FALL/WINTER 2016

GW

Arts & Sciences

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THE EXPLODING WORLD OF DATA SCIENCE

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A BLUEPRINT FOR ECO-FRIENDLY CITIES

A Window From Space
NEW HEIGHTS IN SATELLITE IMAGERY

Black Lives/Lungs Matter
ALUMNUS TAKES ON TOBACCO COMPANIES

THE GEORGE WASHINGTON UNIVERSITY
COLUMBIAN COLLEGE OF ARTS AND SCIENCES

GW Arts & Sciences

FALL/WINTER 2016

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contents

Cover Story

Spotlight

Dean's Message

In a Columbian College chemistry lab, a professor and a team of student researchers extract harmful carbon dioxide from the air and turn it into earth-friendly industrial materials—a process they nicknamed "diamonds from the sky." It's the latest step in their ongoing efforts to reverse the tide of global warming.

In a Washington, D.C., middle school, undergraduate science and math majors are transformed into teachers, leading children through exercises on simple algebra and physics while learning lessons of their own on classroom management and student engagement. It's part of a multi-disciplinary initiative to repair the nation's leaky STEM pipeline and train tomorrow's educators in today's classrooms.

And in Dharavi, India, where more than a million people live in a squalid one-square-mile slum, two recent graduates are adapting their GW class work to address a humanitarian disaster. Their goal is nothing less than solving a sanitation crisis.

From classrooms on campus to the global educational canvas, Columbian College faculty, students and alumni are changing the world as we know it. No matter the field—science, social science, the arts, the humanities—their activities foster intellectual curiosity, encourage academic and artistic creativity and spark new discoveries. They represent the very essence of what we at Columbian College proudly call "the engaged liberal arts."

From faculty who are enlightening minds in their classrooms to students who are touching lives around the world, the breadth and depth of Columian College talent and expertise is staggering. And we are continually pressing onward, moving from initial insights and observations to new ways of thinking about and addressing the most pressing global concerns.

This issue of *GW Arts & Sciences* spotlights an engaged liberal arts that is as relevant today as it was two centuries ago. These remarkable stories of intellectual determination and commitment personify who we are: students who are mastering cutting-edge 21st century skills like data science, fingerprint analysis and art therapy; faculty who follow their quest for knowledge from satellites orbiting the planet to mineral mines deep below the earth's surface; alumni who are engaged in making a difference, from exposing the tobacco industry's targeting of African Americans to being the motivating force behind a new generation of Latino leaders.

It's been a year of looking onward at Columbian College—as well as a time to honor our past. We learned that we will be bidding a heart-felt farewell to GW President **Steven Knapp**, whose tenure at the helm will come to an end this summer. We welcomed **Forrest Maltzman**, a Columbian College faculty member since 1993 and former chair of the Political Science Department, to his new role as university provost. We were saddened by the passing of Rabbi **Max Ticktin**, an iconic former professor of Hebrew and a cherished friend and mentor. We were excited to announce the launch of new transformative initiatives like the Ambassador John L. Loeb Jr. Institute for Religious Freedom at GW.

And soon we will commemorate a milestone of a different sort. We are marking the days to the Columbian College Bicentennial. In 2021, we will celebrate a proud 200 years of educational excellence in the heart of the nation's capital, looking back—and onward—to the people, places and events that have always made Columbian College such a special place to grow and to engage in a dialogue of actions and ideas.

Of course, our college's vision and accomplishments are built upon the commitment of those whose service and philanthropy supports everything we do. We are grateful to those who have advanced our work through their generosity.

I look forward to the continual engagement of our alumni in the life of this college. Join one of our many outreach events or stay in touch by simply dropping me a line. And I invite you to continue our conversation on social media. In the meantime, turn the page and learn more about the amazing men and women moving Columbian College forever onward.

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#CCASOnward

News Briefs

CHANGE IS IN THE AIR

After 10 years of distinguished service, President **Steven Knapp** announced he will be stepping down as GW's 16th president when his term expires in July 2017. A national search has been launched for his successor.


Forrest Maltzman

In other senior leadership news, **Forrest Maltzman**, a Columbian College faculty member since 1993 and former chair of the Political Science Department, was tapped to serve as provost and executive vice president for academic affairs. Maltzman had been serving as interim provost since **Steven Lerman's** departure from the post last year.

GW HITS THE MARK

GW continued to distinguish itself with an array of honors for its students and schools. The Trachtenberg School of Public Policy and Public Administration became the highest ranked public affairs school in the Washington, D.C.-area, according to the 2016 *U.S. News and World Report* rankings of graduate programs. In addition, the university topped the Peace Corps list of volunteer-producing medium-sized schools for the fifth time in 10 years with 43 alumni currently serving in communities around the world. And GW students were named the "Most Politically Active Students" in the nation, according to a *Princeton Review* survey. It was the fourth straight year GW has claimed the top spot.

NEW FACULTY WELCOMED

Columbian College welcomed 23 new full-time faculty members this year, among them Pulitzer Prize winner **Debbie Cenziper**, former Fulbright Fellow **Hilary Silver** and bestselling novelist **Jung Yun**. The new hires add international education experience from France and Germany to Jerusalem and Jordan and important expansions across the disciplines. The college now boasts 496 full-time faculty.

CORCORAN TRANSFORMATION

As the Corcoran School of the Arts and Design marked its second year at GW, the artistic and academic hub expanded its programming and improved its infrastructure, classroom and exhibition space while showcasing a vibrant influx of talent. A multi-year renovation initiative kicked off with upgrades to the Flagg Building, the school's historic Beaux-Arts home. The physical update of the Corcoran was mirrored by a cross-disciplinary collaboration that saw the first steps toward the administrative integration of all GW arts programs under the Corcoran School. Meanwhile, NEXT, the annual exhibition of cutting-edge student thesis artwork, drew 800 people to its opening event. Other exhibition highlights included a multimedia transformation of street trash into art; an exploration of LGBTQ culture titled "Generation Queer"; and the Blue Wings Project, a collaboration between photojournalism students and the Afghan Women's Writing Project.

SMPA SILVER CELEBRATED

Faculty presentations, alumni testimonials and musical performances highlighted a gala event recognizing the 25th anniversary of the School of Media and Public Affairs and its contributions to fostering an informed and engaged democracy through its curriculum, programming and outreach activities. Among the featured speakers at the celebratory gathering was *Meet the Press* moderator **Chuck Todd**, who commemorated SMPA's history at the forefront of media education.


Chuck Todd

MENTORS PAY IT FORWARD

Associate Professor of Chemistry **Cindy Dowd**, Professor of History **Denver Brunsman** and Associate Professor of Speech and Hearing Science **Shelley Brundage** received Columbian College's inaugural Dean's Research Excellence Award for Mentoring (DREAM). The three professors were honored for their commitment toward stewarding ideas and encouraging the development of junior faculty in their teaching and research. "We have each benefitted from good mentorship over the years," Dowd said. "It is incumbent upon us to pay back the system and nurture those following in our footsteps."


Cindy Dowd, Shelley Brundage and Denver Brunsman

21ST CENTURY DEGREES LAUNCHED

To keep pace with the needs of the 21st century global marketplace, Columbian College debuted several new graduate programs to better prepare students for in-demand expertise in homeland security, green chemistry, communication management and cutting-edge forensics science fields like friction ridge analysis and latent print examination. The programs, which include both master's degrees and graduate certificates, offer students the opportunity to acquire a strong academic foundation while mastering practical skills that equip them for success in these burgeoning professions.

At the undergraduate level, the Global Bachelor's Degree launched this year with the goal to immerse students in the international learning experience. The degree builds beyond the typical study-abroad program and includes multiple semester-long residencies to destinations tied to scholarly pursuits. Designed to help students develop an international perspective and an in-depth understanding of other cultures, the first cohort will spend the spring 2017 semester at Shanghai's Fudan University.

Geography students at GW Mapathon

MAPATHON PLOTS AID

In an ongoing collaboration with USAID, the Geography Department hosted the annual Mapathon event, a student-focused initiative to improve global crisis response by mapping vulnerable developing world sites. This year, students used open source software to remotely map communities in Mozambique as part of an Obama Administration anti-malaria campaign. The event was the seventh GW Mapathon in conjunction with USAID. More than 15 Mapathons have been convened in total with partners such as the American Red Cross and the Peace Corps.

LGBT HEALTH FORUM

Panelists discussed the intersection of sex, religion and LGBT health at the fourth annual GW LGBT Health Forum, an annual event hosted by the Columbian College LGBT Health Graduate Program. Experts from several faiths cautioned that shame and stigma from religious teachings may cause LGBT people to put off medical care, fearing discrimination from medical professionals. Panelists included Associate Professor of Clinical Psychology **Sherry Molock**; Bishop Gene Robinson, the first openly gay bishop in a major Christian denomination; Beverly Little Thunder, a Lakota tribal elder; and Rabbi Deborah Waxman, president of Reconstructionist Rabbinical College and Jewish Reconstructionist Communities.

AT THE WHITE HOUSE TABLE

From shaking hands with President Obama and First Lady Michelle Obama to taking a selfie with actor Will Smith, senior **Nana Agyemang** had a star-studded evening as the 2016 recipient of the George Washington University-White House Correspondents' Association Scholarship. A journalism major and founding member of the GW Association of Black Journalists, Agyemang also appeared in a *Washington Post* style feature and took over the university's Snapchat to share moments from the evening.

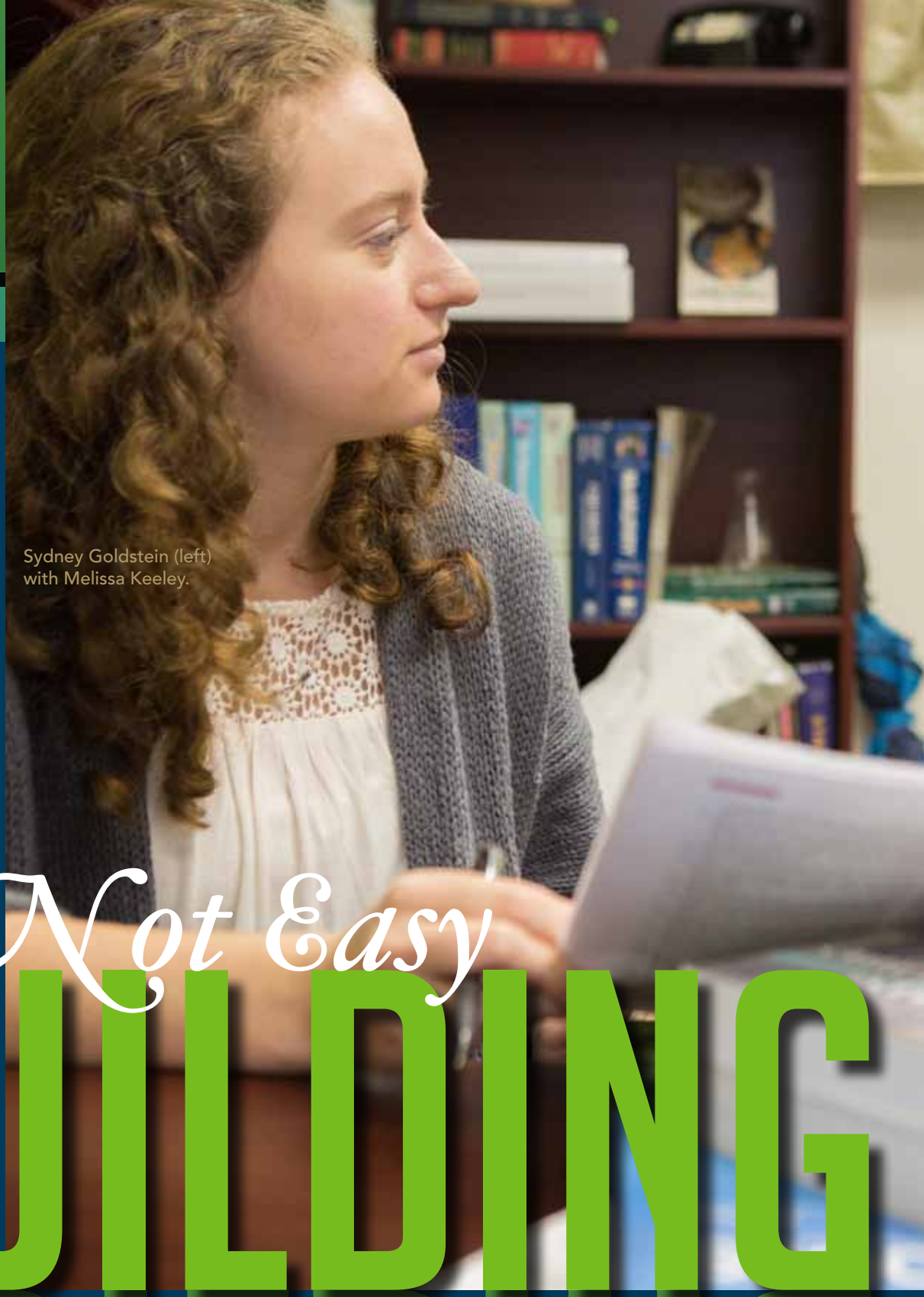
SALONS SPARK DIALOGUE

Columbian College's new Sophomore Scholars Salons are providing opportunities for high-achieving undergraduates to exchange ideas with faculty and students from across disciplines and network with alumni from in-demand career fields. The salons were established to foster dialogue among Dean's List students, showcase the value of a liberal arts education and offer academic and professional guidance.

BOKAMOSO YOUTH AT GW

In a tradition that has thrilled GW audiences for 13 years, singers and dancers from South Africa's Bokamoso Youth Centre brought their sweeping harmonies and rousing choreography to the Bettes Theater for a performance capping their week-long GW residency, part of the Theater and Dance South Africa Project. The program brings young performers from the impoverished Bokamoso township to campus for academic sessions, theater workshops and exchanges with theatre and dance students, leading up to performances for the university community.

Bokamoso Youth Centre performers



Sydney Goldstein (left) with Melissa Keeley.

It's Not Easy BUILDING

GREEN

A passion for research lifted environmental studies major Sydney Goldstein to new heights of green building policy as she investigated urban planning and its effect on the environment. Her commitment led to a Luther Rice Fellowship and a new way of looking at sustainable buildings.

Sydney Goldstein's passion for urban planning and its impact on the environment led her to an incredible research opportunity, one that enabled her to immerse herself in the latest policy trends involving green building heights. With the help of her faculty mentor, Assistant Professor of Geography and Public Policy **Melissa Keeley**, the Luther Rice Undergraduate Research Fellow uncovered new data on the decisions behind the development and design of sustainable buildings.

"I was terrified when I started. It was literally the most intimidating thing I'd ever done," said Goldstein, an environmental studies and dance major. "But I'm the kind of person who loses herself in the research process. You get to a point where you forget about the fears, and you just see the facts and figures."

Goldstein spent long hours combing through reams of raw data and stacks of literature reviews to chart trends relating to sustainable structures across the United States. The outcome of her effort went well beyond her Luther Rice Fellowship: Goldstein's research resulted in a breakthrough perspective on sustainable building policy.

Growing Sustainable Structures

Over the last decade, green building policies—also known as sustainable building—have caught on with cities around the country, particularly those with large populations, as a way to minimize the environmental impact of development. The term green building refers to both an actual structure and the use of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle. Buildings are one of the largest consumers of natural resources and account for a significant portion of greenhouse gas emissions. In the United States, buildings from residential to commercial construction register nearly 40 percent of all CO_2 emissions, 73 percent of electricity consumption and more than 13 percent of all potable water. While definitions vary for what exact criteria make a building "green," according to the nonprofit U.S. Green Building Council, green buildings consume 25 percent less energy and 11 percent less water while accounting for 34 percent lower greenhouse gas emissions than traditional construction. In 2016, it is estimated that nearly half of all new nonresidential construction in the United States will meet green building goals.

When Goldstein first approached Keeley about examining the development of green building policy initiatives by municipalities over the last decade, her faculty mentor suggested looking at green buildings from an angle that

"If we can understand what cities are trying to achieve through their green building policies and where they are getting their information, it puts us in a better place to support them." — Melissa Keeley

had yet to be fully examined: the public policies behind how cities enact green building development. Keeley had already collected data focused on municipal decision making, but the cache of surveys and statistics needed to be analyzed and organized for a cohesive research study. Keeley's response: "Have at it."

Goldstein focused on data from 36 municipalities with populations ranging from 50,000 to over two million. She dove into a comprehensive literature review of major documents on municipal green building, from environmental studies to city planning records, and divided her information into three areas: the green building decision-making process and the administrators behind those decisions; the information relied upon when making those decisions (i.e., case studies or leaders in the field); and the degree that policy designs were localized.

"I haven't seen anybody look at green building in the way Sydney approached it," Keeley said. "The implications are broad. If we can understand what cities are trying to achieve through their green building policies and where they are getting their information, it puts us in a better place to support them."

Instead of identifying which procedures worked better than others, Goldstein sought out policy trends. She noted the number and types of municipal offices that were involved in green building decision-making, such as environmental agencies, mayors' offices and city councils. Also, she examined municipalities' likelihood to turn to cities of similar size and geographic-locations as role models, emulating, for example, recognized leaders like Seattle, Portland and Chicago. In addition, Goldstein made note of the propensity by municipalities to localize those models, adapting them to specific concerns. A southwestern city, for example, might focus on water conservation, while coastal regions would dedicate additional resources to energy and pollution reduction. "Rarely does one city just copy another," Goldstein said. "Usually they take a policy that worked well in a different city and shape it to fit their special circumstances."

Goldstein credits Keeley with keeping her on course as she foraged through libraries resources and online databases. Her mentor was particularly helpful in framing and conceptualizing her research agenda to fit the topic parameters—narrow enough to be manageable but comprehensive enough to meaningfully add to the scientific record. "In research, you want to contribute in a novel way," Keeley said. "You are building on the work of multiple scientists and researchers, but you can't merely repeat what's already been done."

Goldstein presented her findings at GW's 2016 Undergraduate Research Symposium and she continues to build on her research as she prepares an article to submit to peer review journals. "There's always another document to read, another survey to compile," she said. "Research work is never done."

Dancing to a Personal

TWO GRADUATE STUDENTS EXPLORE THEIR CULTURAL IDENTITIES THROUGH IMPASSIONED DANCE CHOREOGRAPHY AND MOVING PERFORMANCE.

Growing up in a small Texas town, **Felicia Avalos,** MFA '16, knew little about her father's past as an undocumented immigrant from Mexico. She had heard the bare bones of his story: He lived on the dangerous streets of Ciudad Juárez; his mother pulled him from school at age 13 to support his family; in his early 20s, he began crisscrossing the U.S. border in search of work. When Avalos pushed for details, her father always held back. "He was very quiet about what he'd gone through," she said.

While choreographing her thesis project for the Department of Theatre and Dance's MFA program, Avalos persuaded her father to sit for hours of conversations. As she listened to him haltingly describe the hardships he faced on his path to citizenship in America, Avalos not only gleaned insights into a chapter of her family history, but she found connections to her cultural identity and inspirations from her dance traditions.

Felicia Avalos' thesis performance, *The Beast*

(Photo: Stephen Clapp)

The result was *The Beast: A Daughter's Document of an Undocumented Journey*, Avalos' thesis performance that she presented at Dance Loft 14 in Washington, D.C. Employing a variety of styles—Thai boxing, Brazilian jiu jitsu, Argentine tango, Mexican folk dancing—Avalos recreated her father's journey on stage. Against the backdrop of a wire fence representing the U.S.-Mexico border, Avalos used dance to depict his experiences as a soldier in the Mexican army, a lettuce-picker in the fields of California and a laborer in the mercury mines of Nevada. Professor of Dance **Maida Withers** described her performance as "extraordinary, passionate and deeply personal."

A desire to reconnect with her Latino roots similarly inspired **Alicia Díaz**, MFA '16, as she crafted her thesis project. Born in Puerto Rico, Díaz's mother was a distinguished professional dancer who trained her daughter in their home studio from age 3. Her father was a prominent intellectual, and her grandfather had been a founder of the Puerto Rican Independence Party in the 1940s. At the age of 12, Díaz emigrated with her family from San Juan to the suburbs of Princeton, N.J. "It was an immense culture shock," she said. "I was uprooted from all that was familiar to me and introduced to an America where I had to navigate difficult racial and class politics."

The only Puerto Rican in her public school, Díaz struggled to find her footing with her new classmates and her new culture. "My life became a constant dance between being white or black—when I was actually neither," she said. She was most at home on a dance stage. But even as she performed with prestigious companies like the Princeton Ballet and the

Tune

Alvin Ailey American Dance Center, Díaz felt disconnected from her artistic roots. "I was doing ballet and jazz and modern dance, but I didn't even know how to salsa," she said. "I had this nagging feeling that I wasn't a real Puerto Rican if I couldn't salsa."

Her thesis performance *Deep Listening*, which was presented to a packed house at the Pregones Theater in the Bronx, confronted what Díaz described as her cultural "inbetween-ness." *Deep Listening* built on the traditional Latino style called bomba, an Afro-Puerto Rican genre created by slaves in the 17th century. Collaborating with noted Puerto Rican percussionist Héctor "Coco" Barez, Díaz designed an "improvised conversation" between musician and dancer. The abstract work—unlike Avalos' *Beast*, *Deep Listening* has no narrative—was accompanied by Barez's drum, a converted rum barrel called a barril. Díaz's movements in her blue and red bomba skirt were designed to invoke nostalgia for the Puerto Rico she left as a child. "I think of it as my origin myth," she said.

"Alicia and Felicia combined their personal stories and their amazing talents and gave us performances that are moving and beautiful," said Withers, who attended both dancers' premieres. "They worked very hard to bring these creations to life."

In today's dance world, Withers noted, a higher learning degree is a veritable must-have. "The bar has gotten higher and higher," she said. "More and more, you need an MFA simply to apply for jobs." Still, she stressed that students' like Avalos and Diaz have a motivation that goes beyond a piece of paper and a tenure track.

Since its inception in 2011, the MFA dance program has attracted an array of mid-career professionals who juggle their MFA studies with a full-time dancing career. Its online learning component has opened the door to dancers from as far as Chile and Russia. The 2015-2016 class included university professors, dance company veterans and a high school math teacher, all with a mix of styles ranging from modern dance to tango.

Alicia Díaz with percussionist Héctor "Coco" Barez

(Photo: Tania Fernández)

"There's no guarantee of any job in this business," Withers said. "These students have a passion for dance. They are seeking an intense experience that will provide growth and change and fulfill their artistic ambitions."

Avalos credited Withers with cultivating the confidence she needed to embark on an ambitious and personal production like *The Beast*. "She brought me out of my shell. She encouraged me to push my boundaries," Avalos said. "I wouldn't have had the courage to make *The Beast* without her."

INTERNATIONAL Teaching Exchange BRIDGES BORDERS

FROM PORTUGUESE SLANG IN D.C. TO EMILY DICKINSON IN ASIA, A TEACHER EXCHANGE BETWEEN GW AND THE UNIVERSITY OF MACAU IS THE LATEST STEP IN A GLOBAL PARTNERSHIP OF SHARED CREATIVE EXCELLENCE.

Poised on a tropical peninsula where Asia's Pearl River washes into the South China Sea, the city of Macau has a reputation for gaming, glitz and an historical blend of Chinese and Portuguese cultures. Its bright lights and casinos have earned it the nickname "the Vegas of China." The city has passed from 300 years of Portuguese rule to its current status as a special administrative region of China—a mix of influences on display in Macau streets paved with traditional Portuguese tile and lined with ancient Chinese temples.

And now, with the help of a special partnership between GW's Columbian College of Arts and Sciences and the University of Macau's Faculty of Arts & Humanities, the city is forging a new name for itself as a home for scholarly exchange. Expanding on a relationship that began in 2015 with the creation of the Macau Friedman Scholars—a semester-long program that brought a cohort of Macau students to the Foggy Bottom campus—the two universities have teamed up again for an exchange of professorial talent.

During the 2015-16 academic year, **Ana Luisa Varani Leal**, a linguistics professor from the University of Macau, travelled to Washington, D.C., to teach Portuguese. (The University of Macau is known for its academic and research excellence in its Portuguese language and literature programs.) In turn, two Columbian College professors—Professor of English **David McAleavey** and Associate Professor of English **Patricia P. Chu**—are spending, respectively, the 2016 fall and 2017 spring semesters in Macau, teaching poetry, creative writing and literature to students at the English-speaking university.

An initiative spearheaded by Columbian College Dean **Ben Vinson**, the Macau exchange builds on a pillar of the university's strategic plan: a drive toward globalization that promotes shared international research and academic excellence. "The faculty exchange is a showcase for the college's strengths beyond our borders and an example of the welcoming environment we provide for scholars from around the world," Vinson said. "It's a starting point," added Columbian College Executive Director of Global Initiatives **Frances Taoran Sun,** that could lead to similar collaborations around the world.

"We are building a terrific relationship with Macau while exposing our students—and faculty—to experiences that they can't get anywhere else," Sun said. "We foresee forming comparable relationships with other international academic institutions."

Since returning to Chinese control in 1999 after centuries of Portuguese colonialism, Macau has enjoyed a self-governing status similar to Hong Kong. The city maintains its own government, economy and educational and legal system while China is responsible for its defense and foreign relations. The mix of languages, customs and cuisine has made Macau an especially diverse location. In the classrooms at the University of Macau, students read novels in English, discuss research findings in Cantonese and write terms papers in Portuguese.

For Leal, coming to GW from Macau added another stop on her teaching journey. In addition to conducting classes in Macau and the United States, she's taught in Senegal, Portugal and Brazil. A Rio de Janeiro native, she guided GW students through the subtleties that varied nations and regions bring to Portuguese dialects. "English is spoken differently by Americans, Australians and the British. It's the same with Portuguese," she said. "The Portuguese spoken in Lisbon is not the same as the Portuguese spoken in Sao Paulo." And, with the burgeoning Brazilian economy, universities are seeing a demand for Portuguese language courses, particularly the relatively rare programs that emphasize Brazilian Portuguese.

In prepping for his teaching stint in Macau, McKelvey—an American poetry and creative writing scholar—decided to focus on literature as a universal art form. His biggest challenge was introducing his Macau students to the workshop methodology of creative writing, which involves critiquing others' works. "Not only does it require each student to emphasize his or her own creativity, it asks them to offer useful comments to one another in public," McAleavey explained. It's sometimes difficult, he said, to inject an "American flavor" into classroom discussions.

Having frequently taught creative writing to GW students for whom English is a second language, McAleavey had no worries about the Macau students expressing themselves in a different tongue. Poetry, he said, translates to all nationalities. "If your desire to write poems is strong, if you have already jumped off that cliff, then it doesn't matter what language you speak, a good teacher can help you fly."

Sophomore Soyeon Park teaches fourth graders at Maury Elementary School in Washington, D.C.
(Photo: Meghan Hollibaugh Baker)

Back to School

PAIRING A STEM-FOCUSED CURRICULUM WITH HANDS-ON TEACHING EXPERIENCE IN D.C. SCHOOLS, GWTEACH IS TRAINING TOMORROW'S EDUCATORS TO STEP INTO CLASSROOMS TODAY.

Columbian College chemistry major **Juliet Adams** calls it her "teacher voice." It's louder and more commanding than her usual tone, but not as stern as a shout. As she stood at the head of a Jefferson Middle School Academy classroom in Washington, D.C., trying to hold the attention of 22 boisterous seventh graders, **Visha Paul**, a biology major, moved from desk to desk, handing out white boards and markers. "We have 45 pieces of candy," Paul explained. "We want to give three pieces to as many of you as possible. But we have 22 students. So how many of you won't get candy?" A hidden bag of Starbursts awaited the first to solve the problem.

For the seventh graders, the assignment was all about algebra. But Adams and Paul were learning a different lesson—skills like classroom management, student engagement and giving clear directions.

The two undergraduates are enrolled in GWTeach, a partnership with GW's Graduate School of Education and Human Development that trains undergraduate STEM-subject majors to become math and science teachers. In spring 2016, approximately 50 Columbian College students were part of the GWTeach program.

Modeled on Uteach, an initiative founded at the University of Texas-Austin, and supported by a five-year, $1.45 million grant to GW (as part of a $22.5 million grant from the Howard Hughes Medical Institute to the National Math and Science Initiative), GWTeach invites STEM students to pair their math and science curriculum with education courses and hands-on teaching experience. Graduates earn a bachelor's degree in their STEM field, a minor in STEM teaching and are eligible for a licensure that allows them to step directly into the teaching workforce. It's part of an effort to address the nation's staggering shortage of qualified teachers with strong backgrounds in STEM fields: science, technology, engineering and math.

"All of us know that our STEM pipeline is in critical need of repair," said Columbian College Dean **Ben Vinson.** "Through this multi-disciplinary partnership, we now have a clearer vision, a roadmap, for how to address the challenges ahead and how to be part of the solution."

With GW previously offering minimal undergraduate education programs, organizers see GWTeach as a way for STEM students to explore education opportunities while filling a gap for those who are already considering joining the teaching ranks.

"GWTeach is a concrete way to show our dedication toward promoting STEM-education while also making our school a destination point for students who want to become teachers," said Physics Professor **Larry Medsker**, director of the GWTeach program. "We are equipping teachers with the STEM-content knowledge and the instructional expertise needed to be effective in the classroom."

STEM-students can enroll in an initial one-credit course that features a student-teaching stint in area elementary schools. Undergraduates who decide to stick with the program must fulfill 27 credits of education courses to gain their certificate; the curriculum includes as many as five sessions per semester teaching in secondary schools as well as education classes covering topics like modeling functions and classroom interactions. Students who are uncertain about pursuing an education career can still choose an 18-credit path to a STEM-teaching minor.

"GW educates a generation of leaders in many fields and these are the kind of leaders I want to see in our classrooms," said **Julia King**, BA '08, a math teacher at Jefferson Academy and GWTeach mentor. "They have grit and perseverance. And as far as the STEM content goes, they obviously know their stuff."

With a curriculum that emphasizes field experience and inquiry-based teaching—fewer lectures, more student-engagement activities—GWTeach educators design lesson plans that capture attention with games and experiments before delving into the finer points of algebra or physics. For example, Paul led third grade students through a simple physics demonstration, stringing weights to toy cars to test how force affected motion. In a fifth grade class taught by Adams, a student was so excited by the science lesson that he pulled Adams aside after class for tips on building a particle accelerator.

"I was like: 'Are you kidding me? You're 10.'" she laughed. "They ask great questions. But that one stumped me."

FINDING THE PERFECT INTERNSHIP


Jennifer Nichols

Ideally, an internship offers a glimpse into a career field, a chance to explore professional interests and hone necessary skillsets and maybe even get a much-needed foot in the door. Or, at the very least, a useful letter of recommendation. That's why it's so disheartening when an internship that appeared to be a stepping stone dissolves into a business-place bust.

"A bad internship can make you feel like you not only wasted your summer, but you wasted an opportunity," said **Jennifer Nichols**, BA '16.

With the *Princeton Review* naming GW the top university for internships in 2016, Nichols spent her senior year taking a scholarly look at why some students are fulfilled by their summer work while others are busy making coffee and copies. Her work, "Exploring Predictors of Internship Satisfaction," led her to a Luther Rice Undergraduate Research Fellowship, a second-place prize at the GW Research Days competition and a chance to present her findings at the prestigious Association for Psychological Science conference in Chicago—a rare honor for an undergraduate.

"The significance and sophistication of Jennifer's research is really unique," said **Tara Behrend**, associate professor of industrial and organizational psychology and Nichols' faculty mentor. "Young people feel pressure to take any job or internship that's offered to them, if only to improve their résumé and their marketability. For students in today's economy, Jennifer's work is extremely important."

KEYS TO A HAPPY INTERNSHIP

Finding the right internship isn't always as easy as having an inside contact or polishing a résumé. Even when an internship-seeker does everything right—like registering on the appropriate websites, asking the right questions and reaching out for interviews at the right firms—he or she can still end up with the wrong fit. How do seemingly good internships go bad?

Surveying more than 200 Columbian College students who had held at least one internship, Nichols looked for trends on what constituted a satisfactory job experience. She quickly determined that one of the biggest mistakes students made was to confuse internship expectations with full-time job goals. For example, a mentoring supervisor is more valuable to an intern than promotion possibilities or job security.

"Unless you see your internship as a step toward getting a job with that company, you are looking for something very different than a full-time employee," Nichols noted. "An intern is thinking less about this job than about how it will help her in her next job."

Nichols tied internship happiness to two key factors: occupational self-efficacy (the confidence that you will actually be able to do the tasks you were hired to perform) and the perceived fit between an internship and a desired career. But even with those factors in mind, Nichols said it can be a challenge to discern if an internship will work out—especially if interns are new to the workplace.

Based on her research, Nichols concluded that finding a satisfying internship starts with being honest about expertise. "If [the employer] asks for knowledge of a particular software and you've never touched it before, you aren't helping yourself by pretending you are an expert," Nichols said. "You'll spend all your time slogging through the software instead of learning skills or making contacts. In the long run, you won't be happy."

Nichols also found that asking the right questions during the initial interview is critical. It's okay, she said, to "interview the interviewer." While many internships require some gopher work, find out if those tasks are balanced by substantive experience. It's also perfectly acceptable to contact past interns and ask if they were satisfied in their roles, Nichols advised. And understand that not all jobs are created equal. Nichols found that the happiest internships are tied to desired career fields. But how close a connection should interns expect? That depends on the industry—and on the intern. Maybe, for example, a potential intern has set her sights on a career in business and receives an offer from a top firm. But there's a catch: The job is in the marketing department and the candidate is interested in sales. "On the surface, it may not seem like a good fit, but maybe it's close enough," Nichols said. "It's in the right business and it could be seen as making progress toward career goals."

Nichols suggested considering whether there are benefits to be derived from even a disappointing internship, like a good recommendation or future networking contacts. "Summer internships require less present-tense thinking and more future-tense thinking," Nichols explained. "The point isn't really where you want to be this summer. It's where you want to be in the long run and how this internship can get you there."

At the National Highway Traffic Safety Administration, freshmen discussed distractions on the road.

PSYCHOLOGY AND OUR DAILY LIVES

Like anyone who has boarded a plane, the students in Associate Professor of Psychology **Stephen Mitroff**'s freshman Dean's Seminar were all too familiar with the headaches and hassles of airport security. They knew about long lines at checkpoints as passengers removed their shoes and security officers searched through carry-on bags. And more than a few students admitted they had rolled their eyes and wondered if the security employees couldn't do their jobs a little bit better.

But that was before Mitroff's Dean's Seminar, called Science in the District, gave them a peek behind the curtain, revealing airport chaos from a cognitive psychology point of view. During a field trip to the Transportation Security Administration (TSA) headquarters at Reagan National Airport, the students trained a watchful eye on the multitude of factors that come into play when thousands of passengers rush through security gates—from the angle and detail of computer monitors to whether an officer got enough sleep the night before. And what about possible visual and audio impairments? Were the tables too cramped? The alcoves too noisy? Were there too many—or too few—display screens?

"Most of [my students] have gone through security and all they probably thought about was how fast they got to their gate," Mitroff said. "But when you actually see what's going on, you get a deeper understanding of everything involved. Security personnel are tasked with opposing jobs: get everyone through quickly but don't let anything dangerous slip by. They rely on perception, decision making and memory." In short, he said, they rely on cognitive psychology.

Cognitive psychology in the real world was at the forefront of Mitroff's mind when he created his Dean's Seminar, one of more than a dozen offered to Columbian College freshmen to provide opportunities for small, focused discussion on a specific topic. Mitroff designed his seminar to take advantage of the proximity to D.C. institutions, planning field trips to agencies like the TSA and the National Highway Traffic Safety Administration, as well as health care facilities such as the GW Breast Imaging and Intervention Center and the MedStar National Rehabilitation Hospital. The goal, he told his students, was to augment their classroom lessons with examples of cognitive psychology principles in action.

"You so often think of psychology as an academic subject or a clinical one," said **Emily Polansky**, now a sophomore psychology major, "but [in Mitroff's class] we looked behind the scenes at how these concepts are used every day, in places you never imagined."

ONE FOOT IN THEORY, ONE IN PRACTICE

A broad branch of scientific study, cognitive psychology involves brain functions like learning, attention and perception. While these can seem like abstract concepts, Mitroff explained that they are the cornerstones of many professions. From the pilot who must recognize which of several hundred switches to pull at the right moment to the ER nurse who monitors a floor full of patients, many jobs hinge on applying cognitive psychology to practical problems. That's Mitroff's personal specialty. Working with organizations as disparate as the U.S. Army and Department of Homeland Security to Nike, Mitroff has studied how professionals use cognitive psychology concepts to improve their job performance. He's worked with tools like a smartphone app that helps TSA officers find contraband and strobe-light eyewear that strengthens sports vision.

"As a cognitive psychologist, I keep one foot in theory and one in practice," he said. "I take ideas about the way we see and remember things and then connect them to the processes by which people actually do their jobs. By understanding their professional experiences, we can help advance scientific theories and, in turn, hopefully, we can help them do their jobs better."

During the field trips, students saw how professionals employ cognitive psychology tools. For example, driving simulators at the Traffic Safety Administration bombarded users with distractions like oncoming traffic and incoming texts. And at the GW Breast Imaging Center, they learned how interruptions like ringing cell phones can impair radiologists' performance.

At the rehab hospital, students saw one of Mitroff's own studies at work. He is teaming with occupational therapists to test whether the sports strobe eyewear might aid stroke patients recovering from visual impairments. During their visit, one of the patient's wearing the eyewear turned his wheelchair to the students and flashed a thumbs-up.

"That was very powerful," said seminar student **Isabel Pellegrino**. "It was awesome to see my professor talking to this man and trying to do something for him. It made the class feel so real."

FINGERPRINT ANALYSIS: DECIPHERING

For more than 100 years, fingerprints have been the forensic scientist's handiest tool. They have been used to catch killers, free the wrongly accused and bring peace of mind to the families of victims. They've helped law enforcement link crime scenes, track criminal records and aid in everything from sentencing to pardoning decisions. Lives often hang in the balance of each recovered loop, whorl and arch on a car door, keyboard or coffee cup.

"Latent print examiners have enormous responsibilities. The way they do their job can determine whether someone goes to prison—or worse," said Associate Professor of Forensic Sciences **Edward Robinson**, who spent more than 25 years as an investigator for police departments in Arlington, Va., and Baltimore, Md. "But it's incredibly satisfying because you can really make a difference."

While loyal *CSI* watchers can explain how perpetrators' prints crack cases on TV, Robinson revealed a secret that real forensics experts know all too well: Fingerprints don't always point to justice being served. An array of factors from weather conditions to human error can mar even the most pristine print. "TV has given us a terribly distorted picture of fingerprints and fingerprint examiners," he said. The characters in some popular shows "use the wrong instruments, mix up the terminology and even dress better than we do in the lab."

To help dispel this misinformation and meet the growing demand for skilled analysts, Forensic Sciences debuted two graduate programs relating to fingerprint investigation: an MFS in friction ridge analysis and a graduate certificate in latent print examination. The programs give students hands-on experience using the department's new state-of-the-art technology like mass spectrometry, digital cameras, forensic instrumentation and the latest in computer programming.

"The value of [these graduate programs] is that students not only learn theory and concepts, they learn practice," Robinson said. "If they are asked to recover a print during a job interview—and there's a good chance they will—they can be confident because they have done it before."

AGE-OLD IDENTIFICATION TOOL

The technical tools in place today are a far cry from ancient Babylon where fingertips were pressed on clay tablets to complete business transactions. Since that first recorded use, the basic premise remains the same: The patterns of raised ridges and sunken furrows on the pads of our fingers, palms, toes and the soles of our feet provide remarkable identification properties. While their primary evolutionary purpose is to help us grip objects, each print's patterns—grouped into three general designs called loops, whorls and arches, all in seemingly unlimited combinations of numbers and sizes—are entirely unique to the individual.

Some of those patterns, referred to as latent prints, are not visible to the naked eye. They are embedded on surfaces by the pressure of a finger's touch and the transfer of moisture from our skin. The prints can be revealed by dusting them with black powder or by advanced crime scene technologies like lasers and LED devices.

Since the 1980s, computer databases have enabled law enforcement officials to instantly cross-check millions of collected prints rather than manually examine one at a time. But even computers have limitations. First, there's no guarantee that the database will actually contain the print an investigator is seeking. "On TV a fingerprint is lifted at a crime scene, fed into a computer and there's always a direct match to a criminal—

FACT V. FICTION

and usually a photo," said **AnniLauri Villeme,** MFS '16, a recent forensic sciences graduate student. "The real-life database [called the Automated Fingerprint Identification System] gives results not just for one individual but for quite a few who have matching fingerprint characteristics."

Also, while a computer may suggest possible candidates, it's still up to the examiner to carefully scrutinize each edge, ridge and valley for a suitable match—an often painstaking process. "When I was in class comparing prints, sometimes it would take hours just to identify one print," Villeme said. "But it is absolutely rewarding when you make an identification after hours or days of working on a comparison. It is a true 'aha!' moment."

Indeed, searching for the perfect print match is as futile as hunting the white whale, Robinson said. Nearly all recovered prints are smeared and smudged by everything from the body's natural oils to grime-covered surfaces. A print can be affected by weather (too hot and perspiration may drown the print; too cold and there may not be enough moisture to leave a mark) and the collection method itself (black powder can clump and obscure ridges). And the limitations to fingerprint science can be confounding. For example, there's no scientific way to determine when a latent print was first deposited on a surface. Under the right conditions, prints can survive indefinitely. And it is not possible to determine sex, age or race from a print unless traces of DNA were left behind as well.

As much as we'd like them to be, note Villeme, "fingerprints aren't magic scientific bullets."

Fingerprints Myths

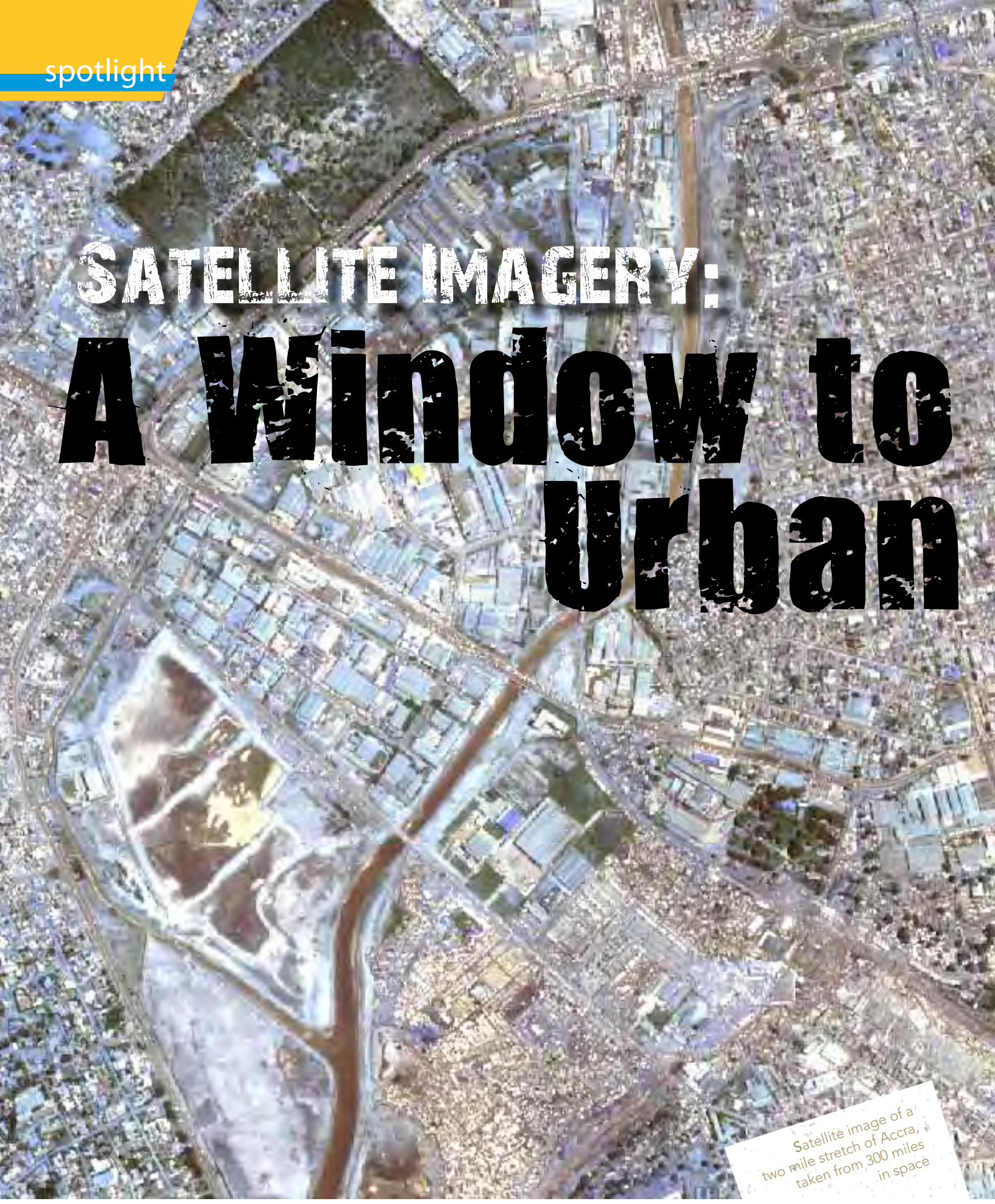
Fingerprints are forever.
Not necessarily. Skin conditions like psoriasis and even genetic factors can either distort or prevent fingerprints from forming in the first place. Tough tactile work like bricklaying can erode fingerprints. And criminals have had varying success with grisly attempts to remove their fingerprints—attacking them with everything from steel files to, in the case of notorious gangster John Dillinger, acid.

Humans are the only animals with prints.
Not true. A few non-human animals have unique fingerprints, including gorillas, chimpanzees and koalas. In fact, koala prints are so similar to humans' that even experts have had trouble telling them apart. But with two thumbs on each hand, a koala's full palm print is unmistakable.

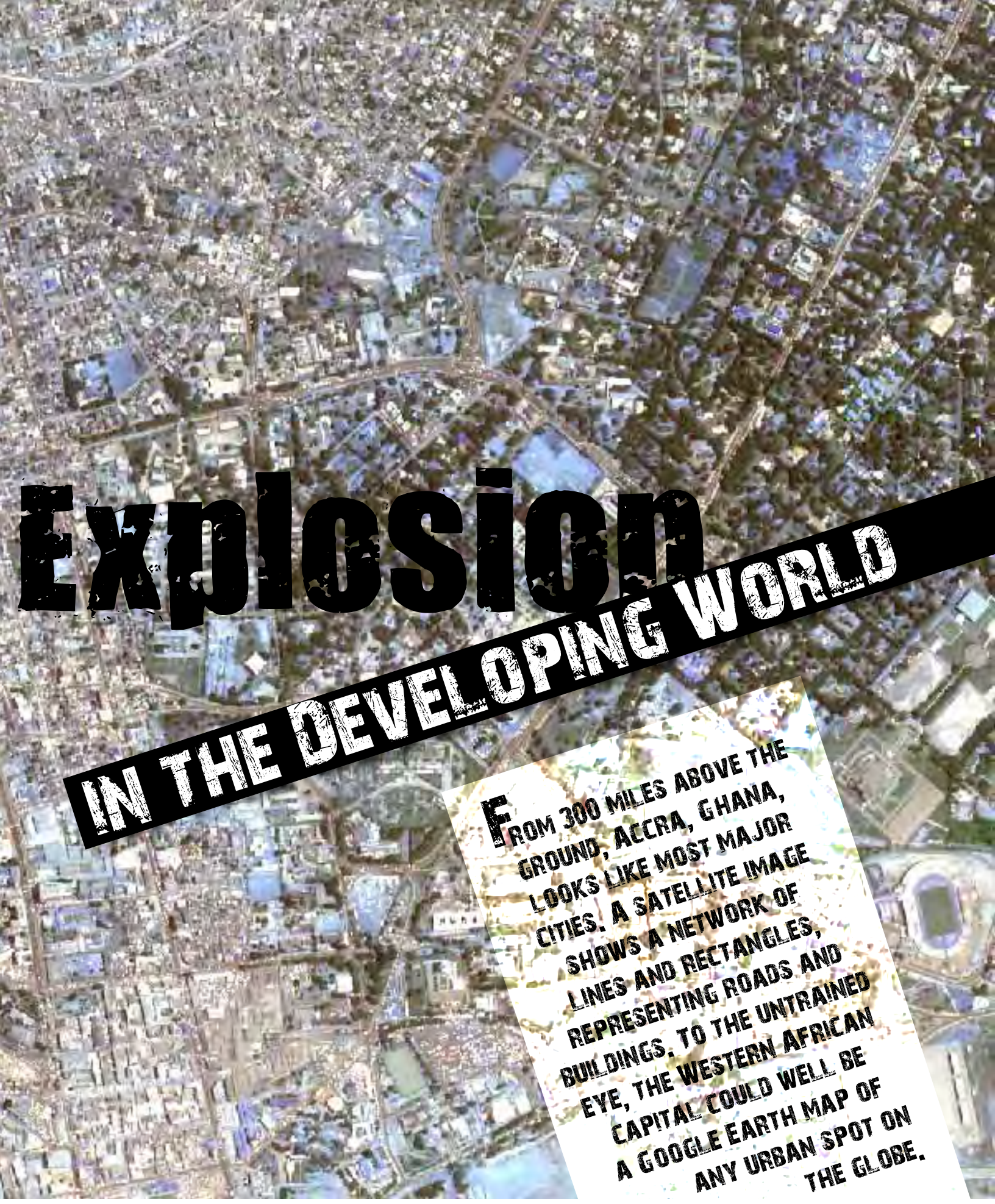
No two sets of prints are alike.
Science has never proven this well-worn assumption—but it hasn't been disproven either. No two identical sets of fingerprints have ever been recorded, not even among twins or triplets who can share the same DNA patterns.

In the age of DNA, fingerprints are becoming irrelevant.
Actually, fingerprints are still the most frequently found evidence at crime scenes—even more than DNA traces. That's because most crime scenes don't have blood and body fluids, but they have been touched by someone.

SATELLITE IMAGERY:
A Window to Urban



Satellite image of a two mile stretch of Accra, taken from 300 miles in space



Explosion

IN THE DEVELOPING WORLD

From 300 miles above the ground, Accra, Ghana, looks like most major cities. A satellite image shows a network of lines and rectangles, representing roads and buildings. To the untrained eye, the western African capital could well be a Google Earth map of any urban spot on the globe.

But **Ryan Engstrom**, associate professor of geography and director of the Center for Urban and Environmental Research, sees something different when he looks at the view from space. Those lines cutting through the city are curved instead of straight, indicating this section of Accra lacks a well-maintained road system. Minimal right angles and corners distinguish well-constructed buildings from slum shacks. There's sparse vegetation and high-population density. In fact, an image of a two-mile stretch can enable him to make estimates on factors like literacy rates, unemployment figures, electricity use and trends in maternal and child health.

Satellite imagery has long been a vital tool for the defense and intelligence industries, disaster relief agencies, urban planners and news reporters. But today, thanks to technology breakthroughs and an explosion in the amount of data available to researchers, once hard-to-obtain imagery is now used for everything from archaeological expeditions to finding your quickest route to work.

"The introduction of Google Earth has made it much easier to explain what we actually do," said Engstrom, who uses high-spatial resolution satellite data to map slums in developing world cities. Efforts by scientists like Engstrom to diagram the surge in urbanization around the world may have a profound impact on issues like pollution, public health, water, land use and quality of life. "Cities are growing and changing incredibly fast," he said.

In the last few years, thanks to reinterpreted government license agreements with commercial satellite vendors, an archive of images have become freely available to federally-funded researchers. After years of struggling to afford data, Engstrom now has free access to thousands of high-resolution images at their fingertips. In 2006, for example, as part of a National Institutes of Health-funded project, Engstrom purchased a small image of Accra for $15,000. In 2015, he was provided 300 free images encompassing the entire country of Ghana taken over the last decade—approximately two terabytes of data that would have cost more than $1 million a few years ago.

"The landscape has completely changed," Engstrom said. "We can now take areas that were once, from an imaging perspective, blank canvases and fill them in with information that will lead to transformative breakthroughs in how we understand, study and manage urban environments."

But having access to vast stores of information does have its price. Processing the "big data" from the satellite images is extraordinarily complex and time consuming. "There are thousands of images taken every day," Engstrom explained. "It's become more and more important to create an automated process that extracts the crucial information we need."

To solve the problem, Engstrom and his colleagues are taking computer algorithms originally developed for facial recognition software and applying them to satellite images. The novel approach is proving to be more accurate and adaptable than previous methods.

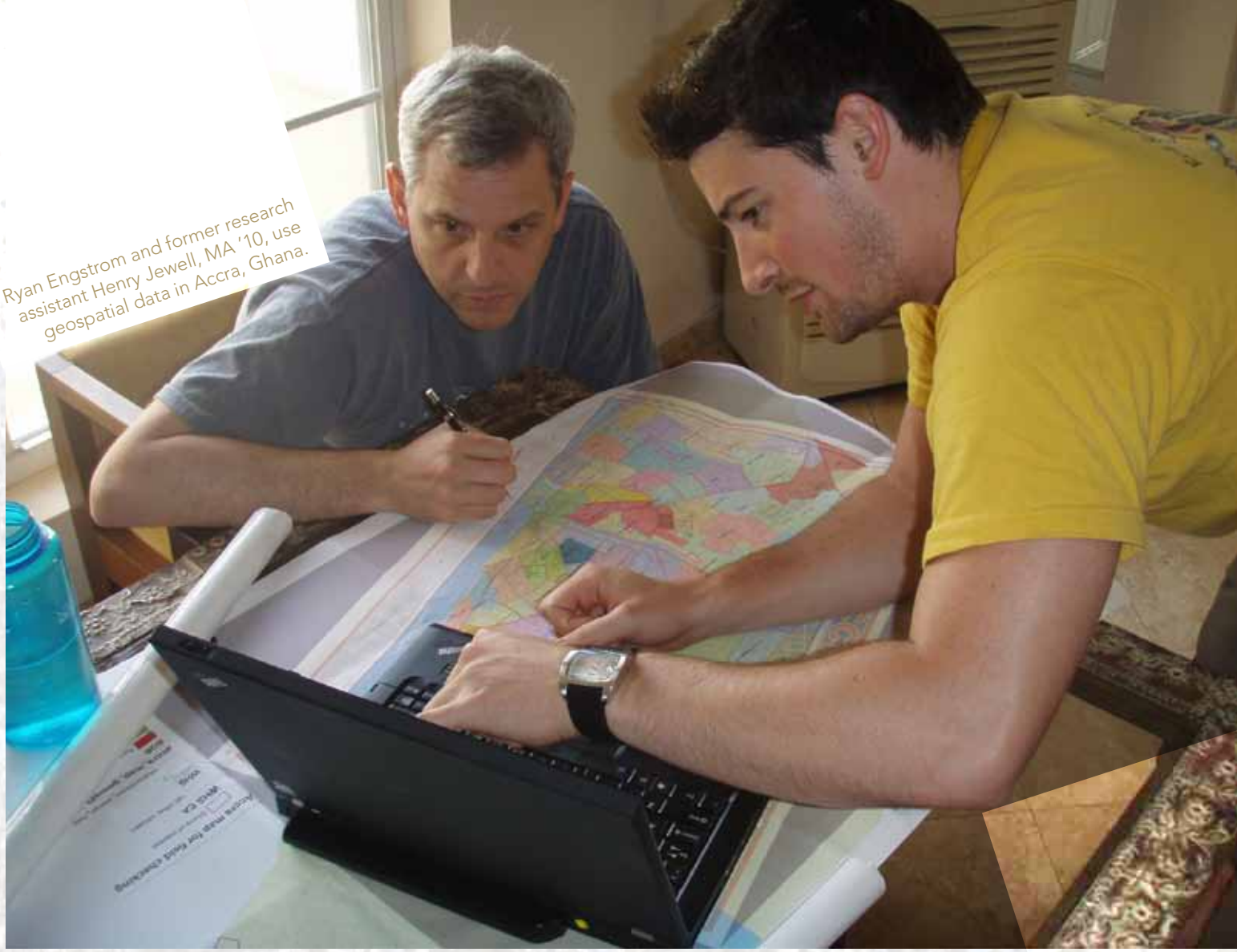
"Ryan Engstrom's research is cutting edge and it has the potential for a real impact in developing cities," said **Avery Sandborn**, MA '15, Engstrom's former research assistant and a spatial analyst with the U.S. Department of Agriculture. In fact, Sandborn has employed the techniques she learned in Engstrom's geography lab to her current position and in past projects with The World Bank.

PINPOINTING VULNERABLE REGIONS

Since 2007, Engstrom has aimed his satellite sights on cities like Accra as an example of the massive growth of urbanization around the world. For the first time in history, more than half the world's population now resides in cities. The United Nations estimates that 60 percent of all people will be urbanized by 2030. "We are becoming an urban population and it's rapidly reshaping the world," Engstrom said.

In the developing world, many of the burgeoning cities' dwellers live in conditions that the U.N. defines as slums, with high incidents of poverty, unemployment and illiteracy as well as exposure to environmental hazards

"We can take areas that were once...blank canvases and fill them in with information that will lead to transformative breakthroughs."
—Ryan Engstrom



Ryan Engstrom and former research assistant Henry Jewell, MA '10, use geospatial data in Accra, Ghana.

such as flooding, open sewers and industrial waste. More than 32 percent of the global developing regions' urban population live in these areas. Using the U.N.'s strictest definition of a slum, that figure rises to over 60 percent in sub-Saharan Africa and as high as 80 percent of the two million residents of Accra, Engstrom said.

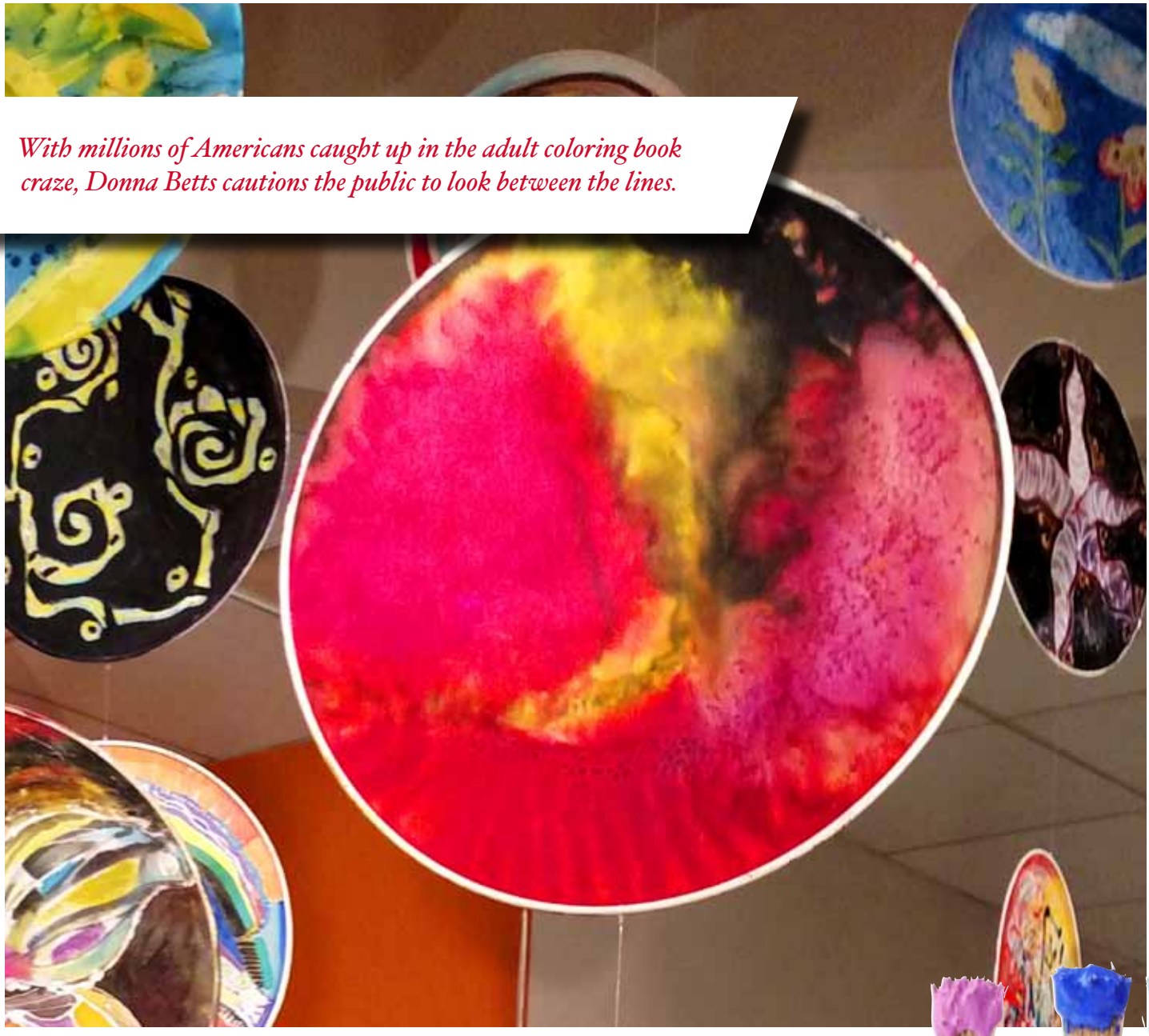
Engstrom and his student researchers have traveled to Ghana to "walk the slums" of Accra, he said. "An image from space can give you a lot of information, but you need to meet the people on the ground." Although Ghana is considered one of Western Africa's most stable democracies and it produces relatively high-quality census data for the region, the sprawling city of Accra defies easy classification. "In Accra, there are million-dollar houses just a few miles away from people living in shacks," Engstrom said. His team has viewed neighborhood streets flooded with sewer water and sanitation. In some of the most densely populated areas, extended families sleep in shifts, with up to 10 people per room in areas with trash-strewn alleys and courtyards.

But conducting on-the-ground surveys in developing countries is costly and not always up to date. From space, the high spatial resolution satellite images can provide a clear cross section of cities like Accra. Using the modified facial recognition software, researchers can isolate spatial characteristics that pinpoint vulnerable regions—like the curved lines of poor roads or the irregular shapes of slum shelters.

"We are, in effect, inferring the quality of life within an urban area from satellite observations," Engstrom said. "Our biggest challenge is determining exactly what matters most in thousands and thousands of images and finding that information as quickly and as accurately as possible."

Color Me Cautious:
DON'T MISTAKE ADULT COLORING BOOKS FOR ART THERAPY

With millions of Americans caught up in the adult coloring book craze, Donna Betts cautions the public to look between the lines.



Silk mandalas created by Columbian College's Art Therapy Program

As a graduate student in Columbian College's Art Therapy Program, **Lida Sunderland**, MA '16, learned how to use materials like clay and colored pencils to help clients work through their emotional pain. She employed art therapy interventions such as mask-making as metaphor to reveal a person's inner struggle, and the circular designs of Jungian mandalas to encourage focus and reflection.

But there's one tool she has never used, whether in internships, clinical settings, classrooms or her position as an art therapist with D.C. public schools: adult coloring books.

"Don't get me wrong, I think they are great," she said of the trend that has taken the publishing world by storm. "Like Sudoku or crossword puzzles, they can be a terrific leisure activity. But you'll never see one in an art therapy class."

While millions of adults are caught up in the coloring craze and half of Amazon's top 10 best-selling U.S. titles last year were adult coloring books, experts like Assistant Professor of Art Therapy **Donna Betts** recommend approaching them with caution. Coloring books may be a relaxing and enjoyable means to unwind, but they are very definitely not art therapy.

"We all have our own ways of zoning out: cooking, gardening, coloring. And that's fine," Betts said. "But art therapy is so much more."

As president of the board of directors for the American Art Therapy Association (AATA), Betts has watched with some concern as adult coloring books labeled as "art therapy" fill racks and rows at bookstores. She recognizes that coloring is a beneficial self-help activity, but she and her colleagues worry about titles like *Color Therapy: An Anti-Stress Coloring Book* and Disney's *Frozen Art Therapy Coloring Book*. By marketing themselves as "art therapy" activities, Betts said, the books come dangerously close to blurring the line between a hobby and a mental health profession that treats clients with conditions ranging from post-traumatic stress disorder to Alzheimer's disease.

A THERAPEUTIC RELATIONSHIP

Perhaps the most fundamental and critical difference between coloring books and art therapy is the presence of trained and certified clinicians, which Betts characterized as "integral to the patient's healing." In art therapy sessions, therapists oversee the art-making process and use their observations to help clients untangle the messages in their creative efforts. Far from merely decorating coloring books' floral arrangements and geographic designs, art therapy allows people to communicate painful feelings and traumatic experiences that may be too difficult to express in words. "The client is speaking to the therapist and to him or herself through the artwork," Betts said.

Likewise, while the constrictive nature of adult coloring books—most present elaborate but ready-made outlines—may validate a reassuring desire to color within the lines, it also prohibits users from creating their own designs. "Coloring books don't work that way," Betts explained. "They limit artistic and personal expression; the creative processes aren't being truly tapped into." And she stopped short of promoting coloring as a stress reliever, as studies confirming this claim are incomplete.

> *"We all have our own ways of zoning out: cooking, gardening, coloring...But art therapy is so much more."*
>
> *—Donna Betts*

Since the onset of the phenomenon, Betts has fielded more queries on coloring books than any other art therapy-related topic. She theorizes that the interest may be a backlash to a tech-obsessed society. "We have too many screens in our lives," she said. "Maybe people are going back to coloring books because they are tactile; they are a way to engage with something that involves using your hand on a piece of paper."

Along with her AATA colleagues, Betts is now advising publishers and retailers on ways to more accurately market and display their products without sending misleading messages. AATA also entered a joint marketing agreement with adult coloring book leader Dover Publishing to begin including professional art therapy resources with their materials.

Diamonds FROM THE SKY

CHEMISTRY'S STUART LICHT IS PULLING CARBON DIOXIDE FROM THE AIR AND TURNING IT INTO EARTH-FRIENDLY INDUSTRIAL MATERIALS. IT'S THE LATEST STEP IN HIS ONGOING EFFORTS TO REVERSE THE TIDE OF GLOBAL WARMING.


Stuart Licht

No one will ever fault Professor of Chemistry **Stuart Licht** for a lack of investigative ambition. Having already developed revolutionary methods for making fertilizer and cement without emitting harmful carbon dioxide (CO_2) into the atmosphere, he has now found a way to extract the greenhouse gas from the air and transform it into a valuable manufacturing material.

"We have taken on the challenge of a comprehensive solution to climate change," Licht said. "We're working towards changing today's fossil fuel to a renewable chemical economy, replacing the largest greenhouse gas emitters with new, inexpensive, solar, CO_2-free chemistries."

Carbon dioxide is the most abundant greenhouse gas in the atmosphere, accounting for 82 percent of all U.S. emissions from human activities. It's primarily released from the combustion of fossil fuels (coal, natural gas and oil) for energy and transportation. Despite dire warnings about the skyrocketing levels of atmospheric carbon dioxide and the role it plays in climate change, the world has been largely unsuccessful at reducing the amount of CO_2 floating over our heads. And the scientific community has been thwarted in its attempts to bypass fossil fuels and generate the staples of society—iron, fuel, cement, fertilizer, building materials—without adding to the CO_2 air-load.

But Licht's breakthrough method has scientists dreaming of a global warming miracle. Dubbed STEP (solar thermal electrochemical pressure), the pioneering process uses sunlight, air and water to produce the now fossil fuel-created materials—and does so with little or no carbon footprint. Indeed, Licht said that rather than releasing CO_2 into the air, he can actually extract it. With the prospect of a low-cost, low-energy method for generating commercial chemicals that also produces a measureable drop in atmospheric carbon dioxide, "this ambitious plan has global implications written in bold letters all over it," said Professor of Chemistry **Michael King**, who chairs the Chemistry Department.

Calling his approach "diamonds from the sky" (carbon is the material from which diamonds are made), Licht's latest STEP efforts involve pulling highly-valued manufacturing material out of thin air. Working with a team of researchers, including postdoctoral fellow **Jiawen Ren** and graduate students **Jason Lau**, **Matthew Jake Lefler** and **Jessica Stuart**, his new technology converts atmospheric CO_2 directly into in-demand carbon nanofibers, an expensive material used in a range of products from batteries and car components to airplane frames.

The method involves applying CO_2—either extracted directly from the air or captured from industrial smokestacks—to a vat of hot molten salt, a liquid solution called carbonate. As the CO_2 rapidly dissolves in the carbonate, Licht's team places nickel and steel electrodes into the molten liquid. Applying just a few volts of electricity, the carbon nanofibers build up on the steel electrode, where they are easily removed.

The entire process, which is ignited by either a conventional power supply or a solar-energy system of Licht's design, is both earth-friendly and economical. Licht estimated the energy input costs at $1,000 per ton of carbon nanofiber, an amount commercially valued at as much as $25,000.

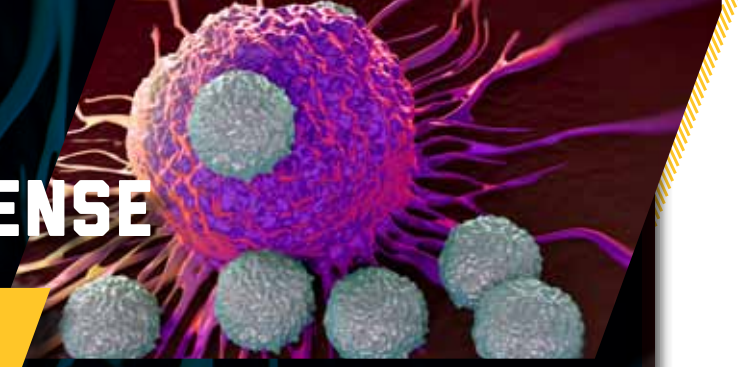
"We are at the beginning of an explosion in the market for carbon nanofiber uses. It's at the same place plastics were at beginning of World War II, Licht said. "By making [nanofiber production] inexpensive, the applications go far beyond airplane bodies. They could, for example, be used in building materials, and could one day replace steel."

Licht has scaled up the nanofiber experiments in his lab by 100-fold, and is confident that his process can erase enough of the greenhouse gas to significantly mitigate global warming.

"We calculate that with a physical area less than 10 percent the size of the Sahara Desert, our process could remove enough CO_2 to decrease atmospheric levels to those of the pre-industrial revolution within 10 years," Licht said. "There's a necessity to work together, to test this on a larger scale, [and then] there's no telling where we can go from here."

TARGETING T-CELLS BOLSTERS BODY'S DEFENSE

T-cells are the human body's soldiers in the war against disease. A new discovery by Physics' Weiqun Peng may strengthen our immune systems' army and help fight off the most virulent toxic invaders.



'Killer' T-Cells defending the body against a cancer cell

In the battle against infections and diseases, from AIDS to cancer to diabetes, T-cells are the human body's first line of defense. The white blood cells act like soldiers searching out and destroying invading bacteria, viruses and parasites. Vital to our immune systems, T-cells not only find and kill infected cells, but are responsible for tasks like creating antibodies, naturally eradicating cancer cells and remembering germs our bodies encountered decades ago.

But even the strongest armies sometimes find themselves under siege. When autoimmune diseases and viral infections attack our bodies, they thrive by targeting T-cells—either killing them, disrupting their performance or causing an imbalance in their ranks. With weakened or depleted T-cells, humans can be left virtually defenseless against potentially fatal assaults.

A new study lead by Associate Professor of Physics **Weiqun Peng** may go a long way toward defending our natural defenders and reinforcing damaged T-cell systems. In a paper published in the journal *Nature Immunology*, Peng, along with fourth-year PhD student **Zhouhao Zeng** and immunologists from the University of Iowa, have unlocked part of the mystery behind T-cell identification—how individual T-cells determine what their functions will be. The discovery is an important step toward designing drugs that can correct a depletion or imbalance of T-cells and may help the body's defense against autoimmune diseases like AIDS.

"Many diseases operate by perturbing the balance between distinct types of T-cells," Peng explained. "By understanding how these cells are formed, we may, in theory, be able to manipulate T-cell creation and combat autoimmune diseases."

T-cells are broadly divided into two categories: Helper cells (also called CD4), which coordinate the immune response to invading infections, and Killer cells (or CD8), which actually destroy infected cells to fight off illnesses. Helper cells send out chemical messages, alerting the immune system that a virus has been detected. The Helper cells instruct the Killer cells to make copies of themselves, creating a CD8 army that then seeks out and eliminates infected cells.

There are 25 million to a billion T-cells in the body. Humans need both Helper and Killer cells to maintain a healthy immune system, with a normal ratio of approximately one Helper cell for every four Killer cells. People with autoimmune diseases tend to have an increased CD4/CD8 ratio, while those with viral infections have a decreased ratio.

Until now, researchers had yet to fully decipher what factors controlled the identity of T-cells—essentially how a cell "decided" if it would be a Helper or Killer. Peng's team revealed that a complex interplay of proteins called transcription factors are the most vital components in establishing individual T-cell identity. "Think of transcription factors as switches that turn 'on' or 'off' the genes in our cells," Peng explained. Different kinds of cells have different transcription patterns (known as gene expression), making genes more or less active. In the case of T-cells, Peng's research found that two specific transcription factors—called Tcf1 and Lef1—switched genes "on" and "off" in a pattern that maintained the identity of CD8 Killer cells. If that on/off pattern is disrupted, the cells instead become like CD4 Helper cells. Surprisingly, they found that this feat depends on a previously unknown function of these transcription factors. They have intrinsic enzyme-related activities that can directly influence the epigenetic make-up of cells.

"This significant discovery is a new perspective on gene regulation," said Zeng, who has worked on the T-cell project since 2014 as a research assistant in Peng's lab. "Obviously, CD4 and CD8 play important roles in our immune systems. If something goes wrong in the CD4/CD8 mix, our ability to fight off infections and diseases is compromised. But if biomedical scientists can develop strategies to turn on/off the T-cell differentiation pathway, we might be able to make drugs that hit the molecular target" and reinforce our immune systems.

A computational biophysicist, Peng's role in the project involved analyzing the enormous troves of high-throughput sequencing data generated from experiments conducted by his University of Iowa counterparts. The result of their collaborative research came "as a complete surprise," Peng said, since, according to conventional wisdom, transcription factors and epigenetic regulators were always thought to be separate entities. After examining numerous scenarios, Peng concluded that Tcf1 and Lef1 were the unexpected determining factors that contain their own epigenetic regulators.

"There were no other options," he said. "We eliminated all of the possible solutions. When you discount the possible, the only option left is the impossible—or at least what we once thought was impossible."

BIG BIG

DATA, OPPORTUNITIES

Data science is among the fastest-growing career fields. In Columbian College's Data Science Program, students are mastering tomorrow's technology and stepping into today's workplace.

Danielle Cuddington imagines that the global surveys she conducts in her job at the Pew Research Center will someday affect international elections. **William Noone** sees himself forecasting stock market trends as a Wall Street trader. And **Meghan Foster** hopes to be at the center of a physics lab, deciphering discoveries that influence humankind's relationship to science.

The three Columbian College graduate students have vastly different career aspirations and undergraduate degrees that vary from sociology and women's studies to business and math. But they have more in common than it may initially seem.

Each recognized that, to reach the top of their professions, they needed to acquire a skillset that barely existed a decade ago—and that few people fully understand today: the ability to interpret so-called "big data," massive troves of digital information that have become vital to fields from marketing to medicine. And to fine-tune their expertise, they turned to Columbian College's new Data Science Graduate Program, launched last year to meet marketplace demand and now one of the college's most popular programs—exploding in growth from 44 students in 2015-16 to 150 students today.

"The world is changing and the job market is changing," said Columbian College Associate Dean for Research and Strategic Initiatives and Professor of Mathematics **Yonwu Rong**, a lead designer of the program. "Data science is among the fastest growing fields. For our students, it's important that we understand this trend and provide an educational experience that enhances their job-seeking opportunities."

With a curriculum that stresses extracting actionable insights from vast collections of information, the program prepares students to immediately step into an array of fields that increasingly rely on data science techniques and theories. One of its unique characteristics is the involvement of a broad swath of faculty from seemingly disparate disciplines but linked by one common denominator: the use and application of big data. The cross-disciplinary effort includes the Departments of Statistics, Mathematics, Physics, Economics, Geography and Political Science, all contributing to courses ranging from statistical computing and econometrics to political analysis and geographical information systems.

"In this town, everyone has an MBA, but I wanted something that would differentiate me from the pool," said Noone, a second-semester graduate student with an undergraduate degree in finance and economics. "Data science is hot and getting hotter. A degree like this really stands out in a crowd."

"In this town, everyone has an MBA, but I wanted something that would differentiate me from the pool. Data science is hot and getting hotter." — William Noone

Data Science adjunct faculty Brian Wright

Data Science students (from left) Meghan Foster, Danielle Cuddington and Abdulrahim Sheikhnureldin

FROM A NICHE TO A MUST

Once a niche corner of computer science, data science is now permeating virtually every profession—even while many people remain confused about exactly what it is. As the prevalence of data-related fields grows, so has the demand for trained data scientists. The research firm Gartner predicted a shortage of 100,000 data scientists in the United States by 2020. A recent CrowdFlower survey found that 83 percent of companies said there weren't enough data scientists to fill their demand. *Harvard Business Review* even declared data scientist to be the "sexiest career of the 21st century."

"The demand for specialists skilled in data analysis is ever-growing, crossing every sector of our economy," said Columbian College Dean **Ben Vinson**. "We are helping to meet that need."

At its core, data science involves analyzing, manipulating and interpreting big data—whether it's doctors providing patient diagnoses based on biometrical information or marketers constructing client profiles around social media posts. "There is a lot of data out there—whether it's represented as numbers or text," said **Larry Medsker**, research professor of physics and director of the Data Science Program. "There is a need for data scientists everywhere."

At GW, students are immersed in complex topics like data mining (extracting patterns from large amounts of data), machine learning (a subsection of computer science that essentially teaches machines how to think) and data-analysis software like Python and R. Guest speakers have included professionals from technology-related industries.

Meghan Foster, a second-semester student, hopes that the knowledge she takes away from the classroom will translate into operating high-performance computers in a physics lab. "Every physics lab has maybe one or two theoretical physicists, but there's always a need for people who can actually program and code, run the technical models and analyze the results of experiments," she said.

Beyond computer programming, the curriculum recognizes that the field of data science may take many forms, such as analyzing Twitter text for clues to public opinion or capturing GIS locations for disaster relief. "Geography, like most fields, has become increasingly quantitative over the years. So data science is a natural fit," said **Michael Mann**, a professor of geography who also teaches data science courses. "These days, I consider myself as much of a data scientist as a geographer."

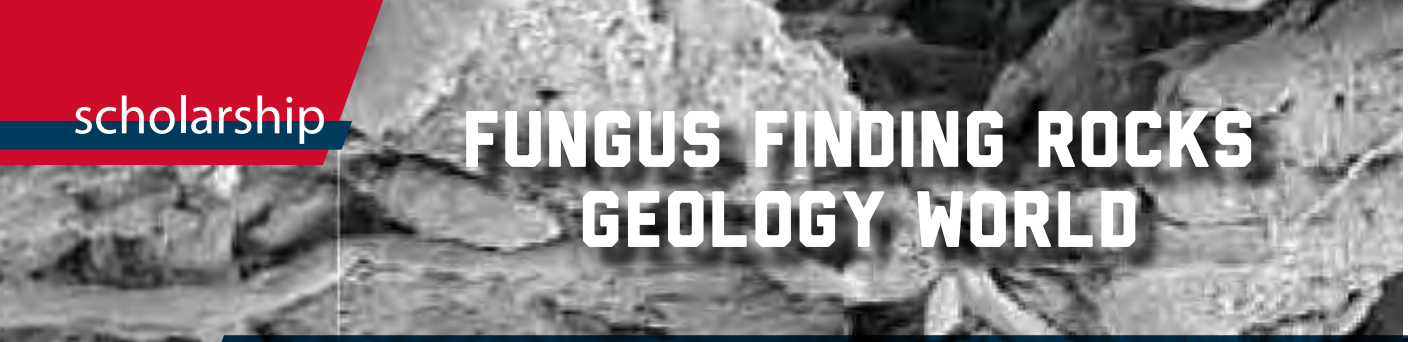
To keep pace with the ever-changing field, Medsker recruited data professionals and CEOs in D.C. tech firms to serve on an external advisory board, consulting with faculty and offering students mentorship and career opportunities. GW also joined the Commonwealth of Virginia's Governor's Data Internship Program (GDIP), through which government agencies give students access to real-world data for state-sponsored projects. This past summer, the first cohort of Data Science students began internships with GDIP, analyzing data from the Virginia Department of Education to broaden career paths for GED students.

"We want to connect out students to the marketplace and open as many doors for them as we can," Medsker said.

Leveraging its Washington, D.C., location, the program also negotiated partnerships with industry experts to secure coveted internships for students and alumni. Among them, are recent graduate **LuLu Zhang**, MS '16, who landed an internship with Amazon in Seattle, and **Abdulrahim Sheikhnureldin**, an undergraduate taking data science courses as part of his political science and computer science double major, who interned with a D.C. political analytics firm.

"A lot of people are tech savvy and a lot of people can code, but not a lot can look at a problem and say: 'Here's how to solve it,'" Sheikhnureldin said. "That's what this program is really about: learning how to be a problem-solver."

FUNGUS FINDING ROCKS GEOLOGY WORLD



The fungus *Talaromyces flavus* in a Chinese mine, consuming minerals and extracting iron

CHEMISTRY'S HENRY TENG LED A TEAM OF RESEARCHERS INTO THE SERPENTINE MINES OF CHINA—AND EMERGED WITH A NEW UNDERSTANDING OF HOW FUNGI AND MINERALS INTERACT IN THE NATURAL WORLD.

Scientists have long known that microbes like bacteria and fungi are crucial to weathering rocks and releasing precious nutrients into soil. But widely held assumptions about how the chemical and physical breakdown of minerals takes place—and which microbe plays a starring role in the geological drama—may be all wrong, according to a research study by **Henry Teng**, associate professor of chemistry and geoscience.

Traveling deep into the mineral mines of China, Teng and a team of researchers and students identified a fungus that is believed to be a surprise key player in the cycle of plant and tree growth. Unlocking the method by which the fungus consumes its mineral meal, Teng's findings, published in the journal *Geology*, may help build better models of plant growth and lead to an agricultural bounty.

In most cases, plants don't extract nutrients from the soil themselves. They rely heavily on microbes to break down rocks and release material like iron, nitrogen and phosphorous—a process known as bioweathering. "Most of the nutrients in rock and soil are in geological form," Teng said. "Roots cannot directly use them in that state. They need help. Plants depend on [microbes] to break them down into a form suitable for their roots."

In the past, researchers estimated that fungi contributed just one percent of total bioweathering. But Teng's observations suggest that they are actually responsible for as much as 40 to 50 percent, a finding that has broad implications for global agricultural issues like maintaining soil health and promoting crop and vegetable growth.

Over the course of two summers, Teng led his team of scholars and students from Nanjing University into the serpentine mines of Donghai, China, to search for microbes that could readily extract magnesium from rocks and lead to energy-efficient and environmentally friendly carbon sequestration. While culturing dozens of microbes, the team discovered that one fungus—*Talaromyces flavus*—was a particularly voracious consumer of magnesium and iron.

Returning to his lab with the fungus in tow, Teng had a novel idea for testing his discovery. Most microbe experiments are conducted by culturing fungi and mixing it in a solution with mineral samples. What would happen, Teng surmised, if the fungus was instead attached directly to a rock, mimicking real-world bioweathering conditions? "In nature, microbes are crawling on the surface of the rock," Teng said. "They don't stay in a suspended state like in a solution."

Teng stuck the *T. flavus* cells on top of mineral samples. He trained super high-resolution microscopes on the experiment and observed the step-by-step process by which fungi attack minerals.

As Teng recorded, the fungi first unleashed acid on the rock's face, dissolving surface minerals to get to the food below. Then it released chemicals called siderophores that extract their iron food. "Fungi don't have brains, but they are smart enough to recognize the rock's surface and to start generating the acid and chemicals to deconstruct that material," Teng said. "They don't like to use up any energy unless they know they are going to get food out of it."

Finally, the fungi extended fast-growing fungal filaments called hyphae which cut into the remaining rock with a pressure 100 times greater than car tires. The pressure disrupted the rock's internal bonds; what was once a crystalline structure became amorphous. Teng's study revealed that microbes not only use chemical forces like acid to destroy the mineral but also employ mechanical methods, like the powerful filament extension.

Previous studies that mixed minerals and fungi in a solution registered only weak levels of acid and siderophores, leading researchers to believe that fungi like *T. flavus* had limited impact on bioweathering. But Teng's work suggests that scientists have underestimated how much weathering occurs at the fungus-mineral interface spot, and that fungi is actually an important nutrient extractor. Apart from providing a better understanding of how fungi and minerals interact, Teng's research could improve agricultural practices around the world and lead to more effective methods for sustaining the global food supply.

THE SCARS OF *Empires* PAST

FROM BRITAIN'S "BREXIT" TO TURMOIL IN THE MIDDLE EAST, DANE KENNEDY EXPLAINS HOW THE VIOLENT AND TUMULTUOUS COLLAPSE OF EUROPEAN EMPIRES LEFT BEHIND CONFLICTS THAT WE STILL HAVEN'T RESOLVED TODAY.


Dane Kennedy

In the mid-20th century, millions of people in Africa, Asia and around the globe lived under the colonial rule of overseas empires. Britain's dominion spanned the continents, reaching from India and Pakistan to Palestine and Burma. From the French-controlled territory in Algeria and Vietnam to the American Philippines, a world map from the 1940s displayed a patchwork of imperial powers.

By the end of the century, that map had been radically redrawn. In the space of an historical blink of an eye, European empires collapsed and nearly all of their former foreign subjects became citizens of independent nation-states. The imperial era came to a swift and certain close.

But that's not the end of the story, according to **Dane Kennedy**, the Elmer Louis Kayser Professor of History and International Affairs and author of the book *Decolonization: A Very Short Introduction* (Oxford University Press, 2016). Despite attempts by both ex-imperial states and post-colonial regimes to promote a sanitized version of decolonization—one that characterizes the transition as a peaceful transfer of sovereignty—Kennedy asserts that "decolonization was a violent, fiercely contested process that left lasting scars on the world we inhabit today." Kennedy explained how the legacy of decolonization—such as widespread violence and mass refugee crises—spawned conflicts that still persist, from tensions between India and Pakistan to Great Britain's "Brexit" from the European Union.

Q: Let's start with the basics. What exactly is "decolonization"?
A: If we look back at the colonial world before 1945, it's ruled mainly by Western European countries—most predominantly the United Kingdom but also colonial empires like France, Holland, Belgium and Portugal. They ruled peoples from parts of the Americas to almost the entirety of Africa, along with large swaths of Asia and portions of the Pacific. Effectively, a huge amount of the world was under the control of foreign imperial authority.

But then there is an historic shift—stretching from the mid-1940s through the late 1970s—from a world of colonial empires to a world of nation-states. That's what we refer to as "decolonization." In the aftermath of the Second World War, we see independence for Britain's South Asian possessions—India, Pakistan, Sri Lanka, Burma—as well as the American Philippines and British and French-controlled territories in the Middle East, notably Palestine/Israel, Jordan, Lebanon and Syria. By the 1960s, European colonial rule had collapsed across the rest of Asia, North Africa and most of sub-Saharan Africa, where more than 30 new nations came into existence. Then we see the end of the Portuguese empire in Africa and East Timor, the collapse of the renegade Rhodesian white regime and independence in various Pacific Island and Caribbean nations. By the end of the '70s, the decolonization deluge had largely swept away the Western colonial empires.

Q: In your book, you assert that there has been an historical rewriting of decolonization to make it appear like a bloodless negotiation process rather than a violent upheaval. Can you elaborate?
A: Both the ex-imperial powers and the new nation-states had incentives for white washing the past. An empire like Britain's whole rationale for colonial rule was to bring the benefits of civilization—the so-called "white man's burden"—to these people and shepherd them towards self-rule. They shrugged off the cruelty they had imposed for hundreds of years by saying, "Sure, there were problems, but, for the most part, we managed this process with great

equanimity and deserve to pat ourselves on the back." Likewise, the rulers of the new nation-states that arose from these colonies had their own reasons to rewrite history. Their claims of national identity often entailed suppressing those within their own societies that envisioned an alternative political future. That often involved cases of ethnic cleansings and mass migrations.

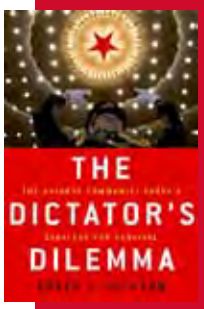
Q: So, the decolonization process was anything but stable and peaceful?
A: Correct. Look, most of us would agree that nation-states, because they are premised on sovereignty derived from the people, represent a more attractive political option than foreign empires imposing rules from afar. But we also must recognize that this transition came with costs. Decolonization in the Indian subcontinent, for example, was an extraordinarily bloodied process, resulting in the deaths of literally millions of people and the mass migrations of millions more. The decolonization of French Algeria produced over a million refugees and hundreds of thousands of deaths. Huge death tolls accompanied the Vietnamese wars for independence and Angola's struggle against Portuguese rule. These are costs that we are still paying today.

Q: Where are the scars of decolonization most evident?
A: Many regions face enduring conflicts that have their roots in decolonization. Again, look at India. Since independence and partition, there have been three wars between India and Pakistan. Most experts would agree that if there is going to be a future nuclear exchange, those are the two nations where it is most likely to happen. Tensions persist throughout the Middle East following the transition of the British colony of Palestine into the state of Israel. It shows no signs of stopping. There are examples in Africa. In the Congo, the collapse of Belgium rule resulted in ethnic rivalries. It is a huge country that still has never fully successfully integrated as a nation-state. Millions of people have died in conflicts there since independence—conflicts that can't be separated from decolonization. I could go on and on.

Q: How does "Brexit" correlate with the legacy of decolonization?
A: Britain's "Brexit" from the European Union cannot be divorced from its long heritage as an imperial power. Those who campaigned for Brexit were promoting a vision of Britain that draws on a nostalgic memory of its imperial past. Hail Britannia, if you will. It's a nationalistic vision that is tied to a loss of empire. As an historian, I want people who read my book to appreciate that decolonization was a complex and difficult process that still has not been fully resolved. Perhaps it never will. We can trace the problems we face today back to events that were put in motion more than half a century ago.

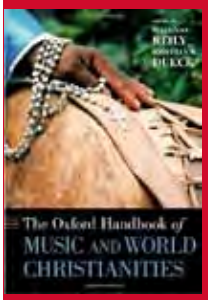
SAMPLING OF

THE DICTATOR'S DILEMMA: THE CHINESE COMMUNIST PARTY'S STRATEGY FOR SURVIVAL



Political observers predicted the fall of the Chinese Communist Party (CCP) following the Tiananmen Square crackdown in 1989. When the party weathered the storm, pundits again forecast its demise after the serial collapse of communist regimes behind the Iron Curtain. Neither prediction proved true. China continued to experience economic growth and relative political stability since 1989. In *The Dictator's Dilemma*, **Bruce J. Dickson**, professor of political science and international affairs, examines why the CCP enjoys high popular support and how its policies have changed with the times. Dispelling notions of the party's impending implosion, he contends that, while it may generate resentment and protest, the CCP is not cut off from the people it governs and tolerates a growing and diverse civil society.

THE OXFORD HANDBOOK OF MUSIC AND WORLD CHRISTIANITIES



Assistant Professor of Writing **Jonathan Dueck** collected and co-edited this volume of essays from leading scholars in the fast-emerging field of ethnomusicology. *The Oxford Handbook of Music and World Christianities* investigates music's role in everyday practice and social history across the diversity of Christian religions and practices around the globe. It explores Christian communities in the Americas, Europe, Africa, Asia and Australia as sites that have created an array of musical traditions. The *Handbook* focuses on five themes: music and missions; music and religious utopias; music and conflict; music and transnational flows; and music and

NEW BOOKS BY COLUMBIAN COLLEGE FACULTY

everyday life. Taken together, each element paints a broad picture of Christianity and its relationship to music as a channel for encompassing and negotiating deeply rooted moral and cultural values.

WRITING NEOLIBERAL VALUES: RHETORICAL CONNECTIVITIES AND GLOBALIZED CAPITALISM

In *Writing Neoliberal Values*, **Rachel Riedner**, associate professor of women's studies, challenges stories that promote narratives about free markets bringing freedom and economic stability to marginalized people. By focusing on individual cases, these stories create portraits of worthy, valued people—often women—who are brought into the technologies of modernity, allowing them to participate in and contribute to markets. The narratives are designed to demonstrate that poverty and violence can be overcome, and that prosperity is in reach to anyone who embraces modern life—despite their circumstances. But Riedner argues that they are built on false pretenses. She highlights the dangers of tying neoliberal ideals of self-responsibility, inclusion and freedom to economic values of privatization, free markets and free trade. These human-interest stories, she maintains, celebrate individual ability and success but ignore the complex reasons for poverty and exclusion.

LOGIC AND ALGEBRAIC STRUCTURES IN QUANTUM COMPUTING

Professor of Physics **Ali Eskandarian** and Professor of Mathematics **Valentina Harizanov** compiled this collection of international cross-disciplinary research on physics and quantum logic. With contributions from leading experts exploring connections across their respective fields—from logicians and mathematicians to computer scientists and

physicists—the book serves as an anthology of modern insight into the fundamental questions surrounding the nature and behavior of matter and energy. It explores themes ranging from philosophical examination of the foundations of physics and quantum logic to exploitations of the methods and structures of operator theory, category theory and knot theory.

LIFE AFTER DEATH: RESURRECTION, JUDGMENT, AND THE FINAL DESTINY OF THE SOUL

With religious turmoil and tension dominating the global headlines, many people around the world hold confused or incorrect views about Islamic teachings and tradition. In *Life After Death*: *Resurrection*, *Judgment*, and the *Final Destiny of the Soul*, Professor of Religion **Mohammad Faghfoory** translates, annotates and explains scholarly theses that explore the concept of death in Islam, and the way the Islamic idea of an afterlife can inspire adherents toward a morally upstanding existence. Belief in life after death is the first among the five fundamental pillars of Islamic tradition; without it, the religion teaches, the other pillars become meaningless. Faghfoory shows how Muslims regard this essential tenet of their faith as a concept that gives meaning to life and illuminates the purpose of the creation of man.

PRESIDENTIAL LIBRARIES AS PERFORMANCE: CURATING AMERICAN CHARACTER FROM HERBERT HOOVER TO GEORGE W. BUSH

In Presidential *Libraries as Performance*, **Jodi Kanter**, associate professor of theatre, presents the first critical assessment of all 13 extant presidential libraries. Through exhaustive research, she reveals how presidential libraries generate narratives about individual presidents, historical events and who we are as Americans. By asking questions about how the funding, setting architecture and exhibition of a presidential library shape our understanding of the president's character, she portrays presidential libraries as performances that encourage visitors to think in particular ways about executive leadership and about their own roles in public life.

17TH CENTURY CHINESE PAINTINGS FROM THE TSAO FAMILY COLLECTION

Comprising 130 paintings from the 17th century, the Tsao Family Collection is singularly comprehensive, including works by nearly all of the most important Chinese painters of the period such as Gong Xian, Hongren, Zhu Da, Daoji, Wang Hui and Wang Yuanqi. In this edition, **Jonathan Chaves**, professor of Chinese, examines the famous collection in the context of a politically turbulent yet creatively dynamic period in China's history. He provides new translations of the poetic inscriptions on these Chinese masterpieces and offers commentary on topics like literary gatherings in China and their cultural significance.

Research Briefs

WIND NEBULA OFFERS UNIQUE WINDOW

Led by Physics Department postdoctoral researcher **George Younes**, a team of scientists detected the first example of a cloud of high-energy particles—dubbed a "wind nebula"—surrounding an ultra-rare magnetar star more than 13,000 light years from earth. The discovery offers a unique window into the properties, environment and outburst history of magnetars, the strongest magnets in the universe. Until now, wind nebulae have only been seen

around young neutron stars called pulsars. Magnetars are a rare and extreme manifestation of pulsars. Of the 2,600 known neutron stars, only 29 of those have been classified as magnetars. This finding has implications for examining how matter behaves under extreme conditions like the high density created by magnetars.

MAMMALIAN BRAIN TRUST

Anthropology Professor **Chet Sherwood** will lead the first ever National Institutes of Health (NIH)-funded collection of chimpanzee brain resources—including tissue samples, MRI scans and an online scientific database—in partnership with Georgia State and Emory universities. Over the last decade, institutions have largely ceased breeding


Chet Sherwood

chimpanzees for scientific research. With a $1 million NIH grant, Sherwood and his colleagues will address the dwindling biomedical resources by creating a database of all available chimpanzee brain tissue and data, much of which offers unparalleled views into evolution and the mind. Sherwood's lab, already home to a collection of 650 mammalian brains, will serve as a brain repository where scientists can request tissue samples for their own labs.

IN-PERSON INTERVIEWS FOR 'DREAM JOBS'

In-person interviews are more likely to help job-seekers land their dream positions than meetings conducted by technology-based outlets like videos, social media platforms or computer interfaces such as Skype. According to a study by Organizational Sciences and Communication doctoral candidate **Nikki Blacksmith**, personal interactions yielded better impressions for both the company and the candidate than technology-mediated interviews. In a review of seven years of case studies, Blacksmith found that perspective employers and employees found face-to-face interviews provided the strongest hiring outcomes, even when the ratings were adjust over time to reflect a growing comfort and familiar with technology. The study was published in the journal *Personal Assessment and Decisions*.

HUMANS IGNITE WILDFIRE FORECAST

Human behavior—from cigarettes tossed on the highway to electrical poles dotting the Santa Ana landscape—is as big a factor in driving the frequency of wildfires as climate change, according to research by Assistant Professor of Geography **Michael Mann**. His study, which appeared in the online journal *PLOSONE*, concluded that previous scientific models have either omitted the impact of humans on wildfires or overstated the influence of climate change. In an examination of California's devastating blazes, Mann revealed that people are at least as dangerous as nature, and that tracking human activity


Michael Mann

can play an important role in predicting wildfire locations and preventing their outbreaks.

APE SPECIES ANCESTRY

Led by Assistant Professor of Anthropology **Sergio Almécija** of the Center for the Advanced Study of Human Paleobiology, researchers identified a new genus and species of small ape that roamed the earth 11 million years ago—before the evolutionary split of humans/great apes (hominids) and gibbons (the "lesser apes") or hylobatids. Named *Pliobates cataloniae*, the new species has important implications for reconstructing living hominoids, the last common ancestor of the two groups. The fossil findings, published in *Science* magazine, may be the missing chapter to the beginning of ape and human history.

HIGH HONORS FOR FACULTY SCHOLARS

Three Columbian College faculty members joined the ranks of the nation's most-distinguished scholars after winning prestigious awards for their work in political science, astrophysics and history. **Marc Lynch**, professor of political science and international affairs, was named one of 33 Andrew Carnegie Fellows from a field of 200 candidates; Professor of Physics **Chryssa Kouveliotou**, already a National Academy of Sciences member, added

to her list of honors with her election to the American Academy of Arts and Sciences; and Associate Professor of History **Marcy Norton** received a Guggenheim fellowship to complete her book on the interaction between humans and animals from 1500 to 1800 in Western Europe, Mexico and South America.

SPIDER WEBS OF ENTRAPMENT


Australian Deinopis spider

Spiders may be creepy but they are also remarkably astute as hunters, architects and master builders, according to Ruth Weintraub Professor of Biology **Gustavo Hormiga**. His research lab has cut through the tangled webs of the arachnid to reveal the complex methods used to trap victims. In examining thousands of spider species, Hormiga identified classic orb web architecture—sometimes a hundred times larger than the spider itself—with patterns of radii and spiral turns. Their sticky silk forms a fine but sturdy mesh to snare prey like insects and other spiders.

TWIST TO FORENSIC LEARNING

Forensic Science Professor **Daniele Podini**'s students solved what they believed was a mock mystery: They examined DNA evidence in the 1984 murder of a 9-year-old girl and found that the man convicted of the crime was innocent—his DNA did not appear on the evidence. But there was a catch. This was actually a real case gone bad, and the innocent man who had been wrongly sentenced to death row was sitting in their classroom. The students met him as part of Podini's efforts to showcase the real-world impact of their studies.

THROAT MICROBES AND SCHIZOPHRENIA

Researchers from the interdisciplinary GW Computational Biology Institute (CBI) identified a potential link between microbes (viruses, bacteria and fungi) in the throat and schizophrenia. The discovery may offer a way to identify causes of the disorder and could lead to new treatments and diagnostic tests. Scientists have suspected that microbiomes—the communities of microbes living within our bodies—are connected to mental health. Published in the journal *PeerJ*, the study, led by PhD biology student **Eduardo Castro-Nallar** and Professor of Biology and CBI Director **Keith Crandall**, used DNA sequencing to compare individuals with schizophrenia against a control group. The team found a significant difference in the microbiomes of healthy and schizophrenic patients.

SPEEDING STELLAR CLUMP

A team of Columbian College physicists led by Assistant Professor of Physics **Oleg Kargaltsev** identified a fast-moving star launching a fragment of material into space at an extraordinary 40 million miles per hour. Using data compiled from NASA's Chandra X-ray Observatory, the researchers determined that the clump of stellar material was jettisoned from a pulsar—a highly magnetized neutron star comprised of the debris from supernova explosions. The scientists are continuing to monitor the cosmic event to understand how a pulsar created such a powerful blow and projected material at incredibly high speeds.

CORCORAN ARCHIVE SHOWS HISTORY

An archive of 2,000 historical documents and artifacts from the former

Corcoran Gallery are now available to the public at the Special Collections Research Center in Gelman Library. The archive includes architectural drawings by Ernest Flagg of the historic Beaux-Arts building, and documents related to a controversial, and ultimately canceled, exhibition by the artist Robert Mapplethorpe. The historical collection also contains photographs of exhibits mounted as early as the 19th century and pages from the 1881 journal of William MacLeod, first-ever curator of the Corcoran Gallery, recounting the assassination attempt on President Garfield.

WEBNOVELA TO PROMOTE HIV TESTING

Funded by a $594,827 grant from the National Institute of Mental Health, Professor of Psychology **Maria Cecilia Zea** will develop a webnovela to promote HIV testing among gay and bisexual men in Colombia, where rates of infection are at epidemic levels. Zea and a group of community members on the ground in Colombia will create seven 13-minute episodes that follow the format of popular telenovela series. Over the next two years the team will develop the series and determine if the study group that views it is more likely to be tested. Stigma and fear of test results keep many gay men from getting regularly screened for HIV infection, and it is only when they show AIDS symptoms that they receive testing, Zea said. The infection rate hovers around 12.1 percent among gay men in Bogotá and it is higher in other cities in the Latin American country.

‘BLACK LIVES/BLACK

When Lincoln Mondy learned of the tobacco industry's strategy to target African Americans, he took action—and took up a camera. His documentary cuts through the cigarette marketing smokescreen.

Lincoln Mondy

LUNGS' MATTER

Growing up in a small Texas town, political science major **Lincoln Mondy**, BA '16, could name the colors on a Newport cigarette pack the way most kids can describe the jerseys of their favorite sports teams. Both of his parents were heavy smokers. His father, who is African American, was hooked on the menthol-flavored Newports that seemed to be advertised on every billboard and bus in his neighborhood.

"When I found out how tobacco companies infiltrated black culture to push menthol cigarettes, I was frustrated, I was mad and I was shocked that I knew nothing about this. I couldn't stay silent." — Lincoln Mondy

"If an adult asked me to describe what the Empire State Building looked like, I don't think I could have done it," recalled Mondy, an account coordinator for BerlinRosen's Issue Advocacy team in D.C. "But if they asked me to describe a pack of Newports, I'm confident that I could articulate that green, white and gold packaging with ease."

In Mondy's hometown, "tobacco was everywhere," he said. If not for a childhood bout with asthma, he believes he certainly would have taken up the habit. But it wasn't until he came to GW and earned a youth fellowship with the anti-tobacco nonprofit Truth Initiative that Mondy realized his father's affinity for menthol cigarette brands like Newports and Kools wasn't a coincidence. Nearly 90 percent of African American smokers prefer menthol, a flavoring additive that, according to the Centers for Disease Control and Prevention (CDC), increases nicotine addiction. Conversely, only 26 percent of white smokers use menthol cigarettes.

Mondy, who is biracial, asked himself why such stark contrasts appeared in smoking statistics—and inside his own house. "My black family all smoked menthol and they could never quit," he noted. "My white side dipped and smoked cigarettes that weren't menthol." His mother, who is half white, stopped smoking after a then 14-year-old Mondy created a PowerPoint presentation detailing tobacco's deadly effects. But despite his father's numerous attempts to quit, Mondy watched him return to the green, white and gold packs again and again.

Through his fellowship at Truth Initiative, Mondy plunged into intensive tobacco research, digging through an archive of 14 million industry documents dating back to the 1960s. He learned of a 50-year campaign by big tobacco companies to saturate black communities with menthol flavored cigarettes, employing tactics like focused advertising in African American publications and "ethnic field trips" in black neighborhoods to distribute cartons of free cigarettes.

"When I found out how tobacco companies infiltrated black culture to push menthol cigarettes, I was frustrated, I was mad and I was shocked that I knew nothing about this," he said. "I couldn't stay silent."

Mondy launched a film project titled *Black Lives/Black Lungs*, a documentary depicting young African Americans. With **Amina Akhtar**, BA '16, as his producer, Mondy recruited concerned African American students from GW and Howard University, asking each to recite excerpts from tobacco industry documents that outlined strategic plans to promote menthol cigarettes among black smokers. In the film, the sometimes teary-eyed students struggle to read the industry's descriptions of its target audience as "ghetto smokers" who are "poorly educated" and come from "lower incomes." In addition to their recitation, some of the students relate their own personal stories, tales of grandparents who chain-smoked even as they were dying of lung cancer.

Initially a four-minute video, Mondy extended *Black Lives/Black Lungs* into a feature-length documentary with historical footage and interviews with anti-tobacco activists—and his work immediately garnered attention. While arranging screenings at historically black colleges and universities, Mondy was the subject of a profile in *The Huffington Post* and was invited to preview *Black Lives/Black Lungs* for the Tobacco Prevention Network and the Campaign for Tobacco-Free Kids. The documentary was also accepted as part of the 2016 Aspen Ideas Festival.

"Tobacco is usually framed as a public health issue, which of course it is. But I wanted to look at it as a social justice issue too," Mondy said. "My generation is very motivated on social justice issues. Look at the impact of the Black Lives Matter movement. This is a way of saying that not only do black lives matter, but black lungs matter too."

Marketing Menthol

Cigarette smoking has struck a particularly devastating blow to the African American population. Death rates from lung cancer and other smoking-related diseases are generally higher among blacks than whites. The CDC reports that smoking-related illnesses kill more black Americans than AIDS, car crashes, murder and drug and alcohol abuse combined. Not only have research studies shown that the menthol cigarettes overwhelmingly smoked by African Americans are more addictive than non-menthols, the additive is also thought to make harmful chemicals more easily absorbed into the body.

When preparing his film, Mondy searched archives for keywords like "ethnic," "ghetto" and "negro," finding reams of reports on strategies to target black people. The industry marketed menthol as a "healthier" cigarette option with a "minty" taste to mask tobacco's harshness—a tactic Mondy called shameful. Tobacco companies bought disproportionate ad space in black publications like *Ebony* and *Jet*, often black athletes and celebraties with cigarettes.

While a 2009 law banned tobacco flavor additives like cherry and bubblegum, menthol is still readily available. Meanwhile, a survey by the Tobacco Control Legal Consortium found that nearly half of all black smokers said they would quit cigarettes if menthol was banned.

"[Tobacco Companies] researched our culture and pinpointed what [black] people like," Mondy said. "Then they swooped in, got as many of us addicted as they could and ran away. They still haven't taken any responsibility."

Although Mondy said he had never picked up a camera before, he chose to make a film as a way to relate to his generation's connection with visual storytelling.

"I wanted to do something powerful that would get people my age to pay attention," he said. "This isn't about pointing fingers at people or assigning blame. I want to reignite the conversation through storytelling and mobilize the community to seek cessation services. If I do anything to help decrease the number of smokers, then I've done good work."

"We want to teach Latino students to be leaders. We want to encourage them to reach their full potential."— Gilbert Cisneros

CISNEROS INSTITUTE *Debuts* NEW LEADERSHIP, NEW OPPORTUNITIES

From a gala ribbon-cutting ceremony to the appointment of new leadership to the debut of a precollege program for the next generation of leaders in the Hispanic community, the GW Cisneros Hispanic Leadership Institute celebrated a landmark year of cultivating diversity in leadership and learning, and encouraging a commitment to community service.

"We want to teach [Latino students] to be leaders," said **Gilbert Cisneros**, BA '94, who, with his wife Jacki, established the institute through a $7 million donation to the university. "We want to encourage them to reach their full potential, and we want them to attend a selective university befitting of their academic achievements and their capabilities."

At the institute's ceremonial ribbon cutting ceremony in April, Cisneros, flanked by young Latino scholars and GW's senior leadership, recalled leaving his native California for the first time when he arrived on the GW campus as a 17-year-old. "That first trip to Washington was a life-changing event for me," he said. "Before that experience, I really had not thought about college, let alone going to college on the East Coast. I didn't know anybody who did that—I barely knew anybody who actually went to college. [GW] opened me up to a whole world of new possibilities."

Opening the door to new possibilities is the bedrock of the Cisneros Institute. It encompasses scholarship and mentorship support for select GW students (Cisneros Scholars) who demonstrate a commitment to leadership and community service and who have aspirations to give back to the Hispanic community. It also provides opportunities for students, faculty and fellows to conduct and publish research on policy issues facing the Hispanic community. And the institute is home to the Caminos al Futuro pre-college summer program for academically talented rising high school seniors who are involved in leadership and service activities. Launched this past summer, the annual three-week program integrates an on-campus cross-disciplinary educational experience with opportunities to interact with community and international leaders, engage in service-learning activities and meet with lawmakers on Capitol Hill and elsewhere.

Last spring, **Elizabeth Vaquera**, noted educator and scholar of Latino immigration and ethnicity, was named the institute's director, and **Louis Caldera**, former University of New Mexico president and Secretary of the Army, joined the institute as its senior fellow involved in teaching, research and strategic connections with external organizations.

Vaquera is particularly cognizant of the challenges facing the Latino-American community through her own experiences as a young girl and as the first in her family to graduate from college. "While I hold a PhD from an Ivy League institution, I am also an immigrant for whom English is her second language and who was raised by a poor single mom," Vaquera noted. "A professor who mentored me through college changed my life, and I am committed to continuing to pay it forward and reducing inequalities through education by helping Hispanic youth succeed and become leaders in their chosen careers."

Caldera, whose family immigrated to the United States from Mexico, is similarly dedicated to drawing from his own personal and professional experience to advance the institute's mission of leadership development and academic support. "Over the course of my education and ensuing public service career, I have worked toward bringing others along and strengthening the capacities of various institutions to broaden Hispanic participation in meaningful and lasting ways," Caldera said. "At the institute, I look forward to doing what I can to cultivate a new generation of students and leaders who will be among those shaping the social, political and economic landscape of our country in the coming years."

Jacki and Gilbert Cisneros (second and third from left), help cut the ribbon on the Cisneros Hispanic Leadership Institute.

Ambassador
John L. Loeb Jr.

LOEB GIFT CREATES INSTITUTE FOR RELIGIOUS FREEDOM AT GW

The John L. Loeb Jr. Foundation and the George Washington Institute for Religious Freedom have donated $2.5 million to establish and endow The Ambassador John L. Loeb Jr. Institute for Religious Freedom at GW. The institute, housed within Columbian College, will foster dialogue on religious understanding and the separation of church and state and will serve as a center for academic collaboration in religion, peace studies, history, political science and other programs for scholars, students, educators and the public.

Since 2009, the New York City-based George Washington Institute for Religious Freedom, which Loeb founded, has offered its own educational programs and partnered with national civic education organizations to reach tens of thousands of teachers and students in the United States and abroad. Those educational programs are being transferred to GW, while the George Washington Institute for Religious Freedom will continue to operate the Loeb Visitors Center at the Touro Synagogue National Historic Site in Newport, R.I.

"George Washington's ringing defense of religious freedom continues to inspire our nation to this day," said GW President **Steven Knapp**. "The university that bears his name is proud to become the new home of a distinguished institute dedicated to the preservation and enhancement of that legacy."

Samuel Goldman, an assistant professor of political science and scholar of the theological sources of political ideas, has been named the institute's inaugural director. He will work with Columbian College Dean **Ben Vinson** to implement educational programs on and off the campus, collaborate with faculty across disciplines, leverage GW's relationships with embassies, and develop new programmatic initiatives and engaging the broader community.

"As controversies about religious freedom proliferate in the United States and around the world, it is imperative to remember what George Washington called 'inherent natural rights' to liberty of conscience and equality under the law," Goldman said. "GW's unique location provides an extraordinary opportunity to apply insights from many scholarly disciplines to controversial issues, while drawing on the firsthand experience of politicians, civil servants, advocates and other practitioners."

Before the First Amendment guaranteed freedom of religion in the United States, President Washington was an early advocate for religious minorities. His 1790 Letter to the Hebrew Congregation in Newport, penned after he and then-Secretary of State Thomas Jefferson visited the city, promised that the new nation would "give to bigotry no sanction, to persecution no assistance" and defined freedom of belief as the "inherent natural right" of every American.

"I can't think of a more appropriate institution to carry on the work of the George Washington Institute for Religious Freedom than this university, named for our first president himself," said Loeb, who served as the U.S. ambassador to Denmark from 1981 to 1983, a delegate to the United Nations, and is a businessman, philanthropist and art collector. "GW's new institute will enable the university to tell the story of how Washington's letter helped define this nation."

Two GW alumni turn a classroom exercise on the global sanitation crisis grew into a socially-minded nonprofit.

By W. Gray Turner

COMING CLEAN

The children of Dharavi are at high risk of contracting waterborne diseases like diarrhea and cholera.

Amidst the gleaming, modern skyscrapers of Mumbai, India's financial capital, is an urban island of refuse and squalor. Less than one square mile in size, Dharavi, routinely referred to as one of the largest slums in the world, is home to more than a million people who live in conditions that seem incomprehensible in the year 2016.

It is a city within a city, with more than 15,000 men, women and children crowded into each acre and families of 15 or more sometimes sharing just 300 square feet of space. It is cramped, hot and a sanitation nightmare. It is a place with just one toilet for every few hundred residents. A nearby creek, already polluted and reeking from sewage and industrial runoff, is Dharavi's unofficial public toilet and no longer resembles the waterway that was populated by local fisherman and Mangrove trees before Mumbai's industrial boom.

Maz Obuz, BA '16, thought he was prepared to see Dharavi firsthand. He knew the numbers, knew the reputation of the community, but what he saw when he arrived in August 2015 was worse than he had imagined: rivers of waste water running through the streets, children openly defecating on the side of the road, pigs grazing on a field of feces.

"What we experienced there was this pervasive sense of poverty," said Obuz, who traveled to Dharavi and other parts of India in 2015 on a fact-finding mission for Asespis, a nonprofit he co-founded with **Evan Young**, BA '15, who majored in international development. "The destitute poverty, the horrible living conditions, it was everywhere you looked."

Their journey to India started with a statistic: 2.5 billion people—roughly one-third of the world's population—lack access to adequate sanitation. Obuz, a biological anthropology major, and Young, came across that alarming statistic while researching an assignment for their Makeshift Innovation and Engineering in the Third World course in 2014.

"It was a social entrepreneurship class, and we were focusing on how to make an impact on a global issue for a low cost," Obuz remembered. "We zeroed in on the water and sanitation crisis because the statistic was just so unfathomable, and then we asked, 'Where is the crisis the worst?'"

The duo found that Dharavi was one of the places where the sanitation issue was most pronounced, so they focused their research on the slum in the heart of Mumbai. They learned that Dharavi—with one toilet for every 1,440 people, 4,000 cases of waterborne diseases every day, and a population where 70 percent of its residents defecate in the open—is considered one of the largest humanitarian disasters in the sanitation field.

"Women and children live in fear of going to unsafe public toilets," Obuz said. "Families have no option but to bathe and clean their clothes in water that they and their neighbors have defecated in."

On the streets of Dharavi, pigs graze in fields of waste and garbage.

(Photos courtesy of Maz Obuz and Evan Young.)

Maz Obuz and Evan Young

"Having people genuinely interested and talking about this issue is the most important first step to really creating a global community that can make a difference." —Maz Obuz

PROJECT DHARAVI

To combat these issues, the pair developed a business model to distribute waterless squat toilets to the community and establish an economical and environmentally sanitary way to dispose of the waste. Their plan, dubbed Project Dharavi, earned them top marks on the class assignment and encouragement to pursue the venture beyond GW's classrooms.

After making it to the semifinals of the Clinton Global Initiative University Resolution Project and winning the 2014-15 GWUpstart D-Prize Competition, Project Dharavi entered the GW New Venture Competition (NVC)—formerly the GW Business Plan Competition—with a more finely-tuned plan and a toilet prototype designed in collaboration with GW engineering students.

"I loved the competition; it was an exhilarating experience," Obuz said. "Learning the lessons we did from that competition was really helpful in preparing for when we went outside of the classroom with some real risk involved."

Project Dharavi beat out nearly 100 other teams to reach the 2014-15 competition's 10-team finals finishing third overall and winning the competition's Best International Venture prize. In total, the engineering and business model won $17,500 in prizes from NVC and another $5,000 from the GWUpstart D-Prize Competition.

"The NVC and D-Prize gave us the funding to see what the issue was like on the ground, to essentially test everything that we had been creating up until that point, discover our weaknesses and pivot to address the world sanitation crisis more effectively," said Obuz, who traveled with Young to the slums of Dharavi, Nicaragua and Haiti to refine their plan to meet situational needs.

Back in Washington, D.C., their young startup took on a more multifaceted approach to reflect the lessons learned. Those lessons included incorporating fundraising initiatives and awareness campaigns—like their very successful #comingclean social media contest—focused on community-based implementation projects around the world, and connecting the right people to better enact change on a local level.

"We're here to generate a dialogue about the issue and work with international organizations and local groups to make sure the impact we want to see on the ground is being made," Obuz said. "Having people genuinely interested and talking about this issue is the most important first step to really creating a global community that can make a difference."

Working with local governments and NGOs, the goal is to strengthen the connections between local leaders, nonprofits and international organizations and bring 2,000 toilets to Dharavi by 2017.

DIGGING UP D.C. HISTORY

At the National Park Service, Museum Studies alumna Kate Birmingham shows Washingtonians that discoveries can happen at home.

No one has ever confused the Anacostia River with the mighty sweep of the Nile. But to archaeologist **Kate Birmingham**, MA'10, a cultural resources program manager with the National Park Service (NPS), the Washington waterway is as rich in history as any of the world's most celebrated rivers. From the traces of Native American settlements along the Anacostia banks to the prehistoric history of Piscataway Park, Birmingham calls the D.C. region an archaeological research gold mine for anyone willing to explore it.

"When people hear 'archaeology,' they picture mummies in pyramids," she said. "No one thinks of cities as historic sites. But discoveries are made all the time, right here in our own community."

Since graduating from the Museum Studies Program, Birmingham, who holds an undergraduate degree in archaeology from the University of Pittsburgh, has championed local archaeology. She made headlines several years ago for her role in uncovering the remains of an historic slave village, among the largest in Maryland. Using ground-penetrating radar, she and her NPS crew identified the foundations of six slave quarters on L'Hermitage, a 740-acre Frederick County plantation owned by a notoriously cruel French family. (By 1800, L'Hermitage was home to 90 slave laborers, 10 times the number the plantation could sustain.) As field director, Birmingham supervised the excavation of pottery chips, buckles and animal bones—all clues to the slaves' day-to-day ordeals. Her efforts were recognized with the prestigious 2014 John L. Cotter Award for Excellence in National Park Service Archeology.

"Everything you find at every site—every button, every oyster shell, every block of stone and mortar—helps paint the landscape of our collective past," said Birmingham, who now oversees archaeological activity and collections care for 16 sites, including Fort Washington Park and the Frederick Douglass House. "I want my passion for my work to inspire the young historic preservationists of the future."

It's that level of passion that Birmingham brings to the Urban Archeology Corps, an eight-week summer internship she supervises to introduce young people from greater D.C. to archaeology in urban settings. Among other projects, the students engage in a trash pick-up activity, sorting through park garbage like explorers sifting through ruins. Birmingham then advises them on how to use those skills in an actual archaeological setting. "As archaeologists, we are looking at people's trash from the past," she said. "You can apply those same principles to trash left behind today. It's a record of where people were, and what they were doing." Birmingham proudly notes that some of her former students are current NPS employees.

PRESERVING THE PAST

Birmingham was bitten by the archaeology bug as a child. Her inspiration came not from an Indiana Jones adventure, but from a staid PBS documentary on the excavation of olive oil jars in Greece. "It wasn't very romantic, not like finding gold in ancient Egypt," she recalled. "But when I saw that crew pulling row upon row of jars from the dirt, I thought, 'That's it, that's what I want to do.'"

After working as an archaeologist for private firms, her focus shifted to the care of valuable collections. Archaeology, she surmised, doesn't end with the dig. All too often, Birmingham saw precious artifacts ignored or mishandled. "Once you do an excavation, you have essentially destroyed your work site. You can't repeat your experiment," she noted. From rusty nails to chipped ceramic bowls, artifacts must be recorded, labeled and bagged with precision. "You can't randomly throw things in a box and put them on a shelf."

Birmingham chose to focus her graduate work in museum studies to gain practical experience in collections management. As part of the program's internship component, Birmingham cataloged archaeological collections at NPS, leading directly to her current job. "Kate was highly organized and a good communicator—two critical skills for success in her chosen field of collections care," said Assistant Director of Museum Studies **Martha Morris.**

Today, Birmingham spends less time excavating sites than advising park managers on how to preserve them. "The work is important and rewarding, and I don't track as much dirt into my car," she laughed. Still, she fondly recalled the quiet sunny mornings she picked up a shovel and trawl and dug alongside her interns at the plantation site. "I can still smell the grass and hear the tools striking the dirt," she said. "Those are really heavy moments. It's when you feel like you are doing something that impacts and enhances our knowledge of history."

In Memoriam:
MAX TICKTIN
A LEGACY SYNONYMOUS WITH JUDAIC STUDIES AT GW

Rabbi Max Ticktin

Rabbi **Max Ticktin**, the iconic former professor of Hebrew at GW who died this past summer, was a cornerstone of the university's Judaic Studies Program for more than 30 years. Long after his retirement in 2014, he continued to touch the hearts and minds of friends, colleagues and former students, who often described him with terms like "legendary," "treasure" and "inspiration". Longtime philanthropist Susie Gelman, a friend and student, called the friendly and self-effacing Ticktin "everyone's beloved grandfather."

"To know Max is to love Max," she said. "I took his class to brush up on my Hebrew, and along the way I learned an incredible amount and also witnessed the special interaction that Max had with his students. He made every student feel valued, appreciated and respected."

The Ticktin name and legacy will continue to resonate for the next generation of Columbian College students thanks to the creation of the Max Ticktin Professorship of Israel Studies by the Susie and Michael Gelman Morningstar Foundation. The professorship, which recognizes Max Ticktin's commitment as a scholar and teacher, was established to help foster a broad understanding of the history, politics, society and culture of modern Israel.

Ticktin grew up in an Orthodox home in Philadelphia, the son of Polish immigrants. His grandfather, a rabbi who refused to accept payment for his lessons, instilled in him the value of education. As a young man in the 1940s, Ticktin traveled to Jerusalem to study at the Hebrew University during the height of Israel's struggle for independence. While he joined the Haganah defense force, he joked about his ineptitude as a soldier. Instead, he was drawn to studying the Torah, speaking Hebrew and, like his grandfather, preparing for a lifetime of teaching. A towering figure in the history of Hillel, the largest Jewish student organization in the world, Ticktin's academic career began in 1948 as a Hillel instructor at the University of Wisconsin. As the organization's assistant director for more than a decade, he recruited and trained a generation of Hillel directors while pioneering social justice causes like women's rights. "In many ways, he was a walking embodiment of the history of Jewish people," Gelman said.

Ticktin joined the GW faculty in 1979, where he taught courses in Hebrew language and contemporary Israeli literature until his retirement in 2014. He gained a reputation as a teacher who connected easily with young people and a consummate storyteller who captivated audiences from the greenest undergraduate to the most-studied academic. A Ticktin lesson on Hebrew grammar might veer into a brilliant reflection on how Shakespeare's sonnets compare to the King James Bible. Or a visit to a colleague's office to offer "Good Shabbos" wishes might blossom into a relaxed afternoon spinning tales of his parents' immigrant journey in the 1920s.

"He had an incredible gift for connecting with people as individuals. Everyone felt they had a special relationship with him," said **Daniel Schwartz**, associate professor of history and director of GW's Judaic Studies Program. "His most central legacy is as a teacher—Max taught thousands of people."

In an interview in January 2016, Ticktin said he encouraged his students to take chances and approach unfamiliar subjects with a spirit of discovery—whether he was teaching language, literature or history. "The fun comes when the students are open-minded, when they are willing to try anything and say anything," he recalled. "Sometimes they said brilliant things, sometimes outrageous things. But they were always sharpening their skills—language skills, analytic skills—and doing things they never expected."

In his later years, Ticktin often reminisced about his teaching years at GW and striking up informal conversations with colleagues from across disciplines. "I liked to chat with people in the English Department, the Art History Department, the History Department, anyone who would stop to talk," he said. "I'd always come away admiring their knowledge, intelligence and openness." And he recalled the excitement he felt guiding young people through new discoveries. "The delight—that's the exact word: delight!— I had in watching students grapple with new things, new ideas, new concepts," he said. "There's nothing else quite like that."

STUDENTS, ALUMNI MAKE CAREER CONNECTIONS

From White House internships to dream jobs in the private sector, Columbian College students and recent graduates are taking advantage of their GW connections to advance their career aspirations. The following are examples of how relationships can translate to success in the workplace:

- When American studies major **Paul Kendrick**, BA '05, MPA '07, met **Ashlynn Profit**, BA '14, MPA '16, a communication major, at an alumni happy hour for Presidential Administrative Fellows (PAF), they discovered that not only were they both PAF members, they also shared a passion for education issues. "She came right up to me and impressed me with the outstanding service work she was leading for GW in the D.C. community," said Kendrick, now the climate and domestic director in the Presidential Personnel Office at the White House. Later, Kendrick asked the PAF program to recommend young volunteers for a summit on youth unemployment and disconnection sponsored by Opportunity Nation, a nonprofit organization for which Kendrick formerly worked as director of grassroots engagement. Profit's name was at the top of the list. "This ended up being a wonderful collaboration, as Ashlynn powerfully spoke up for bipartisan education, workforce and criminal justice policies and got to talk with her Delaware governor at the Opportunity Nation National Summit," he said. Kendrick continued to give encouragement and insights to Profit about a career in education. Profit's experience helped her earn an internship at the U.S. Department of Education where she was later hired as a confidential assistant in the Office of Civil Rights.

- Columbian College alumna **Jacqueline Hackett**, BA '08, MPP '10, deputy director for policy at the White House Office of National Drug Control Policy, has often selected GW interns for her office and she's been happy with the results. Hackett gives them ample professional responsibility, from writing briefings for the drug czar to planning community engagement trips to tracking legislation and guiding the office's social media presence. The skills developed through these opportunities have enabled many of these interns to go onto jobs in fields like public policy and communications, including **Maddison Bruer**, BA '15, who now works with the Centers for Disease Control and Prevention on the Ebola and Zika viruses, and **Mollie Bowman**, BA '16, who works for the Hillary Clinton presidential campaign in Ohio.

- Financial investment firms have frequently recruited economics students through the annual Careers in Economics information sessions sponsored by Columbian College's Department of Economics. **Jeffrey Messina**, BS '13, for example, was recruited to the Washington, D.C., firm Bates White by two economics alumni who attended the networking fair, and he is now participating in the sessions as an alumnus and a recruiter himself. Another financial powerhouse, Price Waterhouse Coopers, has also actively recruited GW students through its alumni network. Economics and political communication major **Sarah Margolis**, BS '14, sent her resume and cover letter to **Ian Potent**, BA '10, an alumnus in the financial firm's office—and interviewed for her eventual job just a few days later. Today she works alongside several GW alumni, including her classmate **Rose Sunj**, BS '14.

- After months of submitting resumes and cover letters to financial firms across New York City, economics undergraduate student **Danielle Zukoff** was ready to abandon her internship search. But through a post on GWork—the GW Career Center's online network that allows students and alumni to access jobs, internships, Federal Work Study and volunteer opportunities—Zukoff landed a summer spot with Vested, a Wall Street financial communications start-up. The "dream internship," she said, bolstered her commitment to major in economics and pursue a career in the financial sector. "Throughout my time at Vested, I've communicated directly with clients, allowing me to gain a deep understanding of the financial industry and reaffirmed my desire to ultimately work within this sector," she said.

- When political science senior **Guillermo J. Martinez** was selected for a prestigious internship at the D.C. Superior Court, his elation was dampened by the cost of taking on a full-time, unpaid postions in Washington, D.C. But a grant from the GW Knowledge in Action Career Internship Fund (KACIF), a career service's initiative that supports the professional development of students by defraying the costs of eligible unpaid internships, enabled him to purse the opportunity. Since 2013, more than 265 students have received KACIF awards of up to $3,000.

- **Maya Warburg**, BS '16, an industrial/organizational psychology major, was hired as a digital engagement coordinator at Reingold LINK Strategic Partners, a national strategic communications and stakeholder engagement firm headquartered in Washington, D.C. What got her foot in the door for an interview? At a Center for Career Services Media Networking Fair, Warburg was introduced to the firm through Reingold LINK executives **Michael Akin**, BA '03, MBA '07, and **Zachary Abaie**, BA '13. Employment soon followed.

Students and alumni at the New York City Career Quest Spring 2016 Alumni Breakfast

Clay Warren (center) with alumni Shanee GRoss and Aaron Kwittken

COLONIALS HELPING COLONIALS: THE PROFESSIONAL PERSUADERS

As students in Professor **Clay Warren's** Persuasion class filtered into the classroom, their eyes were immediately drawn to the duo standing at the front of the lecture hall. Standing with Warren were two guest speakers: the global chairman and CEO and a managing director at Kwittken + Company Worldwide, one of the fastest growing, modern communications agencies in the country.

But, more importantly for these students, both **Aaron Kwittken**, BA '92, and **Shanee Goss**, BA '00, once sat where they were now, attending the very same class taught decades earlier by Warren, the Chauncey M. Depew Professor of Communication and Organizational Sciences. Today, they're the instructors, fielding questions, discussing the latest trends and challenges in the communications agency business and providing advice on career trajectories and how to apply classroom lessons to the real world.

The experience is nothing new for Kwittken, who has returned to Foggy Bottom from his offices in New York City to speak to the Persuasion class each semester for the last five years. When Warren learned that Goss had joined Kwittken + Company last August as the managing director of the agency's global headquarters in New York City, he suggested she join Kwittken as a guest lecturer.

"Having the class hear from both a male and female perspective and from students a decade apart, I mean, that is really special," Warren said.

FROM CLASSROOM TO REAL WORLD

Translating the course material to what she does day-to-day was an important goal for Goss, as was providing some guidance on life beyond graduation.

"No matter what town, city or country you're coming from, no matter what your area of study or your passions are, we've all converged on this place," she said. "There's an opportunity to not only learn from each other while you're here, but to continue to make those connections well beyond your time at GW."

For Kwittken, the decision to come back and engage with students was an easy one. "GW has done enormous things for me—it's the place where I met my wife, and it's really where I launched my career from day one, even as a freshman," he explained. "My recognition and appreciation of the part GW has played in my life is a big reason why I believe that the concept of 'Colonials Helping Colonials' is so important. I want to make sure current and future students can make the most of their time here and go on to succeed like so many Colonials have."

Recognizing the role GW has played in his success was just the first step for Kwittken. The second was finding the right opportunity to support students and other alumni.

"There are opportunities for alums to host dinners and workshops and lectures, not just in D.C., but where they work and live," he said. "There are so many ways to give, but I think giving your time and your interests is really important, and it all comes back around."

"Interacting with students is [also] a great opportunity for GW alumni to act as 'talent scouts' in a way," added Goss. "Whether it's for their own businesses or for the businesses of friends and colleagues, they're really getting to see who's coming up next. Building those relationships really helps connect the right students with the right internship or job opportunities, and everyone wins."

The ultimate beneficiaries, according to Warren, are always the students. He hopes more alumni will recognize the impact they can have if they make a commitment to helping the next generation of Colonials.

"To interact with two former students who were in the class, to hear what they got out of it, to learn how they approach their career aspirations and how things turned out well for them—these are important experiences for current students," Warren said. "To be willing to come back and share your time and your personage with the students is really special, and they love it."

Alumni & Friends Briefs

#CCASONWARD

With faculty, friends and family looking on, the Class of 2016 was welcomed into the family of GW alumni at the 2016 Columbian College Celebration ceremonies. During his address, Dean **Ben Vinson** urged graduates to continue pressing "onward," embracing both the opportunities and challenges that lay ahead. The celebration, which recognized 968 undergraduates and 754 graduate students for their achievements in the arts and sciences, was followed the next day by the Commencement on the National Mall, which featured U.S. Senator Cory A. Booker (D-N.J.).

ACHIEVEMENT, SERVICE AWARDS

Among the Columbian College alumni recognized this past year by the university for their achievement and service were communications executive **Richard Frisch**, BA '78, and philanthropist **Gilbert Cisneros**, BA '94, recipients of the 2016 Alumni Outstanding Service Award; **Geoff Brown**, BA '08, an 8th grade humanities teacher in Baltimore, who received Teach For America's 2016 Alumni Award for Excellence in Teaching; and **Daniel Weiss**, BA '79, president of the Metropolitan Museum of Art, who received a Distinguished Alumni Achievement Award. **Jason Sterlacci**, BA '06, a New Jersey middle school English teacher, made game show history by winning the $100,000 Grand Prize Teachers Tournament on *Jeopardy!*—capped by an on-air shout-out to his GW professors.

PATH TO 'MR. PRESIDENT'

How do you address the first leader of a brand new country? For George Washington, the possibilities ranged from "His Majesty" to "Mr. President." In her book *For Fear of an Elective King* and as the featured speaker at the university's fifth annual George Washington Lecture, **Kathleen (Kata) Bartoloni-Tuazon**, MPhil '06, PhD '10, recalled the great presidential title controversy of 1789. For two months, Congress heatedly debated whether or not to award him a regal title such as "his excellency." The public argument spilled into the streets and newspapers of the fledgling country and, as Bartoloni-Tuazon noted, "cut to the heart of what the American Revolution meant."

Kathleen (Kata) Bartoloni-Tuazon

ALUMNA INSPIRES

Born with spinal muscular atrophy, **Alexa Dectis**, BA '15, never let the disorder hold her back. As a child star on *Sesame Street*, a scholarship-winning communications major and now a law school student in California, she amazed friends, family and faculty with her drive and determination. On campus, she worked with the Office of Disability Support Services to advocate for students with disabilities—a role she continues to play as a speaker and community volunteer promoting education and awareness.

Alexa Dectis

SCHOLARSHIP CHANGES A LIFE

Since enrolling at GW, junior political science major and Eagle Scout **Sebastian Weinmann** has dedicated himself to community service—on and off campus. He was a volunteer for the Community Building Community program, which connects students with local citizenship opportunities, and has worked with the D.C. homeless population. Looking beyond graduation, he hopes to join the Peace Corp. His commitment is all part of paying back what

Sebastian Weinmann

Weinman calls a "gift"—a scholarship awarded through the Power & Promise Fund, which was established by donors to help students like Weimann pursue their goals. "This scholarship truly changed my life," he said.

LAND O'LAKES GIFTS PLANET FORWARD

Land O'Lakes, Inc., made a $500,000 donation to Planet Forward, the GW project that promotes innovative ideas to address food, water, energy and environmental challenges confronting the planet. The gift, which will provide general operating support for Planet Forward and its public events over the next three years, is the latest investment in a growing partnership between the 95-year-old food and agricultural cooperative and the School of Media and Public Affairs. Land O'Lakes has donated more than $850,000 to Planet Forward since 2011 in an effort to reach and educate people about the importance of agriculture.

ALUMNUS KEYS CLINTON CAMPAIGN

At every stop on Hillary Clinton's campaign trail, **DJ Sigworth**, BA '13, worked behind the scenes to ensure that speeches and rallies went off without a hitch. As Clinton's national advance site coordinator, the Columbian College alumnus organized each of the Democratic presidential nominee's appearances. Sigworth credits GW with honing his logistics management skills. He helped direct Colonial Inauguration (CI), GW's orientation program for incoming students. "I use a lot of the skills I learned from CI every day when putting on large rallies or

DJ Sigworth with Hillary Clinton

similar events for the campaign," he said. "Now I just have a slightly smaller time frame and a little more media attention." The campaign has another connection with GW: **Nat Kaine**, the son of vice presidential nominee Sen. Tim Kaine (D-Va.), graduated from Columbian College in 2012 with a bachelor's in political science. He served in NROTC at GW and now continues his service in the Marine Corps.

ALUMNA WINS WHITE HOUSE HONORS

Jessica Koscielniak

As a photojournalism student at the Corcoran, **Jessica Koscielniak**, BFA '07, read the writing on the wall: The journalism industry was headed in a more digital direction. She enrolled in a digital media class at the time but sought work as a photographer after graduating. Fast forward 10 years and Koscielniak is an award-winning multimedia journalist. She was recently recognized for her work on a video profile of a Mississippi alligator hunter and his quest for the Moby Dick of gators. *King of the Swamp* won first place in the multimedia sports category of the White House News Photographers Association's 2016 "Eyes of History" contest.

ALUMNI RALLY AT GOP CONVENTION

Columbian College alumni made their presence felt in Cleveland this summer as part of the team that helped plan and organize the Republican National Convention. Four Republican National Committee (RNC) staffers were GW graduates: **Audrey Scagnelli**, BA '13, is the RNC national press secretary; **Kasey Packer**, BA '15, is an event manager who led logistical management at the convention; **Ninio Fetalvo**, BA '14, served as a liaison between the convention committee and media outlets; and **Zachary Quinn**, BA '13, worked backstage in the official proceedings department.

ALUMNI, STUDENTS RAISE FLAG DAY

GW celebrated the second annual Flag Day, a campus-wide effort to recognize the university's heritage and display philanthropy's impact on the community. Alumni and students unlocked challenge gifts through their own donations and penned notes to donors in recognition of their support. More than 12,000 alumni made a gift to GW in the fiscal year leading up to Flag Day, triggering a $100,000 donation from **Michael Hope**, BA '79, in support of the Power & Promise Fund for student aid. Meanwhile, more than 500 students made their own donations, unlocking a $12,000 gift from a group of GW parents in support of student life.

Students write notes to donors on Flag Day.

WRGW HONORS LATE STATION ALUMNUS

The late **Steven E. Smith**, BA '08, was a devoted fan of GW Athletics and a well-known voice on WRGW Sports, part of GW's student-run radio station. After he passed away in 2010, the Smith family honored their son and brother by funding a remodeling of the WRGW broadcasting center, which opened in 2016 to rave reviews and was officially renamed the Steven E. Smith Broadcasting Center. After graduating from GW, Smith landed a job at ESPN where he developed a significant online presence. He was also the play-by-play broadcaster and radio voice for the Bowie Baysox, a minor league baseball team.

What Does Peace Mean?

Peace. Shalom. As-Salaam-Alikum. In any language, peace is a state we all want to attain—for ourselves, for our loved ones, for the world. In these tumultuous times, Columbian College faculty members from a cross section of disciplines were asked to define what peace means to them.

Daniel E. Martínez

Mika Natif

Heidi Bardot

Christoph A. Rollsto

"Peace means tranquility. Peace means being free from persecution due to one's nationality, immigration status, race, ethnicity, political affiliation, religious beliefs (or lack thereof) or sexual preference. Peace also comes from the comfort in knowing that you have a roof over your head, food to eat and loving family members and friends. Many people are not free from persecution, nor can they count on the comfort of shelter, food and a supportive social circle. These are people we must keep in our thoughts."
— Daniel E. Martínez, Assistant Professor of Sociology

"Peace means making meaningful contacts with colleagues of diverse cultures. I am an Israeli. Two of my Islamic art colleagues are from Belgium and Syria. We forget about the terrible news coming from our respective regions, put aside our nationalities and talk person-to-person, one human being to another. We enjoy our philosophical discussions about the horticulture of the Mughals in Kashmir and the signs of modernism in Syrian architecture. Our rapport gives me great solace and helps me be optimistic about the future."
— Mika Natif, Assistant Professor of Art History

"Peace comes from within, from simple things that affect our spirit, our soul. Peace comes when I wrap my son in my arms. Peace is in shared laughter with a friend, colleague or loved one. Peace is in the grateful smile of a student when we figure out a solution to their problem. Peace is in a connection made through creating art with a client."
— Heidi Bardot, Assistant Professor of Art Therapy; Director, Art Therapy Program

"In Old Aramaic, the language of ancient Syria, the word for 'peace' is 'shalam.' In Old Hebrew, the language of ancient Israel, the word is 'shalom.' And in Old South Arabic, the language of ancient Arabia, the word is 'salam.' These words are often rendered into English as 'peace,' but the actual meaning is much deeper and broader. These words signified then—and now—not merely the absence of war, but also the presence of good health, serenity, happiness, harmony and safety. May we all do our part to bring about 'peace,' in every sense of these grand Semitic words."
— Christopher A. Rollston, Associate Professor of Northwest Semitic Languages & Literatures

J. Houston Miller | Mollie Manier | Robert Baker | Jennifer C. Nash | Martha Morris | Daniel Schwartz | Shoko Hamano

"Peace means living our lives selflessly, treating others with respect, sharing the extra that comes to us with others who have been shortchanged. It means being in the wilderness without fear but with respect for the world around us. It means living as small as possible in material things and as large as possible in good will."
— J. Houston Miller, Professor of Chemistry

"Peace is an omnipotent knowing of both the prosaic and esoteric; dissecting the inner workings of structure, function and theory; synthesizing each facet, factor and factoid into a greater understanding of, and for, the greater good."
— Mollie Manier, Assistant Professor of Biology

"I recently sang two roles in the opera *Appomattox* with the Washington National Opera. The opera spanned 100 years of race in America. The libretto dealt directly with the legacy of hatred and injustice that still stains race relations in our country. Every rehearsal and performance was a chance to address these issues for all involved. At the last performance, Congressman John Lewis attended. The honor of meeting him is my reminder to work for peace and justice as he did that day on the bridge in Selma, and ever since."
— Robert Baker, Assistant Professor of Music; Director, Performance Studies

"Many think of 'peace' and 'conflict' as antagonisms; peace, then, evokes images of calm and tranquility. But struggle—including the political struggles we have seen unfold on college campuses—can be animated by a desire for peace. In this case, peace isn't necessarily quiet and tranquil. Instead, it is a radical call for freedom from oppressions, and a bold challenge to re-think how we live together in ways that not only honor each other's dignity but that recognize and redress the violence that has marked—and continues to mark—the everyday. Peace, then, is an ongoing call to imagine living otherwise."
— Jennifer C. Nash, Assistant Professor of American Studies

"Peace is finding a place that allows me to connect with the world without worry. This usually means being in touch with something inspiring and often visual. That might be an artwork, a historic structure or a path through the woods. Sometimes it's about being by myself; other times I am peaceful in a crowd. It's the joy of walking my dogs in a field that opens to the sky. Or it's the feeling of being lost in the creation of something new."
— Martha Morris, Associate Professor of Museum Studies Assistant; Director, Museum Studies Program

"Like many of life's essentials, peace is hard to savor unless it's imperiled. With the exception of rare moments of discernment, we tend not to experience peace as a positive state or condition. In our busy and overstretched—but also fortunate—lives, peace is typically what we don't worry about so we can worry about grant applications, carpools and the like. But events like the massacre in Paris drive home the wobbliness of what we wrongly take to be the natural order of things, by reminding us how easily our peace can be disturbed."
— Daniel Schwartz, Associate Professor of History; Director, Judaic Studies Program

"In Japanese, the word heiwa—'peace'—can be used as an adjective. But sensoo —'war'—is a noun. Linguistically, the function of nouns is to refer to concrete, definite entities. Therefore, this peculiar contrast between the two terms reflects the Japanese speakers' underlying assumption that 'war' should consist of temporally and geographically confined events as opposed to 'peace,' which should not be confined. Such a perception is not limited to any single language group; it is shared by humanity as a whole."
— Shoko Hamano, Professor of Japanese and International Affairs; Chair, Department of East Asian Languages & Literature

STAY CONNECTED!

Alumni are an important part of the Columbian College and GW community. Stay connected with CCAS and GW and get involved in these ways:

Join one of our industry-based alumni networks and connect with fellow alumni through both virtual and in-person networking programs. (alumni.gwu.edu/industry-networks)

Connect with alumni, faculty, and students at one of our 400+ events around the world! (alumni.gwu.edu/calendar)

Share your insight and professional experiences with current students. Volunteer for a career panel or a student-alumni networking event. (columbian.gwu.edu/alumni-volunteer)

Network and connect with alumni through the Columbian College and GWAA LinkedIn groups, Facebook and Twitter.

Be a part of *Making History: The Campaign for GW* by supporting students, enhancing academics and breaking new ground on research. (campaign.gwu.edu)

Questions? Want to get involved? Visit us at columbian.gwu.edu/alumni or contact us at ccasalum@gwu.edu.

Anita Ponchione, Executive Director, School Alumni Programs
Sarah Olson, Assistant Director, School Alumni Programs

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Thanks to the **4,200+ alumni, parents, friends, faculty** and **students** for **Making History** through **$16 million** in new philanthropic investments last year to establish **research institutes**, endow **professorships** and launch **scholarships.** Columbian College surpassed **$170 million** in its campaign to raise **$100 million** to pursue the frontiers of knowledge and citizen leadership as exemplified by the dean's vision of the **engaged liberal arts.**

As we look toward **Columbian College's Bicentennial** in 2021, we celebrate the pride, passion and achievements of all who have shared the vision of **George Washington** in creating and sustaining an **extraordinary institution** of higher learning. And we invite you to explore how **your legacy** and the next century of the Columbian College can be forever synonymous with **excellence** in education and leadership.

Contact the Columbian College Office of Development at (202) 994-7132 to begin the conversation about your vision for celebrating the Columbian College Bicentennial.

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