RUTGERS
School of Arts and Sciences

FALL/WINTER 2012

Access
Excellence in the Arts and Sciences

Nurturing the Next Generation of Biologists

SAS is at the forefront of a national movement to advance scientific literacy

Shiza Sarfraz was an advanced placement biology student in high school. When she entered Rutgers last fall, she figured she knew what to expect from her introductory biology course. But her experience in a new lab course in the School of Arts and Sciences (SAS) has expanded her understanding of science in ways she hadn't imagined.

She and her classmates worked in small teams, like professional researchers, learning skills such as how to analyze DNA sequences and publish the findings in national databases.

"This is more like what scientists do every day," Sarfraz says. "Even though advanced placement biology is supposed to be college level, it was nothing like this."

Sarfraz is one of about 120 students who participated in a pilot program aimed at transforming "General Biology," the standard introductory biology course for thousands of Rutgers undergraduates, including future medical school students as well as others simply fulfilling their science requirement.

The pilot puts SAS at the forefront of a national movement to better prepare students for the science professions and to advance the level of scientific literacy among the public. It was designed by Martha Haviland, Gregg Transue, and Andrew Vershon in the Division of Life Sciences (DLS) and supported by a National Science Foundation grant as well as funding from SAS.

The new lab is modeled on the professional research lab. Students plunge right into the scientific process rather than memorizing a lot of facts.

"It's not a cookbook lab," says Haviland, the director of the Office of Undergraduate Instruction for DLS. "The students are actually generating and creating new knowledge. And for an introductory lab course, that's pretty unusual." *(continued inside)*

Sophomore Shiza Sarfraz says the new pilot biology lab course is expanding her understanding of science.

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STUDENT SPOTLIGHT

Senior Jimmy Patel

A Gifted Student Learned Life's Lessons from Immigrant Parents

A demanding double major provides opportunity for growth

Jimmy Patel says he gets his aptitude for science from his mother and his work ethic from his father. Judging from his accomplishments in the School of Arts and Sciences (SAS), both parents have had a strong influence on their son's life.

The senior from Edison, New Jersey, is taking a demanding double major in chemistry and molecular biology while also serving as a teaching assistant, student researcher, and part-time employee at a health insurance agency. By the end of his junior year, he was just one course shy of meeting his graduation requirements.

"I'm not happy unless I am multitasking," he quips.

But professors say that this gifted student, who wants to be a researcher and physician, stands out in ways not reflected in his academic transcript.

"He has that special combination of being very smart and hardworking, but also humble and modest," says chemistry professor Jeehiun Katherine Lee. "Jimmy is a very caring person; that is going to serve him extremely well as a physician."

Patel is serving on a research team led by Lee that is examining how DNA in humans becomes damaged, a phenomenon that can lead to cancer.

> "I chose what I believed would help me grow and define me as an individual."

Patel began charting his own path as soon as he entered Rutgers, opting for a unique double major: chemistry and chemical biology, and molecular biology and biochemistry.

"It was the first time I was given a choice of what to study," Patel says. "And I chose what I believed would help me grow and define me as an individual."

Patel's accomplishments exemplify the tradition of academic excellence at SAS. But his background reflects another SAS hallmark—socioeconomic and cultural diversity.

His parents moved from India to the United States, seeking greater opportunities for their children.

"They worked hard and pushed us to work hard," says Patel, the eldest of two sons. "When I wanted to play basketball they said, 'Finish your math.'

"I brought that work ethic with me to middle school, then high school, and finally to Rutgers."

Nevertheless, he is able to find room for basketball.

"Anytime I am free I am at Werblin Recreation Center shooting baskets," he says.

ALUMNI PROFILE

Finding the Route to Medical School as an Undergraduate

A dream that began in the Dominican Republic took shape at Rutgers

Margarita Borghini got the idea to be a doctor from her uncle, a pediatrician in the Dominican Republic where she was born.

She developed the drive to become a doctor from watching her mother, who moved the family to Passaic, New Jersey, and worked in a garment factory to support her children.

Borghini found an academic community that nurtured her dream at Rutgers, where she was a liberal arts and sciences undergraduate.

"All the tools that I needed to succeed as a premed student were right here," says Borghini, a 1993 graduate of Douglass College.

> "All the tools that I needed to succeed as a premed student were right here."

Today, Borghini has a thriving internal medicine practice in Jersey City. She speaks at churches, schools, and on local radio to educate people about health risks.

"A physician should be a public servant," she says. "And one way to serve people is to make them aware of issues that affect their lives."

At Rutgers, Borghini was one of the first students to participate in what is now called the Office of Diversity and Academic Success in the Sciences, or ODASIS. Through the program she was introduced to mentors like professors Francine Essien and Kamal Khan.

"It really opened doors," she says. "It was all about providing opportunity for community, for research, and for intellectual growth."

The value of her undergraduate experience hit home when she attended medical school.

"I had classmates that went to Harvard and Princeton," she said. "But I was just as well prepared."

Her work at Rutgers built on an already-strong family foundation.

Her first inspiration was her uncle.

"I was always sick with tonsillitis, and he would talk to me," Borghini recalls. "I just admired the way he could connect with patients."

Her mother sent her to enrichment programs so she could get ahead of her class.

"There was no question about going to college," she said.

That early support was on Borghini's mind when she spoke to parents recently at the same school she attended in Passaic.

"I talked about the importance of having dreams for your children," she said. "Children need to know that they can do anything they put their minds to."


Margarita Borghini DC'93

Richard S. Falk Appointed Acting Executive Dean

Richard S. Falk has been named acting executive dean of the School of Arts and Sciences.

A professor in the Department of Mathematics, Falk has been a member of the Rutgers faculty since 1972, following undergraduate work at Brown University and a Ph.D. in applied mathematics from Cornell University.

He is the 2007 recipient of the Daniel Gorenstein Memorial Award for outstanding scholarly achievement given to a faculty member who has also performed exceptional service to the university community.

Falk has served in key leadership positions at Rutgers, including as acting executive dean of the Faculty of Arts and Sciences and acting dean of the Graduate School–New Brunswick.

LIFE SCIENCES

(continued from front)

Nurturing the Next Generation of Biologists

Students Daniel Snyder-Vidmar (left) and Nidhi Patel (right) learn fundamental laboratory methods through water quality testing experiments during a recent biology lab session.

During a recent class, students stood at rectangular tables as they worked cooperatively through experiments, learning how to use tools like micropipetors, which dispense microliters of solution containing DNA and proteins.

“I like that it’s so hands-on,” said Carly Kacprowicz, a student considering a major in cell biology and neuroscience. “I’m actually getting an understanding of what I will be doing in medical school.”

Enrollment for “General Biology” is on the rise, a trend that suggests a corresponding surge of interest in the health care field, Haviland notes.

In New Jersey, the health care sector includes pharmaceutical companies, biotechnology firms, and medical device manufacturers, which accounted for $14 billion in wages during 2010, or 8.1 percent of the state’s total wages, according to an analysis by the New Jersey Department of Labor and Workforce Development.

“All of those industries, as well as the allied health fields and the medical fields, need a well-educated, well-trained workforce,” Haviland says. “And with this new lab, we are helping to meet those needs.”

HUMANITIES

A POET TRANSFORMS HER CLASSES INTO COMMUNITY

Evie Shockley helps students empower themselves through literature

Evie Shockley was drawn to the mystery of poetry. But as an undergraduate, she found that mystery intimidating.

“I felt intimidated by having to talk about other people’s work,” Shockley says. “And creating my own seemed beyond my grasp.”

But after attending law school and working as an attorney, she found herself drawn back to literature.

She’s now recognized as a compelling new voice in American poetry, as well as a gifted professor in the School of Arts and Sciences who draws students from across academic disciplines.

Her latest poetry collection, *the new black* (Wesleyan University Press, 2011), is a synthesis of experimental and traditional styles. Her scholarly book, *Renegade Poetics* (University of Iowa Press, 2011), examines the expansiveness of black poetry.

“Some people bloom late, and for me that was certainly the case,” Shockley says. “I eventually came into an understanding of what poetry could do, and that was incredibly empowering.”

Shockley wants to help students discover that sense of empowerment. Her teaching style—informal and conversational, yet insistent on student participation—can transform any class into a small-group workshop.

“I tell each class that we need to think of ourselves as a learning community,” she says. “We need to get to know one another by name.”

Her approach draws budding writers as well as students curious about literature and wanting to experience its power.

“It’s a very effective way to learn,” says Breanna Casey, a junior. “I spent a lot of time organizing my thoughts and preparing what I was going to say.”

Mona Saleh, a junior, says Shockley’s course “Contemporary Narratives of Slavery” helped students reach back across time to take a penetrating and unforgettable look into slavery.

“Reading the narratives was devastating,” she says. “It showed me that the repercussions will extend indefinitely into history.”

Shockley, the daughter of two public school teachers, grew up in a home filled with books and a love for reading. That foundation led to a lifelong love affair with the written word and an understanding of teaching as a way to provide a transformational moment of possibility for students.

“I feel what I can and should do is communicate how much I love literature as a serious intellectual matter, both at the level of emotion and as a lens on our society,” Shockley says. “For all these reasons, students might also come to love it.”

“I tell each class that we need to think of ourselves as a learning community.”

Professor Evie Shockley (standing) talks with students (left to right) Erin McFadden, Katherine Fernandez, and Nicolas McNamara.

(Above) Using a fire extinguisher, David Maiullo demonstrates Newton's third law of motion to youngsters in East Brunswick. (Right) Maiullo lies on a bed of nails to prove a physics point. He is assisted by Rutgers students Elana Resnick (left) and Patricia Homer (right) and two students from the Warnsdorfer Elementary School in East Brunswick.

A Vision of Anthropology for a Rapidly Changing World

Anthropologists at SAS expand the boundaries of their field

Daniel Goldstein travels to Bolivia to examine how the justice system has failed the most vulnerable residents.

Erin Vogel goes to Borneo where she studies orangutans to gain insights into human behavior.

Angelique Haugerud analyzes the work of American satirists who raise delicate issues of class and inequality.

Despite their disparate research interests, the scholars share a common academic home. They are anthropologists, dedicated to studying human life in all its complexity.

"We are all speaking to core issues," says Dorothy L. Hodgson, chair of the Department of Anthropology in the School of Arts and Sciences. "Out in the field and in the classroom our faculty ask the big questions: Who are we? Where did we come from? How do people's lives differ depending on the culture in which they live?"

> "Out in the field and in the classroom, our faculty ask the big questions: Who are we? Where did we come from?"

Renowned for its research and teaching, the anthropology department is constantly reimagining its field for the 21st century to keep up with a rapidly changing world.

Recently Rutgers anthropologists have

- documented the experience of Hmong actors in Clint Eastwood's *Gran Torino* film;
- discovered the oldest known footprints with modern human anatomy;
- revealed the plight of immigrants attempting to cross the U.S.-Mexican border; and
- excavated the home of the last Jewish resident in the Polish town that was home to the Auschwitz concentration camp.

There's also room for topics not typically associated with anthropology, such as humor.

Haugerud's forthcoming book examines how political satirists such as the Billionaires group, who wear costumes to look wealthy and then perform their impersonations at rallies, have emerged to address issues that Americans would rather not discuss, namely, economic inequality and the role of wealth in politics.

"I am interested in how the rupture between the ideal of democracy and the reality has inspired this activism," says Haugerud.

The department includes evolutionary anthropologists, who study the origins and changes in human beings, and cultural anthropologists, who study the lived experiences of humans and how they make their lives meaningful. Both groups are expanding the boundaries of their fields.

Evolutionary anthropologists like Vogel have become increasingly interdisciplinary, working at the intersection of such fields as genetics, morphology, and nutritional sciences.

"I fit into the field of physical anthropology because I am interested in what primates tell us about ourselves," Vogel says.

Her research on the dietary choices made by orangutans during periods of low caloric intake may shed light on human illnesses such as obesity and anorexia.

Rob Scott, also an evolutionary anthropologist, raises one of humankind's most vexing questions in his Signature Course "Extinction," which takes students on a journey from the beginning of the universe to the present and then asks, "How might we go extinct?"

"That question is a real conundrum because I can't imagine us going extinct," Scott says. "But it is the fate of species after species."

Cultural anthropologists, meanwhile, are pioneering the practice of engaged anthropology, which goes beyond producing scholarship about other cultures to promoting social change.

Goldstein has taken students to Bolivia, where they helped build a community center and assisted residents in their struggle for water rights.

"It's a little reciprocity for the communities in which we do our research," Goldstein says. "It's using the knowledge we've gained to transform social realities in a more positive direction."

Hodgson, known for her work on the Maasai pastoralists, agrees.

"There are anthropology programs that may place more emphasis on keeping an objective distance and gathering esoteric knowledge," she says. "But that is not what we are all about. We believe the best theory emerges from ethnography that focuses on issues of concern to the people we are working with."

A DAZZLING SHOW PROVIDES ENDURING LESSONS

Undergraduates gain knowledge and poise working on traveling physics show

Elana Resnick acquired some unusual skills this year. She learned how to set off small explosions, shatter glass with high-pitch frequencies, and use liquid nitrogen to put objects into a deep freeze.

Resnick, a 2012 School of Arts and Sciences (SAS) graduate, wasn't auditioning for a spy movie thriller. She was working as an assistant to David Maiullo, the charismatic Rutgers staffer whose traveling physics show has been captivating audiences across New Jersey for decades.

Last spring during her senior year, Resnick joined a small team of undergraduates who accompany Maiullo to each show, helping to set up and take down the equipment and assist in the demonstrations.

"It seemed like a pretty cool thing to do in my senior year," Resnick says.

But it has turned out to be much more. Resnick, now a student in the Graduate School of Education, is preparing for a career as a high school physics teacher. She says that working with Maiullo has provided her with an enduring lesson in how to engage kids in a classroom.

"Seeing the way Dave does the demos and the way he gets the audience to interact—all of that helps me develop my own path for instruction," Resnick says. "And it's definitely giving me ideas for demos I can use in the classroom."

Maiullo's show is based on a simple proposition: physics is fun and fascinating. And he's willing to detonate hydrogen-filled balloons or lie down on a bed of nails to prove it.

Many of his undergraduate assistants have enjoyed the experience so much that they've gone on to become physics teachers, including some who had never planned to teach.

"Working with me, my assistants definitely get an understanding of how much fun physics education is," says Maiullo, who uses his skills to support physics courses in the Department of Physics and Astronomy in SAS. "Then they start to think, 'Well, maybe I can be a teacher.'"

> "Working with Dave…helped me understand how much you can help students and help society."

Jonathan Mayes, a 2011 SAS graduate, said he had planned to work as a scientist in the private sector until he began working with Maiullo. Now he's teaching physics to high school and middle school students in Edison, New Jersey.

"Working with Dave made me see the light," Mayes says. "It helped me understand how much you can help students and help society. When you see the faces of the kids in the audience light up, it's such a good thing."

The show was developed from the Rutgers Faraday Christmas Children's Lecture that Maiullo and physics professor Mark Croft perform every December.

Maiullo does about 40 additional shows outside of Rutgers every year, beginning each one with an explanation of basic physics concepts and then demonstrating those concepts in imaginative ways.

To illustrate, for example, Newton's Law, which states that for every action there is always an equal and opposite reaction, Maiullo sits on a cart and sprays a fire extinguisher to propel himself across the stage.

Maiullo engages and encourages his audience, creating a friendly atmosphere of discovery.

"You are all scientists," he said last spring to an audience of middle school girls at a private religious school. "And I am going to convince you of that by the time I leave."

The 15th annual Rutgers Faraday Christmas Children's Lecture will take place at 7 p.m. on December 7, 8, and 9 at the Physics Lecture Hall on Rutgers' Busch Campus, 136 Frelinghuysen Road, Piscataway, New Jersey.

Robert L. Barchi, 20th President of Rutgers

Robert L. Barchi—a renowned neuroscientist, respected educator and academic innovator, and successful fundraiser—is the new president of Rutgers.

Before coming to Rutgers, Barchi served from 2004 to 2012 as president of Thomas Jefferson University in Philadelphia, nationally regarded as a top university dedicated to health sciences education and research.

Prior to Jefferson, he spent 32 years at the University of Pennsylvania. In addition to his faculty service, he directed Penn's neurological sciences institute, chaired the Department of Neurology, founded and chaired the Department of Neuroscience, and, from 1999 to 2004, served as provost and chief academic officer with responsibility for Penn's 12 schools, all academic programs, athletics, students, and faculty.

Born in Philadelphia, Barchi spent his formative years living in Westfield, New Jersey. He received his B.S. and M.S. degrees from Georgetown University, and Ph.D. and M.D. degrees from the University of Pennsylvania. He is board certified as a specialist in neurology.

(Far left) Rob Scott's Signature Course focuses on extinction. (Top) Daniel Goldstein's work in Bolivia examines why the justice system has failed vulnerable residents. (Bottom) Erin Vogel studies the dietary habits of orangutans on the island of Borneo.

ROUNDUP

Things You May Not Know about the School of Arts and Sciences

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1 **This year, a record-breaking 18 SAS students are living abroad as Fulbright grantees in countries from Azerbaijan to Thailand.**

Endre Szemerédi, State of New Jersey Professor of Computer Science, was awarded the 2012 Abel Prize by the Norwegian Academy of Science and Letters "for his fundamental contributions to discrete mathematics and theoretical computer science." The Abel Prize recognizes contributions of extraordinary depth and influence to the mathematical sciences and is considered comparable to a Nobel Prize. Awarded annually since 2003, the honor carries an award of $1 million.

7

1 **Critical Language Scholarships, awarded by the U.S. Department of State's Bureau of Educational and Cultural Affairs, will enable seven SAS students to study Bengali, Hindi, Japanese, Russian, and Turkish abroad this year.**

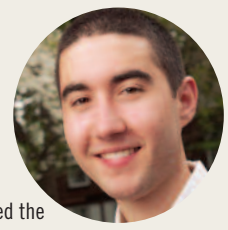
This past spring, the Phi Beta Kappa Honor Society inducted 530 juniors and seniors from SAS.

$1.45 million

1 **A $1.45 million grant from the John Templeton Foundation to the School of Arts and Sciences will enable philosophers, scientists, and three new Rutgers Templeton postdoctoral fellows to spend the next three years considering the nature and fate of the universe. Project leaders Barry Loewer (Rutgers) and David Albert (Columbia) and scholars at Columbia University, Yale University, New York University, and the University of California at Santa Cruz are establishing the philosophy of cosmology—the study of the nature of the universe—as a specific, interdisciplinary field.**

Points of Pride

Senior **Walter Fortson,** an exercise physiology major, is the recipient of a Truman Scholarship, a national award for top students pursuing careers in government or public service. Fortson, a Philadelphia native, is also one of three New Jersey college students recognized by the New York Nets with its Nets Foundation Appreciation Scholarship for his academic achievement and commitment to community service.



Kevin Tobia SAS'12, a triple major in philosophy, cognitive science, and mathematics from Chatham, New Jersey, is one of only 15 students worldwide to be awarded the Ertegun Scholarship to Oxford University for graduate study in the humanities. Tobia also received a Clarendon Scholarship, awarded to academically excellent students to cover expenses at Oxford.

Helen Janiszewski SAS'12 has been awarded a three-year Graduate Research Fellowship from the National Science Foundation. Janiszewski, from Leonia, New Jersey, graduated with majors in both geological sciences and physics, with dual minors in math and Russian studies, and is now pursuing graduate studies in solid earth geophysics at Columbia University.

Senior **Kelvin Mei,** a physics major from Flemington, New Jersey, is among 282 students selected by the Barry M. Goldwater Scholarship and Excellence in Education Foundation to receive awards in mathematics, natural sciences, and engineering. The Goldwater Fellowship is regarded as the premier undergraduate award of its type in these fields.

GETTING THE SMALL-COLLEGE EXPERIENCE AT SAS

The School of Arts and Sciences (SAS) Honors Program is a community. It provides a full range of experiences and opportunities for high-achieving students, including housing, personalized advising, research funding, special seminars, faculty mentors, and many cultural and social activities. Matt K. Matsuda, dean of the SAS Honors Program, explains how the program connects students of diverse backgrounds and creates a community of scholars.

Matt K. Matsuda, dean of the SAS Honors Program

Q: The Honors Program is thought of as a community or even a small college within SAS. What is the vision behind your approach?

A: It's the small liberal arts college experience within the big research university. We focus on building programs and unique opportunities for students who like to learn and want to be in a scholarly, intellectual environment. Our students are supported by mentors, special classes, and professors who work one-on-one to guide their research. We also provide a circle of friends, teachers, and advisers.

Q: How do you build community when students are coming from different backgrounds and with disparate interests and skill sets?

A: There are multiple ways. The most fundamental way is with dedicated honors housing across the campuses in New Brunswick and Piscataway. When we ask alumni what they remember about being part of the Honors Program, they always say, "Oh, it was living in Brett Hall" or "living with my roommates in McCormick Suites." There's nothing like living with other students who are excited about learning.

Q: Many of the courses and seminars for honors students explore emerging knowledge that exists at the intersection of academic disciplines. Can you give an example?

A: Bioethics is an area where we support both faculty teaching and student organizations. Half the participants are philosophers or future legal scholars, while the other half are researchers in genetics, microbiology, chemistry, or cell biology and neuroscience. It's a crossover area with rich possibilities for intellectual engagement.

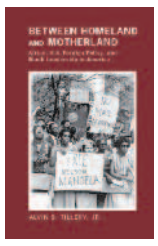
Q: How does the Honors Program shape students over the course of their undergraduate years?

A: It's like being an athlete. You can practice, but you don't know if you are good until you compete with the best. That's where community is very important.

When the students come into the program, they are smart and promising. But over the years, they have classes together, study together, take exams together, and live together. They only keep up by teaching each other, and they excel academically by making friends and forging bonds that will stay with them forever. Then they really know they are getting the honors experience.

Bookshelf

Check out these recently published works by Rutgers School of Arts and Sciences faculty.



Between Homeland and Motherland: Africa, U.S. Foreign Policy, and Black Leadership in America
Cornell University Press, 2011

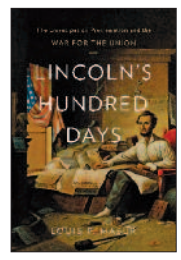
Alvin B. Tillery Jr. (Political Science) examines the African-American elite as they tried to shape U.S. foreign policies toward Africa from 1816 to 2000.

Between Feminism and Islam: Human Rights and Sharia Law in Morocco
University of Minnesota Press, 2011

Zakia Salime (Sociology) studies the interactions between Islamist women and liberal feminists in the battle for women's rights in Morocco.

Know How
Oxford University Press, 2011

Jason Stanley (Philosophy) argues that knowing how to do something, such as swim or cook a meal, amounts to knowing certain truths. Thus, it is knowledge of truths that leads to our capacity for engagement with the world.



Lincoln's Hundred Days: The Emancipation Proclamation and the War for the Union
Harvard University Press, 2012

Louis P. Masur (American Studies and History) examines the period from September 22, 1862, when Lincoln issued his preliminary Emancipation Proclamation, to January 1, 1863, when he signed the final, altered decree.

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