Seeing and Teaching Math

Anne Papakonstantinou has a special gift of seeing math in everything. In the most mundane things, she sees mathematical configurations like others see poetry.

“The beauty of math is everywhere,” Papakonstantinou said. And she wants everyone, especially young people, to enjoy the pleasures and benefits that math has to offer.

“If we develop deductive reasoning, along with critical thinking and problem solving, in people, we will have a better society. I want kids to have these skills so that they can be successful in their lives,” she said.

As director of the Rice University School Mathematics Project (RUSMP), Papakonstantinou has influenced thousands of people with her passion for math. RUSMP’s mission is to help teachers and school administrators better understand the importance of mathematics and to develop new ways to teach math. The program, which began 24 years ago, works with school districts across Texas.

“Anne is a visionary in the math world, working tirelessly to help campuses provide math instruction that is relevant and allows students to master the con-

Houston Teachers Search for Slavery-Era Graves

As part of a summer program at Rice University, a group of local teachers took the latest tools of geophysical science into a remote field at Prairie View A&M University (PVAMU) to search for unmarked graves in one of Texas’ few known slave cemeteries.

“They are finding graves that we did not know existed,” said Akel Kahera, associate professor of architecture and community development at PVAMU and director of the Texas Institute for the Preservation of History and Culture. “And the beautiful thing about this equipment is that it can give us a reading of the location of these graves, and then we can do further research to try to identify who the people are that may have been buried in these locations.”

This is the third year that Kahera has teamed with students and instructors from Rice’s Earth Science Department to search for unmarked graves in and around the Wyatt Chapel Cemetery on the northern portion of the Prairie View campus.

Prairie View, the second-oldest public institution of higher learning in Texas, was founded in 1876 on 1,000
Finding Graves  Continued from Page 1

acres of land that had been part of Alta Vista, one of Texas’ largest pre-Civil War plantations. Though there are no written records of a slave burial ground for Alta Vista, oral histories suggest that the area around the present-day Wyatt Chapel Cemetery served as the slave burial ground for both Alta Vista and Liendo, another large plantation nearby.

Most of the students in the two-week course are science teachers in elementary, junior high and high schools throughout the Houston area. Many have returned for two or three years and say the course pays dividends in the classroom.

Shawn Wegscheid, a teacher at Westchester Academy in Spring Branch Independent School District, who participated for a second time this year, said, “It shows students that there’s more than just commercialization. There’s more than oil. There are other aspects of science that they can really get into if that’s what they’re looking to do.”

The teachers use ground-penetrating radar, GPS and high-tech survey instruments to catalog and map suspected graves. But eventually, they hope to use the data to create a sophisticated map that PVAMU researchers can augment with archival and historical data.

One of the course instructors, Dale Sawyer, professor of Earth science at Rice, said investigating the geology and geography of the area can help reveal clues about the cemetery’s history.

“We’re interested in the geology and the depth of the clay here to tell us something about where we expect burials to be,” Sawyer said.

The course’s lead instructor, Davin Wallace, lecturer in Earth science at Rice, said the ground-penetrating radar lets the class see unusual features down to about 10 feet.

A large measure of the success for the program goes to Alison Henning, a former lecturer in Earth science, who founded and led the program at Rice during its first few years.

—JADE BOYD
Rice News staff

Local Students Prepare for College

Seventy-nine local high school students spent a week this summer at Rice University learning about global issues related to environmental sustainability and cultural understanding.

Through the new student-enrichment program C3: Content, College, Career administered by Rice’s Susanne M. Glasscock School of Continuing Studies, the students also participated in a variety of activities to assist them in navigating the college admission and application process and to explore career options in the sciences and social sciences.

Master teachers, guest speakers and Davin Wallace, an Earth science lecturer at Rice, presented sessions.

The students — sophomore and juniors — came from Carnegie Vanguard High School, Corpus Christi College Prep High School, Strake Jesuit College Preparatory, La Porte ISD and Pasadena ISD.

“The students were able to experience Rice firsthand while attending courses that were interesting, relevant and college related,” said Amy McClurd, program director of teacher professional development and student programs at the Glasscock School.

“I strongly appreciate the time and effort that all our teachers and counselors spent on helping us with our college future and helping us understand our environment and the world around us,” said a student in the C3 program.

This program will be held again in June 2011. “We hope to expand our course offerings and double our outreach efforts to 160 rising sophomores and juniors,” said McClurd.

For more information, please visit teachers.rice.edu.

—KRISTAL M. SCHEFFLER
Marketing Specialist
Glasscock School of Continuing Studies

APPLYING THEMSELVES: Local high schools learn about global issues, college admission and the application process.
Community College Students Conduct Summer Research at Rice

A group of Houston Community College students spent their summer at Rice University conducting research on human proteins and on solar cells that can convert sunlight into electricity.

The students from HCC’s Northwest campus were part of the Undergraduate Summer Research Experience (USRE) program, which identifies talented and motivated community college students and gives them the opportunity to conduct summer research projects. The goal is to provide HCC students with mentoring and research experience and to encourage them to seek advanced degrees in science and engineering. A total of 25 students have participated since the program began in 2007.

Amanda Schlafer, a former HCC student now at the University of Houston, mentored under Rafael Verduzco, assistant professor in chemical and biomolecular engineering at Rice. The team worked to produce and test more than 30 polymer solar cells. These materials can potentially lead to low-cost and flexible solar cells for converting sunlight to electricity.

When describing her experience, Schlafer said, “Not only did I learn a lot about block copolymer solar cells, but I was able to collaborate with a very dedicated research team.” Schlafer’s work will help build new polymer solar cells with materials designed at Rice.

Cecilia Guerra, another HCC student, collaborated with Joff Silberg, assistant professor of biochemistry and cell biology, to experiment on the isolation and purification of a human molecular chaperone. Guerra manipulated the bacteria to kill themselves, which is a process for making a human protein. The new protein was then purified to near homogeneity for the purpose of biophysical studies. The goal is to determine how the hundreds of atoms in this human protein are arranged in three-dimensional space to help scientists understand how it works.

Guerra encourages her peers to participate in the program. “I would advise any student that likes science and likes to always keep learning, to try it. Even if you are afraid, try it because it might help you define your future,” she said.

Bart Sheinberg, the director for the West Houston Center for Science and Engineering at HCC Northwest, has been actively involved in recruiting students there as well as faculty mentors at Rice and the University of Houston to participate in the program. Sheinberg developed the rigorous, interdisciplinary Scholars Program to create an affordable path for community college students to complete undergraduate and advanced degrees in science, technology, engineering and math (STEM) fields.

Many more qualified graduates are urgently needed to pursue careers in science and engineering to keep the region and the nation competitive in the global economy. Community college systems, like HCC, offer a promising untapped source of workforce talent. Although a large percentage of students are enrolled in STEM courses, these students typically have limited access to researchers during their initial years of study.

Sheinberg’s motivation for creating the program was the students. “The students get the opportunity to see what research is all about while working with graduate students and researchers. They begin to get a sense of comfort that this is something they can do as well.”

—RAFAEL VERDUZCO
Assistant Professor
Chemical and Biomolecular Engineering

Seminars Lead Houston Teachers to Asia

The Mongols of China are slowly invading the classrooms of Houston, thanks to the Asia Outreach and Global Education program held at Rice University. Offered by Rice’s Center for Education, this outreach program offers a series of Saturday Seminars designed for Houston-area middle and high school teachers that focus on Asian culture.

Generously supported by the Freeman Foundation and the National Consortium for Teaching About Asia, the seminars provide teachers with an interpretive framework for understanding various Asian cultures, as well as concrete examples of how this information can be employed in the classroom. The Saturday Seminars, which are limited to 15 participants, focus on two basic themes: how different cultures construct reality and the process of globalization, which includes transnational circulation of ideas, people, products and practices — past and present. Participants can use the model to devise their own creative and compelling lesson plans for classes such as history, social science, geography, art and literature.

Since the start of the Saturday Seminars in fall 2009, five six-hour seminars have been offered, including The Mongols in World History; Confucianism: What Was It and What Has It Become; Buddhism, Past and Present: In Asia and the West; China’s First and Last Emperors: A Comparison of the Lives and Times of Qin Shih Huangdi (259–210 BCE) and Mao Zedong (1893–1976 CE); and Asian Religions in America: The Transnational Travels of Hinduism, Buddhism and Daoism. Past participants received a one-year subscription to the journal Education About Asia, a DVD of images and texts, and additional teaching materials.

Future seminars will continue to be taught by Rice faculty and staff and will include topics, such as women in modern China, the rise of communism in China, Korean culture through films, present-day China, Chinese and Asian art, South Asian languages and literatures, Southeast Asia, and Asian languages in secondary schools.

More information about the Asia Outreach and Global Education program can be found at http://centerforeducation.rice.edu. If you have suggestions about programming possibilities, please e-mail smithjr@rice.edu.

—RICHARD J. SMITH
George and Nancy Rupp Professor of Humanities and Professor of History
Connecting Classroom Mathematics to the Outside World

About 600 elementary students from the Houston Independent School District invaded Rice University in May to search for proof that mathematics does exist outside the classroom.

Third graders from Almeda, Hobby, Montgomery and Windsor Village Elementary Schools spent the day scouting around Rice’s academic quadrangle looking for evidence of mathematics.

The goal was for students to see that mathematics is connected to the world around them. Students looked for geometry patterns in the campus architecture and found real-world examples of lines of symmetry, patterns, diameters, circles, angles and other geometric terms that they study in their classrooms.

Ambreen Ali, an HISD numeracy specialist, organized the trip along with Carolyn White and Susan Troutman from the Rice University School Mathematics Project. Numeracy specialists from HISD presented lessons on patterns and symmetry using manipulatives to the visiting students and their teachers in the classrooms of Sewall Hall.

After creating symmetrical patterns, the students toured the exhibit “Sometimes in My Dreams I Fly” by artist Andrea Dezso, which was on display at the Rice Gallery. In this imaginary lunar world, the students’ imaginations were captured by the 3-D scenes. As the students peered into the individual tunnels, they were transported to a fantasy world where geometric shapes and patterns were evident.

Michael Emerson, the Allyn and Gladys Cline Professor of Sociology and co-director of the university’s new Institute for Urban Research (IUR), summarized information on housing segregation in Houston based on the 2000 Census that showed distinct separation between black and white neighborhoods, with Hispanics somewhat more integrated but still dominating many neighborhoods of their own.

“People make their own decisions, their own incomes, and they’re all trying to get the best house and neighborhood they can get. How does it end up they live so segregated by race?” he asked.

Emerson said that he hears two answers. The first: “It’s not race; it’s class.

“That’s not the answer,” he said. “Segregation by race is substantially greater than segregation by income.”

The second answer: “People like to live with people like themselves.” While this may be somewhat more accurate, this is still not the answer, Emerson explained.

“What we have found is that in current times, many people want not to live with certain people — people they think will drive down their property values, raise crime and lower the quality of local education. They use race to decide these other factors.”

Too few are committed to diversity, according to the most recent Houston Area Survey — 2010, Perspectives on a City in Transition.

A “factorial experiment” of African-Americans, Hispanics and whites, 1,000 each, revealed important results. Individuals were first asked if they’d buy a house that had everything they were looking for, was close to work and within their price range.

Emerson said the results showed, as expected, sensitivity among all groups to high crime rates and low-quality schools. Blacks and whites were more sensitive to home valuation than Hispanics.

Race is indeed less of an issue for Hispanics, at least in Harris County, Emerson said. But for whites, “you get a different story. They are highly sensitive to percent black and percent Hispanic.”

“Even if you take a neighborhood that has low crime, high-quality schools and rising property values and you say it’s 30 percent black, in almost every single case, the white respondent will say, ‘Not likely to buy the home.’”

The more educated whites are, the more likely they are to live in highly segregated neighborhoods, he said. “Again, this is not an income effect; it’s an education effect.

Similarly, he said, African-Americans in Harris County proved less interested in neighborhoods where the percent of Asian residents was on the rise.

Why does neighborhood segregation by race matter? The fourfold increase in the national gap between net worth of white and black families — demonstrated in an “incredibly detailed” study of 2,000 families followed over 24 years from 1984 to 2007 — is telling, Emerson said.

The study, he said, “shows most middle-class Americans generate their wealth through their homes, and white neighborhoods, due to higher demand, rise in value more than in other neighborhoods. So it’s a big deal where people live.”

“The fact is,” he said, “the society our children inherit will suffer and the society our grandchildren inherit will suffer even more if we don’t address racial segregation and the resulting increasing racial wealth gap.”

Perspectives on a City in Transition

However much people choose to live in a segregated society, the trend is a losing proposition for all.

That was the takeaway message delivered by Rice’s Michael Emerson in a presentation to the Houston Association of Hispanic Media Professionals (HAHMP) in August. Public Affairs’ Multicultural Community Relations sponsored the event.

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— MIKE WILLIAMS
Rice News Staff
Rice University has created a summer program that lends a writing hand to local students preparing for the college admission essay.

Conceived and hosted by the office of Multicultural Community Relations (MCR) in the Office of Public Affairs, a total of 39 students attended two camps in June and July. Participants, many of whom are first-generation college applicants, learned to navigate the complex path to college admission with a special focus on writing the college admission essay.

For five days in June, rising sophomores, juniors and seniors from the International Baccalaureate program at HISD’s Eisenhower High School participated in a camp designed to prepare students to write essays for their college admission and scholarship applications. This camp resulted from a collaborative relationship between Eisenhower and MCR.

On campus, the students did more than just listen to presentations about college admission, admission tests and financial aid. They engaged in discussions about careers led by staff members from Rice’s Center for Student Professional Development, corporate and community leaders, and Rice alumni, including physician Jamal Joyner, who is also an Eisenhower High School alumna.

For an average of three hours each day, the students wrote, revised and critiqued their essays and those of their peers. At night, they rewrote and edited the day’s work and e-mailed the new results to the camp’s instructors. Dedicated teachers reviewed and critiqued their students’ work in preparation for the next day.

By week’s end, the freshmen and sophomores had produced rough drafts of essays. Juniors and seniors got a head start on the process by completing at least one solid draft of an essay for future refinement.

Dimas Gonzales, a senior at Eisenhower commented, “The Rice summer writing workshop was a wonderful opportunity for me. It allowed me to get a jump on the pack and got me into the mindset that I need to be in for the upcoming semester.”

Gonzales was grateful for the camp’s supportive environment. He said, “I picked up some really useful tips and got a fantastic essay to show for all my work.”

In July, 14 students from the Designing with Rice Engineers, an Achievement and Mentorship (DREAM) project spent an intense day in activities similar to the first camp. An entire afternoon was devoted to reviewing the drafts of essays prepared by students prior to the class.

Students said they were satisfied with the information they received about the financial aid process and strategies for completing a well-written college essay. MCR’s goal is to expand the program to include even more students next summer.

Symposium to Focus on Slavery in the South

Seven outstanding scholars will examine slavery in the colonial South as part of the fourth biennial Symposium on Southern History Feb. 18–20, 2011.

Sponsored by Rice University’s History Department, the symposium will be held in Farnsworth Pavilion at the Ley Student Center and is free and open to the public. Advance registration is not required.

The seven scholars will examine slavery not only in the more traditional areas of the colonial Chesapeake but also in Georgia, the Spanish borderlands, including Texas, and the broader Anglo-American Atlantic world.

Professor Alan Gallay of Ohio State University will open the conference Friday evening with a presentation on Indian slavery and its place in the development of unfree labor in the colonial South. Gallay won the Bancroft Prize for his book “The Indian Slave Trade: The Rise of the English Empire in the American South, 1670–1717” (Yale University Press, 2002). A reception will follow his presentation.

Several sessions and ample time for discussion with the audience will take place all day Saturday and Sunday morning. Robbie Ethridge, professor of anthropology at the University of Mississippi, will share her paper, “Colonial Indian Slaving in the Hinterlands: The Case of the Chickasaws.” Professor Jane Landers of Vanderbilt University will address slavery on the North American Spanish frontier. Landers’ book “Black Society in Spanish Florida” (University of Illinois Press, 1999) won the Francis B. Simkins Award from the Southern Historical Association. Professor Juliana Barr of the University of Florida will discuss Indian enslavement and slave raiding in the 17th-century Spanish Southwest. Barr is the author of the award-winning book “Peace Came in the Form of a Woman: Indians and Spaniards in the Texas Borderlands” (University of North Carolina Press, 2007).

Turning to the eastern seaboard, Professor Watson W. Jennison of the University of North Carolina at Greensboro will present a paper titled “From Subjects of the King to Citizens of the State: Race and Status in Early Georgia.” Davidson College professor Michael J. Guasco will discuss “Slavery before ‘Slavery’ in the Seventeenth-Century Anglo-Atlantic World.” Guasco is the author of the forthcoming book “Slaves and Englishmen: Human Bondage and the Making of an Anglo-American World” (University of Pennsylvania Press). Professor James Sidbury of the University of Texas at Austin will conclude the symposium with a reflection on the legacies of colonial slavery, both Indian and black, for the new nation.

The public is encouraged to attend this symposium, which promises intellectually stimulating and fruitful discussion for all participants. For more information, please contact the conference organizers: Professor Rebecca A. Goetz at 713-348-2548 or rgoetz@rice.edu; Professor John B. Boles 713-348-5546 or boles@rice.edu; or the Journal of Southern History at jsh@rice.edu or 713-348-6039. Additional details regarding the conference schedule, parking and other pertinent information will be available on the symposium website at rice.edu/southernhistory.
Daniel Cohan is an expert on how pollutants affect air and the public’s quality of life. He also knows how to inspire local fifth-graders to take an interest in science.

Cohan, an assistant professor of civil and environmental engineering at Rice University, pledged as part of his 2009 National Science Foundation CAREER Award to develop curriculum that would help students understand air quality issues and meteorology.

Helping him in this endeavor was Rice chemical engineering senior Kavita Venkateswar, who has experience in developing math-lesson plans for San Antonio elementary school students. Together they created a curriculum for fifth-grade Houston Independent School District science teachers.

The project, launched in fall 2009, will continue for the next four years. Initially, 20 educators received special training at the Rice Elementary Model Science Lab on how to lead students in taking weather and atmospheric measurements and students from Elrod, Ralph Anderson, Cynthia Ann Parker and Eleanor Tinsley took part. They learned how to use digital hygrometer/thermometers, infrared thermometers and ozone scanners and charted their findings. Some students created a website and blogged about their experiences, with Cohan occasionally commenting online on the students’ work.

Lauren Topek, then-science coach for the schools, said Cohan’s focus on essential knowledge and skills in the Texas Assessment of Knowledge and Skills exam was perfect for fifth-graders.

“Partnering with Dr. Cohan brought real-world experiments to the classroom,” said Topek. “For our students to truly grasp science concepts and for our teachers to teach deeply and rigorously, we’ve got to connect classroom learning to their lives. This did it. It really helped students understand current issues we face in Houston and how weather and air pollutants affect them.”

Cohan said the effort succeeded beyond his expectations. “Fifth grade is a critical time to spark students’ passion for science,” he explained. “In catching them when they have a natural curiosity about the weather and the environment, we showed that science is not merely an abstract concept, but something that directly impacts their communities. We hope some of these students may now see a future for themselves in science or technology.”

The program could also have an impact far beyond HISD, he noted. The curriculum is available online through Connexions, Rice’s online electronic publishing project, and can be downloaded for free.

Rice Excels at the 2010 Diversity Summit

One of the goals of Rice University’s Vision for the Second Century is to engage Houston. This was made amply clear last May, when Rice professors, staff, alumni and the university president took an active part in the Association of Chinese-American Professionals 2010 Diversity Summit.

Steve Murdock, the Allyn R. and Gladys M. Cline Professor in Sociology, gave a presentation on the 2010 census and the effect that the demographic shift will have on Houston and its workforce.

Mikki Hebl, professor of psychology and management, presented her research on the new way people face discrimination in the workplace.

Both presentations were very popular as indicated by the standing-room only audience and the question-and-answer period that exceeded the designated time limit.

In his luncheon keynote speech, Rice University President David Leebron talked about the term diversity and how it means something different to everyone. Because there are so many different types of people within defined groups, diversity really means inclusion and to be respectful of everyone’s views no matter what they may be and how they differ from our own.

Additionally, David D. Medina, director of Multicultural Community Relations, Public Affairs, received the Diversity Champion Award at the luncheon. Medina was honored for his work in recognizing and advancing diversity within the Houston community.

This is the 11th year of the Diversity Summit, which serves as a forum to understand the impact of global events on Houston’s economy and various workplaces.
cepts,” said Sara Ptomey, executive director of curriculum and instruction for the Aldine School District.

More than 7,000 teachers have participated in at least one of the many programs that RUSMP has offered. “If you multiply the number of teachers by the number of students they teach each year, I would say that we have impacted hundreds of thousands of kids,” Papakonstantinou explained.

RUSMP offers more than 40 programs each year, including the Summer Campus Program, which is a four-week professional development program in mathematics content and pedagogy for K–12 teachers from the greater Houston area. In this program, teachers learn how to effectively use technology and manipulatives to teach mathematics and how to motivate students. Participants receive instruction from master teachers and Rice faculty.

Beth Breuer, who teaches math at St. Thomas High School, has fond memories of taking high school and professional development classes from Papakonstantinou. “Anne has an amazing knack for finding fresh ideas or inspiring them in others,” Breuer said. “I will always jump at the opportunity to learn from and collaborate with her.”

RUSMP provides onsite support to schools and school districts as well. “We don’t tell people what to do,” Papakonstantinou said. “We like to collaborate and see what their needs are and work together to see what has to change or improve.”

In spring 2009, RUSMP began collaborating with HISD on “Math-A-Lectics,” a television show that uses sports, puppets and math coaches to make mathematics fun to learn. Episodes have featured addition, multiplication, division, fractions, measurement and geometry. The show airs daily on the HISD cable television channel.

Born and raised in Houston, Papakonstantinou likes to say that she received all her education inside the 610 Loop. She attended Roberts Elementary, Lanier Middle School, Lamar High School, Rice University and the University of Houston. At an early age, the Houston native showed a propensity for math.

“My mother said I was always a math teacher,” Papakonstantinou recalled. In fact, she started a school when she was 8 years old. Using her house as a classroom, she conducted summer classes for her neighborhood friends — about eight — who ranged in ages from 6 to 11. She taught math, reading and “almost anything else” and offered snacks and lunch that her mother prepared.

As a student, Papakonstantinou encountered several teachers who nurtured her love for math. At Lamar High School, her geometry teacher, Lel Red, who was in the first graduating class of Rice University in 1916, encouraged Papakonstantinou to go to Rice and pursue a degree in mathematics.

At Rice, Papakonstantinou’s model was Frank Jones, now the Noah Harding Professor of Mathematics. “Frank is an amazing person. He always inspired students to learn,” she said. Papakonstantinou received a bachelor’s degree in mathematics and French in 1969 and a master’s degree in mathematics in 1971 from Rice.

She went on to teach math at Sharpstown High School for 18 years, where she was named the 1981 HISD Teacher of the Year. She then taught part time at the High School for the Performing and Visual Arts (HSPVA). While teaching at HSPVA, she received a doctorate in curriculum and instruction in mathematics from the University of Houston in 1992. She also helped to open The Rice School/La Escuela Rice.

When Papakonstantinou started at RUSMP as a master teacher in 1987, the organization was a summer institute funded by the National Science Foundation. But after she became executive director in 1994 and then director in 2000, she led the expansion of RUSMP into becoming a recognized mathematics education center that provides year-round programs and support for schools and districts across Texas.

“If school districts have a problem with math, they call us,” she said. “We are part of the solution.”

—DAVID D. MEDINA
Director
Multicultural Community Relations

Rice At Large Wins Award
For the second year in a row, Rice At Large has won an award from the Council for Advancement and Support of Education District IV.

The quarterly newsletter received an Achievement Award in the Newsletters/Tabloids/Newspapers (8 1/2 x 11 inches or smaller) category. Produced by the Office of Multicultural Community Relations (MCR), Public Affairs, Rice at Large showcases the extensive and varied community outreach and engagement programs that are carried out by many different divisions of Rice University. Rice at Large is sent to more than 2,000 members of the Houston community, including educators, community and political leaders, and others with whom the university hopes to engage.

Dean Mackey, senior graphic designer, designs the publication and David D. Medina, director of MCR, is editor of the newsletter, which runs eight to 12 pages. Others who contribute to the production of Rice at Large are Jan West, MCR assistant director; Stacy Cervantes, Public Affairs events specialist; and Tracey Rhoades, editorial director.
INSIDE THIS EDITION: A group of Houston Community College students spent their summer at Rice University conducting research on human proteins and on solar cells that can convert sunlight into electricity.