially in Industry**

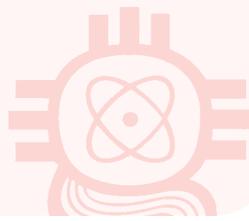
Some scientists find their way into industry well before their postdoc, as did Lorena Barrón, PhD, principal scientist at Amgen (Thousand Oaks, California). Dr. Barrón says, “I took the long approach into graduate school.” Fortunately, her exceptional performance as a Genentech summer intern between her undergraduate junior and senior year led to a job interview for an entry-level position the following March when she finished her undergraduate degree. She accepted and remained with Genentech for six years after graduation until her Genentech

colleagues advised her that obtaining those three extra letters after her name could substantially advance her career. So on that constructive advice from her peers, she entered a top national program for protein formulation and pharmaceutical science at the University of Kansas. Dr. Barrón states, “The experience of what questions were being asked in industry facilitated the research process in graduate school.” With an outstanding résumé and previous work experience in industry, Amgen quickly recruited her. At Amgen her responsibilities encompass early to late-stage process development and technology transfer of protein products. Her ability to apply previous scientific knowledge and acquire on-site engineering principles advanced her career at Amgen. Dr. Barrón’s advice to young scientists interested in entering industry is to search for internship opportunities in order to gain firsthand insight into what an actual industrial position entails.

### **Different Roads Lead to Similar Advice**

The scientists interviewed in this article shared unique transitional experiences, but offered similar advice. They do not feel the loss of “academic freedom” as they continue to pursue lines of research that interest them. When they attend scientific conferences, they discuss new technologies and preliminary work and, as with academic scientists, do not reveal proprietary or unpublished data. Thus, in many ways, industry science still feels and operates like academic science because scientists still publish in peer-reviewed journals, obtain scientific patents, participate in scientific meetings and symposiums, use their abilities in various capacities to conduct science whether at the bench or as a manager, and get excited when making a novel discovery. Although there may be significant differences in working environments and compensation between industry and academia, we are all scientists. Dr. Ramirez-Carrozzi keeps the bottom line in mind: “It is by working in industry that I can help transition discoveries on the bench to products that will benefit the lives of humans.” ■

*Drs. Greg Villareal and Ivonne Vidal Pizarro were among the first SACNAS Neuroscience Scholars at the 1999 SACNAS Conference in Portland, Oregon. Dr. Villareal is a member of the SACNAS Board of Directors (2008–2010), chairperson of the SACNAS Industry Advisory Council, and co-chair of the Industry Session at the SACNAS National Conference. He can be reached at [gregvillarealphd@gmail.com](mailto:gregvillarealphd@gmail.com). Dr. Ivonne Vidal Pizarro can be reached at [ivonneviji@alumni.upenn.edu](mailto:ivonneviji@alumni.upenn.edu).*



## *The SACNAS and MAES 2010 Joint National Conference: Two Great Societies, One Common Vision*

**By Lino Gonzalez, PhD**

*September 30, 2010, will mark a historic joining of forces when SACNAS and MAES (The Society of Mexican American Engineers and Scientists) hold their national conferences at the same site for the first time, for what is being called “the national STEM event of the year”. This landmark event in Anaheim, California, comes as a result of the establishment of the SACNAS-MAES-SHPE (Society of Hispanic Professional Engineers) consortium in 2008. By partnering together, our societies create more membership opportunities and leverage a larger voice in helping to advance policies that affect underrepresented students and scientists in the STEM fields.*

SACNAS and MAES each have humble beginnings, founded independent of each other over 35 years ago, driven by the idea of developing a supportive community to encourage and motivate future generations of minority scientists. In each case, the founders were a small group of committed individuals who gave generously of their time and resources to ensure the survival of the organization. Many of those early pioneers are fully engaged in the organization still today, bringing with them both a sense of history and a responsibility to the mission. Indeed, their efforts were not in vain, as SACNAS and MAES are expanding their reach significantly so that more members may develop their talents and become the next generation of leaders in the STEM fields.

Although the societies have similar roots, over the years each has developed their

own institutional culture. The successes and challenges encountered by each society over the decades have solidified a sense of identity that members of each society value deeply and passionately.

Furthermore, because of these independent beginnings and separate upbringings, SACNAS and MAES have developed different spheres of influence, yet in many respects they are complementary. SACNAS has long focused on supporting the attainment of advanced (graduate) degrees in STEM, and has largely focused on the academic and government institutional arenas. MAES, on the other hand, has been strongly supported by the corporate and national defense sectors. SACNAS members are mainly from science and math disciplines; MAES has traditionally been heavily weighted toward the engineering fields. Consequently, an important component of the MAES national conference is a career fair where recruiters are able to engage and even interview top engineering talent on the spot. SACNAS focuses on promoting graduate school recruitment, relegating job recruitment activities to advanced degree holders. The Postdoctoral Poster

Presentation Reception is one example of an occasion when potential recruiters are able to discuss research with postdocs and senior graduate students.

Regardless of the differences, what both our societies give is a sense of identity, belonging, and achievement for its members. The conferences provide a supportive and nurturing environment where students find that interacting with role models and mentors is a powerful motivator. They return to their campuses eager to tackle their classes and pursue their research, anticipating meeting their peers and mentors the next year to share their achievements.

A large cutout of the word “Familia” (family) marked the stage backdrop at this year’s MAES awards ceremony. Remarkably, to call each other family feels very natural at SACNAS and MAES. We should keep this in mind as our two societies come together to leverage each other’s strengths. Each society should retain its all-important sense of culture and history, while at the same time, we should welcome each other into a larger family, a family that will help us achieve the common vision of our founders.

Please visit the joint SACNAS/MAES forum on Facebook to post any comments. ■

*Dr. Lino Gonzalez works as a scientist in the biotechnology industry. He has served for four years on the SACNAS Board of Directors and has attended the national conferences of both societies for the past six years. In 2005, he co-chaired the MAES national conference in San Jose, California.*



# STRENGTHENING THE NATIVE AMERICAN COMMUNITY AT SACNAS

By **Healani Chang, DrPH, and Libby Dietrich**

SACNAS and its board of directors have re-affirmed the society's commitment to reach out to and support Native Americans in science and math disciplines. As chair of the Native American Affairs Committee, I am pleased to highlight some ways in which SACNAS is acting on this commitment.

At the 2009 SACNAS National Conference in Dallas this past October, I saw a tremendous amount of Native American-focused activity:

- The Native American Gathering Room provided a welcoming environment for students to display their poster boards and for faculty, speakers, and guests to make connections.
- Through our collaboration with the Sloan Indigenous Graduate Partnership, Native American graduate students from four universities were joined by 27 promising college students from reservations and urban environments participating in the SACNAS and Utah Tribes partnership called SYNAPSE (Supporting Young Native Americans to Pursue Science Education). As the graduate students shared their aspirations, including, for some, to return to their tribes and native communities to teach and inspire the next generation, SYNAPSE students experienced firsthand native students, like themselves, achieving success through mentoring support.
- A "visioning session" of the Native American Affairs Committee was attended by an overflow group—undergraduates, graduate students, and community representatives speaking to and with the SACNAS board, committee members, and staff leadership. The Dallas Intertribal Council members in attendance shared that since SACNAS was not a known entity to them, they had been skeptical at first. However, as they worked with SACNAS and then experienced the full conference, they gained great respect and appreciation for our efforts to support and recognize Native Americans in science.
- A unique panel of native scientists discussed traditional healing with their colleagues trained in Western medicine. They shared experiences of how intersecting and complementary practices have benefited patients and clients who seek cultural healing when advanced technology is also available.

As SACNAS celebrates the 48% increase in Native participation at the conference in 2009, I am even more excited about our directions for 2010. SACNAS will be hiring a full-time director of Native American Initiatives dedicated to further engaging Native Americans in SACNAS and the sciences.

Our committee knows that SACNAS must work hard to shift perceptions and build confidence with the Native community about the organization's commitment to developing and executing programs and services directly for our Native American constituents. Among our priorities are to build more partnerships with tribal colleges and community colleges serving large numbers of Native American students, collaborating with other programs at these institutions to create complementary SACNAS chapters and informing students that we have members from their respective tribes and nations ready to mentor them toward success in college and advanced careers. We will continue our award-winning SYNAPSE program with Utah students and we are seeking opportunities to replicate the model with tribes and state or regional education systems beyond Utah. We are working with universities to increase access to scholarships for Native American science students. And so much more! Please join with us as students, young professionals, mentors, chapter leaders, and program partners. ■

*Dr. Healani Chang, Native Hawaiian, is a researcher and program director at the Pacific Biosciences Research Center, University of Hawaii at Manoa, and past member of the SACNAS Board of Directors. She can be reached at [healani@pbrc.hawaii.edu](mailto:healani@pbrc.hawaii.edu).*

*Libby Dietrich is a strategic planning consultant to nonprofit organizations, including SACNAS. She can be reached at [pacificassociates@comcast.net](mailto:pacificassociates@comcast.net).*



**ABOVE**  
*Sloan scholar Mrs. Monica Yellowhair, a graduate student at the University of Arizona, presents her research during the Native American Graduate Research Symposia at the 2009 SACNAS National Conference to mentor Dr. Carlos Murillo, a faculty research scientist at the National Science Foundation.*

■ The National Role Models Project administered by Minority Access in cooperation with the Office of Minority Health of the U.S. Department of Health and Human Services honored SACNAS members **Dr. Almaris N. Alonso** and **Ms. Teresa Ramirez** with Role Model Awards during the Tenth National Role Model Conference that was held in Washington, D.C., September 11-13, 2009.

■ SACNAS member **Dr. Nancy L. Elwess** from the State University of New York at Plattsburgh was named by President Barack Obama as one of the 2009 recipients of the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring.

■ *Paths to Discovery: Autobiographies from Chicanas with Careers in Science, Mathematics, and Engineering* (UCLA Chicano Studies Research Center Press, 2008) was awarded second place in the nonfiction, biography, English category for the 2009 International Latino Book Award. The book features stories about many SACNAS members, including **Drs. Elma González, María Elena Zavala, Cleopatria Martínez, Lupita Montoya, Martha Zúñiga, Elvia Niebla, Dian Marinez, and Lydia Villa-Komaroff.**

■ **Dr. Robert E. Megginson**, a SACNAS life member and professor of mathematics at University of Michigan was elected as a fellow of the American

Association for the Advancement of Science (AAAS) for sustained his excellence as a scholar, mentor, and academic administrator whose pragmatism and hard work have fostered opportunities for those underrepresented in mathematics and science.

■ **Dr. Juan Meza**, a SACNAS life member and a senior scientist and the department head of High Performance Computing Research at Lawrence Berkeley National Laboratory and recipient of the 2008 SACNAS Distinguished Scientist Award, was recently recognized by *Hispanic Business* magazine as one of the 100 most influential Hispanic Americans. Dr. Meza was also recently elected a fellow of the American Association for the Advancement of Science (AAAS) for exemplary service to the federal energy laboratories and professional societies in enhancing research and research participation.

■ SACNAS member **Dr. Marti Morales** received an assistant professorship position in biology at Adrian College in Adrian, Michigan, in August 2009. She started with SACNAS as an undergraduate presenting her research at the 2000 SACNAS conference in Atlanta, Georgia. She was mentored throughout the years by SACNAS members Dr. Elba Serrano and Dr. Maggie Werner-Washburne.

...continued on page 32

#### BELOW

*Students gather in discussion at the Purdue University SACNAS regional meeting.*



## SACNAS CHAPTERS HOLD THREE SUCCESSFUL REGIONAL MEETINGS IN 2009

Three regional meetings were held in 2009 to assist underrepresented minorities with advancing their scientific studies and professional careers, while building leadership skills and a common sense of community. The meetings are some of the organization's newest strategic initiatives to support year-round mentoring development.

The regional meetings were held at Purdue University (Indiana) in February, Auraria Campus (Colorado) in August, and the University of Texas at San Antonio in August. They drew more than 300 SACNAS chapter students, scientists, professionals, and educators for networking, mentoring, research presentations, and leadership skill-building. The regional meetings also contributed to the preparation of students for the SACNAS National Conference. ■

## In Memoriam

**Dr. Ruth L. Kirschstein**, former leader of the National Institutes of Health and the National Institute of General Medical Sciences, passed away in early October. Dr. Kirschstein was a passionate and dedicated advocate for support, training, and expanded opportunities for underrepresented minority students and scientists. SACNAS honored Dr. Kirschstein for her friendship with the organization on October 15 at the opening ceremonies of the 2009 SACNAS National Conference. She will be greatly missed.

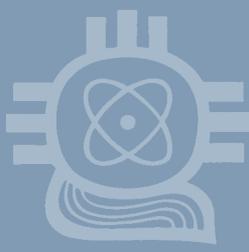
**Dr. Nancy M. Aguilar-Roca and Dr. Alberto I. Roca** mourn the loss of their only child, Andrea Isabel, at the age of 3 this past November. Her webpage, [www.andrearoca.org](http://www.andrearoca.org), describes her battle against a rare pediatric cancer, pleuropulmonary blastoma, and ways to contribute to the search for a cure. During the many months that the Roca family spent in the hospital last year, they developed a new appreciation for the range of professions involved in medical care. Andrea's hospital team included oncologists, surgeons, specialized pharmacists, PhD researchers, child psychologists, many specialized nurses, physical therapists, radiology technicians, and child life specialists. The Rocas would like SACNAS students with an interest in healthcare to know that there is an enormous diversity of biomedical careers that will make a profound difference in the quality of life for patients and their families. During Andrea's brief life, she was a beacon of light and happiness for many, and she fought bravely with a smile until the end. Andrea will be missed by all who were part of her journey.

MAES (The Society of Mexican American Engineers and Scientists) founder **Mr. Robert Von Hatten**, an aerospace electronics engineer with TRW Defense Space Systems in Redondo Beach, California, passed away suddenly in November. Mr. Michael Acosta, MAES's national president, wrote, "Bob was a great man, a visionary and still active with MAES all these years. He was a mentor to me for many years. We will miss him greatly."



### MEET YOUR NEW SACNAS BOARD MEMBERS!

*Results are in from the December board member election. Please go to [www.sacnas.org/board.cfm](http://www.sacnas.org/board.cfm) to learn more about your newly elected representatives.*



## SACNAS Chapter CHECKPOINT.

### The Effects of Climate Change in Tropical Regions

**By Mariela R. Martinez Rivera, Jesabel I. Rivera, Melissa Alvarado, Letzibeth Mendez, University of Puerto Rico at Mayagüez, SACNAS Chapter Editors Committee**

The increasingly detrimental effects of climate change have drawn the scientific community's attention because of the severity of its implications and its consequences for environmental and human life. As students from the University of Puerto Rico at Mayagüez (UPRM) and as members of the SACNAS UPRM Chapter, we have experienced the effects of climate change on this tropical island.

Some events had already been drawn to our attention. An article published in a national newspaper on November 12, 2007, by Dr. Wilson J. González-Espada presented a report from the Intergovernmental Panel of Climate Change stating that Puerto Rico's climate change in the upcoming years would be markedly evident through increasing temperatures and rainfall, and a higher incidence of hurricanes. The average temperature will increase approximately 5°F in the next century.<sup>1</sup> An increase in rainfall was observed recently on the east side of Puerto Rico, where many residents had to be evacuated because of floods of up to four feet. It is also expected that the sea level will rise about 20 feet by 2106.<sup>2</sup> Climate change can potentially have devastating economic effects on homeowners and businesses in the coastal areas. These observations, along with our increased interest in environmental protection and conservation, led to this investigation into the possible effects of climate change on tropical regions like Puerto Rico, "La Isla del Encanto."

Puerto Rico is well known for its beautiful beaches and its tropical environment. Rincón, a town on the west coast of the island, is the home of the elkhorn coral (*Acropora palmate*).<sup>2</sup> Due to climate changes and human activity, this coral is at risk of disappearing. The

lost of the elkhorn coral would have a significant impact not only in terms of the reduction of biodiversity, but also in reduction of tourism, an important aspect of Puerto Rico's economy. Furthermore, the loss of this coral would result in stronger waves reaching the shoreline, which will subsequently cause substantial increase in erosion of sand.

Climate change will also have a big impact on the island's sea-level rise. In 2001, the Intergovernmental Panel on Climate Change (IPCC) estimated a sea-level rise of 0.16–0.49 feet by 2030 and 0.33–2.13 feet by 2080.<sup>3</sup>

Sea-level rise would also increase storm events. A storm with seven-foot-high waves is expected to occur once every 76 years; however, with a sea-level rise of one or two feet, the frequency can change to once every 21 years or once every five years, respectively.<sup>3</sup> The potential negative impacts caused by climate change encouraged our chapter to educate the community and participate in activities that contribute to the protection of our resources.

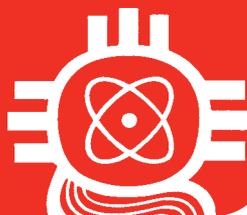
As undergraduate students in industrial biotechnology, our interest in the biological sciences joined us together in our active involvement as SACNAS UPRM Chapter members, participating in workshops, social activities, and charity events. All these activities, along with research opportunities at the Center for Hemispherical Cooperation in Research and Education in Engineering and Applied Science (CoHemis), have given us insight on the need for further understanding

...continued on page 28



**ABOVE**  
*Elkhorn coral has largely disappeared along the coasts of Puerto Rico because of climate change.*





## Meet the New PhDs of SACNAS



### **Ruben T. Almaraz, PhD**

*rtalmaraz@ucdavis.edu*

**Ethnicity:** Chicano, Mexican American

**Degree Conferred:** PhD in biophysics

**Institution:** University of California, Davis, Biophysics Program

**Dissertation Title:** Computational Modeling and Surface Plasmon Resonance Analysis of Carbohydrate-Protein Interactions

**Thesis Advisor:** Dr. Jerry L. Hedrick

**Research Interests:** Cancer metastasis

**Current Position:** Postdoctoral fellow in chemical and biomolecular engineering, Johns Hopkins University

### **Annette Alicia Angus, PhD**

*aangus@ucla.edu*

**Ethnicity:** Black, Caribbean American

**Degree Conferred:** PhD in microbiology

**Institution:** University of California, Berkeley, Department of Plant and Microbial Biology

**Dissertation Title:** The Secret Life of *Pseudomonas Aeruginosa*; Opportunistic Intracellular Pathogenesis

**Thesis Advisor:** Dr. Suzanne MJ Fleiszig

**Research Interests:** Bacterial-host interactions

**Current Position:** University of California President's Postdoctoral Fellowship 2009-2011

### **Josephine Allen, PhD**

*Josephine.allen@gmail.com*

**Ethnicity:** African American

**Degree Conferred:** PhD in biological sciences

**Institution:** Northwestern University, Department of Interdepartmental Biological Sciences

**Dissertation Title:** Toward Engineering and Neodotherium with Circulating Progenitor Cells

**Thesis Advisor:** Dr. Guillermo Ameer

**Research Interests:** Blood derived endothelial progenitor cells as a cell source for vascular tissue engineering applications

**Current Position:** Postdoctoral fellow in biomedical engineering department at Northwestern University

### **Sebastian Biglione, PhD**

*biglione@fas.harvard.edu*

**Ethnicity:** Latino

**Degree Conferred:** PhD in molecular biology

**Institution:** University of Iowa, Department of Microbiology

**Dissertation Title:** Change in the Ratio of Large to GREE Form of PTEF-b During Apoptosis and HIV Replication

**Research Interests:** Cancer biology

**Current Position:** Postdoctoral fellow in cellular biology, University of Texas

### **Stephanie M. Cabarcas, PhD**

*cabarcasm@mail.nih.gov*

**Ethnicity:** Latina

**Degree Conferred:** PhD in biology

**Institution:** St. John's University, Department of Biology

**Dissertation Title:** Negative Regulation of RNA Polymerase III Transcription

**Thesis Advisor:** Laura M. Schramm, PhD

**Research Interests:** Cancer stem cells

**Current Position:** CRTA postdoctoral fellow, NIH-NCI-Frederick

### **Oralia Garcia Dominic, PhD**

*odomonic@hes.hmc-psu.edu*

**Ethnicity:** Chicano, Mexican American

**Degree Conferred:** PhD in biobehavioral health

**Institution:** Pennsylvania State University, Department of Biobehavioral Health

**Dissertation Title:** Prevalence of Diabetes and Obesity

**Thesis Advisors:** Drs. Jan Ulbreth and Linda Wray

**Research Interests:** Cancer health disparities and co-morbid diabetes

**Current Position:** Postdoctoral fellow, NIH, National Cancer Institute

### **Celia Garcia-Prieto, PhD**

*cgarciaprieto1@gmail.com*

**Ethnicity:** Chicana, Mexican American

**Degree Conferred:** PhD in molecular pathology

**Institution:** University of Texas Health Science Center, MD Anderson Cancer Center

**Dissertation Title:** Anticancer Activity of OSW-1: Induction of Apoptotic Pathway in Leukemia and Autophagic Death in Pancreatic Cancer Through a Ca<sup>2+</sup> Mediated Mechanism

**Thesis Advisor:** Dr. Peng Huang

**Research Interests:** Minority health, molecular biomarkers, metabolic stress

**Current Position:** Postdoctoral research fellow, MD Anderson Cancer Center

### **Nánibaa Angela Garrison, PhD**

*nanibaa@gmail.com*

**Ethnicity:** Navajo and White

**Degree Conferred:** PhD in genetics

**Institution:** Stanford University, Department of Genetics

**Dissertation Title:** The Genetic Architecture of Human Pigmentation

**Thesis Advisor:** Dr. Greg Barsh

**Research Interests:** Human genetics, personal genomics, population genetics, genetic ancestry, and issues with privacy and confidentiality

**Current Position:** Postdoctoral fellow at the Center for Integration of Research on Genetics and Ethics at the Stanford Center for Biomedical Ethics

### **Audrey Gutierrez, PhD**

*ag3ax@virginia.edu*

**Ethnicity:** Chicana, Mexican American

**Degree Conferred:** PhD in microbiology

**Institution:** University of California, Davis, Microbiology Graduate Group

**Dissertation Title:** Priming Immunization with a vif-deleted Feline Immunodeficiency Virus Proviral DNA Vaccine Boosted with a Killed Whole Virus Vaccine

**Thesis Advisor:** Dr. Ellen E. Sparger

**Research Interests:** Vaccine research, immunology

**Current Position:** Postdoctoral research fellow, Department of Pathology, University of Virginia

### **Ryan J. Mays, PhD**

*ryan.mays@ucdenver.edu*

**Ethnicity:** Native American, Cherokee

**Degree Conferred:** PhD in exercise physiology

**Institution:** University of Pittsburgh, Department of Health and Physical Activity

**Dissertation Title:** Validation of Adult OMNI Perceived Exertion

**Thesis Advisor:** Dr. Fredric L. Goss

**Research Interests:** Peripheral artery disease

**Current Position:** Postdoctoral fellow, University of Colorado at Denver, School of Medicine

### **Rafael Antonio Prieto Piedrahita, PhD**

*raprieto@gmail.com*

**Ethnicity:** Latino

**Degree Conferred:** PhD in civil engineering

**Institution:** University of New Hampshire, College of Engineering and Physical Sciences

**Dissertation Title:** Treatment of Contaminated Sediments Using Reactive Cap Technology: Characterization and Modeling of

Geotechnical Hydraulic and Contaminant Transport Behavior of Cap-Sediment Systems  
**Thesis Advisor:** Dr. Jefferey S. Melton  
**Research Interests:** Soft soil behavior, soil mechanics, numerical modeling in geotechnical engineering  
**Current Position:** Project designer, geotechnical department, Gannett Fleming, Inc.

**Dana Sanchez, PhD**

*Dana.Sanchez@oregonstate.edu*  
**Ethnicity:** Latina  
**Degree Conferred:** PhD in natural resources (wildlife ecology)  
**Institution:** University of Idaho, Department of Fish and Wildlife Resources  
**Dissertation Title:** Pieces of the Pygmy Rabbit Puzzle: Space Use, Survival and Survey Indicators  
**Thesis Advisor:** Dr. Janet L. Rachlow  
**Research Interests:** Space and habitat use by mammals, extension wildlife education, diversity in the natural resource professions  
**Current Position:** Assistant professor, extension wildlife specialist, Oregon State University, Department of Fisheries and Wildlife

**Marina B. Suarez, PhD**

*Msuarez5@jhu.edu*  
**Ethnicity:** Chicana  
**Degree Conferred:** PhD in geology  
**Institution:** University of Kansas, Department of Geology  
**Dissertation Title:** Global Hydrologic Perspectives on the Mid-Cretaceous Greenhouse Climate (Aptian-Albian)  
**Thesis Advisor:** Dr. Luis A. Gonzalez  
**Research Interests:** Paleoclimatology, paleontology  
**Current Position:** Blaustein postdoctoral fellow at Johns Hopkins University

**David T. Uminsky, PhD**

*duminsky@math.ucla.edu*  
**Ethnicity:** Latino  
**Degree Conferred:** PhD in mathematics  
**Institution:** Boston University, Department of Mathematics  
**Dissertation Title:** The Vicious N Vortex Problem: A Generalized Helmholtz/Kirchhoff Approach  
**Thesis Advisor:** Dr. Eugene Wayne  
**Research Interests:** Dynamical systems, PDEs, fluid dynamics  
**Current Position:** Postdoctoral fellow, National Science Foundation, mathematical sciences

**Anael Verdugo, PhD**

*verdugo@vt.edu*  
**Ethnicity:** Chicano, Mexican American  
**Degree Conferred:** PhD in applied mathematics

**Institution:** Cornell University, Center for Applied Mathematics  
**Dissertation Title:** Dynamics of Gene Networks with Time Delays  
**Thesis Advisor:** Dr. Richard Rand  
**Research Interests:** Dynamical systems, computational cell biology, bifurcation theory  
**Current Position:** National Science Foundation postdoctoral fellow at Virginia Technical University

**Julius Yellowhair, PhD**

*je422@gmail.com*  
**Ethnicity:** Native American  
**Degree Conferred:** PhD in optical sciences  
**Institution:** University of Arizona, College of Optical Sciences  
**Dissertation Title:** Advanced Technologies for Fabrication and Testing of Large Flat Mirrors  
**Thesis Advisor:** Dr. Jim Burge

**Research Interests:** Renewable energy and solar technologies  
**Current Position:** Senior optical engineer, Sandia National Laboratories

**Sonia Zarate, PhD**

*soniaz@lifesci.ucla.edu*  
**Ethnicity:** Chicana, Mexican American  
**Degree Conferred:** PhD in molecular and cellular biology  
**Institution:** University of California, Riverside  
**Dissertation Title:** Plant Responses to the Silverleaf Whitefly  
**Thesis Advisors:** Drs. Linda L. Walling and Patricia S. Springer

## Leadership Positions at SACNAS

### SACNAS' organizational structure is expanding!

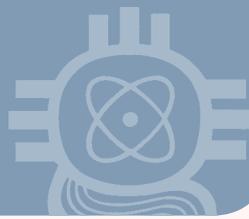
We look to our community to select talent for two key leadership positions to be filled early this year:

- Vice President for Programs
- Director of Native American Initiatives

SACNAS welcomes interested individuals to view complete job descriptions on the Jobs/Opportunities tab of the SACNAS website ([www.sacnas.org](http://www.sacnas.org)) or contact Beth Roszman, SACNAS Director of Operations ([beth@sacnas.org](mailto:beth@sacnas.org)), for more information.



Advancing Hispanics/Chicanos  
& Native Americans in Science



**THIS SUMMER**, I had the privilege of working with Dr. Greg Polzin at the Centers for Disease Control in Atlanta, Georgia. My main project for the summer was studying make-your-own cigarettes by analyzing the tar, nicotine, and carbon monoxide (TNCO) deliveries.

This is currently a hot topic in tobacco research due to the recent passage of the historic Family Smoking Prevention and Tobacco Control Act, an act granting the Food and Drug Administration regulatory authority over the tobacco industry. Through the project, I acquired proficiency in gas chromatography, mass spectrometry, and even learned how to smoke 16 cigarettes simultaneously (with the help of a 16-port ASM 500 smoking machine)! The results showed that tube type, namely filter ventilation holes, dictates TNCO yields, while tobacco type plays a noticeable but not significant role. ■

—Brandon “Bubba” Brooks



**LEFT**  
SACNAS member Brandon “Bubba” Brooks was an intern with the Centers for Disease Control during the first year of a partnership between CDC and SACNAS.

## SACNAS Member’s Summer Experience at CDC

By Brandon Brooks and Andrea Lipman

**FOR THE FIRST TIME** in its history, SACNAS was able to recommend and place a SACNAS-affiliated member as a summer fellow at the Division of Laboratory Sciences (DLS) at the National Center for Environmental Health (NCEH), Centers for Disease Control and Prevention (CDC). Fellows are hired through the Oak Ridge Institute for Science and Education (ORISE) and given a monthly stipend. CDC’s NCEH is unique in the federal government

because of its particular focus on public health issues related to the environment. DLS develops and applies laboratory science to prevent disease and death caused by exposure to environmental chemicals and to improve the diagnosis, treatment, and prevention of selected chronic diseases. For more information about DLS, visit [www.cdc.gov/nceh/dls](http://www.cdc.gov/nceh/dls).

Applications were requested in January, and sent through the objective review. All applications are then ranked and the top SACNAS applicant is chosen to come to CDC for the summer. Non-SACNAS members who apply do have a second chance because all of the remaining applications are then placed in the entire pool of applications that DLS receives, and those who rank high enough are placed in a highly qualified list for the summer mentors to choose from. This past summer, a second SACNAS member was actually chosen, but had already accepted another summer position.

We hope the SACNAS and DLS partnership continues to grow and thrive. Please be on the lookout for information about next summer’s opportunities. ■

—Andrea Lipman

### Effects of Climate Change continued...

about the increasing effects of climate change in tropical regions. We’re also linked by the fact that we are seeing how climate change affects our everyday lives. Therefore, we used the skills learned at our chapter’s workshops, such as leadership, teamwork, and dedication, to be part of the solution.

We formed an investigative group on climate change in the Caribbean islands with the help

of Dr. Fernando Gilbes-Santaella, director of the Geology Department and CoHemis. Our experience while doing this research has been surprising, since we learned how the infrastructure, the economy, health, and tourism are directly impacted by climate change. It is very important for us to understand this catastrophic situation because we live on an island where these affected resources are a vital part of our sustainability.

The SACNAS UPRM Chapter has become part of the solution by supporting other organizations such as Campus Verde (Green Campus), which is a group of students, professors, and employers who make an effort to create consciousness about the importance of living in harmony with the environment in a healthy and responsible way. As a chapter, we keep our activities as green as possible. In addi-

# From Dreams to Achievable Goals—

## *Reflections from the SACNAS Summer Leadership Institute*

**By JoAnn Trejo, PhD**

**I AM AN ASSOCIATE PROFESSOR** at the University of California, San Diego, and have headed my own independent research group of post-doctoral fellows, technicians, and graduate and undergraduate students for almost 10 years. I have also served on and led various committees for faculty recruitment and equity, as well as graduate student admissions and training. However, I desired to gain a better understanding of what truly makes a great leader with the ambition of eventually taking on more leadership roles within my department and institution. I also felt that I needed to learn more about special challenges that I might face in becoming an effective leader of individuals from diverse cultures, since my background is quite different from that of most of my colleagues in academia. Hence, I was thrilled and honored to be selected to participate in the SACNAS Leadership Institute conference held in Washington, D.C., in late July 2009.

The following are highlights of my experiences and perspectives from the SACNAS Leadership Institute conference. Thirty individuals, including mid-career-level professionals like myself as well as early-career junior faculty and administrators, and postdoctoral fellows from across the continental U.S. and Hawaii, attended the conference. During the very intensive five-day conference, we participated in many activities that refined our leadership skills, facilitated community-building, and established important networking opportunities. We also listened to distinguished leaders from our communities talk about their incredibly inspiring journeys and learned from their success. The conference confirmed that we are all leaders, but more importantly, it provided us with a solid framework to further develop our leadership skills so that we could have greater access to leadership roles at all levels.

tion, we have been involved in activities such as the International Day of Cleaning Beaches, the Ride-a-Bike Day, and educational environmental workshops. The SACNAS UPRM Chapter's quest to work toward practical solutions to climate change started because we know that the future is in our hands: Up-and-coming professionals must work together for environmental conservation. ■

*Mariela R. Martinez Rivera, Melissa Alvarado, Letzibeth Mendez, and Jesabel I. Rivera are all undergraduates in industrial biotechnology at the University of Puerto Rico at Mayagüez. The authors are active members of the SACNAS UPRM Chapter.*

Photo: Colella Photography



**ABOVE**

*Dr. Trejo turns her dreams into goals at the 2009 SACNAS Summer Leadership Institute.*

So, what is effective leadership? I learned that leadership is defined in many ways—but for me, effective leadership means identifying and implementing processes, and monitoring achievement of *specific* goals. Thus, at the conference, I realized for the first time that I needed to clearly define my career and research goals. I now have a defined set of short- and long-term goals; some are very focused and others are ambitious. These goals encompass aims related to achievements in research, academics, and community outreach as well as personal desires. I also learned that one must constantly work and re-work plans for effectiveness and efficiency because a goal without a plan is just a dream. For example, I must provide constant and proper guidance and support to trainees to achieve very specific research objectives in my lab. I also needed to define a plan to gauge whether I am making progress in achieving specific goals; such metrics could include new publications and funded grants.

Ultimately, I learned that there is no defined step-by-step process to become an effective leader, but identifying reasonable goals, implementing methods to achieve those goals, and developing a system to gauge your success can profoundly affect the impact you will have in a leadership role. ■

*Dr. JoAnn Trejo is currently an associate professor in the School of Medicine at the University of California, San Diego, and may be contacted at [joanntrejo@ucsd.edu](mailto:joanntrejo@ucsd.edu).*

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## STUDENT


**JEN ELANA QUICK  
CLEVELAND**

**Discipline:** Biology

**Ethnic Background:** African American, Irish American

**Year in School:** Junior

**Institution:** California State University, Monterey Bay

**Research Abstract:** My research interests are in cellular function and how diseases, such as cancer, operate on a cellular level. I am also very interested in the immune response and what factors influence the complex system that protects us from infection. It is of the utmost importance to me that my research have clear applications to the medical field and the general improvement of the human condition.

**What path have you followed to get to where you are now?**

I have learned a lot through many internships, but one of the major influences on my determination to achieve my goals came from a volunteer experience in Ireland. My work in Ireland was the hardest thing I had ever done in my 18 years. My responsibilities included running a small farm and caring for an incredible woman with Down syndrome. This was an exposure to a completely different kind of life than I had ever experienced growing up in Sacramento. My confidence and leadership abilities blossomed in Ireland along with a new belief in myself. My return to school was colored with new determination and a trust that it was within my power to accomplish anything.

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

The biggest challenge I have had to face in my education is a financial one. I know I speak for many students when I say that it is incredibly difficult to give school that number-one priority treatment it deserves when you are holding down two to three jobs just to pay rent. My desire, commitment, or ability are not factors in the challenge of school, but these have often been called into question from professors who never dealt with the kind of situation I am in. I was taught that cultivation of a strong community is paramount to success. To meet this challenge, I took this childhood lesson to heart. I have been blessed with a group of incredible mentors that I have cultivated a close relationship with. It makes everything so much easier when you have faculty who can

push you to higher levels of excellence and support you from a place of real understanding.

**What are your career goals?**

My goal is to obtain a PhD in the biomedical sciences. My long-term career goals are to continue as a researcher by doing postdoctoral research and contributing to our body of knowledge with special attention to applications in the fields of medical and developmental biology. My ultimate goal is to run a laboratory at a research university and inspire curiosity in the next generation of minority scholars.

## POSTDOC/YOUNG PROFESSIONAL


**NANCY HURTADO-ZIOLA, PHD**

**Discipline:** Biomedical Science, Glycobiology

**Ethnic Background:** Mexican, Otomi

**Highest Degree Earned:** PhD

**Employer:** Gc-Free, Inc.

**Research Abstract:** As a biomedical glycobiologist, I study the role of N-glycolylneuraminic acid (Neu5Gc), a non-human glycan (sugar) recognized as foreign by the human immune system, in health and disease. Recent research has found that Neu5Gc from external animal sources, such as red meat and dairy products, is metabolically incorporated into living humans and that a similar incorporation occurs on commercially available biotherapeutic products. The interaction between human anti-Neu5Gc antibodies expressed in all humans and Neu5Gc-containing molecules seems to be implicated in various disease processes (coronary artery disease, cancer, chronic inflammation, obesity, etc.) and in the reduced efficacy of Neu5Gc-containing biotherapeutic treatments.

**How did you know you wanted to get a PhD?**

I absolutely knew I wanted to earn a PhD because it was the only way that I could be in charge of the kind of biomedical research I wanted to conduct. I came to this realization while I was still an undergraduate at California State University, Fullerton.

**What challenges and rewards did you encounter during the transition from doctoral student to postdoctoral researcher?**

The main challenge that I faced during the transition from graduate student to postdoc researcher was my own insecurity. There were so many brilliant scientists out there competing for the same positions I wanted! I reached out to my colleagues for support and advice. Each one assured me that the transition was quite possible and that perseverance was essential. The persistence paid off. I'm now a senior scientist at a small biotech company.

There have been myriad rewards since making this transition. Among the most important to me are the relationships that have come into

being because of the transition to the next level in my career. I now have friends and colleagues that I met during this leg of my journey. I'm certain that most of these relationships will last a lifetime. Tell me that's not rewarding!

***How do you see yourself as a leader? And what knowledge did you gain by attending the 2009 SACNAS Summer Leadership Institute?***

I see myself becoming a leader who can effectively balance the needs of my constituency with those of the larger organization. I gained valuable insight about myself at the SACNAS Summer Leadership Institute through lectures, workshops, and team-building exercises in a small group setting. The topics I found most useful were the 360 self-assessment and the introduction to conflict management. I came away from the institute with a positive sense of my leadership style. It is my hope that I can repay the priceless opportunity I was given for professional improvement by serving the SACNAS constituency sometime in the near future.

**PROFESSIONAL**



**CHRISTINE A. STANLEY**

**Title:** Vice President and Associate Provost for Diversity and Professor, Higher Education Administration

**Discipline:** Higher Education Administration and Science

**Ethnic Background:** Black (Caribbean

descent; Jamaica, West Indies)

**Highest Degree Earned:** PhD

**Institution:** Texas A&M University, College Station, Texas

**Research Abstract:** My research interests are in faculty development, diversity, and college teaching. I am the author of over 45 publications and 47 refereed national conference presentations, and I have consulted nationally and internationally with faculty and administrators on faculty development issues in the U.S., Mexico, Armenia, China, and South Africa. My recent book, *Faculty of Color: Teaching in Predominantly White Colleges and Universities*, features the personal narratives of African, African American, Asian American, American Indian, and Hispanic faculty who share their experiences, across a variety of disciplines, related to collegiality, mentoring, racism, service, and teaching at predominantly White colleges and universities.

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

If you are interested in a career in the professoriate and, in particular, at a research university, there is no substitute for becoming a good scholar. A good scholar comes from a place of effective mentoring, in

which someone (or a group of individuals) has made a commitment to help you be marketable. You become marketable in academia when you are acknowledged for your work. Mentors can play a key role in helping you to be marketable by opening doors, placing you in venues to influence decision-making, or coaching you in areas that need more professional development. I would not have accomplished what I have today as an administrator without first being a good scholar.

***Has there been a particularly challenging point in your career? If so, how did you manage it?***

During my undergraduate years, I was preparing myself for a medical career. Growing up in a rural area in Jamaica, I thought that I could do the most good to help others by taking care of those who did not always have access to the resources that I had as a child or young adult. Health care—specifically, pediatrics or family medicine—seemed to be the logical choice, or so I thought at the time. However, it was during the end of my first year in the master's of science degree program when I developed and acknowledged my passion for teaching. It was also during this time, while working at a health-care facility for the elderly, that I realized quickly that death and dying (especially after having established a relationship with patients) was really too much for my soul to bear.

When I am in a college classroom, I feel an energy that I have never felt before. So, I had an honest conversation with my thesis advisor, who listened and encouraged me to follow my passion. I finished my master's degree and applied to the PhD program in education. I have never once looked back or regretted my decision. I still draw upon my background in science and am still able to do the most good to help others—students, faculty, staff, and, ultimately, the university.

***What do you like most about your current position?***

In my current position, I am primarily responsible for (1) assisting the president and provost in holding units accountable for progress in achieving diversity and promoting a supportive climate for diversity, (2) assessing and monitoring the efforts and progress in diversifying the faculty, staff, and student bodies, and (3) planning and implementing programs to ensure diversity and equity among students, faculty, and staff by working with vice presidents, deans, department heads, and the leadership of the faculty, student, and staff governance bodies.

What I like most about my position is my constant interaction with a variety of constituent groups, internal as well as external to the university. Everybody cares about the university and wants it to be a place that is welcoming to all. It is fascinating and challenging to listen to a wealth of perspectives about a topic that will be integral to us all, not only because of changing demographics, but also because of an increasingly diverse, global, complex society, and world. ■

## Community News continued...

■ SACNAS life member **Dr. Daniel Romo**, a professor of chemistry at Texas A&M University, was recently awarded the National Institutes of Health MERIT (Method to Extend Research in Time) Award, which enables a principal investigator to receive up to 10 years of research support in two five-year segments.

■ World-renowned mathematician and founding SACNAS member **Dr. Richard Tapia** received the Hispanic Heritage Award for Math and Science on September 29 in Washington, D.C., honoring his contributions to the country and his role-model leadership to students and colleagues alike. Since the first ceremony in 1988, the Hispanic Heritage Awards have grown into the most prestigious Hispanic honor and event in the country.

■ **Dr. David Vigerust**, chair of the SACNAS postdoc committee and a research scientist in the Department of Veteran Affairs, received a three-year career development award administered through the Department of Veteran Affairs Research and Development Service. ■

## The Human Side continued...

at the University of Maryland at College Park (UMCP). At UMCP all of my graduate professors were heavily involved in research, and I noticed a pattern in their careers. Before becoming professors, many of them had spent a significant portion of their careers in top-notch research laboratories doing full-time research. It was then that I started to think about getting as much research experience as I could before immersing myself in teaching.

For the past two years I have been a postdoctoral associate at the Cooperative Institute for Marine and Atmospheric Studies (CIMAS) at the University of Miami conducting research in NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML). As part of CIMAS, I have continued to delve into (and enjoyed analyzing) the

climate dynamics of the Caribbean Sea and the Gulf of Mexico. For example, I have analyzed the relationship between the moisture carried by the Caribbean low-level jet into the United States and the environmental factors leading to tornadic activity in the Mississippi River basin.

Now I am heading to Los Alamos, New Mexico, to continue to expand my research track. I believe that my dedication to research and discovery will strengthen my commitment to teaching and will help make me more competitive for faculty positions in academic institutions. ■

*When not conducting research, Dr. Ernesto Muñoz enjoys playing the acoustic guitar, going to the beach, and hiking nature trails. He can be contacted at [Ernesto.Munoz@noaa.gov](mailto:Ernesto.Munoz@noaa.gov).*



## Scientific Director

### National Human Genome Research Institute

The National Human Genome Research Institute (NHGRI), a major research component of the National Institutes of Health (NIH) and the Department of Health and Human Services (DHHS), seeks to identify an outstanding Scientific Director to lead its Division of Intramural Research (DIR; see [genome.gov/DIR](http://genome.gov/DIR)), located in Bethesda, Maryland. The NHGRI Scientific Director leads a basic and clinical research program that has consistently been at the forefront of scientific innovation, developing a variety of research approaches that have accelerated the understanding of the molecular basis of human disease. The Scientific Director is responsible for an annual budget exceeding \$100 million and a staff of ~550. In addition to providing scientific and administrative leadership of this premier research enterprise, the Scientific Director is expected to be an internationally recognized and highly accomplished researcher in genetics and/or genomics.

This position offers a unique and exciting opportunity to develop and implement an overall vision for the NHGRI/DIR that is consistent with the mission and strategic objectives of the Institute. The Scientific Director is responsible for the recruitment and professional development of the NHGRI research faculty. S/he plays a key role in creating and maintaining a nurturing research environment that encourages creativity, collaboration among scientists from different disciplines, effective training of students and postdoctoral fellows, and efficient utilization of common resources. The ability to develop productive interactions among NHGRI investigators, other NIH Institutes, and the research community at large is critical, as is the ability to serve as a spokesperson for NHGRI/DIR research.

Applicants must have an M.D. and/or Ph.D or equivalent degree in the biomedical sciences, as well as a broad knowledge of the field of human genetics and genomics and a compelling vision for the future of the field, including clinical applications. S/he must have proven experience in directing and managing a scientific research program, with well-honed administrative and interpersonal skills to meet the demands of both research and program direction.

Salary is competitive and will be commensurate with the candidate's experience. A full Federal benefit package is available, including retirement, health and life insurance, long-term care insurance, annual and sick leave, and the Thrift Savings Plan (401K equivalent). Appropriate support for an ongoing independent research program will be provided.

Interested applicants should submit a cover letter that includes a brief description of research and administrative experience, a current curriculum vitae and bibliography, names and contact information of five references, and a brief written vision for leading the NHGRI/DIR. Questions about the position and applications themselves should be sent to Ms. Ellen Rolfe via email at [ellenr@exchange.nih.gov](mailto:ellenr@exchange.nih.gov). All information provided by the candidates will remain confidential and will not be released outside the NHGRI search process without a signed release from the candidate.

**Applications will be reviewed starting March 1st, 2010, and will be accepted until the position is filled.**

DHHS and NIH are Equal Opportunity Employers and encourage applications from women and minorities.

**NATIONAL HUMAN GENOME RESEARCH INSTITUTE** Division of Intramural Research  
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# SACNAS AND SOCIAL ENTREPRENEURSHIP

By Robert Barnhill, PhD

*As a scientist, I like to know both the theory and the application of my subject. In these policy columns, I plan to bring you up to date on current SACNAS policy initiatives and to introduce some of the theory behind the policy by including concepts from more general publications.*

## SACNAS 2009 ANNUAL NATIONAL CONFERENCE IN DALLAS

Coming just after the SACNAS National Conference held in Dallas, this column continues themes from the summer/fall SACNAS News policy column. With over 2,800 participants, the 2009 SACNAS conference marked the largest event in our organization's history. Even more important than the record-breaking number of participants was the richness of ideas generated by our community coming together. Collaborative meetings at the conference between SACNAS' leadership and officers from several federal agencies and other government units laid the groundwork for advances in science policy. More precisely, the continuing partnership between SACNAS and science agencies will impact science policy through an increased awareness of diversity issues at the federal level. Furthermore, science policy both in Texas and at the national level was advanced through the active participation of many sponsors, especially the three major university sponsors: the University of North Texas, the University of Texas Southwestern Medical Center, and Texas A&M University. Immediate examples include visits by national leaders like Mr. Juan Sepulveda, the director of the White House Initiative on Educational Excellence for Hispanic Americans to the 2009 SACNAS conference, and significant press and media support.

## SACNAS AND SOCIAL MOVEMENTS

Many of you have read Malcolm Gladwell's seminal book *The Tipping Point*, which is about social movements. He famously

writes about "social epidemics," describing how seemingly small events can build on each other until they have significant impact on society, whether for good or ill. Gladwell writes, "The moment when they take off, when they reach their critical mass, is the Tipping Point." In the book Gladwell identifies three types of individuals who play a part in this process: "connectors,"

"mavens," and "salesmen." These concepts, also applicable to organizations, can be used to describe some of SACNAS' policy initiatives.

**SACNAS as a "connector" society.** In policy work, relationships are especially important. "Connectors" bring people and groups together in useful ways. They facilitate establishing and developing relationships without which policy work does not get done. SACNAS' connector role includes bringing its people together with those of other organizations and groups, such as the Office of the President of the United States, the Society of Mexican American Engineers and Scientists (MAES), the Society of Hispanic Professional Engineers (SHPE), the American Association for the Advancement of Science (AAAS), the American Chemical Society (ACS) and the Council of Scientific Society Presidents (CSSP). The fruit of these connections is bountiful. For example, in July of 2009, SACNAS and AAAS joined forces to hold the first week-long SACNAS Summer Leadership Institute in Washington, D.C. SACNAS and MAES will hold their annual conferences in adjacent spaces in Anaheim, California, from September 30 to October 3, 2010. Also, SACNAS, ACS, and CSSP are collaborating on several projects at multiple levels, including how to strategically approach federal legislators and others for funding and initiatives to advance our communities in the sciences.

**SACNAS as a "maven" society.** A "maven" is "one who accumulates knowledge." Thus, a maven organization is one that is consulted on important issues within its purview. Said differently, SACNAS is striving to become a "go to" organization on topics related to our goals. To clarify our purposes, we have created a strategic plan (available on our website) that includes evaluation/assessment as a key component of our activities.\* SACNAS seeks to become a premier organization that can supply useful information and interpretations about the challenges and successes of Hispanics/Chicanos and Native Americans in STEM. Another example, directly involving specific SACNAS members in this case, is the above-mentioned SACNAS

Leadership Institute, which has the goal of helping competitively selected participants (postdocs, junior and mid-career scientists) to deepen their scientific possibilities and/or widen their administrative possibilities, such as becoming department chairs, deans, and presidents. An initial group of 30 participated last summer during a week in Washington, D.C., and there will be more groups of 30 during the next few years, supported by a National Institutes of Health award given to SACNAS. The graduates of our leadership institute will make SACNAS a more knowledgeable resource for national policy leaders.

**SACNAS as a “salesman” society.** Gladwell’s use of the word “salesman” can be applied to SACNAS’ new, systemic emphasis on policy and advocacy itself and, in particular, to establishing a “Washington presence.” We seek to improve both the methodology and the achievement of significantly greater diversity in the science enterprise. As an immediate means toward these ends, the SACNAS board will hold its winter meeting in Washington, D.C., in January 2010 to optimize interactions with key agency officials and to explore other federal possibilities. The board will also learn more about how policy is developed in Washington. We are pleased to announce that our first SACNAS fellow for science policy has just been appointed. John Christensen, who has considerable experience with CSSP, will be based in Washington, D.C.

SACNAS has played an important role for almost four decades as it has attempted to create greater representation of minority scientists, particularly Native Americans and Hispanics/Chicanos. Many challenges lie before us, but as we increasingly add self-conscious policy development to our portfolio, we will accomplish these tasks more quickly. We have much to do, but together we shall accomplish this very important work.

As the Belgian Nobel laureate Maurice Maeterlinck said, “At every crossway on the road that leads to the future, each progressive spirit is opposed by a thousand men appointed to guard the past.”\*\*

*Dr. Robert Barnhill is SACNAS’ vice president for science policy and strategic initiatives. His career in mathematics and computer science included creating the subject of computer-aided geometric design, as well as supervising and mentoring many students and faculty at all levels of higher education. He was vice president for research for a total of 15 years at Arizona State University, the University of Kansas and the University of Texas system.*

**BELOW**

*Leadership in action! Gathering together at the 2009 SACNAS Summer Leadership Institute are Dr. Marigold Linton, past president of SACNAS; Dr. Joe Francisco, president-elect of the American Chemical Society; Dr. Shirley Malcom, head of Education and Human Resources at the American Association for the Advancement of Science; Judit Camacho, SACNAS executive director; and Dr. Robert Barnhill, SACNAS vice president for science policy and strategic initiatives.*



\*SACNAS members can help by responding to future requests for information on their accomplishments. To read the strategic plan online, go to [www.sacnas.org/pdfs/SACNASstrategicPlan\\_09.pdf](http://www.sacnas.org/pdfs/SACNASstrategicPlan_09.pdf).

\*\*This quote is given in the book *Disrupting Class* by Clayton M. Christensen, 2008. This fascinating book uses his earlier work on “disruptive innovations,” first published in his book *The Innovator’s Dilemma*, 1997. I will return to this topic in future articles.



**Learn more about SACNAS’ plan for engaging in policy by reading the Strategic Plan at [www.sacnas.org](http://www.sacnas.org)**

# Resource Listings

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

To place a paid advertisement in the next edition of the SACNAS News, contact the advertising sales department at [sigolene@sacnas.org](mailto:sigolene@sacnas.org) or call toll free, 877-SACNAS-1, ext. 237.

## 2010 SACNAS National Conference Session Proposal

SACNAS is now accepting proposals in all disciplines for: scientific symposia, professional development, precollege teacher workshops, pre-conference events, special interest forums, and receptions. A relationship to the theme—"Science, Technology, & Diversity for a Sustainable Future" (sustainability, new sustainable technologies and engineering in service to minority communities, sustainable systems, cycles, or processes)—is encouraged but not required.

Proposal Deadline:  
February 26, 2010

More information:  
831-459-0170, ext. 238 or online at  
[www.sacnas.org/conf/New/confClient/](http://www.sacnas.org/conf/New/confClient/)

## STEP-UP Internship in Biomedical Research

Interested in a medical research career? Looking for an opportunity to work in a biomedical research lab next summer? STEP-UP is a ten-week summer program that places undergraduates in research labs nationwide. A \$4000 stipend and paid travel to the STEP-UP conference in Atlanta is provided.

Application deadline:  
February 15, 2010

More information at:  
<http://stepup.niddk.nih.gov/>

## Purdue University Faculty Positions

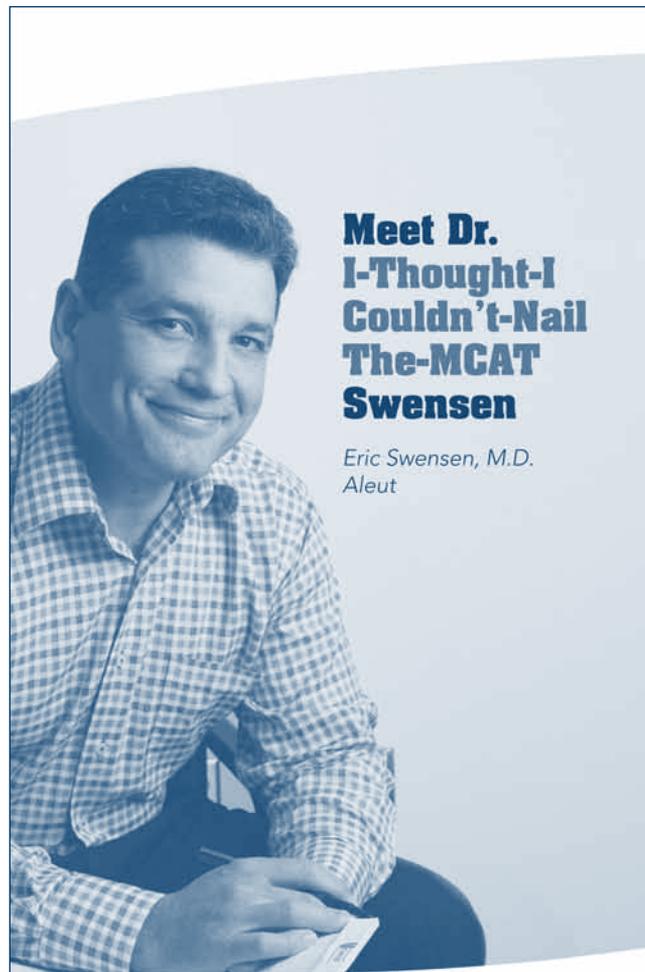
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More information at:  
[www.stat.purdue.edu/hiring/](http://www.stat.purdue.edu/hiring/)

## Assistant/Associate Professor of Seismology/Seismic Exploration:

The Department of Geology and Geophysics at the University of Utah seeks applicants for a tenure track position at the associate or assistant professor level in seismology/seismic exploration.

For additional information regarding the position, deadlines and submission requirements, visit our website at [www.earth.utah.edu](http://www.earth.utah.edu).



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Eric Swensen, M.D.  
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SACNAS

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