Williams

MAGAZINE SPRING 2019

MISSION POSSIBLE

Ephs are advancing space exploration and travel **p.10**

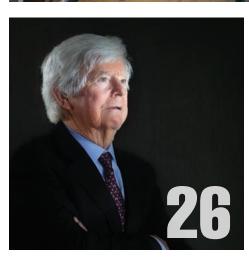














2 Report

President Maud S. Mandel on the college's position of strength.

Comment

Readers respond to our coverage of connections to Hawai'i, WWI and more...

4 Notice

Stained glass, faculty tenure, student scholars, a milestone for Africana studies and more...

10 Mission Possible

A number of Ephs lead the way when it comes to advances in space exploration and travel.

6 How We Thrive

Williams takes a comprehensive, collective approach to providing students the tools they need to navigate college—and life.

22 #williamsunfiltered

Photographs and tags inspired by social media depict student life as it's being lived.

26 In Pursuit of Liberal Learning

Historian Francis Oakley's new memoir reflects on teaching, research and the transformation of Williams.

30 Study

A look at the 3D nature of molecules, Arctic ice and the environment, anti-Semitism and an art historian's body of work.

36 Muse

WCMA Director Pamela Franks on the role of the college museum.









Front cover illustration: Davide Bonazzi Back cover photo: Josephine Sittenfeld

A Position of Strength

AFTER HUNDREDS OF CONVERSATIONS WITH WILLIAMS STUDENTS, STAFF, ALUMNI and faculty over the last six months, and having immersed myself in the history of this stellar institution, I am starting to get a sense of its traditions, heritage and impact. Given the college's strong foundation and the vitality of its programs, Williams is poised to make an even greater impact on the American higher education landscape.

Where do we want to go next? As I settle into my presidency, and the college nears the June 2019 close of its extraordinarily successful Teach It Forward campaign, it's an opportune moment to ask that question. The strategic planning effort I introduced in November is designed to prompt consideration of the possible



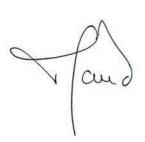
Williams is poised to make an even greater impact on the American higher education landscape. answers. Although it's a time of considerable economic and political volatility, we're fortunate to work from a position of great strength for Williams. This is an opportunity to imagine new possibilities ambitiously, creatively, openly and, most of all, collectively.

The Strategic Planning Coordinating Committee has started building a framework to support these efforts, and eight themed working groups will drill down into some of the areas important to us. Visit williams.edu/strategic-planning to learn more and share your ideas. We'll update the site as the work progresses and share major developments and opportunities through the college's monthly email newsletter, Ephnotes, among other outlets.

In January, an ad hoc committee convened to develop ideas on how Williams can bring clarity to the role of campus speakers in our educational program in ways that ensure our commitments to both free expression and inclusion. Public interest in higher education tends to treat these two values as separate. I'm eager to see Williams contribute to the conversation by addressing them together. The committee will deliver its recommendations by this summer. I look forward to reviewing them with the community.

Another exciting development is our recent move to eliminate one summer of the college's required earnings contribution for all students receiving financial aid from Williams. The change will enable students to use the summer to expand their studies or explore careers. Affordability is a concern for all Williams families, and we'll continue looking for ways to open doors and reduce obstacles to access.

There's a great deal more happening at Williams, including the work of our wonderful faculty and students: six professors were granted tenure by the board in January, while students were honored with Rhodes, Schwarzman and Mitchell scholarships. There was yet another Directors' Cup—we've now won 21 in the award's 23-year history—and the completion of phase one of our science center building project. So many alumni and others have helped get the college to where it is today. I look forward to working with you to chart the next stage of Williams' long and exciting journey.



Williams

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HISTORIES IN THE MAKING

After reading about Williams' influence on the social and political history of Hawai'i ("Histories in the Making," fall 2018), I couldn't help remembering my Junior Advisor Duane Yee '57, a graduate of the Iolani School, who taught and administered at the Punahou School for 41 years. As president of the local chapter of Delta Phi Fraternity, Duane and his fraternity brothers revolted against the discriminatory admission and rushing policies in existence. This resulted in the expulsion of the local chapter by the national organization. With the help of some of Duane's other classmates, a campus-wide movement developed, which, only a few years later, under the leadership of President Jack Sawyer, resulted in the disappearance of fraternities altogether from the Williams campus, well before this happened at other colleges—a legacy of which we can all be proud. In light of the article and of the meanings of the exhibition, Duane was, in his own way, reciprocating Williams' influence on Hawai'i with his own influence on the social and political history of Williams.

> -ANDREW B. PACKARD '59, BAR MILLS, MAINE

I was charmed by the cover story about the connection between Williams and Hawai'i. As an undergraduate, I was only dimly aware of the Haystack Monument/Movement and its significance, but after graduation I taught at Punahou School for two years before graduate study and a career in



-@HYPERALLERGIC, TWEETING A LINK TO ITS REVIEW OF WCMA'S EXHIBITION, NOV. 21, 2018.

international affairs. A Williams classmate, Win Healy '60, accompanied me to Hawai'i and stayed at Punahou for almost 40 years, serving as principal of the academy (upper school) for 30 years before retirement. The magazine noted that six Williams alumni served as Punahou administrators, trustees or faculty in the 19th century. During my two years at Punahou (1960-1962), there were three Williams alumni on the faculty (myself, Win and Eugene Ambard '53), and Win went on to a senior leadership position. An article about Punahou in 1982 noted that three Williams alumni were then in leadership roles there and this is just a snapshot of a 20-year period in the 20th century. A search of school or college records would no doubt find well more than six Williams graduates serving this distinguished college preparatory school in the 20th century.

> -JOHN P. RICHARDSON '60, ARLINGTON, VA.

WILLIAMS AND WWI

As a history buff, I read with interest "Williams and World War I" (fall 2018) featuring

the exploits of professor Jean Norton Cru and Medal of Honor winner Charles Whittlesey, Class of 1905. But I was surprised to see no mention of Capt. Belvidere Brooks, Class of 1910, who made the ultimate sacrifice. Brooks was killed in action in France on Aug. 21, 1918, leading the 308th Infantry. In 1960, I was the recipient of the Belvidere Brooks Medal, which is awarded each year to that member of the football team who brought the most credit to the college. I was hoping to learn more about the man in whose memory the medal is dedicated.

> -JOHN NEWTON '62, ALEXANDRIA, VA.

EVEN MORE ON NORMALIZATION

I read David Kane's '88 commentary ("Letters," fall 2018) four times, at first thinking it must be parody. But he seems deadly serious. What has Williams become? What kind of illiberal college has Williams become to spawn such comments by an '88 graduate?

> -RICHARD EGGERS '60, LONGMONT, COLO.

KUDOS

I read with such interest the article by Bruce M. Beehler '74 titled "North on the Wing" (fall 2018) that I have bought the book from which your magazine printed an excerpt. Williams Magazine has few equals perhaps Harvard's?—among college magazines. Another article in the issue I was lucky enough to see, of astounding interest, was your lead article about Williams' connection with Hawai'i ("Histories in the Making").

> -JUDITH MCCONNELL, BEDFORD, MASS.



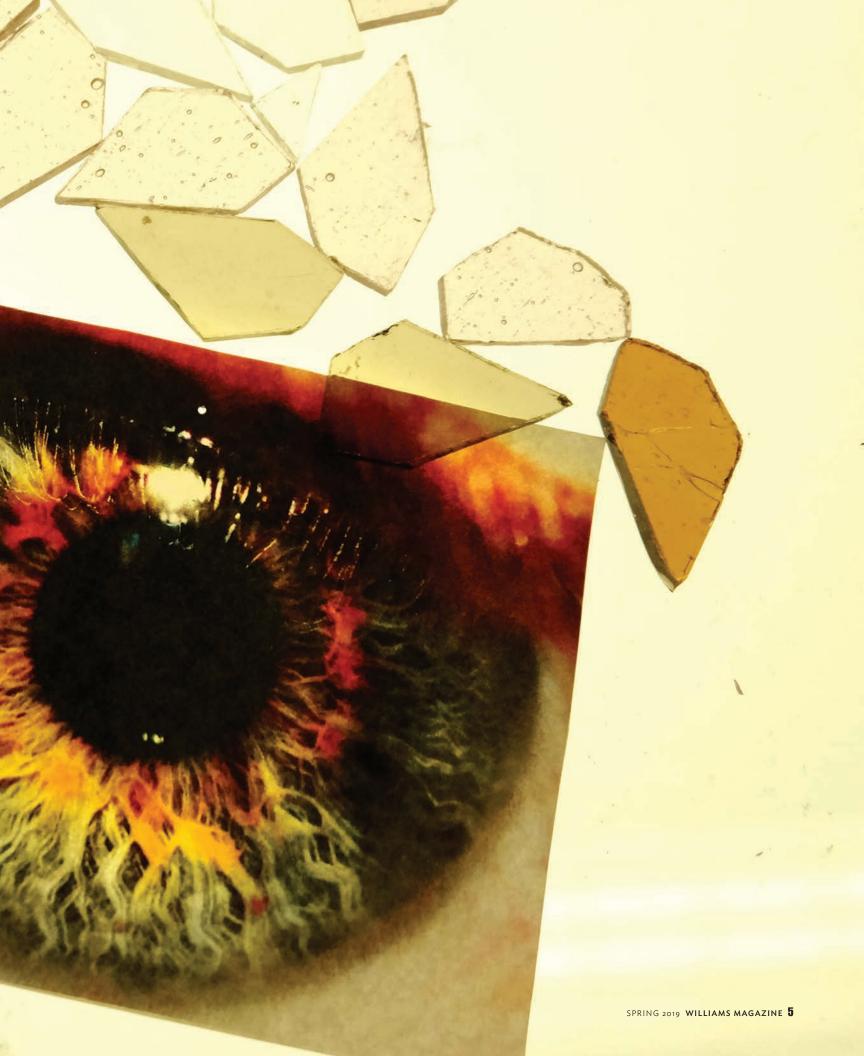
The Society of Professional Designers selected the fall 2018 issue of Williams Magazine as its Cover of the Day for Dec. 19, 2018.

Williams Magazine welcomes letters about articles or items published in recent issues. Please send comments to magazine@williams.edu or Williams Magazine, P.O. Box 676, Williamstown, MA 01267-0676. Letters may be edited for clarity and space.

NOTICE

PAINTING WITH LIGHT

In the Winter Study course Stained Glass Tiling: Quasicrystals and Geometric Solids, Building an Invisibility Cloak, students learned the geometric drawing, design and craft skills needed to build a stained glass window. The course was taught by Debora Coombs, a fellow of the British Society of Master Glass Painters, who has 35 years of experience designing, fabricating and teaching stained glass making. At the end of the term, the students' finished pieces were displayed in the sunny, third-floor corridor between Morley chemistry and physics labs in the exhibition "Painting with Light."



NEWLY TENURED

IN JANUARY, SIX FACULTY MEMBERS WERE PROMOTED to the position of associate professor with tenure, effective July 1. Williams Magazine asked them what stands out most about their time at Williams—so far. You can learn more about their teaching and research at bit.ly/wms2019tenure.



"I've had the opportunity to teach and conduct research with talented students, work alongside incredible colleagues whom I've learned from along the way and been part of a department that has become a second family."

> -JULIE BLACKWOOD, MATHEMATICS



"The students have taught me so much about how to fight harder and better for an equitable society. The honesty and energy of these young scholars has been the very best part of every day."

—ANJULI F. RAZA KOLB, ENGLISH





"My favorite aspect of my job is developing meaningful relationships with my students over time, experiencing the transition from curious introductory students to advanced students who can work with me in the lab."

-MATT CARTER, BIOLOGY



"It is always a thrill, inviting students to make interpretive judgments about their world. It is exciting to see who they become in the process." —JEFFREY ISRAEL, RELIGION



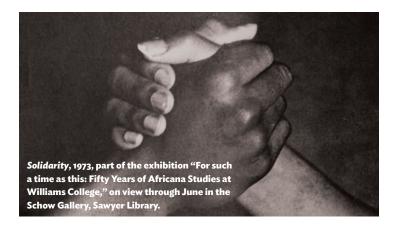
"My greatest joy is watching poetry transform my students as thinkers and makers and working with them to uncover through their own writing the freedom that poetry offers."

-JESSICA FISHER, ENGLISH

SCHOLARSHIP, SHARED

Six professors presented their research to the college community during the weekly Faculty Lecture Series in February and early March.

This year's speakers were Chad M. Topaz, professor of mathematics, on "Patterns, Swarms and the Unreasonable Effectiveness of Mathematics"; Phoebe Cohen, associate professor of geosciences, on "The Evolution of Life before Animals: Building Shields, Dodging Snowballs and Gasping for Breath"; Maria Elena Cepeda, professor of Latina/o studies, on "Latina Feminist Moments of Recognition: A U.S. Colombiana Encounter with Bomba Estereo's 'Soy yo.""; Guy Hedreen, the Amos Lawrence Professor of Art, on "The Origin of Species in Empedocles and the Visual Representation of Monsters: A Tale of Two Theories"; Neil Roberts, associate professor of Africana studies, on "How to Live Free in an Age of Pessimism"; and Alison Case, the Dennis A. Meenan '54 Third Century Professor of English, on "Authorizing Nelly: Female Narrative Authority, Wuthering Heights and Me."



FOR SUCH A TIME AS THIS

FIFTY YEARS AGO THIS APRIL, WILLIAMS' AFRO-AMERICAN STUDENT Association occupied Hopkins Hall and presented the college with 15 demands reflecting the needs and experiences of black students. The occupation ended with the association's leader, Preston Washington '70, and Williams' provost, Steve Lewis '60, presenting an action plan to address students' concerns. The seeds of today's Africana studies department were planted in that plan.

Today the work continues, with new concerns and priorities emerging in the effort to make Williams an inclusive campus. Reflecting on the past, present and future of this work, the Africana studies department is commemorating its 50-year presence with events and exhibitions organized around six themes: student activism; the genealogy of Africana studies; the academic impact of the Sterling Brown '22 Visiting Professorship and Gaius Charles Bolin Fellowship; the 30-year history of the Davis Center; ancestral ties; and considerations of black futurity. See bit.ly/2McfrTx for details and events.

RECENTLY PUBLISHED

In The Children You Teach: Using a Developmental Framework in the Classroom (Heinemann, 2018), **Susan Engel**, senior lecturer in psychology and Class of 1959 Director of the Program in Teaching, weaves together psychological research and real stories of students and teachers to show how looking at children through a developmental lens can transform the craft of teaching.

Alan Hirsch, lecturer in humanities and chair of justice and law studies, offers guidance on how to remove a sitting president—using historical lessons and perspective on the Constitution's stability during times of political uncertainty and crisis—in Impeaching the President: Past, Present and Future (City Lights Publishers, 2018).

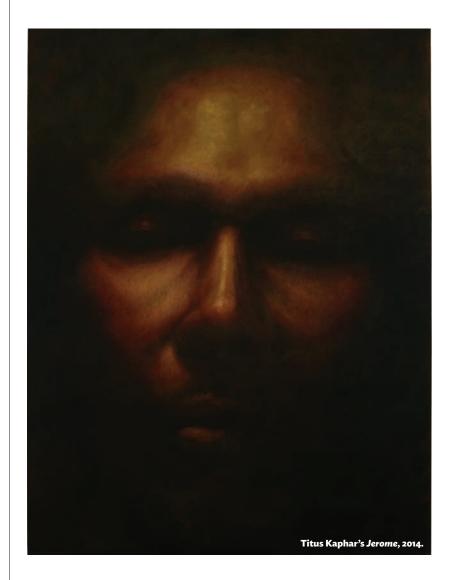
Williams College: The Campus Guide (Princeton Architectural Press, 2018) is a tour of buildings and art works led by **Eugene J. Johnson** '59, Amos Lawrence Professor of Art, emeritus, and **Michael J. Lewis**, Faison-Pierson-Stoddard Professor of Art History. Part memoir, part participant-observer's educational history, From the Cast-Iron Shore: In Lifelong Pursuit of Liberal Learning (Notre Dame Press, 2018), by **Francis Oakley**, Williams president, emeritus, Edward Dorr Griffin Professor of the History of Ideas, emeritus, and Senior Oakley Fellow is an account of the life of a scholar who has made a deep impact on his historical field, his institution, his nation and his church. Read an excerpt on p. 26.

Mark C. Taylor, Cluett Professor of Humanities, emeritus, returns to his central philosophical preoccupations in *Abiding Grace: Time, Modernity,*

Death (University of Chicago Press, 2018), asking
"What comes after the end?" in the post-war,
post-industrialism, post-religion, post-truth,
post-biological, post-human and postmodern ages.

See more works and submit updates on new publications at ephsbookshelf.williams.edu.

A CLOSER LOOK



ENORMOUS ACQUISITION

THE WILLIAMS COLLEGE MUSEUM OF ART (WCMA) IS DEEPENING ITS engagement with a living artist—and with issues of social and racial justice—with the recent acquisition of Titus Kaphar's large-scale work, *Jerome*.

A 96-inch x 72-inch oil on canvas, *Jerome* is the first in a series titled The Jerome Project, inspired by Kaphar's search for his estranged birth father's prison records. The painting, now on view, also reflects the artist's exploration of technique in the history of painting.

Two collages by Kaphar are part of WCMA's art loan program, WALLS, and inspired students to invite him to speak at Claiming Williams in 2018. His talk sparked student interest and the decision to acquire *Jerome*.

"The addition of major works by prominent African-American artists demonstrates a passion on the part of students, faculty, staff and alumni for making the collection ever-more inclusive," says WCMA director Pamela Franks. "Jerome will be a touchstone for students and faculty and a visitor highlight."



BEIJING BOUND

KAI CASH '19 WILL TAKE PART IN a highly selective, one-year master's program at Tsinghua University in Beijing next year as a Schwarzman Scholar.

An economics major from the Bronx, N.Y., Cash plans to pursue a degree in global studies with a focus on public health. He'll also explore how China's culture, politics and economy impact the country's public health issues. Combining interests in business, entrepreneurship and empowerment, he hopes to someday found an organization that improves living conditions and health for members of disenfranchised communities.

"Williams instilled in me the ability to leverage and understand multiple perspectives and disciplines while addressing my own biases to confront challenging problems," he says. "The framework of human-centered design thinking that I learned here changed the way I view the world and has allowed me to grow as an individual."

Cash, who is class president and a student trustee for the Gaudino Program, was president of the Williams Business Association. From there he co-founded the Williams Professional Association, which helps students, especially those from historically underrepresented communities, find meaningful careers after Williams.

CLOSING THE GAP

Keshav Goel '19 will study in Ireland next year as a Mitchell Scholar. He's the first Williams student to receive the highly competitive scholarship since its 2001 inception.

An economics and biology major from Monte Sereno, Calif., Goel is an aspiring physician interested in addressing effects of socioeconomic inequity in the U.S. health care system, especially the impact on children. At age 16 he co-authored his first published clinical paper on the automated detection of congenital heart defects in newborns. He is now working on a biology thesis to uncover the mechanisms of asthma, which largely affect impoverished children.

At Williams, Goel has been a teaching assistant in the economics and chemistry departments, is a Class of 1960 Scholar in biology and has served as a class representative on the college's Honor and Discipline Committee.

Goel plans to study immunology and global health at Maynooth University. "I am convinced that public health care and evidence-based medicine in Ireland will inform me of how to implement similar models in the U.S.," he says. "I believe society can close the gap in youth health outcomes, and I intend to be part of that change."

NEW RHODES

LINDA WORDEN '19, A POLITICAL ECONOMY MAJOR FROM Penticton, B.C., is headed to the University of Oxford next fall as a Rhodes Scholar. Worden plans to pursue an M.Phil. in comparative social policy with an emphasis on social policy reform and its effects—and to pursue her favorite sport, roller derby. Williams Magazine checked in with her to learn more.

What inspired your path?

As part of Winter Study in 2017, I did an independent study project to interview precariously housed LGBT youth in Vancouver, Canada. The experience combined my interests in social policy and housing justice.

Why an M.Phil.?

The comparative and interdisciplinary nature of the M.Phil. is ideal for further exploration of social and housing policies due to its focus on social citizenship, typologies of welfare states and social policy reform pressures.

What do you hope to learn?

I want to better understand the role of new social risks, such as deregulation of finance, immigration and mental health, on both the welfare state and citizen participation across different national contexts.

So, roller derby?

I love roller derby! While abroad on the Williams-Exeter Programme at Oxford, I learned to skate with Oxford Roller Derby. I plan to return to their team next year.

IN MEMORIAM

The college community said goodbye to Renzie Lamb, retired coach and assistant professor of athletics, who died on Nov. 17, 2018, at the age of 81, and to Charles "Charlie" Fugua, the Garfield Professor of Ancient Languages, emeritus, who died on Jan. 19 at the age of 83.

Lamb coached Williams men's lacrosse and football and women's squash in a career that spanned 36

years. He was a mentor, friend and inspiration to generations of Ephs. "He taught [players] the value of hard work, sacrifice, loyalty and leadership," says Dick Nesbitt '74, senior advisor in the admission and financial aid office, who played lacrosse for Lamb as a student and coached the sport with him for a decade. Lamb was inducted into four Halls of Fame. including the Intercollegiate



Men's Lacrosse Coaches Association Hall of Fame. Thirty of his players earned All-America honors. He is survived by his wife, two daughters, two stepsons and five grandchildren.



Fugua joined the faculty in 1966 as chair of the **Department of Classics** and taught Greek and Latin until his retirement in 2003. He served on numerous college committees and was known widely as the author of the "Fugua Letter," which pioneered the concept of transparency in the higher education tenure process. "He contained worlds, and he gave of those worlds to his students and colleagues at Williams," says Meredith Hoppin, the Frank M. Gagliardi Professor of Classics, emerita. He is survived by his wife, three children and a granddaughter.



BY MICHAEL BLANDING '95
ILLUSTRATIONS BY DAVIDE BONAZZI

Humankind is poised to make tremendous advances in space exploration and travel within the next 15 years.

A number of Ephs are leading the way.

IMAGINE A HIGH-RESOLUTION TELESCOPE that uses X-rays to "see" inside a black hole. Or a fleet of tiny satellites that inspect the surface of a planet before a larger craft sets down. Or a remote-controlled probe that collects soil samples and shoots 3D photos and videos in an uncharted region of Mars. Or medical advances that clear the way for humans to travel to galaxies far, far away.

Such innovations and technologies are within reach, and a number of Williams alumni and faculty are on the front lines of developing them. Among them is astrophysicist Laura Brenneman '99, whose pioneering research has expanded our understanding of black holes. Joseph Shoer '06, a spaceflight engineer, is adapting small, disposable satellites to capture detailed images of the moon's surface, and Joseph Gangestad '06, an orbital mechanics expert, is behind the calculations that keep satellites like Shoer's from crashing into one another. Researchers Tim McConnochie '98, Kathryn Stack Morgan '08 and Tina Seeger '16 are playing prominent roles on the Mars Curiosity and 2020 rovers. And flight surgeon Robert Sanders '90 is developing hightech space suits and medical protocols, while Williams biology professor Steven Swoap is studying torpor in mice to uncover links to human hibernation—all of which will be useful for long-distance space travel.

The science and technology central to their work can seem mind-bending—the stuff of science fiction. Yet these Ephs and others are making sense of it all, enjoying the thrill of discovery in ways large and small. As Sanders puts it: "One of the best parts of my job is problem-solving. I am part of a mission where I know what I do makes a difference."

small. As Sanders puts it: "One of the best parts of my job is problem-solving. I am part of a mission where I know what I do makes a difference."

STAR GAZING

Williams has been punching above its weight in fields tied to space research since 1836. That year, Albert Hopkins, a Williams graduate and professor of mathematics and philosophy who also taught astronomy and French, began designing, funding and, with his students, helping to construct the observatory that bears his name.

Hopkins Observatory, now the oldest in the country, was among the factors that drew Laura Brenneman '99 to Williams to study the stars. Others included state-of-theart telescopes atop the Science Center and a powerhouse astronomy faculty consisting of Karen Kwitter, Steven Souza and department chair Jay Pasachoff, who each year travels with students to view and research solar eclipses.

"There aren't a lot of institutions that boast those kinds of resources," says Brenneman, who went with Pasachoff and a team of researchers to observe an eclipse in Aruba.

A connection she made as a student led her to NASA's Goddard Space Flight Center in Maryland to work on high-energy astrophysics and to study black holes. These hot, swirling centers of matter have a gravitational field so strong, not even light can escape. They're among "the most extreme and violent phenomena in the universe," Brenneman says.

Using X-ray telescopes orbiting Earth, she was able to calculate for the first time ever how fast black holes spin by measuring the speed at which gas closest to the event horizon—the point at which light can't escape—revolves around the black hole.

"It's like placing eggbeaters in thick batter," she says. "Spinning the beaters causes the batter to spin, too."

Adds Brenneman, who published a short book on her findings in 2013, "My interest in X-ray astronomy coincided with a golden age in the field."

Now an astrophysicist at Harvard & Smithsonian's Center for Astrophysics, Brenneman is in high demand as a collaborator on other missions involving new, more powerful telescopes. She is a co-investigator for XRISM, a Japanese X-ray astronomy satellite to be launched in 2022, and she's helping to develop the science plan for Athena, a European X-ray telescope set to launch in the early 2030s to investigate black holes at the centers of galaxies, among many other areas of astrophysical research.

She's also co-investigator and scientific operations manager of Arcus, a U.S.-based X-ray telescope carrying the highest-resolution grating spectrometer that will have ever flown. Brenneman likens the instrument to "a fancy, high-tech prism that will refract color very, very finely."

Proposed for launch in 2023, Arcus will give scientists the ability to analyze objects ranging in size from supermassive black holes to fine bits of interstellar dust in order to determine traits such as temperature, chemical abundance and ionization. Brenneman and her colleagues expect it to yield evidence of hidden baryons—subatomic particles that are predicted to lie in hot haloes of gas surrounding galaxies and star clusters. All of which may shed light on how galaxies form and change over time.

Arcus, says Brenneman, is "literally going to be a hundred times more sensitive than our current best instruments in this energy range."

SPACE SCOUTS

In June 2020, NASA is scheduled to launch its new Orion spacecraft in hopes of paving the way for future travel to the moon and deep space. In addition to ricocheting around the moon for a month, the un-crewed vessel will accompany a fleet of 13 small satellites called CubeSats, each roughly the size of a shoe box, to test propulsion and communication technologies and capture images.

Joseph Shoer '06, a spaceflight engineer at Lockheed Martin, is working on one CubeSat fitted with an experimental infrared camera. Images from the camera are

'WE HUMANS HAVE A UNIVERSAL DESIRE **TO PROBE BEYOND OURSELVES WHEN WE LOOK INTO THE NIGHT SKY AND SEE STARS AND NEBULAS AND ASK** OURSELVES WHERE THEY CAME FROM.

-LAURA BRENNEMAN '99, ASTROPHYSICIST, HARVARD & SMITHSONIAN'S CENTER FOR ASTROPHYSICS, WHO IS USING X-RAY TELESCOPES TO BETTER UNDERSTAND BLACK HOLES



expected to help researchers better understand the interaction between the moon's surface and solar particles.

"We want to prove that even tiny satellites can take useful images in deep space," Shoer says.

A physics major at Williams, he worked with Professor Jeff Strait to investigate laser pulses in fiber-optic wires. Shoer says he learned important and "very translatable" skills in Strait's lab, including "being systematic and careful when working with hardware."

Shoer earned a Ph.D. in aerospace engineering at Cornell University, where he first experimented with using CubeSats as modules assembled into larger spacecraft.

Small and disposable, CubeSats require less fuel to launch and are less expensive to build than a typical satellite. But they pose interesting design challenges, especially the deeper they go into space, Shoer says. As one example, a satellite traveling far from the sun requires large solar panels to gather energy. Fitting large panels onto a CubeSat isn't feasible, so a different solution is required.

"It's a balancing act," Shoer says. "Nothing about physics changes when you go from a van-sized satellite down to one the size of a briefcase."

About 1,000 CubeSats already orbit the Earth, launched by governments, universities and corporations to gather climate data, monitor weather patterns and track hurricanes and forest fires. They are among approximately 4,600 known satellites currently in orbit—2,000 of which are operational.

With all that equipment winging around at 15,000 miles per hour, plus what's estimated to be hundreds of thousands of pieces of man-made debris of all sizes floating through space, there's little room for error when tracking satellites' movement. That's where Joseph Gangestad '06 comes in. An astronomy major at Williams, he now works for the Aerospace Corporation, a national nonprofit that operates a federally funded research and development center and provides technical guidance to the U.S. Air Force, NASA and other civil agencies.

Gangestad specializes in orbital mechanics, using complex mathematics to calculate satellites' courses and determine their positions with high precision—within 20 feet for each microsecond. Among his recent projects, he helped develop the orbits for NASA's Transiting Exoplanet Survey Satellite (TESS), which seeks out signs of planets just outside our solar system. TESS already has identified three new exoplanets, the closest of which is 49 light years away.

His calculations can also be used to help coordinate constellations of multiple CubeSats, which can work together to sample a single spot on a planet's surface every few minutes. A larger satellite would need hours to orbit around a planet to perform the same task.

In the future, Shoer and Gangestad say, CubeSats can serve as scouts, finding safe places for spaceships

to land on Earth's moon or other planets. Already NASA scientists are exploring the possibility of sending a constellation of CubeSats to Europa, an ice-covered moon of Jupiter, to survey the planet's surface in preparation for a future landing by a larger spacecraft.

"Instead of sending one gigantic satellite, you could have a mother ship with lots of little ones," Gangestad says.
"With that ubiquity, you'd be able to investigate multiple places at once."

CubeSat technology might also translate into tiny, portable devices that astronauts can one day carry with them onto a planet's surface.

"An astronaut exploring the moon or Mars might unclip the device from their backpack and chuck it out there to pick up samples or take photos," Shoer says. "In the end, it could make the whole mission better."

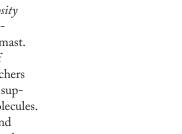
MARS ROVERS

A trio of Ephs—Tim McConnochie '98, Kathryn Stack Morgan '08 and Tina Seeger '16—are playing important roles in the ongoing Mars *Curiosity* rover mission. They're also looking ahead to 2020, when NASA will launch a new, more sophisticated rover to explore a different part of the red planet.

McConnochie studied astrophysics and economics at Williams and then joined the Federal Reserve. After a year, he changed careers, joining NASA's Jet Propulsion Laboratory (JPL) to study lunar ice. From there he went on to receive a Ph.D. at Cornell University, where he took part in the 2001 Mars *Odyssey* mission. Though the robotic spacecraft completed its primary work—including searching for evidence that Mars might once have been able to support life—it continues to orbit the red planet and send data back to researchers.

In 2006, McConnochie moved to NASA's Goddard Space Flight Center as a postdoc, joining the *Curiosity* rover team in 2012. Among the rover's many instruments is ChemCam, situated at the top of its long mast. ChemCam was designed to fire a laser at an area of rocks or soil less than an inch wide, allowing researchers searching for clues that ancient Mars' environment supported life to analyze the elements in vaporized molecules. The instrument can also operate without its laser, and McConnochie and his colleagues realized that, with the laser off, they could aim ChemCam at the atmosphere and gather useful data.

Experimenting with this capability "led me to very accidentally realize I could measure water vapor and oxygen," McConnochie says.



Data he collected via ChemCam helped show that, every night, more than half the near-surface water vapor in Mars' atmosphere is being removed by adsorption, a process by which water molecules stick to the surface in cold temperatures. The process could be the key to providing a water supply for humans traveling to Mars in the future, says McConnochie, who will continue his research during the 2020 mission using the new rover's SuperCam, which expands ChemCam's features to include a laser that can be fired longer distances and tools to analyze unvaporized molecules directly.

Mars is also the focus of Stack Morgan's work, thanks, in part, to a "life changing" tutorial at Williams. She came to college planning to study astrophysics. During her sophomore year, she took Professor Rónadh Cox's Planetary Geology, in which students hypothesized about geological processes on other planets using remotely

captured images and chemical and spectral data. Stack Morgan says she was hooked and decided to major in geosciences and astronomy instead.

She continued her studies at Caltech, conducting research and creating geological maps based on orbital images of the surface of Mars. Her work, which included searching for evidence of water in Mars' sedimentary rock, made her an obvious choice to join the Curiosity team. After the Mini Cooper-sized rover landed in the Gale crater in 2012, she was responsible for planning Curiosity's routes and determining the best places for it to stop and investigate, based on her maps. She also drove the rover and lived on "Mars time" for three months,

syncing her working hours with those on the red planet, whose days are 40 minutes longer than Earth days.

"You wake up, and you are seeing a new piece of Mars no one has ever seen before," she says of the experience.

Stack Morgan completed her Ph.D. in 2014 and now works at the JPL, which runs the Curiosity mission, using the rover's mass spectrometer to detect organic molecules including carbon, nitrogen and oxygen as well as minerals such as sulfate and clay that depend on water for their formation. In addition, she serves as the deputy project scientist on the Mars 2020 rover mission.

Not long after Stack Morgan graduated from Williams, Seeger arrived at the college and forged a similar path. She, too, took Cox's Planetary Geology tutorial and calls it a "turning point" in her academic career. Seeger also majored in astronomy and geosciences, and she calls Stack Morgan "a legend in our department."

"She drives the Mars rover," Seeger says. "As a student, it was the coolest thing I had ever heard."

Seeger's senior thesis on the moons of Jupiter captured the attention of a Caltech professor who invited her to be his laboratory technician. She began working on *Curiosity*, studying conglomerate rocks on Mars for signs of past water—and working alongside Stack Morgan.

Soon Seeger was the "Keeper of the Plan," sharing her laptop screen with scientists all over the world so they could drag and drop their work into the research queue. Now at Western Washington University, she is poring over kaleidoscopic images of rocks and soil photographed by an instrument called Mastcam, which is mounted below ChemCam on *Curiosity*'s mast. Her research involves identifying large-scale patterns that may improve understanding of how weather patterns, including dust storms, have moved the soil from one place to another. The 2020 rover will also have a mast camera, Mastcam-Z, with the ability to take 3D photographs and shoot video.

The 2020 rover features other enhancements, including a robotic drill to take samples of soil and rock and store them on the planet for a future mission to retrieve. Once the samples are back on Earth, researchers will be able to examine them for signs of biological signatures or fossils to confirm that life once existed on Mars.

"Most likely it would be microbial life," Stack Morgan says. "We'd be extremely lucky and very surprised if we found the martian equivalent of fossils like trilobites or dinosaur bones."

Scientists will also be testing another instrument on the new rover called MOXIE, which converts carbon dioxide into oxygen—a nod to eventual human travel.

MOXIE "could produce oxygen to breathe," says Stack Morgan. "But, more importantly, it could produce oxygen fuel for us to leave Mars and come home."

PREPARING FOR LIFTOFF

NASA is planning a crewed spaceflight back to the moon in the late 2020s. If all goes well, the agency may be able to send people to Mars-or, more likely, its moon Phobos—by 2033, when the red planet will be at its closest to Earth in 30 years. The journey could take nine to 10 months each way, and NASA flight surgeon Robert Sanders '90 and Williams biology professor Steven Swoap are conducting research and developing technologies to get astronauts there as safely as possible.

Sanders is a crew health and safety flight surgeon at NASA's Johnson Space Center in Houston and medical director at the Neutral Buoyancy Laboratory—a pool four stories deep and large enough to contain a full-sized space station—which simulates a zero-gravity environment. Astronauts in training there can don a spacesuit and experience every aspect of a six-and-a-half-hour spacewalk.

Sanders describes himself as a "dive bum" who began scuba diving at age 14. A theater major at Williams, he also worked as a part-time emergency medical technician, helped organize a scuba club and taught diving classes through the physical education department. After graduation, he worked on set design with the Metropolitan



Opera Company in New York and then moved west to work in a dive shop, as an Antarctic research diver and then as a first-aid person/set medic on film and TV productions. He went on to receive a medical degree at Rosalind Franklin University in Chicago.

Today Sanders is an expert in hyperbaric medicine the treatment of patients who develop decompression sickness, known as "the bends." Decompression sickness can occur when a diver surfaces too quickly, causing nitrogen that dissolved in the blood during the dive to form bubbles that can lead to pain, weakness, heart attack and stroke.

The same thing can happen in the vacuum of space. An astronaut must decompress before leaving a spaceship or space station to make repairs or do a spacewalk. Currently, spacesuits are pressurized to 4.3 pounds per square inch (psi), about a third of Earth's atmospheric pressure.

"Just to do a spacewalk takes four hours to de-nitrogenate," says Sanders, who's overseeing tests on new spacesuits that can be pressurized to 8 psi, cutting the time an astronaut needs to depressurize to as little as 10 minutes.

He's also researching the effects of fluid shifts inside the body due to zero gravity, which may cause vision and sinus problems as well as excess fluid in the lungs. And he's addressing other challenges on long missions, including providing medical care.

"We usually don't have a physician on board, so everything we do now is through telemedicine," Sanders says.

But telemedicine isn't always viable, since it would take half an hour for a signal from Earth to reach a spaceship on Mars. So Sanders and his colleagues are developing computer-assisted procedures to help astronauts provide care themselves.

Another issue on long missions involves medication. Most drugs expire within a few years of their date of manufacture.

"If a Mars mission is three years, what does that mean for the Advil we send with them?" Sanders asks.

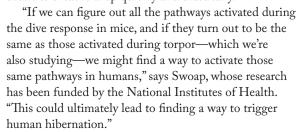
Other risks and challenges associated with a monthslong flight are easy to imagine—providing food and water, managing waste of all kinds and keeping astronauts' bodies and minds active to avoid deterioration of muscles, bones and brains. But what if those issues could be avoided altogether by putting the humans into states of suspended animation? That's a question Swoap and other researchers are trying to answer.

The idea isn't as far-fetched as it may seem, says Swoap, who came to Williams in 1996 and who studies the connections between hibernation and the dive response in mice. When their caloric intake is reduced and the temperature gets cold, mice enter a state of torpor. Their heart rates slow, and their internal body temperatures and metabolisms drop. The reverse happens when temperatures rise and caloric intake increases.

"YOU WAKE UP, AND YOU ARE **SEEING A NEW PIECE OF MARS NO ONE HAS EVER SEEN BEFORE."**

-KATHRYN STACK MORGAN '08, MARS 2020 ROVER DEPUTY PROJECT SCIENTIST, WHO DROVE THE MARS CURIOSITY ROVER AND LIVED ON "MARS TIME" FOR THREE MONTHS

A mouse has a similar physiological response as soon as its nose is submerged in water. Called the dive response, it's something humans experience as well. When people dive under water, their heart rates, blood pressure and desire to breathe drop quickly and drastically.



Swoap and his students are also studying cyclohexyladenosine, a modified version of one of the components of DNA. When it binds to cells in the heart or central nervous system, the compound sends a signal to slow the heart rate and metabolism. Another promising avenue to bringing on torpor is 2-deoxyglucose, a modified sugar molecule that the body can't break down, outcompeting regular glucose and starving cells for energy.

"The brain sees this as a starvation signal and induces hibernation," Swoap says.

In mice, both compounds cause torpor, which can be reversed with no ill effects. Whether they can be used similarly in humans remains to be seen.

"The optimist in me says that we will have some information about how animals hibernate within the next three years," Swoap says. "But the applicability of it and safety in humans is a big question mark. I don't know if it will happen by 2033, but I'm optimistic it could."

That optimism pervades the work of all these Ephs and many others—who are making meaningful progress in understanding life beyond our solar system.

Says Brenneman, "We humans have a universal desire to probe beyond ourselves when we look into the night sky and see stars and nebulas and ask ourselves where they came from. Looking at the extremes of the universe can help answer those big questions."

Michael Blanding '95 is a Boston-based writer and the author of The Map Thief (Gotham Books, June 2014).



WENDY ADAM

Director of Integrative Wellbeing Services, helping all students develop healthy coping and self-care skills while ensuring that those who need it can access excellent professional counseling in a timely manner.





their needs so he can better advocate for them.

HOW PHOTOGRAPHS BY JULIA MUNEMO PHOTOGRAPHS BY KATHLEEN DOOHER MEAN TO THE PROPERTY OF THE PR

A look at Williams' comprehensive, collective approach to providing students the tools they need to navigate college—and life.

TATIANA McINNIS

Associate Director of the Davis Center, who collaborates with students, faculty and staff to integrate the critical inquiry and praxis of social justice and equity into the broader Williams community.

CHRISTOPHER SEWELL '05 VISITED THE DEAN'S OFFICE ONLY TWICE AS A Williams student. Once was during his first year, when he spoke to the dean of the college about a bad grade. The other time was to discuss study abroad.

These days, however, it's common for a student to meet with a dean several times a semester for all sorts of reasons, says Sewell. Now an associate dean at Williams, he's part of a complex, comprehensive web of people who provide students with important tools for navigating college—and life.

The work isn't new. It's more that the college's approach, and that of higher education, nationally, is evolving. "Twenty years ago, a small number of staff were dedicated to student support," says Marlene Sandstrom, the Hales Professor of Psychology and dean of the college. "Today we invest many more resources as we've shifted our philosophy from 'How can we help students be better prepared for Williams?' to 'How can Williams be better prepared to meet the needs of our students?""

Across the college, countless staff look out for students' wellbeing every day in ways large and small. But numbers don't tell the whole story. "We describe Williams as high touch, because we're small and intimate," Sewell says. "We need to make sure students know about and utilize these resources, and we try to help normalize support."

To get a sense of that collective work, and new approaches to it, *Williams Magazine* interviewed eight people who provide direct support to students. Common themes emerged, including why college can be such a difficult time of transition, how a small community presents both challenges and opportunities, and what it's like to work with high-achieving students.

What does your work involve?

WENDY ADAM, DIRECTOR OF INTEGRATIVE WELLBEING

SERVICES: We work with students whose needs range from serious, long-term mental illness to adjustment challenges such as being away from home for the first time and learning to manage all that comes with it. Williams has and always will have a very strong clinical treatment approach. We also want to empower all students with the variety of skills they need—including, for example, self-compassion and mindfulness—to keep themselves well and to live in the full range of human experiences. I see the student as a whole person, with physical, psychological, emotional, social and spiritual aspects of self. It's crucial to care for their unique needs and opportunities for growth in each of these areas.

THE REV. VALERIE BAILEY FISCHER, CHAPLAIN TO THE **COLLEGE:** I support three chaplains in our work to serve all our students regardless of their religious affiliation. Our office is a ministry of presence—we meet with students over coffee and meals and offer a listening ear or encouraging thought. They might talk about their lives or what's going on in the world, or they may just sit and do their work. We reach out to students throughout the semester, including hosting a tea station at the library and a Hanukkah party attended by Jewish and non-Jewish students. We provide religious services and sacred texts and Bible study. We leave room for exploration and questioning, and, as much as students want to learn, we are there to help them.

HANNAH LIPSTEIN, VIOLENCE PREVENTION

COORDINATOR: Often in interpersonal violence work we think of response—serving survivors of sexual assault or harassment or stalking. My focus is on prevention. My work involves digging into why violence is happening—broadly and at Williams—and educating the entire student body to work toward ending it. I run bystander training workshops, helping students learn how to be accountable, informed, responsible community members. I do consent education and workshops on healthy boundaries. I work with student groups and athletic teams. I've sat in the student center with a whiteboard, asking students to respond to prompts about what healthy relationships look like. It's rare for a college our size to have a full-time person working in this capacity, but Williams has two. (Meg Bossong '05 is director of sexual assault prevention and response.)

TATIANA McINNIS, ASSOCIATE DIRECTOR OF THE DAVIS

CENTER: I provide holistic care for students—everything from discussing class assignments to consulting on group dynamics within and beyond the Minority Coalition to organizing off-campus trips or bringing a band to campus. I provide workshops for folks who are just jumping into the vocabulary around equity and inclusion

and for those seeking to understand how experiences of oppression compound and inform how students arrive at and move through their own college experiences. I also train hiring committees so that staff and faculty diversity reflects that of students.

LAURA MULLER, DIRECTOR OF QUANTITATIVE SKILLS PROGRAMS AND PEER SUPPORT: I work with faculty who are teaching any course with a quantitative component, small to large, on everything from writing assignments to helping students build particular skill sets, like graphing or learning Excel spreadsheets. I also oversee the peer tutoring program, which includes the Math and Science Resource Center, the Economics Resource Center and individual peer tutoring. Students come to our resource centers from across the disciplines. Our centers have about 650 visits per semester and about the same number in individual tutoring. We see everyone from the student who is having a lot of difficulty to the student who is getting a B-plus and wants an A.

APRIL RUIZ, ASSOCIATE DEAN: My particular focus is on first-generation college students. It can be a difficult transition from a family that has not navigated college or a community where not many people graduate high school and go on to four-year institutions, to a place overflowing with resources, choice and opportunity—to be in classrooms with peers that are their intellectual equals but who have been better prepared for what college brings. I help students celebrate their first-gen identity while also working through challenges that identity sometimes brings. I help them connect with the Williams family alumni, faculty and staff who all want to help students make the most of their undergraduate education.

CHRISTOPHER SEWELL '05, ASSOCIATE DEAN: I focus on transfer students, veterans and anyone who takes a leave of absence and then returns. The students I serve are either older or have taken time away and are coming back in a different space. My work might be as simple as emailing transfer students and veterans over the summer and inviting them to a welcome dinner. I might check in with my students once a month, or more often, asking, "Are you OK? What's going on?" I try to ensure that all my students see my office as a place they can be helped and leave feeling like there is a clear plan in place to ensure they are successful.

G.L. WALLACE, DIRECTOR OF ACCESSIBLE EDUCATION:

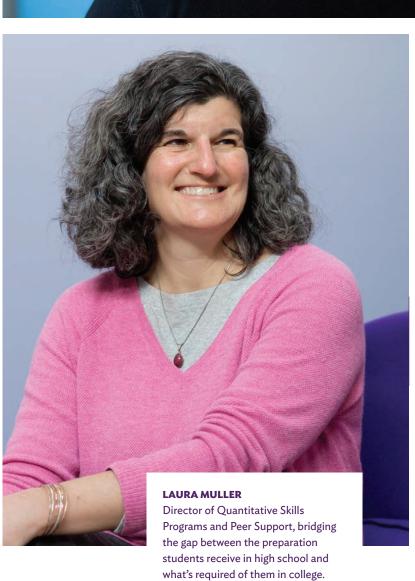
My job involves articulating a vision for and being engaged with the discourse around disability and accessibility on campus. The populations I serve include students who had formal supports in high school, students who wish they didn't still need services in college but do and students who find the experience of college to be somewhat debilitating. We help them get access to day-to-day supports, like additional time on an exam, or provide them with services like note-takers or audio

G.L. WALLACE

Director of Accessible Education, whose goal is for the college to look at ability holistically, placing the work of his office in the context of larger conversations around issues of diversity.



recordings of readings. We have structural accommodations, like offering students who need it a reduced course load or the chance to take a course over the summer or graduate on a different timeline. I try to remind students that accessing these resources should not be a stigmatized experience but one that acknowledges that institutions are narrow and we need to expand on their design.



APRIL RUIZ

Associate Dean, focusing on first-gen students, helping them engage with the opportunities their education affords through times of struggle and achievement.



Why is college such a time of transition for students, and how is the understanding around their transitions shifting?

SEWELL: The transition to college comes with social, emotional and academic changes. Whether it's "This is my first time away from home," or "These are the hardest classes I've ever taken," or "I come from a very structured school environment, and now you're asking me to make choices about my schooling," there's so much happening, and it's very easy to become overwhelmed.

MULLER: As students transition from high school to college, a lot has to happen that first semester. We're taking a whole bunch of students from different backgrounds and placing them in a classroom together, and we can't expect them to all be the same. There are experience gaps.



ADAM: National data indicate that more than 30 percent of college-age students have seriously contemplated suicide, and 25 percent report having used self-harm, such as cutting or burning themselves, in stressful situations. Strong emotions and a limited capacity to manage them manifest differently in the college population. This generation is constantly on and has immediate access to pretty much anything they want to know. That comes with the capacity to distract themselves from what they're feeling or experiencing, sometimes allowing strong emotions or important needs to go unattended and become overwhelming. Sleep deprivation and interrupted rest also have significant impacts. One thing I recommend to students is to take sleep seriously, because it directly affects their mental health.

McINNIS: Our student body is 36 percent to 38 percent students of color, and those students have experienced and/or witnessed alienation, racialized violence and violence against trans folks and queer folks. But now they're at Williams, and that means they'll be "set" in the future if they take advantage of the network and privileges here. It's hard to balance acknowledging that it's difficult here but that there are folks who share cultural identities and don't have access to the same wealth of resources—and for our students to accept those resources.

RUIZ: For first-generation students and students from marginalized identities, there's a pressure to represent as well as possible all of the folks from their background. They think, "The moment I ask for help and admit what I perceive to be a weakness is the moment I let my entire community down." They carry a lot on their shoulders to achieve and be independent, which are good qualities in some ways but also don't always serve students well.

outreach and advocacy.

How does the intimacy of a small campus enhance or complicate your work with students?

BAILEY FISCHER: We're lucky to be able to provide a space where people can navigate differences. Because our community is diverse, and we do things together, we can create a village with neighborhoods. Some people always stay within their proverbial neighborhood, and some will go out to the bodega that's shared by everybody—and the students love this diversity. They also enjoy the opportunity to dive deeper into their own faiths or the room to explore another.

LIPSTEIN: Williams is fortunate to have a really invested and engaged student body. There is a sense that people look out for each other. The belief that everyone should be having safe and healthy experiences on campus is not new here, and it feels doable because Williams students know each other. When one student is engaged in a conversation about prevention and building healthy communities, it has ripple effects across the whole student body.

MULLER: Our students like working in study groups. They like being together. They like thinking about problems together. One benefit of Williams is that it provides spaces for students to find each other. The Math and Science Resource Center is in a beautiful space in Schow Science Library, with little pods for each class. The Economics Resource Center is in Schapiro Hall, in close proximity to the department. And we have dedicated student tutors who can help.

WALLACE: Increasingly, we're understanding that there is a cultural component to being differently abled in the world—of living with a chronic illness, of living as a person who is deaf or blind, of living with a learning disability. These are life experiences that can radically alter how students engage with the college. We can be flexible and individualized in our approach to serving students' needs. Sometimes an accommodation is temporary for someone with a health issue. If a student has chronic depression, it may impact their ability to complete coursework or take an exam at a certain time, but it may not present itself in regular, routinized ways. So we can respond as needed.

Williams students are understood to be high-achieving. How does that impact your work with them?

BAILEY FISCHER: Students are here working very hard at great personal, financial and intellectual cost. Part of what we do in the Chaplains' Office is support them pastorally and spiritually. We do the soul care, and it's primarily so that they are able to be here and it can be a life-giving experience. We tell them we know it's sometimes hard, but we're here to help them through it.

ADAM: Williams students need relationships with people they can trust. They need a place where they can feel safe not to be hyper-performing, where they don't have to have it all worked out or have all the answers or be perfect. They need to have a place where they can struggle with their identity over and over and over again, because it's so intricately linked to thriving during this time in their lives. They need to know it's OK not to know—to not know why they feel so bad or why they're struggling. This population is quick to solve, and the beauty of ongoing mental health work is to be more and more curious. The less we're certain about things, the more growth can happen. Our team gives them a larger vision for what mental health services and wellbeing can look like, with the skills and knowledge they need to help themselves stay well.

RUIZ: Our students are used to taking on a lot, and they are highly driven and motivated. When they land in this playground of opportunity, they can take on so much, and it creates a feeling of pressure to maximize—to do it right. They want to live up to the expectations of their community, of themselves, of their professors. And there can be a hesitation to ask for help. Many good students realize that at some point they will reach a bump in the road, and some are prepared to know what those moments look like and how to get the resources and guidance they need. But some students aren't as prepared. It's a sign of great maturity to ask for help, and college is a good place to ask. So I remind my students that if they already knew everything, they wouldn't have to be here. I remind them that it's OK to receive less than an A grade if they know they worked really hard and developed a skill or learned something new or grew personally or in their ability to engage with a certain type of academic work. Learning outcomes are really valuable and sometimes more important than a specific grade, because those perspective shifts will carry them forward to other courses and to what they do beyond Williams.

SEWELL: We don't say loudly enough that people here struggle. What we hear is: "Everyone's great, everyone's doing well." We hear the stories about alumni who went off to become the CEO of some big organization, but we're not hearing the story of how that person struggled freshman year to find friends, or struggled academically or had a socio-emotional crisis—and what they did to overcome it that eventually led them to become the CEO. These things need to be normalized for students. We need to be able to say, "It's hard, I know, and this could be crippling for you. This is a really hard transition. So here are things you have at your disposal to use right now. Here are the things you already possess that you need to exhibit more and that will help you. Here are the resources you need to draw from. Let me connect you."

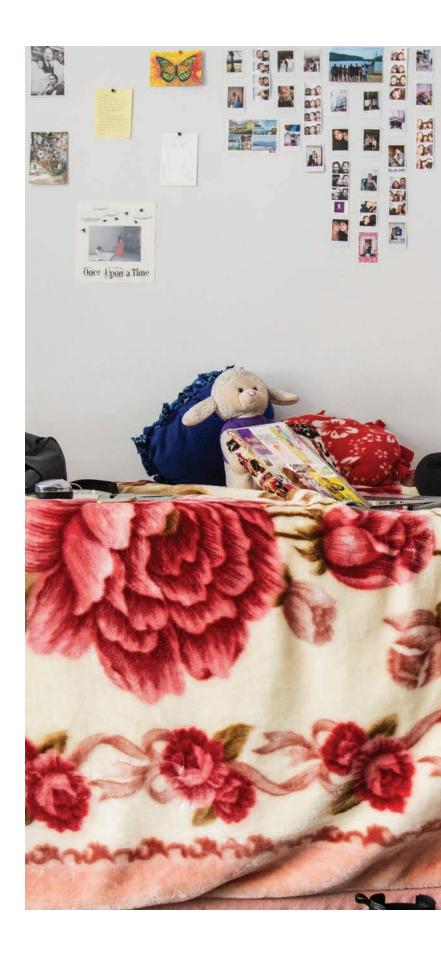
Julia Munemo is a contributing writer for Williams Magazine.

PHOTOGRAPHS BY JOSEPHINE SITTENFELD



What is life really like at Williams? The question comes up often, in a variety of settings, from campus tours with prospective students to gatherings with far-flung alumni. One answer many answers, really—can be seen in a new photography project initiated by the college.

The photographs, which appear in print and online and are described in a style akin to social media hashtags, were taken during the fall and winter by acclaimed photographer Josephine Sittenfeld. They're candid, authentic and real—just like Williams. See more on Instagram at @williamsadmission #williamsunfiltered.







Claim Williams / Personal Style / Dorm Life / Cozy / Home Away from Home / Small Space





Sankofa / Behind the Scenes / Goodrich / Squad Goals / LOL

Lino Cut / Spencer Studio Art /
Cutting Edge / Printmaking / Ink Big





Study Break / Caffeine / Tunnel City / Spring Street / Nightlife



A memoir by historian Francis Oakley offers reflections on teaching, research IN and the transformation of Williams-and American higher education.

PURSUIT OF LIBERAL IEARNING

PHOTOGRAPH BY DANA SMITH

IN AUGUST 1961, FRANCIS OAKLEY CAME TO Williams to teach early European history. At the time, his concerns were "parochially personal," as he writes in his memoir, From the Cast-Iron Shore: In Lifelong Pursuit of Liberal Learning, published late last year by Notre Dame Press. Like most young faculty members, he was focused on raising a family, meeting what he calls the students' "dauntingly high" expectations for teaching and finding enough time for research. Writes Oakley, "I was blissfully unprescient about the dimensions of the wave of institutional discontent and change that, by the end of the decade, was to break over the world of higher education."

But change came—and quickly. The end of fraternities, the start of coeducation and an expansion of the curriculum all occurred within Oakley's first 10 years at Williams. In 1977, he was named dean of the faculty, and he served as president from 1985 to 1994, another period of transformation. As president, Oakley was instrumental in establishing tutorial courses, doubling the population of students of color, building the Jewish Religious Center and founding the Bolin Fellowships, which seek to diversify the academy. The Multicultural Center (now the Davis

Center) and the Center for Languages, Literatures and Cultures were founded during Oakley's presidency, and he was deeply involved in the effort to establish MASS MoCA in North Adams.

Williams figures prominently in From the Cast-Iron Shore, which is described by the publisher as "part personal memoir and part participant-observer's educational history."Turning his expert gaze on his own life and work, Oakley, who has written widely about medieval and early modern intellectual and religious history and about American higher education, reflects on social class, the relationship between teaching and research, and the challenge of educational leadership in the late 20th and early 21st centuries.

In the excerpt that follows, taken from the chapter "Williamstown and its College," Oakley describes a Williams on the cusp of monumental change. But first he explores the college's roots, beginning with the question of why it was chartered as a "college" in the first place. "For what exactly did that mean?" he writes. "The question is not as redundant as it might seem to be. In the 20th century, the institutional status of colleges like Williams came to be dogged by uncertainty."

THE SHARP DISTINCTION BETWEEN COLLEGE AND university ... is not one rooted in the earlier history of the American liberal arts college. It is, instead, something of a late 19th century American novelty. ... It has tended to promote the idea that the freestanding residential liberal arts college is something less than the modern American university rather than something other than that. It has even encouraged colleges to permit themselves to be defined by what they lack—great research libraries and laboratories, graduate and professional schools—rather than in terms of what they profoundly possess, an undistracted and undiffused intensity of focus on a broadly based education in the arts and sciences which has long since become wholly extraordinary, not only abroad but increasingly so here in the United States, as well as the firm and unswerving commitment to bring to the education of all undergraduates the full resources pertaining to a small university. For that is what all the older colleges were and what those among them that ... chose not to transform themselves into research universities still are small college universities devoted exclusively (or almost exclusively) to the education of undergraduates. And that is the type of institution whose faculty I joined in 1961 when I came to Williams.

Obviously, like Williamstown itself, it had undergone a great deal of change since it was chartered in 1793. At the heart of the campus, however, still stood its first building, West College (1790), situated on the east side of Main Street at the crest of what used to be called Consumption Hill. And right opposite it on the westerly side still stood

Colleges ... profoundly possess an undistracted and undiffused intensity of focus on a broadly based education in the arts and sciences which has ... become wholly extraordinary.

the elegant house that General Sloane had built in 1801 and that has, for more than a century, served as the house of the college president. And such obvious symbols of continuity make it all too easy to forget just how different and, indeed, tiny the early college was. When Mark Hopkins, its fourth (and most celebrated) president, retired from that office in 1872, the student body numbered no more than 119 and the faculty amounted to no more than a handful of professors and

tutors—these last playing much the same role as graduate assistants later on. To remind myself of that fact, I hung in my office as president a picture of Hopkins and his entire faculty, taken in 1866. They numbered only 10 and fitted easily, even posed in space-consuming Victorian casual style, on one half of the porch of the President's House. The administrative burdens shouldered by the president can hardly have been very pressing and, so far as I know, Hopkins didn't even have an office.

By 1961, with its decline as an agricultural community, Williamstown itself, with a population of around 7,500 (not very different from today) was well on the way to becoming a destination point for skiers and cultural tourists. The all-encompassing forest, which, in the late 18th and 19th centuries, had been pushed back and well up the slopes of the surrounding mountains, was now reclaiming with astonishingly rapid second growth the ground it had reluctantly yielded to the tenacity of the early settlers. And with that partial return of James Fenimore Cooper's "boundless woods" was coming also, after a century of marginalization by agriculture, the return of an abundant wildlife: black bears, wild turkeys, coyotes, bobcats, possibly cougar (i.e., catamounts or mountain lions), the occasional lugubrious itinerant moose and everywhere, it seems, white-tailed deer. It is interesting that the town history felt it noteworthy enough to record for posterity that in 1905 some "wild deer" had been sighted in the Hemlock Brook area. By 1961 that had come to be a phenomenon taken simply for granted.

If the town had changed, so, too, had the college, which now boasted a student body of some 1,100. For its first 70 or 80 years, its main achievement was that of having survived to become a rather modest if reasonably stable institution whose mission it was to serve the needs of the region and locality, in the process sending a goodly proportion of its graduates into the ministry. That achievement was not something to be taken for granted. A great crisis had to be surmounted in 1821. In that year, the trustees having failed to persuade the legislature to move the college from its westerly rural backwater to the more civilized of environs of Northampton in the Connecticut valley, the then president, Zephaniah Swift Moore, took matters into his own hands and led some of its students over the mountains to establish a new college at Amherst. It was a secession reminiscent of the moves that had led, five centuries earlier, to the foundation of the University of Angers by secession from the University of Paris and to the foundation of Cambridge via a similar breakaway from Oxford. Williams somehow survived that moment of crisis, and by 1872 when Hopkins stepped down it had begun to attract students from the midwestern as well as the eastern states and, probably because of its missionary connections, from Hawaii and countries like China and Persia. It was also beginning to attract students from prosperous families with backgrounds in commerce, business and finance. Its graduates were now beginning to pursue callings in those same realms, as well as in the professions at large, and the wealth controlled by its alumni was accordingly on the increase. While it had long been surpassed both in endowment and enrollment by Amherst and by Union College in Schenectady, N.Y., Williams began, in the late 19th and early 20th centuries, to develop into a more prosperous institution, graced with an array of handsome collegiate buildings and possessed of the resources enabling it to

mount a much richer array of curricular offerings, especially in the natural sciences. Its Latin requirement for admission tended to limit its applicant pool to students of privilege graduating from the old preparatory boarding schools. But when it dropped that requirement in the late 1930s, something of a quickening in intellectual tempo began to occur. Under two presidencies marked by a measure of activism, those of Tyler Dennett (1934-37) and James Phinney Baxter (1937-61), a good deal of accumulated deadwood was cleared from the ranks of the faculty and some stellar appointments made. At the same time, and especially in the wake of the influx of veterans on the G.I. Bill after the war, the nature of the student body had begun to change. It was becoming somewhat more diverse in religious and racial terms, and an increasing number of gifted students from public schools nationwide matriculated.

Such developments, however, desirable though they might be, turned out to cause growing tension with the fraternity culture that had established itself so firmly at the college during the Gilded Age. That culture reached its apogee in the years leading up to the Second World War, when fraternity membership climbed to as high as 80 percent of the student body and when it was no longer the college but the fraternities—independent, self-governing corporations—that had come to carry the primary responsibility for the feeding and housing of students. And it was the fraternities, with all their self-selecting exclusivisms, that had come to shape the social mores and dominate the social life of the campus. The bulk of their members periodically failed to meet even an average level of scholastic performance, and they came increasingly to be seen as heading into collision with the college's academic mission and as constituting, indeed, an impediment to its intellectual vibrancy.

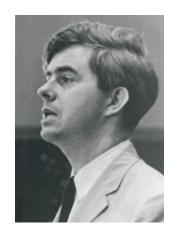
The fraternities were closed during the war years, and their functioning, once reopened and as the 1950s wore on, came to be dogged by controversy. They were shadowed by suspicion (sometimes well founded) that they were still following the racially and ethnically discriminatory practices encouraged by some of the national fraternal bodies with which they were affiliated. As a result, an enormous amount of institutional energy at the level both of the students themselves and of the president and trustees came to be devoted to the attempt to rectify any such wrongs and to align the functioning of fraternities more effectively with the college's institutional values and academic goals. Committee after committee was formed to address the intricate issues involved, but their recommendations (not always implemented) usually took the form of tinkering with the system rather than of calling it into question. Only one of them, the student Committee of 22, chose to bite the bullet, calling in 1957 for the outright abolition of fraternities at Williams and the substitution of a system of collegeadministered residential units to which students would be assigned via a system of random selection. But to no avail.

If the drawbacks of the prevailing system were becoming daily more evident, the identification of generally acceptable solutions proved elusive.

Of all of this I was almost totally ignorant when I arrived at Williams in August 1961 as a new, wet-behindthe-ears member of the history department. Never having been an undergraduate in the United States, I knew little or nothing about fraternities or about the degree of power they were capable of wielding over student life. I tended to

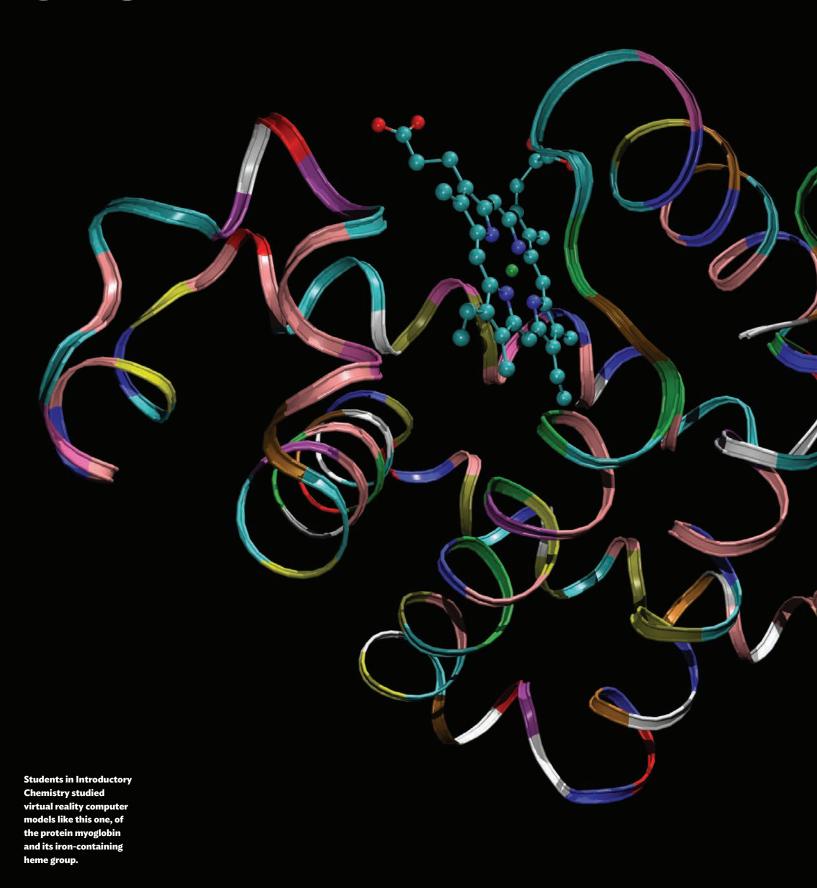
view them, I think, as a species of self-selecting exclusive club that merely punctuated the general disposition of student living. Something akin, perhaps, to Yale's Skull and Bones, whose building I passed regularly on my way into campus and which, or so I assumed, was little more than a rather childish (if well-endowed) survival into the present of late-Victorian group sentimentalism. Nor did fraternity-related concerns come up as a topic of conversation when I first met Jack Sawyer (John E. Sawyer) in the spring of 1961 and not long after he had been elected to succeed Phinney Baxter as president of Williams. Robin Winks, a friend of his and a colleague of mine in the Yale history department, had invited me along with Dan O'Connor (just appointed

to the Williams philosophy department) to meet him over lunch at one of the Yale colleges. On that occasion, as I recall it, Jack talked mainly about the Williams faculty members he had known and admired, not least among them Richard Newhall, by then emeritus, a medieval historian of some distinction who, in his day, had been a student at Harvard of Charles Homer Haskins, the great pioneer of medieval historical studies in America. (The Newhalls were to extend a gracious welcome to us when we got to Williams and, by virtue of his kind gift, on my bookshelves proudly sit Mr. Newhall's six volumes of R.W. and A.J. Carlyle's A History of Mediaeval Political Theory in the West). At that time an associate professor of economics at Yale, Sawyer was a graduate of Williams, Class of 1939, and as an insider to the fraternity scene and a long-standing trustee of Williams, had to have been acutely conscious of the mounting unease on campus about the way in which the fraternity system was now functioning. But he had not yet had to confront the urgencies of the situation created when, at the end of the 1960-61 academic year, a group of 45 students, most of them campus leaders and fraternity men, submitted to President Baxter a petition requesting the formation of a committee charged with finding some alternative approach to the fraternity selection process that would involve collegiate decision rather than student election. That petition and Sawyer's ultimate reaction to it were to determine not only the shape of his own presidency but also much of the dynamics of institutional life at Williams as the transformative and eventually tumultuous 1960s unfolded.



Oakley, not long after he came to Williams in 1961 to teach early European history. He went on to become dean of the faculty and then served as president of the college from 1985 to 1994.

STUDY





CHEMICAL REACTION

Virtual and augmented reality allow students to experience the 3D nature of molecules.

IN A COMPACT LAB IN SAWYER LIBRARY ONE morning last fall, Amy Garcia '22 donned some black goggles and, holding a wand in one hand, waited to spot a molecule in the darkness around her.

"Oh, hello," she said as she glanced to the right and caught sight of a collection of green curls. "I like this one." She used the wand to pull it toward her for closer inspection.

A computer monitor displayed what Garcia was seeing, and a teaching assistant asked her what she noticed about the molecule. Garcia spotted iron and asked if it was a globin protein. The TA confirmed it was, and Garcia correctly identified it as myoglobin. Looking to her left and right, Garcia saw the myoglobin curls suspended all around her, and laughed.

Garcia was one of 37 students in Introductory Chemistry, taught by Professor Christopher Goh, who last semester used virtual reality and augmented reality in his teaching for the first time. Both tools "give students the ability to experience the three-dimensional nature of molecules," says Goh, who has been at Williams since 2007 and also teaches organic and inorganic chemistry and methods of analysis.

Chemistry courses commonly use twodimensional representations and plastic models to help students understand the shape of molecules. But Goh says adding virtual reality and augmented reality—a pedagogical shift he learned about at a Liberal Arts Collaborative for Digital Innovation workshop on how technology can be used in STEM fields—greatly enhanced the introductory course, which he's taught before. Now students were able to watch molecular processes as they unfolded and to interact with molecules in a more nuanced way.

In addition to the virtual reality goggles, Goh's students used an augmented reality app to view and rotate three-dimensional renderings of chemical reactions on their mobile devices. The app was designed by three Williams students at the Center for Educational Technology. Located in the library, the center provides spaces and tools that enhance teaching and learning in all areas of the curriculum, says Jonathan Leamon, director of instructional technology. Resources include a recording studio, a video conference room, a "maker space" with a 3D printer and scanner, and the virtual reality lab Goh used for his course.

Garcia, who is considering a biology major, had never used virtual reality prior to Goh's course. She liked being able to scale a molecule to different sizes and see it from different angles. "It was definitely easier to retain the information with the model right in front of me in three dimensions," she says, adding that being exposed to virtual reality in general "develops and improves our skills in a world where technology is rapidly evolving."

Goh, whose research focuses on metalbased catalysis that occurs in many biochemical and chemical processes, is happy to offer another method of learning to students. "There will be some students for whom things will click when they see molecules through virtual reality," he says. "For a visual learner, virtual reality really leaves deep impressions."

—SHANNON O'BRIEN

ICE WATCH

ALICE BRADLEY, A GEOSCIENCES PROFESSOR STUDYING Arctic climate, and Will Downs '19, a geosciences and computer science major, have teamed up to analyze 40 years' worth of weather data to better understand how storms might ultimately impact the Arctic environment.

Bradley studied engineering as an undergraduate at Dartmouth and earned a Ph.D. in aerospace engineering, with a focus on environmental observation, at the University of Colorado. Her graduate work involved building small buoys that were dropped from drones into the water between sea ice floes and then comparing measurements from the buoys to those taken by satellites.



She wanted to understand fluctuations in what she calls "the freeze-up date"—that is, "the time when an area of open water in the Arctic starts to freeze over for the winter," she says. "The earlier in the fall that happens, the longer the ice growth season lasts, and, at least in theory, the thicker the sea ice can become that winter."

All of which has a positive impact on the environment, as thicker ice reflects energy from the sun for more of the summer and keeps the planet cool.

Bradley says fluctuations in the freeze-up date may significantly impact how thick sea ice can become in a given winter, which is important "as we transition from an Arctic Ocean primarily covered in thick, multi-year ice to one with exclusively first-year ice," she says, referring to ice thicker than 30 centimeters that hasn't survived a summer melt season. "Given predictions of future climate, it is likely that even first-year ice will thin over time."

Bradley began to wonder what, other than shorter and warmer winters, might impact sea ice growth and freeze-up date fluctuations. She looked to summer and fall storms, which "can carry warm air over cold water, warming the water and delaying freeze-up," she says. "When Will said he was interested in studying storms, I knew I had the perfect project for him."

Downs grew up in New Orleans and had to evacuate with his family for several months after Hurricane Katrina. During his sophomore year of high school, Hurricane Isaac closed his school for a week. He spent the time tracking storms on meteorological websites, which sparked a fascination with storm patterns and their effects on the environment.

For his senior thesis at Williams, Downs spent the fall gathering four decades of weather data and satellite sea ice data, creating maps and charts that track freeze-up dates across the Arctic over time. He's now analyzing that data and hoping to come to a conclusion about effects of cyclones and other storms on Arctic sea ice growth.

"This project is exciting, because it exists at the intersection between geosciences and computer science," says Downs, who plans to work in software development after graduation, building programs that can predict weather patterns and their environmental effects.

Bradley, who, along with environmental studies professor Laura Martin, joined the faculty last semester as part of the college's climate initiative, is happy to have a research partner in answering these questions.

"Will's programming skills, combined with a well-informed interest in weather and climate, means this research has been progressing at an incredible rate," she says. "He's doing grad-school level research and generating exciting results." —JULIA MUNEMO



ANTI-SEMITISM IN CONTEXT

A TIMELY EXPLORATION OF ANTI-SEMITISM IN A NEW COURSE TAUGHT by religion professor Jeffrey Israel took on even more significance after a fatal shooting at the Tree of Life Synagogue in Pittsburgh, Pa., in October 2018.

The course, Anti-Semitism, investigates the "intellectual traditions, political movements and cultural objects that portray Jews, Jewishness or Judaism as essentially pernicious." Israel developed the class during the run-up to the 2016 presidential election, with the intention of studying everything from ancient Egyptian anti-Jewish ideology to what he calls "today's anti-Semitism/anti-Zionism quagmire."

"I had a feeling the time was right," he says of developing the course. "I worried we would see a rise in violence against Jews."

Noting that anti-Semitism has been "under-theorized," Israel designed the course around theoretical questions. One in particular—How should anti-Semitism be defined?—came into sharp focus after the Oct. 27 shooting.

According to Jake Porath '19, a history and political science major and one of seven students participating in the class, "Most people think anti-Semitism is a religious hatred geared toward Jews. But Professor Israel helped us understand that this act was based

on a racial stereotype about Jews leading a conspiracy whose aim is to pursue world domination through financial globalism and the empowerment of nonwhite races."

Israel says this distinction is often "willfully ignored" when it comes to understanding anti-Semitic acts, including the shooting. "In many cases, coverage of the shooting insisted on interpreting it as an assault on 'people of faith," he says. Yet archived screen shots of the shooter's social media posts, which the class studied closely, showed that "he sought to kill Jews as a nonwhite menace to white America."

While the content was disturbing, it was helpful to analyze it within the context of the course, Porath says. "I was grateful for a toolbox to help me try to make sense of what happened," he adds.

The small size of the class was also beneficial, says Catherine May '20, a political science major with a concentration in public health. Discussions that could have been awkward instead "became a team effort," she says. "Even when our thoughts weren't fully formed, we could express them and then work together to follow them to their logical conclusions."

Not that Israel, who was promoted to associate professor with tenure beginning July 1, offered the students easy answers. As he does with all of his courses, he assigned the students four papers, each with an open prompt. "I believe students need to be put in a position to find their own meaning in the world," he says. "The more I curate that, the more I get in the way of their capacity to develop views about the material. Instead, I work with them to find a window into the material that helps them write something that reflects their own thoughts in robust, sophisticated and textually rich ways."

May says the assignments motivated her to take risks she wouldn't otherwise have considered. "They took longer to write—I had to develop my idea, look at the evidence, find readings to support my argument," she says. "But I found them deeply fulfilling."

Israel, who also teaches Judaism: Before The Law, Religion and the State, and What is Religion?, among other courses, says the goal in all of them is the same: "I always hope to provide students a space where they can be fully present—emotionally and intellectually."

—ј.м.



is the curator-at-large of exhibitions at the Marie Selby Botanical Gardens in Sarasota, Fla. Her four-decade career at Williams includes teaching courses on European art as well as representation and the body. Among the courses is her tutorial, Writing About Bodies.

Now, Ockman is collaborating with 25 dancers and scholars in Paramodernities, choreographed by renowned dance artist Netta Yerushalmy. The show—which critics have described as "daring," "lush" and "brilliantly executed"—explores modernity through six independent pieces, each deconstructing an iconic work of

"Graham's feminism and dual love for the classical and the modern interested Yerushalmy and me," Ockman says.

The segment opens with Ockman falling onto the stage, "dead." She comes back to life, describing an experience in a dental chair that reclined in a way that reminded her of the angle of the bed shared by Oedipus and his mother and wife, Jocasta, in Night Journey. "How do you experience or process trauma?" she asks the audience. "Even a small one? How can you give it form? When is it shrouded in silence?"

Moving among the dancers on stage, Ockman ultimately juxtaposes her own experience of trauma—that of



A MUSEUM FOR EVERYONE

BY PAMELA FRANKS

FEW MONTHS INTO MY ROLE AS DIRECTOR OF THE WILLIAMS College Museum of Art (WCMA), I am absorbing as much as I can as fast as I can about this storied institution. I also find myself reflecting on my own very first impressions of art museums, which became important to me as an undergraduate. ■ I began my first year at Vanderbilt University planning to pursue science or math. But I realized that if I majored in English, reading literature—my favorite activity—could be the basis of my studies. Then, on a whim, I took an introductory art history course. The professor sent us to the art museum, and I never looked back.

Growing up, I wasn't a museumgoer, so this experience was new to me. During a class visit to Vanderbilt's Fine Arts Gallery I was mesmerized by a group of Italian Renaissance paintings. I was even more mystified by how they got there, until I learned about the remarkable collector Samuel H. Kress, who distributed his vast collection to museums across the country in hopes of creating opportunities for eye-opening experiences like mine. An essay assignment brought me to the Carl Van Vechten Gallery at nearby Fisk University, where I was thrilled by the works of American modernists like Georgia O'Keeffe, Marsden Hartley

and Aaron Douglas. A classmate and I spent the afternoon seated before Douglas' Building More Stately Mansions, a landmark of African-American art, discussing our amazement that Douglas' simple geometry and color palette could yield not only a celebration of major monuments of human civilization but also recognize and laud the human labor responsible for building them.

Just as I found whole worlds within novels and poems, I was astonished to find the ever-unfolding meanings and associations that emerged from looking closely at a work of art. The joy of prolonged observation, of seeing ever more detail over time and becoming fluent in the visual language of art, was transformative. Knowing that someone, somewhere, made these remarkable objects felt like a direct connection across time and place. To me, the space

of the museum seemed that of a "more stately mansion," so aspirational, so purposeful—there specifically to show great art and welcome people to share in its wonder. I came to know that some stories are told especially well through exhibitions and that understanding history and human creation in three dimensions is different from reading about it in a book. The art informed all I was learning—and not only in the art history classes that brought me to the museum in the first place. It resonated with nearly every one of my courses and extracurricular activities, seemingly venturing into all parts of my education and my intellectual life.

Such formative experiences as an undergraduate have been guiding principles throughout my career in college and university art museums. I have never ceased to be surprised by the limitless potential to connect art to any and every academic discipline. At WCMA, these connections are vivid and vibrant in Object Lab installations and during class sessions with original art works in the Rose Study Gallery. College and university museums are at their best when activated by the

curiosity and creativity of students. I love discussing with Williams students the magic of the museum experience, the role of art in society and the contribution of museums as public institutions. We talk about the unique role WCMA can play in this arts-rich region and about the importance for museums everywhere to become ever more diverse and inclusive. We talk about how leadership in the arts will change over time and how WCMA can help prepare future leaders. And we think about how we might use the lessons of this museum's long and influential history to chart a future of meaningful impact.

As I envision what I want to build moving forward—and as I imagine what WCMA can be and offer—I am thinking a lot about

> what brings people to art museums and why people make art and museums part of their lives. Their paths and passions are varied, and college museums play a major role. For some students, they are familiar spaces. For others, like me, museums are uncharted territory, discovered when that first professor sends them off to complete that first assignment. Whatever the

path, WCMA can be the place where students learn to care about museums.

WCMA is for everyone. It's the college's museum. It's open to all: students, professors, staff members, community members, visitors from afar. It's a place for all visitors—students especially—to return to, again and again, where together we can create community and engage in conversations that will help shape our futures and inspire us all to live lives touched by art.

Pamela Franks is the Class of 1956 Director of the Williams College Museum of Art.

I am thinking a lot about what brings people to art museums and why people make art and museums part of their lives.



Students in Leyla **Rouhi's Elementary** Spanish course this semester are using their budding vocabulary and grammar skills to learn about Spanish, Mexican and Chicanx artists and culture while exploring works in the Williams **College Museum of** Art's Object Lab. Among the art works is Hombre Fumando (Man Smoking) by Diego Rivera, considered to be one of the leading artists of the 20th century.

Williams

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