Forging Tomorrow’s Community Leaders
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Acumen is published twice a year by the College of Arts and Sciences at Lehigh University.

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CONTINUOUSLY INNOVATIVE IN THE SERVICE OF LEARNING
An Arts and Sciences Approach to Leadership

This issue of the magazine explores the topic of leadership and the impact of CAS students, faculty, and alumni.

The fall semester is always an exciting time to be on campus. There is a sense of renewal and progress as new faces join us in the classrooms. Once again, you will find that the stories contained in Acumen exemplify the best of what we do in the arts and sciences—develop world citizens who are trained and eager to be active leaders throughout their lives. As part of its strategic plan, Lehigh talks about what it means to lead, and the intrinsic qualities of leadership are found in an arts and sciences education. Leadership is both an art and a science. Leadership is an art because it requires imagination and creative skill. No two leaders approach a challenge exactly alike, and our faculty impart to our students the skills needed to approach challenges from multiples perspectives to find success. Leadership is also a science. The natural sciences, as well as the fields of political science, psychology, and sociology, shape our understanding of leadership and provide arenas for its practice. The combination of arts and sciences creates leaders who possess the ability to communicate their views powerfully, to express their ideas creatively, and to analyze data before they act.

The stories found in Acumen are prime examples of the College’s ability to develop leaders. The college’s Community Fellows program is shaping tomorrow’s leaders by strengthening the relationships between Lehigh and regional nonprofits and governmental agencies active in the broad areas of economic and community development. Matt Berman ’94 and Andrew Kotchen ’94 are leading the way in green design as partners of a New York City design firm. On campus, graduate student Dan Coviello ’13 ’15G is transforming youth engagement through his work at the United Nations, while Douglas Solowey ’15 is examining novel ways to incorporate fluorine into organic molecules as a prestigious Moissan Summer Research fellow. You’ll also learn of Clare DeNicola ’85 and her leadership in the realm of marketing and communications, and Amy Shotmeyer ’06, who combined her passions for journalism and the environment and went on to a impressive legal career.

A hallmark of an arts and sciences education is our students’ ability to anticipate and lead change, to view challenges as opportunities, to turn knowledge into action, and to make a difference in the world. We seek to make the most of student growth and development while placing the individual in the broader context of human culture and the natural world. It is no surprise that two of the most revolutionary thinkers of the 20th century—Albert Einstein and Steve Jobs—were also individuals who loved music, art, and culture. They had a complexity of vision acquired through a deep exposure to the original thinking and creative expression that leads to innovation. Jobs attributed some of his most revolutionary innovations in designing the first generation of Apple computers to the influence of a calligraphy class he took while in college. Similarly Einstein studied and play violin, and had a deep love of German philosophy. These were not narrowly trained technicians.

We are doing things right at Lehigh. Our enrollments are high and our students are going on to highly successful careers. The College of Arts and Sciences provides the essential core training that students need in order to lead in life: an ability to understand ambiguity, to reason with care and sensitivity, and to approach problems in all of their complexity. Your support of our mission is crucial. Lehigh alumni play important roles in helping mold tomorrow’s leaders. Enjoy this issue of Acumen. I look forward to hearing your thoughts.

Donald E. Hall
Herbert and Ann Siegel Dean
ART

Found Objects
Contemporary African art encompasses a variety of styles and techniques, and the creative transformation of discarded, found and ready-made materials into works of art influences many contemporary African art practices. For art historian Susan Kart, found object art has led her to reconsider the history of sculpture and the use of figuration in sculpture from the colonial period to the present.

Kart, assistant professor of art history in the department of art, architecture and design and a member of the Africana studies program, has focused on Moustapha Dimé, a Senegalese sculptor who passed away in 1998 but was important to the establishment of the Senegalese found object art movement. The author of the forthcoming book Found Objects, Kart examines Dimé’s work within the context of the avant-garde movement in Senegal, its connection to the colonial past and the future of independence.

Kart also studies the history of European collection of African art, specifically figurative forms—figurative sculptures and anthropomorphic items that were brought to Europe as exotic commodities from the colonial territories.

“The European colonial collectors were not really interested in things that were completely abstract, nonfigurative or decorative as defined by the European colonial tastes of the time,” she says. “As a result, we have massive collections of African figurative sculpture in the U.S. and Europe. The objects were collected primarily in the late 19th and early 20th century. It’s a very small snippet of the artworks of certain cultures as observed from the outside and collected within a 100-year span.”

These works are influencing contemporary artists, and Kart studies the associations between these historical objects in their own contexts—mediated through the colonial collections—and how they become the core of materials being examined and questioned by current artists dealing with the figure in sculpture.

“The idea of the found object is highly relevant for contemporary artists. They examine the objects in European and American museums as found objects: objects dislocated from the past that can be reinvented. This is parallel to the way an artist like El Anatsui (Ghana) might take bottle caps and turn them into a contemporary sculpture that looks like a traditional textile in some way. There’s an interesting theoretical link.”

African artists who are situated around the globe or else remain in their countries of origin.

“I see myself as an interlocutor or translator for this material. I don’t make the claim to be an expert on African art, but rather I’m working to best present the material to an audience who is not yet familiar with it. I hope to use this material to widen the perspective of an American audience and have students gain a nuanced view of Africa. I want them to be able to understand these countries as the contemporary, dynamic, culture-producing places they have always been.”

The findings in African art history are constantly being rethought, as every new generation of art historians debunks the findings of their predecessors, which requires Kart to stay current with the latest findings.

“The information changes so quickly, but it’s very satisfying that I get to provide students with the newest information every year from my research in Senegal and elsewhere. Most American students don’t have access to any of this. At Lehigh, we operate on the cutting edge, whether in engineering, community health and, yes, even art history! As research faculty, we’re constantly discovering new information and bringing it immediately into the classroom. I am incredibly passionate about that!”

MUSIC

The Warfield Core-tet
Bill Warfield is always working on a new project. Coming off his latest release on the Grammy Award-winning label Planet Arts Records, the jazz trumpeter is in the process of developing his latest effort, an international collaboration of leading jazz musicians culminating in a tour starting at Lehig’s Zoellner Arts Center.

Supported by a New Directions Fellowship from the College of Arts and Sciences, Warfield brings together Czechoslovakian guitarist Libor Smoldas and keyboardist Jakub Zomer and Danish saxophonist Jens Jensen. Saxophonist Glenn Cashman, head of jazz studies at Colgate University, will round out the core group. Warfield says the Core-tet, as he calls it, will also ask local artists to perform with them as part of an international jazz tour scheduled for 2015.

“We’re looking to have an international exchange of musicians. For instance, when we’re in Prague, there’s a great drummer, so we’ll ask him to play. All the European guys want to come here and play, and we want to go there and play.”

The Core-tet project stems from Warfield’s trips to Europe, where he has performed on many occasions. Warfield says he was in Prague, Czech Republic, performing with a group of musicians with whom he had never collaborated. In an effort to find artistic common ground, he took classic Miles Davis and reinterpreted it.

“These guys just shred this stuff,” he says. “They use the tune as a reference point, but it becomes a free association of musical ideas based on and around the motive of the tune. By the end of my time with them, we were on stage and the music was on fire. It was just
the way I wanted it to be. We knew there was something special, and we had to make it happen.”

“This tour is a great experience because it allows us to expand our horizons, to work with musicians we’ve never worked with before and apply this concept of doing tunes that everybody knows and being as free as we can with it. It makes the logistics of putting it together very easy. Everybody knows Bye Bye Blackbird, but the end product is remarkable.”

The Core-tet will perform at Zoellner on Feb. 28, Colgate University on March 1 and New York City, culminating with a recording to be released by Planet Arts Records. Jeff “Tain” Watts, who holds the unique distinction of being the only musician to appear on every Grammy Award-winning jazz record by both Wynton and Branford Marsalis, will join the group at Zoellner. Beyond the American performances, Warfield envisions performances in Lisbon, Portugal, where he will be a guest lecturer in the spring of 2015, and at a jazz festival in Morocco.

“The great thing about jazz is that when you start plugging in these cultural influences, you don’t know what you are going to get. It’s risk taking and it’s exciting and you end up in some places you wouldn’t expect to be. That’s what attracted me to jazz in the first place.”

THEATRE

Rhinoceros

Designer Erica Hoelscher teamed recently with the Idiopathic Ridiculopathy Consortium (IRC) theatre to develop costumes and scenery for a production of Eugene Ionesco’s Rhinoceros.

The Philadelphia-based IRC specializes in absurdism, where the main theme is the inadequacy of language to communicate. In Rhinoceros, inhabitants of a small, provincial French town turn into rhinoceroses over the course of three acts. Ultimately, the only human who does not succumb to this mass metamorphosis is the central character, Bérenger. The rhinoceros suggests competition between people; characters refuse to be bettered even if it means becoming a rhinoceros. They chase after ways to distinguish themselves, the ultimate conformation and unifying factor.

Hoelscher costumed 15 characters and wanted rhinoceros masks because she believed that a contemporary audience would want real and tangible three-dimensional experiences. She researched previous productions that had approached the idea of the rhinoceros in different ways. Some were creative, almost a found object-type rhinoceros, while others were more realistic in the approach. Throughout the course of the play, more and more characters turn into rhinoceroses until the end of the play when only one character is left not transformed. At first they believe it is a disease, but it increasingly becomes clear that it is a choice people are making.

As more people become rhinoceroses, becoming part of the crowd becomes hard to resist. “I was trying to figure out what to do with these rhinoceros masks, because I wanted there to be a physical, tangible way the actor turns into a rhinoceros,” she says. “Over the course of the play, rhinoceros heads start appearing around Bérenger and they get increasingly elaborate until they are incredibly ornate. I wanted something real that would make a connection for the audience between themselves and the rhinoceroses.”

Hoelscher wanted a mask that would aid the actors in their transformations and add shock value to the show. She consulted with Brian Slocum, manager of the design shop in Lehigh’s Wilbur Powerhouse, as to how best to fabricate molds. Slocum suggested that Hoelscher work with Lisa Glover ’13 ’14G, a student in Lehigh’s technical entrepreneurship master’s program. Glover, who received her bachelor’s degree in architecture, recently launched an online crowd-funding effort, a 3-D paper velociraptor built by folding a high-quality paper board. As Glover’s dinosaur entrepreneurial efforts were catching the attention of national media, Hoelscher spoke with her about collaborating on a rhinoceros mask.

Several revisions were needed before the pair found the right prototype. The mask is similar to origami. The computerized CAD program and the laser cutter create the shapes in cardboard, then it takes two hours to fold, manipulate and glue it together. The cost is in developing the pattern and perfecting the prototype, she says, which is essential as each actor needs several masks to accommodate for damage during rehearsals and performances.

“Masks in the theatre are incredibly traditional but in America we’re so accustomed to realism that actors aren’t trained to work with masks,” says Hoelscher. “If I want the masks to be fully integrated into the play, the actors have to work with them from the beginning of the rehearsal process.”
ENGLISH

Metamorphoses

The Roman poet Ovid is best known for Metamorphoses, an epic poem of 15 books, in which he seeks to recount the history of the world and of human civilization through the use of Greek and Roman mythology, starting at the beginning of the world and ending with the death of Julius Caesar in 44 BCE and the accession of Augustus. Analysis of this epic poem and of the poet’s characters lies at the center of research by Barbara Pavlock.

Professor of English and director of Lehigh’s classical studies program, Pavlock explores issues central to Ovid’s poetics—the status of images, generation of plots, repetition of themes, opposition between epic and other genres, trustworthiness of the narrative voice and the interrelation of rhetoric and poetry. She is the author of The Image of the Poet in Ovid’s Metamorphoses, one of Choice Magazine’s outstanding academic books in 2009, and her recent work is shedding light on ancient writers’ interests in etymologizing names.

In Metamorphoses, Ovid explains the nature of gods and goddesses, the creation of the human race, the interactions between gods and humans, and some major events, such as the Trojan War and the founding of Rome. Pavlock has been exploring the poem’s intricacies. Her book revealed how Ovid played with the nature of characters, giving them unexpected twists often by the meaning of their names, and in a recent invited lecture at Rice University, Pavlock noted that one episode involves Scylla. Scylla was in love with Minos, the Cretan king of a besieging army, and betrayed her city to him, but he spurned her. Pavlock notes there are two Scyllas; one metamorphosed into a sea bird, the other into a sea monster. The sea monster had dogs coming out of her waist, and her voice was likened to the yelping of dogs. A word for dog, the root word from which Scylla is derived, has negative connotations in ancient Greek literature, Pavlock notes, which Ovid used in this episode to comment symbolically on Roman society. Ovid alludes to the mythical figures Ariadne and Phaedra, daughters of King Minos, to comment on Roman social issues and to criticize Augustus. Understanding Ovid’s use of etymology is essential to interpreting Ovid’s work, says Pavlock.

“Roman authors were very interested in etymology. Writers in the late Republic and early Empire were concerned with connecting the meaning and roots of words with character traits. If you read the poem just in English, you get the themes and know what is going on, but not all the levels are operative in the original language.”

RELIGION STUDIES

The Letter of Aristeas

The Letter of Aristeas, which was written by a Hellenistic Jew in the mid-second century BCE, is an elaborate legendary tale about the translation into Greek of the five books of Moses, the reasons for it and the circumstances surrounding it. The story provides the basis for the name by which the Greek Bible has become known, the Septuagint, and is at the center of a project by Benjamin Wright.

Wright, professor of religion studies, studied 23 Greek manuscripts, which purport to tell the story of Aristeas, an official of Ptolemy II Philadelphus, a Greek monarch of Egypt in the third century BCE. The letter is addressed to Aristeas’ brother and tells how Ptolemy II requisitioned a translation of the first five books of the Old Testament into Greek. The translation was made in...
72 days by 72 elders, brought from Jerusalem, “as if by some design.” As part of his forthcoming book, the first full-length commentary on Aristeas, Wright, whose scholarship focuses on ancient translations and issues surrounding translation in the ancient world, gives a new translation and comments on the text, setting out what the Jewish author was trying to accomplish with this story. Like a number of ancient Jewish writers in Greek, the text of Aristeas contains numerous difficulties.

“The Greek manuscript tradition has one form of a Greek word or phrase, and one scholar might say ‘this makes no sense and is really this form of the Greek, given what else is present.’ Some other scholar says the Greek manuscripts are all incorrect,” says Wright. “The problem is the text of the book was not transmitted carefully, and scribes often made mistakes in the process. There are a quite a number of cases like this, where it’s not the manuscript tradition that is the problem, where you don’t know what it says, but what it says is nonsense. Scholars have tried to figure it out in order to reconstruct a reasonable path to a Greek reading that makes sense.”

Scholars argue about the extent to which the Letter of Aristeas provides an historical account of the origins of the translation. Wright’s research in this area, which included his 2007 English translation of the Septuagint, led him to the conclusion that this book tells scholars nothing about the historical origins of the translation.

“I don’t think the story is historical. I think the text gives a fairly elaborate myth of origins for this translation, which I think was done for different reasons. But it is a marvelously interesting text that tells us a lot about the Jewish community in Alexandria in the middle of the second century BCE.”

Wright’s findings may reshape scholars’ understanding of the manuscript. The Letter of Aristeas is important to scholars not only because of its connection to the Septuagint, but also because it is one of the few early Jewish works in Greek preserved in its entirety. For many ancient Jews, the Septuagint was their bible, and it became the scriptures of early Christianity. New Testament writers used the Septuagint, and this new English translation of, and commentary on, Aristeas provides insight into how many Greek-speaking Jews understood the origins of their scriptures.

MODERN LANGUAGES AND LITERATURES

Birth of Ancient China

Five years ago, Tsinghua University in Beijing, China, received a donation of nearly 2,500 bamboo strips. The strips probably originated from the illegal excavation of a tomb, and the donor had purchased them at a Hong Kong market. Tsinghua researchers carbon-dated the materials to around 305 BC, during the Warring States period before the unification of China, and from a few fragments of this collection of bamboo strips, Constance Cook, professor of Chinese in the department of modern languages and literatures, is piecing together the story of the birth of the Chu people.

Inspired by a Tsinghua text that purports to describe the birth of the Chu ancestral founder, Cook, in collaboration with a colleague at Beijing Normal University, examined the topic of miraculous births of ancestral founders. This text, the “Chu Ju,” which otherwise is just a list of places and ancestral rulers’ names, begins with an extraordinary description of the traumatic—possible C-sectional—birth involving the female ancestor and a shaman with a thorn tool. Curiously, “thorn” becomes the name of the people, Chu.

The co-author of the forthcoming book Birth in Ancient China, Cook examined differing cultural strands within ancient Chinese genealogy and mythology, as well as the framework of the meaning behind birthing myths. She deciphered the stories of women giving birth and examined divination records, the early idea of Dao as “mother” and the stories surrounding the notion of birth, as well as ancient Chinese words for birth.

“In such a study, it is impossible to separate myth from history,” she says. “We are searching between the lines preserved by male historians for hints of the female experience.”

The female experience of birth, while the subject of many late imperial Chinese medical texts, was rarely recorded in ancient Chinese texts. In a world concerned with preserving the patriarchy, histories recorded men generating sons, rarely mentioning the mother. However, social and political reproduction relied on control over female fertility. In antiquity, this involved divination, sacrifices, prayer, medicine and magic.

Cook’s research focused on the Chu region in southern China, a regional state that rose as the once-dominant Zhou house crumbled in the 8th century BCE. In the Tsinghua

The Tsinghua Manuscripts (above), the focus of Constance Cook’s research.

“Chu Ju” text, there were two types of births, smooth and difficult. The primal ancestor “descended” from heaven to marry a Shang princess (the Shang people in the east were conquered by the Zhou from the west in the 11th century BCE). This princess smoothly gave birth to twins. Smooth birthing was legendarily associated with the birth of the Zhou people. The Chu people, tapping into legends associated with Shang and southeastern peoples, split open their mothers’ bodies. This ancestress (post-Shang princess and possibly associated with a mythical Chu ruler of early Zhou time) also gave birth to twins, the first coming out smoothly but the second requiring the aid of a shaman healer. The mother returned to heaven, and the Chu people began.

“There’s a clear cultural aspect to the early birthing stories,” says Cook. “After the Zhou fell, formerly marginalized peoples rose to power. The Chu creativity was a powerful influence over Han dynasty culture and the subsequent Chinese civilization. In some ways, these ancient stories reflected early cultural competitions.”
Levels for most other species of fish. Temperature and salinity reach lethal levels for most other species of fish. But not the Leon Springs pupfish. Here, in a small desert spring near Big Bend National Park in west Texas, the pupfish are thriving. At various times during the year, largely in the summer, the water temperature and salinity reach lethal levels for most other species of fish. “They are a clunky kind of fish that could not compete effectively with more advanced species of fish like minnows, and they’re not very good at avoiding predators,” says Itzkowitz, professor and chair of biological sciences. “They survive by living in water that their competitors can’t tolerate. At various times during the year, largely in the summer, the water temperature and salinity reach lethal levels for most other species of fish.”

The Leon Springs pupfish is struggling to survive, and for the past 14 years, Murray Itzkowitz has been a leading voice in the conservation of this endangered species. This two-inch creature is found in only one or two very small, isolated desert springs near the Big Bend region of west Texas and has been on the verge of extinction since it was found to be not extinct about 50 years ago. “They are a clunky kind of fish that could not compete effectively with more advanced species of fish like minnows, and they’re not very good at avoiding predators,” says Itzkowitz, professor and chair of biological sciences. “They survive by living in water that their competitors can’t tolerate. At various times during the year, largely in the summer, the water temperature and salinity reach lethal levels for most other species of fish.”

Murray Itzkowitz

Funded by the Texas Parks and Wildlife Department, Itzkowitz travels frequently to Stockton, Tex., to study these fish. He has two hypotheses as to their decreased populations. First, bulrushes, a grass-like aquatic plant, are taking over critical spawning areas in the pools. His second hypothesis was that Gambusia nobilis, another small, endangered fish, was feeding on the eggs of the pupfish, in part because the constrictions of their habitat was forcing them into pupfish spawning areas.

The trouble, he says, is that these pupfish are so highly endangered that while researchers can cull the bulrush and improve the habitat, they cannot perform experiments on the protected fish. “It’s difficult to answer basic questions like, what does it take to establish a new population because we’re in the business of protecting them, not experimenting on them.”

In response to Lehigh’s Mountaintop Initiative and in collaboration with Michael Kuchka, associate professor of biological sciences, Itzkowitz guided a team of six undergraduates and two graduates in a 10-week summer project to develop an animal model that may guide further conservation practices of this species. They used a species that is very similar to the Leon Springs pupfish but is not endangered, sheepshead minnows (Cyprinodon variegatus), which are extremely common along the east coast of the United States. Houseled in Lehigh’s new Mountaintop facility where space is abundant, the study involved 10 kiddie pools measuring six feet in diameter, where students tested their hypotheses. The basic idea was to study ecological and behavioral aspects that may influence the fish’s breeding biology. Students also used modern molecular genetics tools to examine hypotheses about the reproductive success of specific individuals.

This new opportunity at the Mountaintop campus coincides with Lehigh’s push to give its undergraduates a learning environment that couples important problems in science with a research-intensive environment. At the same time, Itzkowitz and Kuchka hope that this venture will contribute to the restoration of pupfish populations in their native West Texas waters.

Sheepshead minnows are the focus of a Mountaintop project to develop an animal model that may help save the West Texas pupfish.
where electrons transfer from a metal to an organic substrate (or vice versa). The researchers can examine how these bond-forming reactions are carried out. They are intrigued by free radicals because of their efficiency and ability to form a new carbon-carbon bond and another intermediate radical. When this occurs, the intermediate radical can be either oxidized to form a cation or reduced to form an anion. With this new reactive intermediate in place, a very different type of reaction can be carried out in the same reaction flask.

“We view cations, radicals and anions as different oxidation states of carbon that can be interconverted through single electron transfer. Understanding this process gives synthetic chemists great control over reactions and provides the possibility of forming multiple bonds in a reaction sequence with one set of reagents” says Flowers.

A great deal of Flowers’ work is in collaboration with synthetic chemists at other universities. He is particularly proud of his recent collaboration with Andreas Gansäuer, professor of chemistry at the Kekulé-Institute, University of Bonn in Germany. In most electron transfer processes, the reagent is used in a one-to-one ratio with the substrate so that for each electron transferred, one equivalent of reagent is used. The pair’s work has shown that it is possible to carry out electron transfer reactions catalytically.

“We generate low valent titanium; it wants to be in the higher valent oxidation state because that’s where it’s more stable, so it transfers an electron to a substrate, undergoes a bond-forming reaction to generate an intermediate high-energy radical, which donates the electron back to the titanium, regenerating the active catalyst.”

The pair’s first paper, funded by the National Science Foundation, piqued the interest of the chemistry world. Using the information found in mechanistic studies, Flowers and his team have made the processes much more efficient, which is important in the development of new synthetic methods in the synthesis of pharmaceuticals and fine chemicals.

**EARTH AND ENVIRONMENTAL SCIENCES**

**Meltzer Named Inaugural Trembley Chair**

Anne Meltzer, professor of earth and environmental sciences, has been named the first holder of the Francis J. Trembley Chair in Earth and Environmental Sciences at Lehigh University.

As a seismologist, Meltzer studies earthquakes and the structure of the earth through naturally and artificially generated seismic waves. Published in many highly respected journals, Meltzer’s research has had a great impact in the field of earth science. In 1999, she received the Albert and Alice Weeks Visiting Professorship at the University of Wisconsin-Madison. An observational seismologist, she focuses her research on the geologic processes involved in mountain building and deformation along continental margins. Her research is collaborative with colleagues from other earth science disciplines at Lehigh and at other institutions in the U.S. and abroad. Her research interests have taken her and her students to many remote, beautiful and interesting parts of the world, in North America, South America, the Caribbean and Asia, including the Himalaya of Pakistan and Tibet. Most recently, she has been engaged in multidisciplinary research to understand the origin of high topography in central Mongolia and has used aftershocks from significant earthquakes to better understand deformation and faulting.

She has distinguished herself in the research community by twice serving as chair of the Board of Directors of the Independent Research Institutions for Seismology (IRIS), a consortium of more than 120 American academic institutions and over 120 foreign affiliates, dedicated to the operation of scientific facilities for the acquisition, management and distribution of open seismic data. In this role, Meltzer worked closely with the geoscience community in a successful effort to secure funding from the National Science Foundation for EarthScope, a new initiative to establish observational facilities to measure deformation of the earth in real time at continental scales and to better understand the structure, evolution and dynamics of the North American continent. She later served as chair of the EarthScope Program Committee and the EarthScope Steering Committee. She also helped establish a new initiative within IRIS to support international development efforts to build technical infrastructure and human capacity to improve earthquake monitoring, research and education in developing countries.

From 2004 to 2011, Meltzer served as the Herbert J. and Ann L. Siegel Dean of the College of Arts and Sciences and chaired Lehigh’s department of earth and environmental sciences from 2002 to 2004. She was the recipient of the Class of 1961 Professorship in 1998 and was promoted to the rank of professor in 2001. In addition to serving as chair of the earth and environmental sciences department, Meltzer served as the director of LEO (Lehigh Earth Observatory), which installed a seismic station at Lehigh to monitor local, regional and global seismic activity. Data from this station is part of a regional seismic network monitoring seismicity in the northeastern U.S. Under her direction, LEO successfully obtained significant funding from the Keck Foundation, the Culpeper Foundation and the William Penn Foundation to expand research funding and opportunities available to graduate and undergraduate students.

The Francis J. Trembley Chair was established by Lehigh alumna Marjorie M. Nemes, who received her M.S. in 1951 and Ph.D. in 1955 in bacteriology. The position is named in honor of Francis Trembley, who was a former chair of biological sciences at Lehigh and a pioneer ecologist.
ANTHROPOLOGY

Small Receives Fulbright

Archaeologist David Small, professor of anthropology in the department of sociology and anthropology, is the recipient of a Core Fulbright Scholar award to teach and conduct research at the University of Crete in Rethymnon, Greece, for the 2015 spring semester.

Small, who is also a member of Lehigh’s Classics program, will teach graduate students on topics related to similarities between ancient Greek culture and other archaeological cultures in the world and the evolution of Cretan communities in the Iron Age (ca. 1100-700 BCE). During his time at the university, he will also lead research on the use of elaborate funeral feasting as a window into isolating rapid social change in the Cretan society. Small is interested in how Greek archaeologists view research topics and interests and how they approach their work. “I want to listen as much as possible and get their view,” he says. “What is their take on their own past? We tend to think our way of doing archaeology is the right way to do it, so it will be good to listen to different views.”

The author of Evolutionary Approaches to the Ancient Greeks, Small focuses his research on cross-cultural comparisons of small states in ancient Greece and Maya. Funded three times by Lehigh faculty research grants, his research has determined that small territorial size allowed members of the elite class to play personal connections outside the territory to gain political advantage. In large territories, the government controls everything, so these connections create instability inside the government itself, says Small. By comparing the two, researchers have a clearer view of weak government structures.

“You have a king, but all of his subordinates are playing their cards as well. The leader was always looking over his shoulder. Subordinates were always playing extraterritorial ties in attempts to subvert the power of the king. That was true of the political economy of ancient Greek city states. It was always flipping from one form of government to another, and it was the same for the Maya.”

Small is the third faculty member of his department to win a Fulbright award in the past three years.

HISTORY

Lenape Country

At the time of William Penn’s arrival in America in 1682, the Lenape Indians inhabited the region from northern Delaware to central New Jersey, from the Atlantic Ocean to eastern Pennsylvania. The relationship between the Lenapes and Dutch, Swedish and British settlers is the focus of research by Jean Soderlund.

The author of the book Lenape Country: Delaware Valley Society before William Penn, Soderlund examines a period from the early 1600s and arrival of European settlers to the mid-1700s. A professor of history, her latest project examines the relationships between the Lenapes and the Europeans who came to settle the Delaware Valley. She is pushing the boundaries of her discipline by challenging two myths: that the Lenapes were a weak people who did not control the region and that the Lenapes and their culture had little impact on Delaware Valley society.

“My method was to read everything I could and try to discern from each treaty, each record, what the Lenapes were thinking.”

The Lenapes, in alliance with the early Swedish and Finnish colonists, created the distinctive features of Delaware Valley society, says Soderlund. Their ideals included respect for other cultures, peace between Native Americans and Europeans, opposition to hierarchical authority, religious liberty, an emphasis on trade and a belief in personal freedom for one’s self and others. Lenapes had no central government, but rather each Lenape town generally operated independent of the others, except for diplomacy and in war. A trusted spokesman, or sachem, took leadership, but Lenape towns were democratic, with many adults having a voice in important decisions.

“The Lenapes used violence strategically. They weren’t pacifists, but they preferred to find peaceful ways to resolve conflict.”

William Penn’s arrival brought 8,000 settlers within five years. The Quakers reinforced the culture that the Lenapes, Finns and Swedes had created, but the sheer numbers of new colonists pushed most Lenapes out of their homelands in eastern Pennsylvania. Lenape communities in New Jersey also declined from
Politics and Facebook

Social media has dramatically altered the communication landscape, offering new frameworks for individual expression. The millennial generation, 18- to 29-year-olds, have never known a world without the Internet. Political candidates have become aware of the important role social media plays in shaping voters’ perceptions, and how voter impressions can be formed through social media is the focus of research by Jayeon Lee.

Lee, assistant professor of journalism and communication, examines social media’s effects on millennials’ perceptions and attitudes in political communication and the general consumption and interpretation of news. “A lot of young people are consuming political information and news through Facebook. They have friends posting or commenting on a story; there are likes and images that influence perceptions. Many factors can influence their interpretation of the same information.”

In a study of college students, Lee exposed students to a fictitious candidate and then posted fabricated positive or negative comments from unknown users, depending on the experimental condition. The students took their prompts from the comments and photos of the commenters.

“Their perceptions were significantly influenced by these factors. When you watch TV news or read a newspaper, you don’t immediately know how other people will react to the same information. There’s less social influence in that sense. With social media, you are almost always immediately exposed to others’ reactions. Those reactions are not necessarily accurate or representative of public opinion in general, but those still significantly influence your impression.”

She compares traditional media and social media in the political arena. With traditional media, the political views of young adults were heavily influenced by their parents’ views or their close friends’ views.

“Now you can access more diverse people’s views about political issues and candidates, and if they themselves having no fixed attitudes, no knowledge about politics or candidates, they are more easily influenced by the opinions of others through social media.”

Lee also analyzes who is more likely to post political news or comments in social media. Viewers with perceptions of strong media bias are more likely to post news stories to counteract opposing views and use social media a persuasive tool.

PSYCHOLOGY

Implicit Stereotypes

Health care professionals learn that some categories of people are more likely than others to manifest specific symptoms and diseases. Psychologist Gordon Moskowitz has been studying whether, in addition to these medically correct inferences that are made about patients, stereotypes unconsciously influence the thinking and behavior of physicians. His research finds that health care workers unknowingly categorize people according to social stereotypes and that this unconscious bias among health care workers can influence diagnoses and treatments.

In research, funded by the National Institutes of Health’s Minority Health and Health Disparities division, Moskowitz, professor and chair of psychology, and Dr. Jeff Stone, at the University of Arizona, study issues surrounding health disparities and the degree to which bias might be contributing.

In a recent series of experiments, the team asked participants to complete an experiment individually on a computer. Participants were asked to identify whether words that were to appear on the screen were names of diseases or treatments, or not, by pressing buttons marked yes or no on the keyboard. Some of the words are stereotypic words associated with a group (noncompliant-Hispanic; criminal-Black). They were asked to respond as quickly and accurately as possible. Prior to each word, and unbeknownst to the participants, the researchers flashed on the screen faces of different racial groups and flashed them so quickly subjects could not see them. Health care professionals’ responses to the stereotypic words, as well as the words related to group-relevant diseases, were different when they first “saw” a face of the relevant minority group instead of a white face.

Although doctors often use medical stereotypes and are fully aware of the positive consequences of such conscious thoughts (making appropriate diagnoses), they may also be activating unintended consequences associated with unconscious stereotyping that seemingly occurs every time they have any thought of a patient’s social group, Moskowitz says. The team found that stereotypes were triggered by subliminal cues, of which doctors could not possibly be aware, and a better understanding of bias may help in physician training.

“In the end, what can we do to prevent this from happening?” he says. “What can we do about stereotype control, and what do we know about controlling these unconscious thoughts and feelings that we can then develop effective training programs where we teach physicians how to interact with patients in ways that don’t trigger these stereotypes and have these consequences?”

President Barack Obama at a town hall style meeting at Facebook headquarters in Palo Alto, CA.

Gordon Moskowitz (right) finds health care workers unknowingly categorize people according to social stereotypes.
AS PRINCIPAL OF THE 10 COMPANY, Clare DeNicola ’85 develops and executes creative strategies to increase sales, launch new products, enter new markets, enhance customer relations and build brands for Fortune 500 companies around the globe. She credits her Lehigh experience for helping her discover her communications talent while also giving her a jump-start on learning the fine art of proper work/life balance.

Speaking of communications, it was a letter from Lehigh that convinced DeNicola that she would thrive on South Mountain.

“Lehigh sent me a great letter—kind of a pre-acceptance letter very early in my senior year of high school. It said something like ‘you’re in, and we hope you will come here.’ The letter made me feel as if it was a good match,” says DeNicola.

Touring the campus sealed the deal. “I loved the campus. I can remember taking the tour and sitting under a large oak tree at the end of the tour. It was beautiful.”

DeNicola used her four years at Lehigh wisely. Starting out as an English major, she quickly realized how much she loved to write, especially for journalism. She added a journalism major and put her talents to use for the Brown & White, she was vice president of her sorority, Delta Gamma, held a four-year position as an administrative assistant in the history department and interned during her senior year in the public relations department of Historic Bethlehem, Inc.

“Lehigh prepared me well for life and my career,” she says. “The mix of classes, work on the Brown & White, the internship and work-study experience gave me the right balance—with a similar intensity to the real world of having a job and managing life outside of college.”

Married for 22 years and living in Greenwich, Conn., with husband Frank, son Jack, 15, daughter Olivia, 14, and their four pets, DeNicola has a full life away from the office. Besides taking care of her family, she says helping and saving animals is a “big interest” of hers. Three of the family pets are rescues. She blends this with leading a business in New York City that assists big clients that expect big results. But DeNicola is no stranger to business success at the highest level.

Prior to The 10 Company, DeNicola was president and CEO of IVANS, Inc. and a member of the company’s board of directors since March 2004. While leading IVANS, she transformed the company from an insurance industry network reseller to an innovative technology solutions provider for the insurance and healthcare industries, resulting in significant revenue growth and increased shareholder value. In 2010, DeNicola was named one of the 100 Most Powerful People in the Insurance Industry for North America by Insurance Broadcasting and the Insurance Media Association, an honor reserved for the individuals who control or who have the greatest influence on people, capital, intellectual knowledge, technology and other industry resources. In healthcare, she has been an avid supporter of ways technology can advance the entire healthcare experience for doctors, hospitals, payers and patients and has met regularly with analysts and the media to promote these programs.

Before joining IVANS, she was vice president at the New York headquarters of Grey Advertising’s worldwide public relations agency, GCI Group. Prior to GCI, she was a marketing manager with Coopers & Lybrand for more than six years. After her 1985 graduation from Lehigh with a dual major in English and journalism, DeNicola went on to earn an MBA from Fordham University, attending class while working full time at Coopers & Lybrand. After 14 years at IVANS, DeNicola left in 2012 and, with a business partner, started her own firm, The 10 Company. A full-service marketing communications agency, the firm has a wide variety of Fortune 500 and emerging high-tech clients. She works on a variety of communications initiatives, including traditional and social media and employee communications. Specializing in C-suite communications, she has worked with CEOs on thought leadership programs, blogging and developing the right social media presence, particularly on LinkedIn and Twitter. And she’s also worked on a couple of CEO transitions and

Clare DeNicola ’85 has a passion for creating effective communications and helping her clients grow their businesses.

the Brown & White. As features editor for the newspaper, DeNicola discovered her penchant for learning about what makes people tick and writing about them in a way that reveals their personalities and illustrates what makes them unique and interesting. She wrote many personality profiles, including those of professors, giving readers a look at the other facets of faces famous around campus.

Being busy at Lehigh helped DeNicola learn how to manage time, priorities and activities—giving her valuable experience that’s been vital to her success in a high-profile and demanding career. Beyond her job at the
all of the associated communications—both internal and external. These types of high-level and high-impact communications require a special touch and an authentic voice. DeNicola believes she first found that voice in her creative endeavors at Lehigh.

“At Lehigh, there were many opportunities to express myself creatively—which enabled me to develop my strengths and helped me to focus on the direction that would suit me best,” DeNicola states. “By developing my communications skills, whether by writing articles and op-eds on tight deadlines twice a week for the Brown & White, pitching Historic Bethlehem Inc.’s shad festival for coverage by local broadcast and print outlets or writing a paper for my Old English class, communication was at the core.”

DeNicola still finds time to visit her alma mater and remain active in Lehigh societies. She has been a member of the College of Arts and Sciences Dean’s Advisory Council and recently assumed a leadership role as chair. She is also a member of the Asa Packer Society. “Dean Hall is advancing the College of Arts and Sciences in so many ways—progressing on the strategic plan to grow and enhance the college and what it offers to students,” explains DeNicola. “I’m eager to contribute to executing his vision as part of the Council.”

DeNicola adds, “Being active with Lehigh gives me the opportunity to stay abreast of what’s happening at the university. From learning about the exciting plans for Williams Hall to engaging with students who have studied abroad, my participation on the Council has enabled me to connect back with Lehigh and experience it not just as the Lehigh I remembered, but what it is today. That’s extremely valuable. It is also fulfilling in a second way, and that is the ability to give back. This is with time and financial support, as well as the ability to provide advice.”

And, DeNicola makes sure to attend at least one Lehigh football game each year. It’s an annual tradition she shares with friends and their families, complete with tailgating and catching up and swapping stories about their time at Lehigh. “I am excited about attending the 150th Lehigh-Lafayette game at Yankee Stadium on Nov. 22. “The Lehigh-Lafayette rivalry runs so strong, and the game itself was such a memorable part of the Lehigh experience. I’m planning to attend with my family. The fact that it’s in Yankee Stadium makes it a very special and memorable event.”

“At Lehigh, there were many opportunities to express myself creatively—which enabled me to develop my strengths and helped me to focus on the direction that would suit me best.”
Ellen Larmer’s path to Lehigh was paved with a love of community.

Before enrolling in the first class of Lehigh’s Community Fellows program, a one-year master’s program designed to strengthen relationships between academic study and community-based work, Larmer ’02G worked as a professional social worker in child welfare. She had long recognized the need for communities to develop the tools to better themselves, but when she began visiting area colleges with her daughter in 2000, she took note of the untapped potential in the growing network between universities and their communities. “Taking my daughter to visit prospective colleges and universities helped to expose me to some exciting town-gown projects and relationships that were happening in a few urban areas of the country,” Larmer says. “My dream was to learn how to help the community help itself.”

For Larmer, the opportunity to follow that dream would come in the inaugural year of Lehigh’s graduate program in 2001. The program was designed to create or enhance partnerships between Lehigh University and regional nonprofits and governmental agencies active in the broad areas of economic and community development.

Unlike traditional internships, the Community Fellowship develops leadership skills through a partnership between the Lehigh Community Fellow, his or her professors, the hosting nonprofit organization and the community. In that sense, fellowships are tailored to the individual research interests and professional goals of students majoring in political science, sociology and, more recently, environmental policy design.

Larmer’s fellowship, in line with these goals, is a story of inception that reflects the growing impact of Community Fellows since 2001. The effects of Larmer’s yearlong fellowship at Alert Partnership can still be felt at Lehigh each year. At the agency, she worked to establish, organize and execute the first-ever Great Southside Sale in Bethlehem.

Though the seeds of the project were in place before Larmer’s work on the project, they needed help taking root. “Each year a couple of Lehigh professors would dumpster-dive and collect goods to avoid them being thrown into the landfill,” she says. “They had been having a garage sale every summer for a few years, but their goal was to make this sale an annual community event to benefit southside programs for children.”

That’s just what Larmer did. With the help of her professors at Lehigh and her supervisors at Alert Partnership, she helped create a lasting network of community-based resources that combine human services, economic development and environmental vision.

Twelve years later, Larmer is associate executive director for community development at the Community Action Committee of Lehigh Valley. But she says that the impact of her fellowship has continued to affect her professional life—and, just as importantly, has continued to grow in the southside community and beyond.

“My supervisors at Alert Partnership encouraged me to develop a small committee to advise me on the project,” Larmer says. “What I didn’t know then was that these were the partners who would eventually lead this project throughout the next decade, and they would continue to be my colleagues after I became permanently employed in the community. Twelve years later, we are still working to create a better south Bethlehem. And the Great Southside Sale continues to grow, with reported earnings in 2014 of over $19,000 to benefit southside homework clubs.”

Lehigh’s Community Fellows program draws on a legacy of bridge building to shape tomorrow’s leaders

by Elena Gambino ’12G
that emphasizes the potential in connecting academics, communities and innovative solutions to big problems.

Since the advent of the Community Fellows program, 52 nonprofit and governmental organizations have hosted more than 130 Fellows, whose projects have made significant contributions to agency objectives. Among these, many projects have forged an interconnected network between professionals to lead change and address problems in economic development, human services and health.

For alumni like Flordelisa Perez Dolan ’04G, the ability to make these connections between sectors is what sets Community Fellows apart from other professional graduate programs.

Like Larmer, Dolan saw an opportunity to ask big questions in the Lehigh Valley community, all while working toward on-the-ground solutions. Her work at the YWCA of Bethlehem began an ongoing process of dialogue concerning racism and race relations.

Using a discussion method called Democracy Now (then, it was called the Study Circles model), Dolan facilitated months of dialogue on racism and race relations with community members, trained volunteers and developed action steps toward addressing some of the problems that came up in these discussions.

Though her project focused on big picture aspects of the community, Dolan says that the fellowship helped her—and the institutions she worked with—make connections between a wide variety of specific issues.

“The health of a community is impacted by a number of factors,” she says. “What are the economic opportunities available? How does the education system function? How do hospitals respond to race? There’s also environmental racism, and it can even impact the transportation systems. We realized that racism plays a big role that affects the health of the community. We realized we needed to start addressing this through community institutions. Change had to come from the top, through area colleges, hospitals and companies.”

Because her fellowship pushed her to make crucial connections between vital sectors of the community, Dolan was able to facilitate and carry through a three-year series on these topics, extending far beyond the initial scope of her fellowship project.

Like Larmer, Dolan cites her work as a Community Fellow as a crucial turning point in her career. Now a fundraiser with the Washington, D.C., branch of AARP Experience Corps DC Metro, which fosters relationships between older adults and school children to develop literacy skills, Dolan says her experience with the YWCA gave her the skills and confidence she needed to forge a career in relationship building.

“The idea that I could live in my community, work in my community and go to school there, all while making it a better place, made the idea of a one-year master’s so attractive to me because I had already been doing grassroots work. I could really make connections. Sometimes it takes a long time to build trust in work like that, but it is a great opportunity to build bridges that were broken before.

“After Community Fellows,” she added, “I wanted to get into communications and development to overcome my fear of fundraising. But I quickly realized this was about building relationships. That’s exactly what I had done in my fellowship.”

Making Community Activism Count

Creating a lasting impact on community—facilitating discussion and institutional change or inaugurating an annual community event, just to name a few—is one of the central goals of the Community Fellows program. But part of what determines that impact, says Kim Carrell-Smith, the program’s director, is its unique structure.

To ensure that fellowship projects follow in the footsteps of those like Larmer’s and Dolan’s, Carrell-Smith works tirelessly to match participating agencies with incoming Fellows. A successful project, she says, depends on the dynamic and flexible nature of these partnerships.

“The types of proposals I receive each year are often, but not always, influenced by the academic disciplines represented in the programs. From Lehigh’s perspective, the ability to impact community through relationship building is much more permanent than some other forms of outreach.”
Students in the Community Fellows program have worked with more than 52 community partner organizations including (left to right) Habitat for Humanity, Community Action Development Corporation of Bethlehem, Southside Sale, Buy Fresh Buy Local and Touchstone Theatre.

program,” she says. “All three of our current disciplines—political science, sociology and environmental policy design—include students who are learning about research, research methods and policy work. Some students have a very clear interest in a particular sector of nonprofit work, but others are open to a wide range of opportunities and understand that they will build skills that transfer to many kinds of nonprofit or government work. Student interests and the needs of partnering organizations mean that Community Fellows placements change every year.”

Recent alum Gabe Hurtado ’14G adds that the unique structure of the Community Fellowship—and its dedication to working toward common goals—was the link between his academic and professional goals and his organization’s community goals. In his fellowship at the West End Alliance of Allentown, he helped streamline economic development and business networks in the West End Theater District. His work has already resulted in a summer-long internship at the Lehigh Planning Commission that he hopes will allow him to have an even greater and more long-term impact in the community.

“Both Kim Carrell-Smith and Michael Drabenstott, president of the West End Alliance, were instrumental in creating a true symbiotic relationship,” he says. “The key to designing projects that reflected both of our priorities was communication. Regular meetings with Kim and Mike ensured we were on track in achieving our goals.”

“It sounds simple,” he added, “but this commitment to communication made it easy to develop long-lasting professional relationships.”

For Hurtado, communication colors almost every aspect of his goals in the community. “At the West End Alliance, I was charged with developing a structure for welcoming businesses to the area and formulating a stronger neighborhood identity. Again, it comes down to communication. Many current and future business owners want to market as a commercial district, because it benefits their individual businesses to create a greater sense of community. But the breakdown comes in coordinating these types of endeavors.”

Along with Hurtado, Natalie LaVan ’14G is a prime example of the unique role that communication and coordination play in the Community Fellows program. At her fellowship, LaVan helped oversee a merger between two organizations in the community, and accomplished more in a year of academic study at Lehigh than many students can boast in an entire undergraduate education.

“Looking at my resume, an employer will see that in the last 12 months, I completed courses for a master’s degree, installed a rain barrel for a Ugandan elementary school, conducted a community needs assessment for a Sierra Leone mining company, performed research on flood mitigation attitudes in the Mississippi River Basin and facilitated a nonprofit merger,” she says.

LaVan hopes to work as an executive director of an environmental nonprofit, but the Community Fellows experience extends beyond even her individual goals. Thanks to LaVan’s unique networking opportunities, her organization, which already had a network of strong human services, teamed up with St. Luke’s—and another Community Fellow in her class—to strengthen professional networks and human services across the Valley. It’s this kind of interconnectivity that LaVan says gives Fellows a chance to realize the impact of their goals.

“The greatest synergy I witnessed in the program was between the Fellows themselves,” she says. “Every week we Fellows took part in a roundtable where we would share our successes and our challenges. This allowed us to brainstorm solutions that ultimately created lasting partnerships among our organizations.”

For LaVan, the connection between the organizations she worked with as a Community Fellow and her classmates was “an easy connection to make.”

Continuing the Legacy

What is clear about Community Fellows—seen through even a few of its hundreds of success stories—is that its unique commitment to connectivity and the community is a resource that extends far beyond the scope of any one student, project or idea. For Carrell-Smith and the Fellows she works with, it’s all about these relationships.

“The Community Fellows program allows students—they’re what a university is all about, after all—to represent the university in a variety of ways,” she says. “Smart, committed, passionate, professional graduate students are great ambassadors beyond our ivy-covered walls. And when they build capacity for nonprofit organizations, develop programs, help to research and build best-practice work in the Valley or do outreach work that improves our communities, that is really building Lehigh’s reputation in the world beyond the campus and transforms our communities for the better.”

“You cannot put a price on the formation of that type of mutually beneficial relationship,” added Hurtado. “From Lehigh’s perspective, the ability to impact community through relationship building is much more permanent than some other forms of outreach. It is a structure that continues to produce positive outcomes long after any single student completes the program.”

Students in the Community Fellows program have worked with more than 52 community partner organizations including (left to right) Habitat for Humanity, Community Action Development Corporation of Bethlehem, Southside Sale, Buy Fresh Buy Local and Touchstone Theatre.
Volkmar Dierolf prefers thinking about defects over perfection—not the defects that lead to degraded performance or reduction of quality, but rather, Dierolf is interested in defects that can be used as tools to enhance a material's functionality.

Gemstones are a good example of how defects in an otherwise perfect crystal can add beauty. A ruby's color comes from the presence of a chromium ion in the aluminum oxide crystal. A different defect in the same material leads to a different color.

Dierolf, AGF University Distinguished Professor and chair of physics, deals in defect engineering. He intentionally laces materials with foreign atoms to enhance their functionality. This type of precise control of atomic or electronic doping turns pure silicon into a material that can be highly functionalized and is the key for devices such as computers and smartphones.

"In my world, defects make the world beautiful," he says.

Dierolf’s specialty, optical spectroscopy and microscopy of insulating and semiconducting materials, provides the tools he uses to study the physics of incorporating defects in a variety of materials related to light sources, such as lasers and light-emitting diodes (LEDs). He uses his observations to learn how the combination of more than one defect in a material may improve its functionality. One of Dierolf’s goals is to dope semiconductor material used in LEDs to create more efficient white light devices. He is collaborating with a scientist in Japan who produces the Europium-based LED devices that are designed on the basis of the findings obtained in Dierolf’s research group.

Dierolf believes scientists will eventually create LED-based intelligent lighting systems capable of many simultaneous functions, including natural daylight, environmental sensing, humidity control or disinfection. Such advancements must be efficient and energy-saving as well, he says.

“If we can reduce the amount of energy it takes to create lighting, it would make a big impact. In one scheme we envision, you can choose any color for your light fixture. Or you could have an LED display that acts as a skylight window with natural-looking light. Especially, if we could design LEDs to emit the red part of the visible spectrum more efficiently, it would recreate a nice warm feeling without producing wasteful heat, the way incandescents do, but you could also change the color composition to a cooler tone that is better while doing some work.”
SEEING THE LIGHT

Dierolf’s team uses near-field optical microscopes and scanning electron microscopes to examine the internal atomic structure of materials. A wealth of data can be found at resolutions down to 50 nanometers, he says.

“If you look deep enough, you can find all kinds of fascinating properties that can not only provide information about the characteristics of a material, but can be used as a tool to shape that material into a useful device that typically is very small and requires control on that length scale.”

Current white LED assemblies are basically on a cap on top of a gallium indium nitride semiconductor with layers of different gallium and indium ratios and additional doping to induce the desired conductivity. The device itself releases photons in the blue spectral region that are then converted in the cap layer into the visible light we see in lamps, on street signals and on high-definition televisions. Depending on the type of cap, the color can be cool, soft or warm white.

Yet, LED fixtures pose challenges. They use far less energy and last longer than standard incandescent bulbs, but the typical approach to constructing white LEDs is less efficient than it could be. Also, they appear imperfect when viewed from different angles and at various brightness levels.

“It is desirable to create the white light within the semiconductor itself and not convert it externally,” says Dierolf.

The standard gallium nitride semiconductor design starts with a base sapphire substrate, onto which crystalline layers of gallium nitride and indium gallium are deposited. This comes with challenges of its own. If the sapphire and gallium or indium gallium nitride lattices have a size mismatch, the ions must be forced into the correct configuration. This creates a strain, which can cause problems. These problems become most severe if a higher indium content is needed to obtain the colors red and green.

The goal of highly efficient white light LED would best be achieved with well-designed red, green and blue LEDs based on nitride materials. However, currently green and red LEDs are currently inefficient.

To overcome the challenges, Dierolf collaborates with groups at Lehigh and in Japan. Collaborating with Nelson Tansu’s group in Lehigh’s PC Rossin College of Engineering and Applied Science, Dierolf’s group studied ways to improve the efficiency of green LEDs through improved semiconductor design. This work resulted in a 2011 paper, “Approaches for high internal quantum efficiency green InGaN light-emitting diodes with large overlap quantum wells,” in the journal Energy Express. Co-authored with Tansu, associate professor of electrical and computer engineering, and two scientists at other institutions, it has been cited almost 300 times and was recognized as one of the five most cited papers among scholarly physics publications from May to June 2013.

To improve the performance of red LEDs, Dierolf wants to put europium dopant inside the semiconductor itself, a neater, more integrated solution compared to the current approach where such ions are part of the color converting cap.

“We want to transfer the energy that the gallium nitride typically emits into an excitation of the europium atom, which would then emit a red light. The crux of the problem is how to transfer the energy with 100 percent efficiency,” he says.

Precision optical spectroscopy and microscopy allow his team to see a detailed map of the electromagnetic spectrum produced when charged carriers or tunable lasers excite the atoms within semiconductor samples. Changing the environment around the europium ion yields differences in the spectrum and, more importantly, influences the efficiency of excitation.

Dierolf is known for not shying away from the painstaking work of considering small defects. The detailed spatial and spectral maps of the portion of the spectrum they are analyzing may look identical, but a deeper probe often reveals information other researchers may overlook.

“The energy at which the ion is excited is like a distinct fingerprint. That way, we can get a fingerprint of a particular defect and its modifications. If you look carefully and do your measurements systematically, you can get significant information from looking at a small subset of the data area as well as looking at the overall picture,” he says.

In one experiment, he and his team of graduate students typically perform 700 to 1,000 spectral snapshots in two hours. They compare the sample for any minute changes in data. Dierolf uses the emissions data map as a guide to identify and design particular defects.

Lehigh is unique because his team has optimized its own near-field optical microscopes to examine samples at the nanometer level and analyze particular specks of the emitted spectrum. Electron microscopes are useful because electron beams can focus on small spaces. His group has built an instrument that combines the capability to excite the sample with both a laser and an electron and collects the resulting emission with an optical microscope.

“This can be tedious work,” Dierolf admits. Fortunately, the imaging and analysis are all computer-controlled. Students write programs to evaluate data.

DEFECTS CREATE THE PERFECT FIT

Dierolf, who joined Lehigh in 2000 as the university’s Optical Center for Technology was starting, found an ideal research fit. He earned a Ph.D. in physics from the University of Utah and a habilitation from the University of Paderborn, Germany, which is a qualification earned after submitting an original, independent thesis following a Ph.D. His habilitation was published as a book, Electronic Defect States in Alkali Halides: Effects of Interaction with Molecular Ions, a tome that placed Dierolf as a leader on analyzing materials for defects and combining defects for special uses.

As department chair, he tries to raise Lehigh’s profile in physics, optics and optoelectronics through workshops and programs, including weekly colloquia that bring together leading scholars. He collaborates with other experts internationally. Beyond his research and teaching, Dierolf is now also the co-director of the lauded physics REU program, a competitive summer research program open to undergraduate students across the country who are interested in research experience.

“Certainly, we have world-class research going on at Lehigh,” he says. “Lighting is a billion-dollar industry and a worldwide research endeavor that needs international cooperation to develop ideas. I’m sure the lighting we have will go well beyond what we know now. We’re always enslaved at any one time by what’s technologically possible to build, but we’ve come a long way from the candle,” he says.
Matt Berman ‘94 and Andrew Kotchen ‘94 run an architectural firm that specializes in historic visions

by GEOFF GEHMAN ’89 M.A.

In the middle of a Manhattan loft is a staircase that doubles as a showcase. The handrails are made of ribboning steel. Cut into the scrolling sides are tree branches that lace wooden stairs with light patterns. A functional sculpture and a climbing experience, the staircase triples as a sleek, subtly seductive version of a 17th-century wooden staircase, with a fancy filigree of oak leaves and pinecones, in residence at the Metropolitan Museum of Art.

The staircase is part of the design spine of workshop/apd, an architectural firm run by Matt Berman ’94 and Andrew Kotchen ’94. Assisted by a chief designer and three architects, the founding partners mix and match antique with contemporary, industry with humanity, calmness with crispness. They’ve applied their brand of warm modernism to everything from a visitor’s center for a former Brooklyn Navy Yard to a community of affordable, sustainable houses in hurricane-devastated New Orleans. They’ve received big commissions and big publicity for a design mission they call “ethical, poetic and of its time.”

“We like to add character through hard materials like steel; we like to add a human hand in an age of mechanization,” says Berman. Adds Kotchen: “We like to use materials that wear well over the years, that develop not only a patina but a story.”

Kotchen and Berman discuss their backstories by workshop/apd’s conference table, a split wooden runway designed for their line of hotel furnishings. Kotchen grew up in Connecticut with a developer father; he gained a fondness for distinctive structures by building Lego skyscrapers. Berman grew up in Connecticut with a furniture-selling mother; he deconstructed and reconstructed TV sets and video-game players, developing a fascination with how things work.

At Lehigh they learned how things work and don’t work from Anthony Viscardi, professor of art, architecture and design and their first mentor.

“Tony was very good at liberating you, but also helping you focus so it wasn’t just a free-for-all,” says Berman. “It was never black and white with him; it was always an exploration.”

“Tony had us looking upside down and from the back,” adds Kotchen. “He created an environment where every idea is a good idea. He unlocked the safe of creativity; he made creativity safe.”

Hope Rises from Destruction

Berman and Kotchen blended creativity with safety in workshop/apd’s first major project. In 2006, the firm, then seven years old, won a competition to design an energy-efficient, eco-friendly neighborhood in New Orleans’ Lower Ninth Ward, wrecked the year before by Hurricane Katrina. The contest was sponsored by Global Green USA and Make It Right, a foundation founded by actor/humanitarian Brad Pitt, a big fan of architecture and the Crescent City’s revival.

Helped by the Home Depot Foundation, Berman and Kotchen expanded the outlines of the city’s trademark shotgun cottages with taller ceilings and wider porches. They harvested energy with solar roof panels and saved energy with sun-blocking porch lattice. Blending recycled-wood floors with flexible spaces, they made the interiors bright and hopeful, important qualities to owners traumatized by the destruction of their former homes.

Smart and stylish, the houses turned Berman and Kotchen into leaders in green design. The Pitt stamp of approval led to more celebrated projects, including the Brooklyn Navy Yard, a former private ship-building mecca being reborn as a public industrial/artisanal park. The pair converted the Commander’s House, a 19th-century residence, into an engaging exhibition space. They attached the brick building to a new visitor’s center, a 20,000-square-foot modular light box. They anchored the lobby with a 22,500-pound, three-story anchor from a Navy ship.

Opened on Veterans Day 2011, the visitor’s center receives high marks from Daniella Romano, vice president for exhibits and programs at the Navy Yard’s BLDG 92. She praises Berman and Kotchen for dramatically improving the...
derelict Commander’s House and for creating drama by transforming the exterior windows of the Commander’s House into an interior attraction. She especially enjoys a Berman-designed steel screen cut with an impression of the USS Brooklyn. It not only illustrates the Navy Yard’s rich history, but it also saves energy by halving natural light. In June, it became a screen for projections of the works of a stone mason who honored the naval complex’s impressive stone works, including a hospital full of marble.

Perfectly Imperfect

The ship-shape screen typifies what Berman and Kotchen call “that one big moment,” or “the big reveal.” The big reveal of a family compound they designed on Nantucket is the harmonious marriage between architecture and nature. They helped client Bill Reiland, a financial-services specialist, find a site by the ocean, a pond and thousands of preserved acres. They conceived buildings with natural sizes and panoramas, structures with “an old-school Nantucket feel, that don’t look pumped up,” according to Reiland. Mixing cool stainless steel, warm recycled wood and gentle colors, they made the interiors spare and almost spiritual. Reiland senses Wabi-sabi, a Japanese/Buddhist notion of beauty that’s perfectly imperfect.

“Many homes have a single moment when you say ‘Aahh!’ This one probably has 15 moments,” says Reiland. “It’s truly spectacular.”

Impressed by the efficient vision of Berman and Kotchen, Reiland hired them to redesign his Brooklyn brownstone. “Matt and Andrew truly listen well,” he says. “They’re smart, they’re quick, there’s no ego involved. They’re just on it.”

Kotchen and Berman salute Reiland as an ideal residential client, a collaborator both complementary and complimentary. More common, they say, are home-owning saboteurs who can’t make up their mind and mash together conflicting schemes. They interfere. They run out of money and energy. And still they try to make you feel like you’re their servants.

“In an ideal world, we would be playing ping-pong, with a lot of back and forth, with no winner and no loser,” says Kotchen. “In the real world, you’re lucky to get a hit every third time at bat. When a job goes great, it’s awesome. When something doesn’t work, and you get 1,000 texts an hour, it sucks.”

Commercial customers tend to be more hospitable, and Kotchen and Berman are branching into the world of hospitality. Their first venture, an Italian restaurant in a Manhattan apartment building, is an elegant, invigorating union of concrete floors, walls of reclaimed mushroom wood and six spaces with six experiences theatrically surrounding a private dining room.

Their work has earned them an enviable assortment of awards and rewards. Residential Architect magazine placed them on a list of Top 15 Architects to Watch. The Navy Yard visitor’s center received a civic/institutional prize from the Brooklyn Chamber of Commerce. Berman and Kotchen shopped for dining tables with a New York Times writer. They posed for a photograph in a subway car for a New York Spaces magazine feature on their favorite space. They praise the New York City underground as a fast, fairly cheap mode of transportation that forces riders to share differences.

After 15 years together, Kotchen and Berman have learned to accept their significant differences as control freaks. Zachary Helmers, workshop/apd’s senior designer, says Kotchen tends to seize one pivotal scheme and examine every angle. Berman tends to examine many schemes until he grabs the pivotal one.

“Andrew helps Matt by focusing him and setting direction, while Matt helps Andrew by taking a look outside the box and bringing other ideas to the table,” says Helmers. “It would definitely be easier to work for them if they were both coming from the same side, but the work we do wouldn’t be as good as what we’ve able to produce when we mesh both their ideals.”

Berman and Kotchen have developed a brotherly relationship.

“We’re like family,” says Berman. “There are people who push your buttons and you wish you could change them and you can’t. We’ve just learned to understand each other better and to strive to do better work.”

“I used to lie in bed at night stressing about a lot of stuff,” says Kotchen. “I’ve learned to look at the big picture, to realize that doing your best can be good enough, that you have to balance your career against your sanity. We’re not saving lives here; it’s not arms and legs.”

Kotchen and Berman are committed to expanding workshop/apd’s body of work. They plan to complete the Holy Cross Project in New Orleans with a park, apartments and a rainwater-recycling community center. They intend to promote a new beach club at the Jersey shore and a new line of hotel furnishings, including a wall-mounted nightstand shaped like an iceberg. And they’d like to revisit, or “retread,” a canceled commission, a country cottage draped in steel that rusts rustically.

Given the chance, the partners would even modernize motifs of New York’s subway system. “We’re fascinated by all things,” says Berman. Adds Kotchen: “We would design pretty much anything.”
Feature

Dan Coviello ’13 ’15G, who has served two terms as chair of the United Nations’ Department of Public Information (DPI)/Nongovernmental Organization (NGO) Youth Representative Program, advocates for young people to advance the mission of their NGO by participating in education, orientation and training opportunities at the United Nations.

NGOs, nonprofit groups that are independent of governmental structures, fill an important role in policy-making processes. They exist for many causes, including environmental, social and economic. Their passionate members hold fundraisers, campaign, educate communities, push for appropriate legislation and conduct research.

Every NGO associated with the UN through the DPI is able to provide two grounds passes—entrance tickets that permit recipients to attend weekly meetings, access public information events, acquire training and represent their NGOs at conferences and other events—to youth representatives (between 18 and 32 years old) annually.

As chair of the DPI/NGO Youth Representative Program, Coviello afforded leadership in providing institutional structure to the youth representative program and enhancing communication between NGOs and the UN. His achievements include the development of youth-led conferences and briefings and outreach through social media, blogs and newsletters.

“I was fortunate enough to be elected chair and have continuously helped define what the program is, as well as guide what it can become,” says Coviello, a student in the College of Arts and Sciences’ environmental policy design program. “There was a need for leadership in terms of organization, and I quite honestly didn’t know what I was getting myself into. One of the most important things I learned was how to establish an environment where people’s opinions were valued, heard and incorporated.”

On June 1, Coviello stepped down as chair to pursue other avenues of service. Following a summer of international travel, he now works as an intern in the policy analysis branch of the UN’s division for sustainable development and will train two representatives to serve as youth delegates for Tarumitra, an environmental NGO based in India.

Coviello’s zeal for civic engagement started at Lehigh. As an undergraduate environmental engineering major, he served as the outreach chair...
and Global Union representative for engineers, where members partner with disadvantaged communities to improve their quality of life through education and implementation of sustainable engineering projects, while promoting global experience for engineers, engineering students and similarly motivated non-engineers. Through the organization, he helped design a water conservation plan for Pueblo Nuevo, Honduras, and led a water filter design competition for seventh-grade students at Broughal Middle School in the Bethlehem Area School District.

“It was in Engineers Without Borders that I discovered firsthand how to approach a development project,” he says. “I learned a lot about how to make some tough decisions.”

Coviello also founded a student chapter of the American Academy of Environmental Engineers and Scientists and facilitated the establishment of the Lehigh University Eco-Representatives group. Now in the College of Arts and Sciences, several themes underline all of his activities—a dedication to help others, a willingness to seize the day and assistance from Lehigh in achieving his goals.

“Lehigh will help open doors for you, but it’s up to you to take that step through,” he reveals. “After representing Lehigh at the 64th annual UN NGO conference in Germany, I was able to contribute to the text (of the conference declaration, which was focused on youth empowerment in sustainable development). After that, I served as a social media volunteer for the UN and, not long afterward, became an official youth representative. I just kept moving.”

Support from Lehigh came both before and after Coviello’s association with the UN. It was at the community service office and through the mentorship and guidance of director Carolina Hernandez where he learned the five critical elements of service: community voice, orientation, meaningful action, reflection and evaluation.

“I use them daily in my activities at the UN,” he says.

Coviello’s efforts at the UN have primed him to inspire others on a global scale. In May, he traveled to Taiwan with members of the Buddha’s Light International Association (BLIA) and was a guest of honor at a ceremony to honor Buddha’s birthday and Mother’s Day in Taipei, the capital city. One thing is certain: Coviello does not suffer from stage fright. At the celebration, he spoke in front of 100,000 people and met Ma Ying-jeou, president of Taiwan; Hau Lung-pin, mayor of Taipei; and the venerable master Hsing Yun, one of the leaders of humanistic Buddhism.

During his travels, he lived in a monastery for two days, visited a fishing village that reminded him of his hometown of Brick, N.J., and had the opportunity to deliver a speech titled “The World We Want, 2015: A Future for All” at universities around the country. In his presentation, Coviello discussed how meaningful youth engagement means being seen as and treated like a partner, before, during and after decisions are made. He also explained to students that an individual’s background informs his or her perspective on different issues.

“It was fun,” he recalls. “Each speech was a little different for me and the audience, and I enjoy that. Everywhere I went, the people were extremely welcoming, compassionate and genuinely interested in me being in and seeing Taiwan and learning about Buddhism. My favorite part of the trip was interacting with the people I met over there and being able to connect with the BLIA. They really made the trip unforgettable.”

Not one to stand still, Coviello attended the third Youth Led Briefing and Youth Rep Orientation at the UN, completed arrangements for his fraternity’s (Psi Upsilon) convention and half-day of service at Lehigh University and prepared to head abroad again after returning from Taiwan. On June 8, he traveled to Galway, Ireland, as the graduate assistant for the Lehigh in Ireland summer study abroad program.

“I try to sleep, eat well and say yes to the right things,” he laughs. “I have a great girlfriend, a supportive family and a great Lehigh support structure to help me as well. I’m always trying to find balance. I’m not there yet, but I’m getting close. Through it all, I’ve realized that if you have passion, ambition and a good network, there’s no telling what can happen if you set your mind to something. My route hasn’t been direct, but it’s been fun every single turn.”
Family at the Center of Success

Amy Shotmeyer ’05 finds there is no downtime working in the legal profession. As an associate at the firm of DeCotiis, Fitzpatrick & Cole, LLP in Teaneck, N.J., her practice crosses several disciplines including civil litigation, insurance defense, renewable energy, community development and affordable housing. As a member of the partnership’s insurance defense group, she defends public entity clients, including municipalities and housing authorities.

Amy Shotmeyer ’05 credits family with successful career

Amy Shotmeyer ’05 finds there is no downtime working in the legal profession. As an associate at the firm of DeCotiis, Fitzpatrick & Cole, LLP in Teaneck, N.J., her practice crosses several disciplines including civil litigation, insurance defense, renewable energy, community development and affordable housing. As a member of the partnership’s insurance defense group, she defends public entity clients, including municipalities and housing authorities.

I gained an appreciation for environmental sciences. I declared my EES major shortly thereafter,” she says.

A Rock-Solid Foundation

As a student in the EES department, Shotmeyer vividly remembers taking part in several overnight field trips to study the region’s geology and its rock formations. However, during her senior year, Shotmeyer, who was a member of the Phi Beta Kappa honor society, took several courses focusing on environmental studies, policy-making, climate change and international environmental law.

“I was hooked. I knew this was my career path,” she says. She graduated with a B.A. degree, with dual majors in earth and environmental sciences and science and environmental writing. Shotmeyer notes her science and environmental writing major served as a strong foundation for her writing skills,
“A highlight of my career so far has been working with my firm’s green practice group to become a leader in providing solar renewable energy-related legal services throughout New Jersey,” explains Shotmeyer, who has been with the firm since 2010. She had the opportunity to attend the 2011 Energy Master Plan hearings conducted by the New Jersey Board of Public Utilities in Trenton, N.J., on behalf of her solar clients.

Currently, Shotmeyer spends her days researching law, writing briefs, conducting depositions and appearing in the courts across New Jersey for oral arguments or motions.

“I defend public entities in a complex environmental litigation involving the discharge of hazardous substances under the New Jersey Spill Compensation and Control Act and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).”

She says she hopes to continue her work in the private sector of the legal field at DeCotiis and perhaps branch out into environmental policy making.

Work/Life Balance

Although work is extremely important to Shotmeyer, her love for her family is a priority. Shotmeyer says she was drawn to Lehigh because it resembled a large family, something with which she is quite familiar as the youngest of six children. Her older brother, Tim ’00, provided a first glimpse of life on South Mountain, and it wasn’t long before Shotmeyer knew that she also wanted to join her sibling.

“When Tim would return home for breaks, he would light up telling me about how exciting his Lehigh experience was,” explains Shotmeyer. “I started visiting him with my parents occasionally on the weekends. From seeing the Alumni Memorial Building to visiting Tim on the Hill, I knew that Lehigh was going to be the place for me.”

When she entered Lehigh, her brother was working in the university’s advancement office. “It was wonderful to have him at Lehigh throughout my first year to guide me through typical first-year experiences,” she says.

Family support—from her parents and siblings as well as from her Lehigh family—has played a prominent role in Shotmeyer’s success and happiness in both her career and her personal life.

“I have incredibly supportive parents who encouraged me to follow the direction of my true interests. I undoubtedly would not be where I am today without the support from my parents and siblings,” she says.

She credits her Lehigh family for providing her with excellent opportunities to keep pursuing her interests, no matter where they led. Not only did Shotmeyer pursue her interests in her academic work at Lehigh, but she also followed her passions outside the classroom. She was a member of Alpha Gamma Delta sorority and is still very close with her sisters. As a staff writer for the Brown & White bi-weekly feature “Science Times,” she wrote about climate change. She was also a staff member of Lehigh’s Epitome yearbook and worked on the sororities and fraternities section. The coursework, combined with the extra-curricular activities, provided a solid skill set she uses daily in her career.

“Lehigh prepared me incredibly well in writing, communication and interpersonal skills,” she says.

An active Lehigh alum, Shotmeyer visits campus at least once a year and says she particularly enjoys visiting the new Science, Technology, Environment, Policy and Society (STEPS) building. She also plans events for the Lehigh Alumni Club of Northern New Jersey and is on the EES department career panel, where she speaks to Lehigh students about using an EES degree to get into the legal field.

As a resident of Franklin Lakes, N.J., the same town where she grew up, Shotmeyer says her tight-knit family all live nearby and she enjoys spending a lot of time with her nieces and nephews.

“When I’m not doing my day job, I’m at recitals, sports games, birthday parties and play dates.”

Involved with Grace Bible Church, Shotmeyer was recently appointed to the missions committee and will assist in planning the church’s missions outreach initiatives. A lover of fresh air, Shotmeyer loves skiing, running, biking and basically any outdoor activity.

“Although I’m in a suit during the week, I stay true to my Lehigh ‘environment roots’ and trade the pumps for hiking boots on the weekends!”

Shotmeyer adds she’s “extraordinarily blessed” with two “wonderfully loving” parents, Charles and Alexandra Shotmeyer, who have been married for more than 51 years, five older siblings and 11 nieces and nephews.

“My parents have always been huge supporters of Lehigh,” she says. “They frequently visited me on weekends, taking me to the Hotel Bethlehem for Sunday brunch and coming back to campus to visit with my friends. Those are some of my fondest memories of Lehigh.”
In Search of a Better Catalyst

Undergraduate chemistry student is making use of prominent fellowship to study fluorine

by Manasee Wagh

Doug Solowey ’15 is a student on a mission. The 21-year-old chemistry major hopes to discover a new catalytic method that could eventually be used to incorporate fluorine into small molecules and polymers crucial to the design of materials with uses as wide-ranging as Teflon and drugs.

“Any discoveries he makes will occur in Professor David Vicic’s lab, thanks to a prestigious American Chemical Society’s (ACS) Moissan Summer Research Fellowship. After many hours in the lab during the academic year, Solowey discovered he had a zeal for research and credits Vicic for encouraging him.

“He responded very positively when I asked for research experience. He assigned me this project, which is a variation of his own research interests. He’s served as my mentor, and he’s really taught me a lot,” Solowey says.

The fellowship, which paid $5,000 for 10 weeks of research, included salary and supplies. Only two people throughout North America received the fellowship this year, Solowey discovered. He received the fellowship with a student at Université Laval in Quebec City, Canada. Solowey earned an extra two weeks of research through a College of Arts and Sciences Research Grant.

“To get this fellowship, I had to demonstrate its potential for success. We’ve had some preliminary results in my lab that indicates the next step, which Doug is pursuing, is likely to work,” says Vicic, professor of chemistry.

Vicic’s research focuses on developing novel ways to incorporate fluorine into organic molecules. Certain metals, when combined with fluorine, can act as compounds that jump-start chemical reactions necessary for the creation of substances such as Teflon. These compounds, known as metallacyclobutanes, have the potential to revolutionize the way fluorinated polymers are prepared.

Fluorinated polymers, which possess high thermal and chemical stability and resistance to oxidation and corrosion, are used industrially in membranes for fuel cells and water-repellent cloths, as protective coatings, in flares, seals and gaskets or to regulate drug delivery and metabolism in the body. However, the procedures to prepare fluorine-rich polymers are either limited or involve environmentally unsound conditions, such as subjecting the nonfluorinated parent polymer to harsh fluorine plasmas or using involving environmentally persistent and toxic fluorinated surfactants. Using a particular reagent in the polymerization process could move industry away from such hazardous conditions. Vicic believes he and his team have a good grip on preparing the compounds that could act as intermediaries in the process to polymerize fluorine-containing substrates. By having direct routes to these intermediaries, scientists could achieve exceptional microstructure control, which ultimately may lead to the discovery of many new fluorinated materials.

Over the past spring semester, Solowey prepared new iron and nickel complexes in hopes of incorporating fluorine in a specific, four-membered molecular ring structure. During the summer, he continued his work to develop catalytic processes with these new compounds to fluorinate organic substrates.

“We test their reactivity and their ability to form fluorinated molecules and polymers once we get a stable metal precatalyst,” Solowey says.

Fluorine polymer synthesis can be a slow and painstaking task.

“Sometimes, the most useful ones are the hardest to make,” he adds.

On a typical day, he mixes compounds in vials, dissolving, stirring and observing. The compounds can be damaged by oxygen and water vapor, so Solowey works with them in a nitrogen-filled glove box. He conducts all of his experiments inside the box, analyzing reactions with a nuclear magnetic resonance spectrometer and an X-ray crystallography machine.

“It’s time-consuming. This work has taught me a lot about patience. I initially thought that things would always work the way they should, but I quickly found out they don’t,” he says.

Solowey is grateful for the intensive research opportunity.

“I really like the chance to get a good academic experience while being able to contribute beyond the classroom. Lehigh provided more opportunity,” he says.

Solowey never imagined himself a researcher by trade, but based on the research he’s tasted so far, he can picture himself in an academic career.

“I came to Lehigh with the mentality that I wanted to get a good job after I graduated. I never considered research chemistry as a path. But now I’m working toward acceptance into graduate school. For everything I learn, two new questions come up,” he says.

The Moissan fellowship also pays for a trip to an upcoming ACS Fluorine Division Conference to present his experimental results. Vicic is confident in Solowey’s potential.

“I anticipate he’ll be able to make one of these fluorine-containing compounds. Once he does, we’ll have infinite possibilities to explore their reaction chemistry,” he says.
Long-Standing Faculty Join Dean’s Office

Two new associate deans joined the dean’s office in July, expanding the support and services offered to students and faculty within the college. Jackie Krasas ’87, associate professor of sociology and anthropology, is associate dean for interdisciplinary programs and international initiatives. She directed the women, gender and sexuality studies (WGSS) program from 2005 until 2014. As director of WGSS, she expanded the program from an undergraduate minor in 2005 to a program that now includes both an undergraduate major and an interdisciplinary graduate certificate. Her scholarship focuses on gender, race and employment inequality, masculinities, work and family, sexual harassment and nonstandard work. Her book, *Temps: The Many Faces of the Changing Workplace*, analyzes the rise in temporary employment and the experience of temporary workers in terms of race, gender, power and identity. Krasas is co-principal investigator and part of the leadership team for the Lehigh ADVANCE grant, “Building Community Beyond Academic Departments.” Her scholarship from the grant focuses on gender and interdisciplinary work in academia, particularly in science, technology, engineering and mathematics (STEM) fields. Krasas received her Ph.D. in sociology with a specialty in gender studies from the University of Southern California.

“I have always enjoyed working in interdisciplinary spaces,” says Krasas. “They can be challenging but are also intellectually invigorating and rewarding. In CAS, we have a wealth of interdisciplinary programs that can benefit from my role through creating regular collaboration, shared problem-solving and institutional advocacy for those units and interdisciplinarity that already exist at Lehigh. Equally important will be my role in facilitating and guiding the development of new, faculty-generated international collaborations. These initiatives, which may be pedagogical, creative and/or scholarly in focus, will be designed with the goal of being mutually beneficial to all cooperating institutions.”

Cameron Wesson, the Lucy G. Moses Distinguished Professor in the department of sociology and anthropology, is associate dean of undergraduate programs. Before arriving at Lehigh in 2011, he served as associate professor and chair of the department of anthropology at the University of Vermont (UVM). Prior to his tenure at UVM, he was associate professor of anthropology and director of graduate studies at the University of Illinois at Chicago (UIC). His scholarly interests center on Native American architecture and community planning, non-capitalist political economies, archaeological remote sensing and archaeometry. He is the author or co-editor of three books, with his most recent volume, *Households and Hegemony*, examining Native American responses to European colonization in the Deep South. He is presently developing a new archaeological research project addressing Iron Age hill forts in England and Wales. Wesson received both his Ph.D. and M.A. in anthropology from the University of Illinois and his B.A. in anthropology and B.S. in architecture and environmental studies from Auburn University.

“Although I’ve spent the majority of my career in departments with large graduate programs, I’ve always found my roles as an undergraduate teacher and mentor to be the most rewarding aspects of my career,” he says. “I was attracted to this position because of the established reputation of excellence for undergraduate education within CAS and because of the broader challenges facing undergraduate education. New technologies and learning assessment tools are transforming how we present information, engage our students and evaluate their mastery of key course concepts. Meanwhile, student concerns over educational debt and the anemic job market have forced many to question the relevance of a liberal arts education in the 21st century. I want to take on these issues as associate dean by empowering faculty to make full use of emerging pedagogies, finding new ways to engage students and developing a compelling case for why a broad-based liberal arts education is not only relevant, but an essential basis for employment in the global economy.”

Krasas and Wesson join Diane Hyland, senior associate dean for faculty and staff, and Garth Isaak, associate dean for research and graduate programs.
“Although I’m in a suit during the week, I stay true to my Lehigh ‘environment roots’ and trade the pumps for hiking boots on the weekends.”

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