

HARVEY MUDD COLLEGE

magazine

SPRING 2019



**THANK
YOU!**

Campaign Success

After achieving \$25 million above goal, the community celebrates The Campaign for Harvey Mudd College. | 35

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The Year of the Periodic Table

We're celebrating 150 years of one of science's greatest discoveries with a tour of the Department of Chemistry's periodic table collection.

It's the Year of the Periodic Table (designated by UNESCO to celebrate the 150th anniversary of its invention). In the 150 years since Russian chemist Dmitri Mendeleev first developed it, the periodic table has become one of science's iconic figures, recognizable by students and scientists around the world.

The Harvey Mudd College Department of Chemistry is home to an eclectic collection of periodic tables, some of which might surprise Mendeleev, even though he predicted his original version would change over time as more elements were discovered. Were he to climb the west stairwell of the Jacobs-Keck Science Complex today, Mendeleev would see 20 unique posters featuring periodic tables inspired by his

own, but some with elements unimaginable in his time. Included in the stairwell collection are the periodic tables of sandwichy, elephants, fruits and nuts, ice cream, wine, monsters and more.

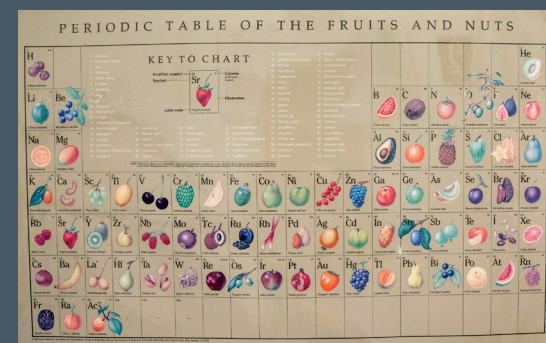
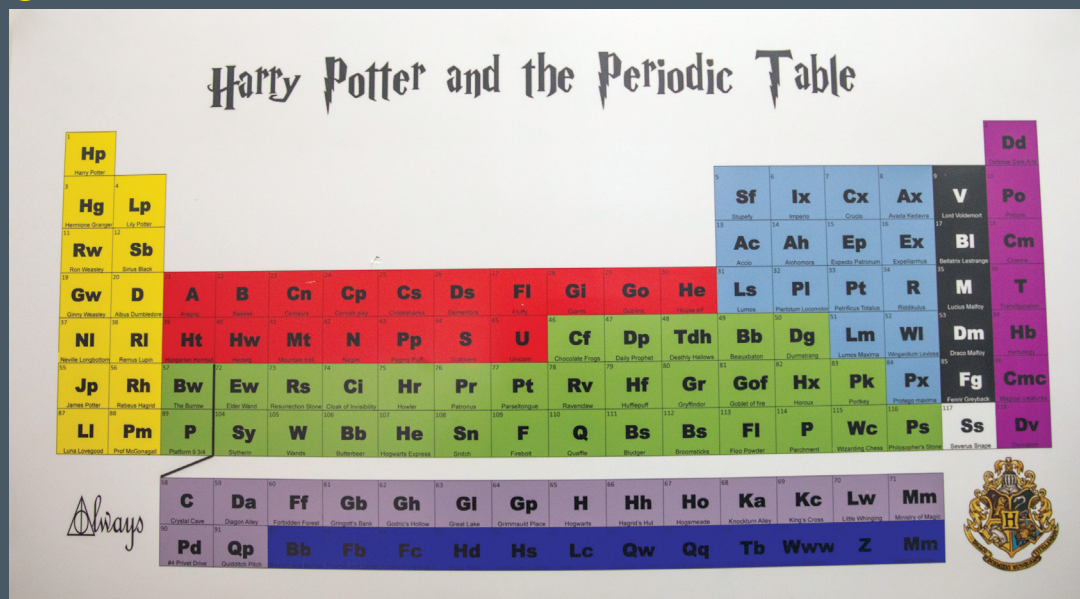
"The posters were given to the department over the years by students and friends," says Kim Young, the chemistry department administrative coordinator. Young's favorite is the Harry Potter periodic table (1), designed by Laura Haushalter, daughter of biology and chemistry professor Karl Haushalter. "It's very clever," Young says.

Laura got the idea to make the table in 2015 (she was 11), when she needed a project to help her learn Excel and become comfortable on her new computer.

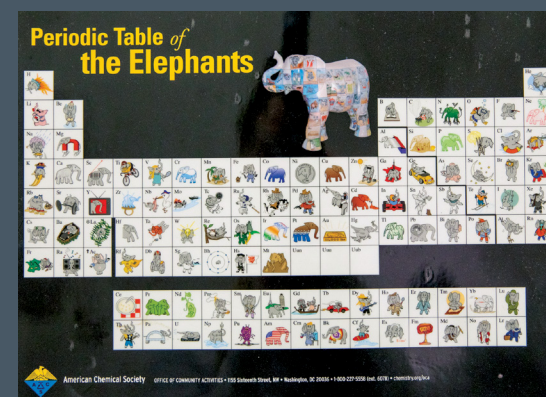
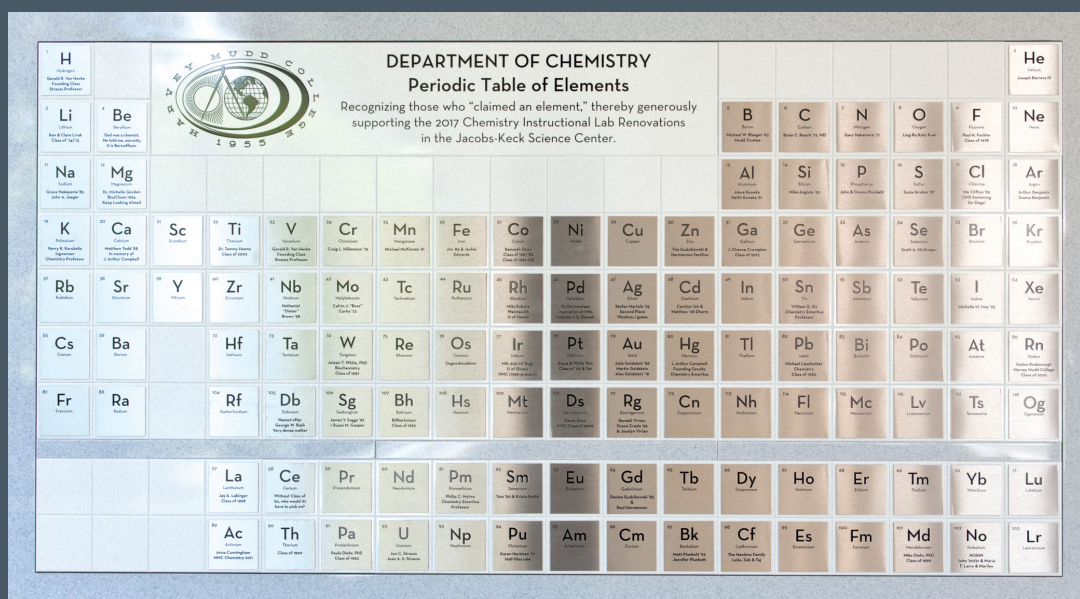
"I always loved visiting the periodic tables at HMC and wanted to make my own with a theme I loved," she says.

The color categories represent different parts of the Harry Potter world. "There are categories like heroes, villains and spells," Laura says. "For example, yellow is heroes, so you will find Harry Potter's element there, and black is villains, where you will find Lord Voldemort's element. There are the same number of elements as the standard periodic table, and I tried to make it accurate in the layout of the table. To create the elements, I started by creating lists of my favorite parts of Harry Potter and then found how they could be put into groups."

1



2



Another table, displayed on the exterior north wall of the Jacobs Science Center, was added to the collection during the chemistry laboratory renovations in 2017. The result of the Claim Your Element campaign (2), the table's 118 elements were made available for dedication by donors in support of the renovation. The display is a celebration of the Department of Chemistry, featuring elements claimed by alumni representing each decade of Harvey Mudd history, current and past professors and other members of the Harvey Mudd community. A few elements have yet to be named (see hmc.edu/ClaimYourElement).

Mendeleev is said to have been defiantly uncon-

ventional, so it's possible he'd very much enjoy the posters and the named elements (element 101, Md, Mendeleevium, discovered and named for him in 1955, was claimed by Mike Diehr '90). However, if he'd favor a more literal periodic table, he'd likely have his mind blown by the newest and perhaps most impressive addition to the collection.

Housed in the Rose Hills Foundation General Chemistry Laboratory, is an interactive periodic table of the elements with lighted displays and video animations (3). A gift from John Benediktsson '01 and his spouse, Rajashree Karwa, the story of how the table came to Harvey Mudd is a popular one.

"Benediktsson found this little two-person artisan shop in the UK that made these exquisite periodic tables, complete with video animations, facts and example compounds, all mounted in a very nice (and large) cabinet," says Hal Van Ryswyk, John Stauffer Professor of Chemistry and department chair. "He wanted one for his home, but his wife suggested that he should find someplace else to put it, preferably where he could visit it. We were extremely lucky that he chose us. It's a grand resource, both for our students and for tours of prospective students and their families."

FROM THE PRESIDENT

Spring Forward

Spring is a time for new beginnings.

We began this spring semester with an on-campus celebration to highlight all that the Harvey Mudd College community has been able to accomplish together through the successful conclusion of The Campaign for Harvey Mudd College. With the support of more than 6,000 alumni, parents, friends, faculty, staff and students, we concluded the largest comprehensive campaign in the College's history by raising more than \$175 million—\$25 million over our original goal.

These gifts have fueled tremendous accomplishments and changes on campus, including the construction of the R. Michael Shanahan Center for Teaching and Learning and the Wayne '73 and Julie Drinkward Residence Hall; the renovation of Engineering Clinic space in Parsons, chemistry instructional labs in Jacobs-Keck and the Galileo Auditoria; 11 new endowed professorships; greater support for scholarships for students; more than \$50 million in increased funding for the College's endowment; and a number of new services and staff in areas such as Community Engagement, Health and Wellness, and Institutional Diversity.

Events celebrating all that the Mudd community has accomplished together began in Claremont and continued in cities across the country and concluded in late May with our event in New York. We are all so grateful for the incredibly generous support of our community during this critical fundraising effort.

Because of your support, Harvey Mudd has benefited from countless new beginnings. Whether in the form of new people, new programs or new and renovated spaces on campus, your thoughtful generosity is making an impact. We continue to push ourselves to further improve this College that we all love, and, rest assured,

we are already thinking about ways in which future fundraising efforts can further strengthen Harvey Mudd.



Maria Klawe
President, Harvey Mudd College

Also, during this spring semester, the faculty has spent a great deal of time and effort reviewing and evaluating the details, implications and resources required for implementation of the Core proposals. As an iterative step, the Department of Mathematics is changing its Core courses (see story, page 5). Work on the proposals will continue over the summer. You can learn more by visiting the CRC's website at hmc.edu/core-revision.

We also have been hard at work determining what form the College's next vision for diversity and inclusion will take. Students, faculty, staff, parents, alumni and friends came together in a series of workshops on campus during the spring semester to hold discussions and to brainstorm around topics related to diversity and inclusion. The College has made tremendous strides toward diversifying our students, faculty and staff over the last 15 years, and we continue toward our goal of ensuring an inclusive community for all who work and study here. As we move into the fall semester, we will be hosting planning workshops to develop the basis for a new diversity and inclusion strategic plan—part of an overall strategic planning effort our community will undertake as we reach the conclusion of our current strategic vision—HMC 2020: Envisioning the Future. I encourage you to watch for announcements of these workshops, and I hope you will join us to lend your voice and ideas to this important effort.

As we complete this spring semester and celebrate the College's 61st Commencement, I know you join me in wishing our graduating class all the best as they begin the next stage of their life's journey. We look forward to hearing great things from them.

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Beyond the Horizon

An algorithm developed for an Engineering Clinic project is being used to detect and track Kuiper Belt objects, improving our understanding of how the solar system was formed.

Written by Daniel F. LeRay

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Launching a Solution

How do you test new software features while protecting users from bugs? Two Mudders found a way.

Written by Ashley Festa

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Hacking Misconduct

A trustee and computer science students use technology to connect victims and help rid workplaces of bad behavior.

Written by S.C. Stuart



HEARD ONLINE

CONVERSATIONS ON HARVEY
MUDD SOCIAL MEDIA

Facebook, March 7, 2019: The post featuring President Maria Klawe's March *Forbes* blog about international experiences being vital for STEM students received great feedback. President Klawe shared that U.S. scientists and engineers must be able to collaborate on multicultural, international teams in order to be successful in their careers and to tackle global challenges together.

Jenny Switkes '94– "I loved studying abroad through Budapest Semesters in Math while I was a student at HMC!"

Laurie Mackenzie– "Hurray for study abroad!"

Kyle Grice '05– "This is why I worked hard to create a research-based study abroad for my students to go to Spain... studying abroad is amazing. I did it at Mudd through a Pitzer program to China. I had to shift my schedule a lot, but it was one of the best things I ever did in college."



LETTERS TO THE EDITOR

Opinions about the content of *Harvey Mudd College Magazine* are welcome. Letters for publication must be signed and may be edited for clarity and brevity.

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CAMPAIGN
REPORT

• Celebrating Success: The Campaign for Harvey Mudd College

THE HARVEY MUDD COMMUNITY gathered on campus Jan. 26 to celebrate the successful conclusion of The Campaign for Harvey Mudd College. The event included presentations from the recipients of scholarships, summer experiential learning stipends and endowed chairs as well as those who work in newly renovated spaces and live in the new residence hall—all made possible by the generosity of those who supported the Campaign.

The success of the \$150 million Campaign has transformed the people, places and programs at Harvey Mudd. The seven-year comprehensive campaign began in July 2011 and launched publicly in February 2014 with a goal of \$150 million. The goal was exceeded, with over \$175 million raised.

“The goal was ambitious, set at twice what was raised in the last campaign ending in 1994,” says President Maria Klawe. “But we had a strong and unified vision, a committed board of trustees and a growing engagement among our alumni and parent communities that gave us confidence that our community could achieve this goal.”

Celebrations were held during spring 2019 at select locations around the U.S.

For more on campaign results and impacts, see the special section beginning on page 35. ■



▲ CLAREMONT: Maria Klawe, Paul Bruno, Colleen Lewis, Leah Mendelson



▲ BAY AREA



▲ LOS ANGELES: Cindy Connolly, Heather Mingst P22, Joe Connolly and Howard Deshong '89, P21



▲ SEATTLE: Kevin Schofield P13 P13 and Laura Larson P20



▲ CHICAGO: Craig Levin '12 and Kathy French '97

Diversity, Equity and Inclusion

During March, HMC community members had an opportunity to attend several sessions organized to collaboratively develop a strategic vision for diversity, inclusion and equity for Harvey Mudd College. The same strategic visioning process that was used for these workshops was used in the four workshops during fall 2006 that led to the strategic vision for the College, HMC 2020: Envisioning the Future. Discussions about diversity and inclusion on campus, equity-centered pedagogy and curriculum, and personal experiences are helping move the community toward further improvements in the area of diversity and inclusive excellence.



HMC community members discuss issues of diversity, equity and inclusion.

Core Review and Pilot

An extensive review of the Core Curriculum continues, facilitated by the Core Review Committee. Core-related events during the spring semester included student-centered discussions and events related to a particular theme, like “Writing in the Core.”

New Math Core for incoming class of 2019.

On Feb. 14, the faculty approved changes to the Math Core for next year’s incoming class. Graduation requirements for students currently enrolled in Core are not affected by this change; the requirements apply only to the next incoming class. Incoming students will take a sequence of three, one-semester courses: Calculus, Linear Algebra and Differential Equations. With this change, five half-semester math courses are being consolidated into a sequence of three full-semester courses that will provide a significant shared experience for students and, potentially, more cohesion across the Core. These changes arise from and support the ongoing, holistic Core-revision process, by

bringing the Math Core more in line with the recently adopted goals for the Core and by making it easier to make further changes, if needed.

Most of the math content from the current Core remains, in a newly structured form. Relative to the current Core, the change removes a half-semester of Probability and Statistics. The math department is working on expanding their offering of Probability and Statistics by developing new courses in these areas that students may elect to take. These changes to the Math Core are a pilot; departments are working together to make sure that the curriculum gains cohesion. Next year, the faculty will review whether that is the case and decide whether and how to build on this pilot.

Proposals for a new Core Curriculum. The process to foster ideas for a new Core Curriculum is ongoing and has generated important questions. The specifics of a curriculum are still being debated, and

the faculty looks forward to sharing concrete proposals when formed. The important thing for the faculty is that the Core engages students and faculty in the kinds of high-quality, hands-on, multidisciplinary learning that Mudders cherish. How to do so—and with which specific collection of courses—is a design space that brings with it all the incumbent priorities and tradeoffs.

▶ More details about this process are available at hmc.edu/core-revision.

Curious About Black Holes? We Asked Our Physicists

On April 10, scientists released the first visual evidence of a supermassive black hole. The image, a result of international collaboration between scientists and eight separate telescopes collectively known as the Event Horizon Telescope, shows a blurry orange ring and—that's all. "Sometimes seeing is believing but in this case not seeing is believing," says professor of physics and dean emeritus Tom Helliwell. Of course, the dark space inside the orange ring is the black hole, which lurks some 55 million light-years away from Earth in the M87 galaxy. "The bright ring around the black hole is emitted by the matter orbiting the black hole, gradually drifting inward as it orbits, until it approaches the event horizon and subsequently vanishes from our view," Helliwell says. "Evidence for black holes has been very strong for a long time now," Helliwell says. "The picture is a graphical confirmation that black holes really do exist in the nuclei of galaxies. The first-ever picture of a black hole is very impressive. Einstein would have been amazed!"

The *HMC Magazine* received professional insight from Helliwell and other members of the Harvey Mudd physics community (see bit.ly/BHhmc19), and we asked our social media followers to submit their questions about the phenomenon. Harvey Mudd physics experts graciously replied.

Via Instagram, @captain_mom7 asks, What took us so long to get this picture? Why is this hard?

Mae Lee '20, co-president of HMC's Women in Physics Club, replies:

In short, this process took so long because of the pure volume of data that had to be processed. To get a full picture of the black hole, we would need a radio telescope as large as the entire earth! Instead of this, we have eight telescope locations that together make up the Event Horizon Telescope; they give us bits of the picture which we can feed through an algorithm that can piece together the rest of the image. Data was taken from these eight locations, collecting 64 gigabytes of data every second, which is around 1,000 times as fast as your standard home internet connection. This is too large to be transported over the internet, so it had to be physically transported (from

all around the world to Massachusetts). In addition to transportation, that amount of data had to be fed through the algorithm, which also took a long time. These are just some of the reasons why it took so long to get this photo! (More of a visual learner? Lee has created a cartoon to explain this. See bit.ly/BHcomicHMC)

@preet_h.i asks via Instagram, can the Hawking radiation theory be proved by the data collected? Thus, do black holes shrink over time?

We asked physics professor Vatche Sahakian to tackle this one.

Very unlikely. The temperature of a black hole is lower the larger the black hole, and it is extremely low for supermassive black holes. The rate of evaporation is correspondingly very slow. A black hole with the mass of our Sun would take many, many times the age of the universe to evaporate away (ten to the power 58 times the age of the universe!). A supermassive black hole with millions of solar masses is even slower to evaporate away. So, black hole evaporation is really unlikely to be directly detected. But then, by imaging this black hole, they were essentially able to resolve the lettering on a coin over the distance between L.A. and New York, so who knows what the future holds ...

On Facebook, Santosh Zachariah asks: Might it be possible one day to see a (false-color) rainbow around a black hole? In this image, since the electromagnetic radiation (3mm IR, I believe) from the accretion disk is bending around the black hole, much like visible light in a raindrop, would the dimensions of the image have been different at a different wavelength? And if so, what might a black-hole-bow look like?

Professor Shuve answers:

That's a great question! The short answer is: No, different wavelengths of light wouldn't bend at different angles, BUT light originating from different distances from the black hole center could arrive in different colors. Let me explain a bit more.

In our current theory of gravity, general relativity, the force of gravity is actually a manifestation of the bending of space and time. Every object is trying to go in as straight of a line as possible, but the bending of

space-time means that objects tend to have paths that converge over time (which is gravitational attraction). A consequence of this is that every object is attracted identically under gravity: Because the gravitational force is really just objects moving through a curved space-time, every object bends the same way when traveling through that space-time. So different colors (or wavelengths) of light will bend the same way due to the gravitational force.

However, there is an additional effect called "redshift." Essentially, light that originates from closer to the black hole has to expend more energy to escape the black hole and get to us than light emitted further from the black hole. In quantum mechanics, light with lower energy is redder in color (has a longer wavelength), so that means that light from closer to the black hole will appear as different in color. This means that if we had sources that emitted a single color (wavelength) of light, but some were closer than others to the black hole, we would see a combination of different colors coming out at us. In practice, the light is being emitted at a lot of different wavelengths, so we wouldn't see anything like a rainbow, but the color of the light is nevertheless changing between its emission near the black hole and the telescopes on Earth.

For more questions and answers, see bit.ly/BHquest.



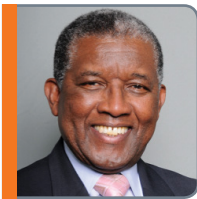


NOTES & QUOTES

TALKS ON CAMPUS

“My Journey to Becoming a Leader in School Reform and Philanthropy”

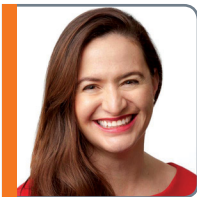
“ We have two ears and one mouth because God intended for us to listen more than we talk. If you’re going to be a leader, you have to listen to what people say. You have to listen to the people you want to lead. You can’t lead and be tone deaf. ”



Virgil Roberts, managing partner and founder of the entertainment law firm Bobbitt & Roberts, was president of Solar Records, one of the most successful African American-owned record companies, during the 1980s. His early work as a civil rights attorney with Manning & Roberts included representing the NAACP in the Los Angeles school desegregation case *Crawford v. Board of Education*. Roberts spoke as part of the Annenberg Leadership and Management Speaker Series on campus Feb. 19.

“The Unpopular Choice”

“ Unique challenges (the ones that no one else wanted!) made all the difference in building my career. I benefited greatly from decisions I made that others thought I shouldn’t do, and I progressed because of them . ”



Ana Corrales, COO of Google Consumer Hardware, is a champion for diversity within the organization and serves as a member of the Women@Google board and is an executive sponsor for HOLA, Google’s Latino Employee Resource Group. She was the April 9 Annenberg speaker.

“Carbon and Water: Two Sustainability Challenges for Corporations and the World”

“ Sustainability and business do not have to be separate or at odds. There are so many opportunities to bring those two together and make decisions which are positive from both a business perspective as well as a sustainability perspective. ”



Todd Brady, director of global affairs and sustainability at Intel, spoke as part of the Hixon Center’s spring Black, Gold and Green Speaker Series April 10.



TRUSTEE UPDATE

Changes to the board effective Jan. 29.

New to the board



Marie Ekeland, co-founder and partner for daphni, a venture capital firm that invests in European tech startups



Scott Fraser '76, director of science initiatives for the USC campuses and a Provost Professor in the Dornsife College of Letters Arts

and Sciences, the Children’s Hospital Los Angeles, Keck School of Medicine and the Viterbi School of Engineering (returning to the board after serving as a trustee emeritus)



Robert Hulse '96/97, partner in intellectual property, Fenwick & West LLP

Departing the board

Venkat Varadachary
Hector Ruiz

Cypriot Artifacts Returning Home

DURING A CEREMONY ON DEC. 11, HARVEY MUDD College President Maria Klawe joined representatives from the University of Cyprus and members of the Mudd family to announce the donation of the College's Cypriot artifact collection to the university.

"We have had, for many years, artifacts that were brought from the island of Cyprus to Harvey Mudd's home and later to HMC," says Klawe. "It was a joy to have such rare and beautiful things at a tiny college like Harvey Mudd. But, I think we always felt that they were not really ours. They really belong on the island from which they were brought in the 1930s."

Harvey S. Mudd, the namesake of the College, began collecting the artifacts after he became president of the Cyprus Mines Corporation on the island of Cyprus in 1916. Mudd exported many items to his home in California, and the Mudd family later donated them to the College. The collection, which has been housed at Harvey Mudd and Scripps colleges, includes an Athenian drinking vessel from the fifth century BCE; an oil lamp from 1500 BCE; and—the oldest item—a red, ceramic Cypriot drinking bowl circa 2300–2000 BCE.

In 2017, 100 years after Mudd began his collection, Vasiliki (Lina) Kassianidou, director of the Archaeological Research Unit in the Department of History and Archaeology at University of Cyprus, sent an email to Klawe expressing interest in

researching the artifacts. That's when a conversation began between Klawe, then Dean of the Faculty Jeff Groves and two of Harvey Mudd's granddaughters, Victoria (Tory) Mudd and Caryl Sprague Mingst, about how the College and the University of Cyprus could do something collaboratively with the artifacts. "There were a number of possibilities that were explored," says Klawe, "but, in the end, what really turned out to be the right thing was to repatriate all of these items as a gift to the University of Cyprus."

Victoria Mudd recalls marveling at the artifacts her grandfather had collected and traveling to Cyprus with her father, Henry T. Mudd, as a teenager. "Growing up with these ancient treasures nourished my imagination and my appreciation for the history of art, of ancient peoples and of the rich cultures that created them."

One of these treasures is a Cypriot copper oxhide ingot. "The ingot is extremely important for the history of Cyprus," says Kassianidou, who gave a presentation about the island and its history. Her research focuses on ancient technology, specifically the production and trade of Cypriot copper through antiquity but also its impact on the Cypriot landscape and environment. "It was kept very well here, but I think now the fact that it's coming to the University of Cyprus, a new institution, is very symbolic."

The University of Cyprus was established in 1989 and admitted its first students in 1992. Constantinos Christofides, rector of University of Cyprus, described the university as striving to attain the same level of excellence as Harvey Mudd College. "This is very important for us," he says, "that the collection is coming from one academic institution to another." Christofides says the artifacts "will be on display for all to see," housed in its new, five-story library, the Stelios Ioannou Learning Resource Center, with space dedicated to the collection.

With the agreement between the two institutions in place, the work of transporting the artifacts begins. The collection's antiquity, size (more than 200 items) and variety make shipping it the 7,000-plus miles from California to Cyprus a complicated endeavor. Once the collection has been catalogued and measured, size-specific packaging materials for each item will be made, as will custom shipping boxes.

"It's my hope the artifacts will inspire and instruct new generations of students and scholars to better understand and appreciate this rich history and our magnificent yet fragile world," Victoria Mudd says. "The profundity of this moment touches us all." ■





▲ University of Cyprus representatives Vasiliki (Lina) Kassianidou and Constantinos Christofides with the Cypriot copper oxhide ingot.



▲ Tory Mudd and President Maria Klawe



▲ A selection of items in the collection: copper bowl, fifth-fourth century BCE; Cypro-Archaic terra cotta figurine; limestone head, circa 400 BCE; Roman pottery, circa 50 BCE–50 A.D.; second- or third-century Roman unguentarium. The items will be shipped to Cyprus in custom-made, size-specific packing material.

• Navigating Career Crossroads

Inclusivity and access drive the Office of Career Services

AS DIRECTOR OF THE NATION'S TOP-RANKED COLLEGE career services office (No. 1 or No. 2 for “Best Career Placement” since 2016), Sarah Park oversees career development, employer relations and recruiting. She has worked at various institutions across the U.S., from small liberal arts institutions (Pomona and Claremont McKenna) to large research universities (UCLA and University of Georgia) and has held positions in residential living, academic advising, international student and scholar advising, diversity and inclusion, and career development. Since joining the Division of Student Affairs in December 2018, she has been developing new programming tailored to the specific career needs and interests of Harvey Mudd students. She is focused on the whole student experience and makes inclusivity and access for all students—“building intersection into all programming,” as she describes it—the foundation of her practice.

How are you “building intersection into all programming?”

Inclusion is important as is recognizing dimensions and intersectionality of identities. I want to weave diversity and inclusion into our career education programming. For example, if we have an industry panel, I prompt the panelists to speak about their experiences and organizational culture—recognizing their identities. If we do a resume workshop, I discuss how bias could impact moving forward in an application process. Finding a graduate program, internship, research opportunity or job is more than just applying and accepting; fit matters. And each person needs to explore what might be important to them when selecting career opportunities.

How soon should students connect with Career Services?

Students can connect with us as soon as they step foot on campus—career exploration can start as early as they want. We can help students gain a better understanding of their interests, personality, values and skills, which can help them decide on a major or career trajectory. We can help students

with resumes, connecting with opportunities and people, informational interviews—all things related to a career.

What’s an OCS resource that you wish more students and/or alumni took advantage of?

Handshake (an online recruitment and job posting tool shared with all The Claremont Colleges) and our workshops and information sessions. On Handshake, students can schedule appointments with our office, apply for internships and jobs, and see upcoming events. Almost every week, we have employers visit campus for information sessions, and we host career education workshops, all of which are highlighted in our weekly newsletter sent to students.

What topics and student needs are you addressing in your programming?

We hope to provide students with the resources and skills needed not only for their first job out of school but for opportunities throughout their careers. I see our office working more collaboratively with students, academic departments and staff to develop ways for students to explore, prepare and engage with career opportunities. We are working with institutional research staff to conduct focus groups with students so we get a better understanding of what areas students are interested in and in what ways they want to interact with employers and/or industry experts.

The idea of work-life balance is becoming more important to job seekers. What other criteria do you discuss with students as they think about a career?

When I meet with students, I try to get a better understanding of their values and interests, to help them weigh options and figure out the best fit for them. Salary is one factor to consider, but there are many others, like benefits, location,

support systems (affinity groups, family, friends, etc.), opportunity for professional development or mobility. Sometimes students think they are limited by industry but it’s important to pay attention to function; for example, a person can be a data scientist in many different industries.

How can parents and alumni help Career Services support current students?

We can’t do it without the support from our alumni and families. We always appreciate internship and shadowing opportunities for students. We help students explore different companies and industries by doing site visits; they are able to see varying work environments, meet others in industries they are interested in and hopefully make connections. We can always use volunteers as external resume reviewers and mock interviewers for programs. Introductions to recruiters or human resources personnel is always appreciated. ■



Leading the Way

A chemist's ambitious educational program leaves a legacy of community engagement

Written by Sarah Barnes



IN 2006, AFTER A YEAR OF field and lab work, Hal Van Ryswyk, John Stauffer Professor of Chemistry, and the entire class of first-year chemistry lab students made one last trip

to their off-campus collection site to present their findings to the community. The students had been participating in The Lead Project, a unique research and educational program developed by Van Ryswyk and the Department of Chemistry to test lead levels in soil at local elementary schools.

Over two semesters, the HMC students traveled regularly by van to Vista del Valle Elementary School, where they led lessons on math and science, collected soil samples with the elementary students and helped interpret the test results. Back on campus, they tested their samples, often under the eye of a webcam they'd set up so the Vista students could watch online.

As his students prepared to field final questions from the community at Vista del Valle, Van Ryswyk had one more lesson. He recalls saying, "You've done all this science. Think about what it means and how you can explain it, bring it down to English." In the end, he says, "That was the most valuable lesson for many of our kids. Through this project, every Harvey Mudd College student came face-to-face with questions regarding the impact of their technical work upon society while simultaneously developing tools to examine this relationship."

The successful program lasted six years, until curriculum changes and logistical challenges made it untenable. "We experienced such growth," Van Ryswyk says. "We reached out into the community. The Vista kids loved the hands-on science. Our students learned a lot—if nothing else, that their fourth grade teacher must have been a saint—and we learned about our students. They really blossomed."

"It was a group effort," Van Ryswyk says. "Many people were involved, and it led to direct benefits



Vista del Valle Elementary School students work on The Lead Project with HMC students in 2006.

for HMC and the elementary students." The Lead Project turned out to be a gateway to a more formal HMC community engagement program with a full-time staff member, Gabriela Gamiz. "Right after the Vista project began, the Science Bus was formed. People saw the possibilities of such programs," says Van Ryswyk. Science Bus is a student-run, volunteer organization at The Claremont Colleges, in which 5C students teach science to local fourth and fifth grade students.

Van Ryswyk still considers community engagement to be a significant part of his work. As department chair, part of his job is to support community engagement among faculty, like biology and chemistry professor Karl Haushalter, who teaches Inside-Out courses, attended by both 5C "outside" and incarcerated "inside" students at local prisons.

Over the years, Van Ryswyk's research interests have shifted. "Now I'm a little farther out on the material science side of things. My research is in solar energy conversion, and I see the value of that science and talking about where that fits into the larger societal picture," he says.

Recently, a group of students interested in finding solutions to the problem of climate change invited Van Ryswyk and some of his chemistry and computer science colleagues to lunch. "They wanted to talk about how they could protect the planet both as students and in their careers," he says. "Talking about how to incorporate this into their education brings up the Harvey Mudd Emphasis

in Environmental Analysis, which came out of The Lead Project as a way to institutionalize ways to think about environmental issues in your education regardless of major."

Students choosing the Emphasis in Environmental Analysis follow a coordinated program of study that allows them to address environmental issues from a range of perspectives in order to better understand the impact of their work.

Societal impact and effective community engagement is a running theme in Van Ryswyk's teaching, perhaps now more than ever. "When I talk to our first-year class, a lot of the units we're doing are energy-related—where to get renewable energy, how to store it and the chemistry behind that. So it can sound like, 'Oh, if I just invent this silver bullet, everything will be fine,' but that may not be the case. There's a lot of science and engineering around climate change worth doing, but we also want students to think about the humanities and the arts, because even if you do have the silver bullet, you have to understand the psychology and politics and how to get society to bend in that direction."

Science isn't the entire question, says Van Ryswyk, and maybe not even the biggest part of the question. "How do we change human behavior? How do you get people to confront a train that you can see 30 or 40 years down the track and do something about it now?" he asks. "I want to get people to start thinking about using all the tools they have to take on the complicated issues." ■

• Teaching Impact, Multiplied

MATHEMATICS PROFESSOR LISETTE DE PILLIS IS the winner of the 2019 MAA Southern California-Nevada Section Award for Distinguished College or University Teaching of Mathematics, given to instructors recognized as extraordinarily successful and whose teaching effectiveness has had an influence beyond their own institutions.

“Lisette is an extraordinary teacher, scholar, mentor and chair,” says Art Benjamin, Smallwood Family Professor of Mathematics, who was instrumental in de Pillis’ nomination for the award. “We are so lucky to have her on our faculty, and it’s hard to imagine anyone more deserving of this award. It was wonderful to see so many current and former students write enthusiastic letters of support.”

Indeed, the references to de Pillis’s meaningful influence on her students and colleagues are a unified narrative. One nominator wrote, “Lisette has been a champion of supporting women in our field. Her inspiring attitude toward science, teaching and service, her wonderful ability to reach out to young colleagues and lend an ear or a hand whenever possible are an absolute inspiration.”

De Pillis is the Norman F. Sprague Professor of Life Sciences, a professor of mathematics and department chair (2014–2019). She also led the Global Clinic Program from 2009–2014 as director. She is a recognized expert in the field of cancer immunology modeling. Passionate about using mathematics to seek solutions to real-world problems, she works with other mathematicians, biologists and oncologists to search for new ways to treat diseases that interact with the immune system, in particular cancer, HIV and Type I diabetes.

In 2000, de Pillis’s multidisciplinary accomplishments were recognized by the Argonne National Laboratory with the Maria Goeppert-Mayer Distinguished (MGM) Scholar award. The award was established to recognize an outstanding woman scientist or engineer, chosen from an international pool of nominees. This was the first and only MGM award that was bestowed upon a researcher from an undergraduate institution, and only the second time the recipient was a mathematician. In 2016, de Pillis was elected as a Fellow of the American Mathematical Society, which recognizes members

who have made outstanding contributions to the creation, exposition, advancement, communication and utilization of mathematics.

“It is a privilege to be able to teach at a place like HMC,” de Pillis says. “It is particularly rewarding when we can watch our students progress from being bright first years, eager to learn, to professionals, who can create and share new knowledge of their own, and who have built successful careers in the mathematical sciences and beyond. It is a special pleasure to see how so many of our students and alumni are committed to welcoming new generations of talented individuals into the world of mathematics and science.”

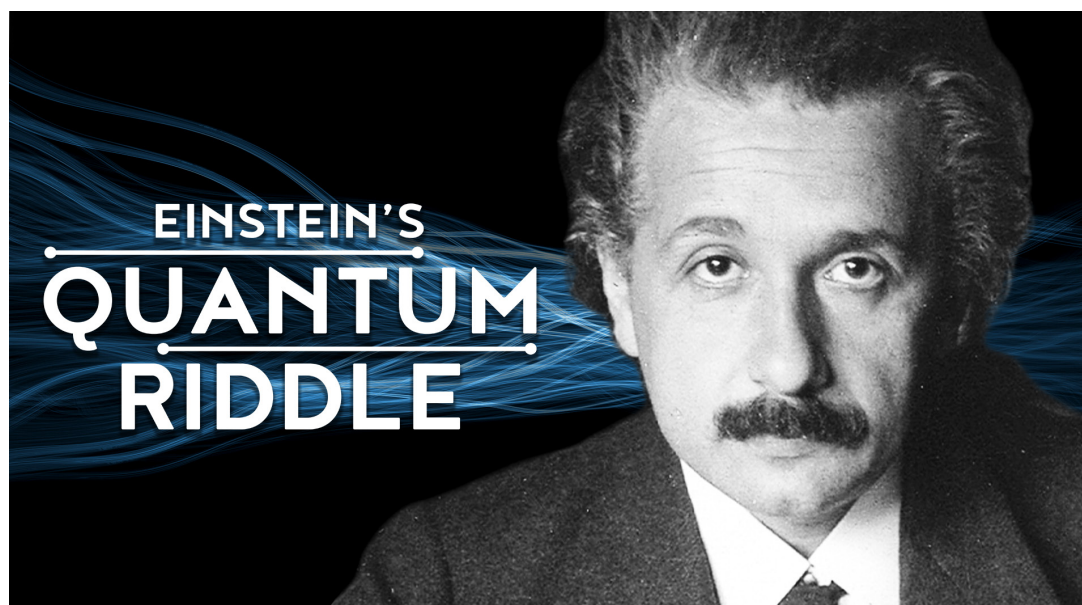
As the Southern California-Nevada Section award winner, de Pillis is also nominated for the national MAA Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics. ■

“ We are so lucky to have her on our faculty, and it’s hard to imagine anyone more deserving of this award. It was wonderful to see so many current and former students write enthusiastic letters of support. ”

—ART BENJAMIN, SMALLWOOD FAMILY PROFESSOR OF MATHEMATICS



Loring Thomas PZ '17 and Lisette de Pillis



Promotions, Tenure and Appointments

Effective July 1, 2019

Tenure promotion



Jim Boerkoel (computer science) was approved for tenure and for promotion to associate professor. Boerkoel, who directs the Human Experience & Agent Teamwork

Lab (HEATLab), specializes in human-robot interaction, artificial intelligence and interaction design—designing better human-computer interactions.

Reappointments

Tanja Srebotnjak, Hixon Associate Professor of Sustainable Environmental Design, was reappointed for a third, two-year term

Five assistant professors were approved for a second reappointment: **Katherine Breeden** (computer science), **Nicholas Breznay '02** (physics), **Leah Mendelson** (engineering), **David Seitz** (humanities, social sciences, and the arts), and **Brian Shuve** (physics)

Chair of the Faculty

Tom Donnelly, professor of physics, will serve from July 2019 through June 2022.

Associate Deans

Chris Clark, professor of engineering and associate dean for research and experiential learning

Bill Daub, Seeley W. Mudd Professor of Chemistry and associate dean for academic affairs

Talithia Williams, associate professor of mathematics and associate dean of faculty for diversity

HMC Physicists Co-star with Quasars

Last year, Harvey Mudd physics professor Jason Gallicchio, Calvin Leung '17 and Beili (Nora) Hu '19 published a paper describing a new test of quantum entanglement using photons from distant astronomical objects. Working as part of quantum physicist Anton Zeilinger's group at the Austrian Academy of Sciences and the University of Vienna, Gallicchio, Leung and Hu ran their successful experiment using two of the world's largest telescopes, on the Canary Island of La Palma.

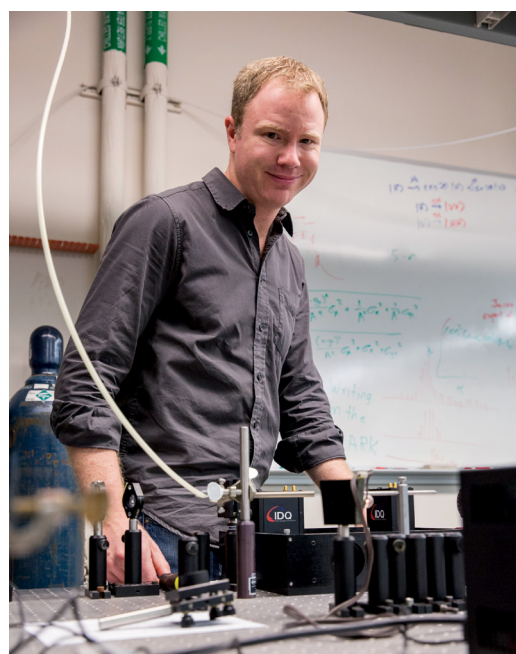
A film crew from the PBS science series *NOVA* was there to document the test and included much of their footage in "Einstein's Quantum Riddle," an episode of *NOVA* which aired on PBS stations in January. In February, the Mudd community enjoyed a screening of the film on campus, followed by a discussion with Gallicchio and *NOVA* executive producer Chris Schmidt, who provided insight on the challenges of explaining complicated topics via film.

"It was great having my team's work at Mudd being featured as the culmination of the Einstein-Bohr debate, even if that's a bit of a stretch," says Gallicchio.

Though Gallicchio and his group are finished with this particular test for now, he says there are other aspects of quantum mechanics whose experimental verification can be improved using light from distant quasars. "My group is looking at improving tests of wave-particle duality and something called

a quantum eraser, where one particle acts like either a wave or a particle based on something you do to a different particle."

And, if *NOVA* comes calling again, they're hoping to share the spotlight, "My group is always interested in welcoming new students who have optics, electronics and data analysis skills," he says.



▲ Jason Gallicchio

Gu Appointed First McAlister Professor



Data science expert and longtime mathematics professor Weiying Gu is HMC's first McAlister Professor in Mathematics. Gu, who is also director of the College's Mathematics Clinic, joined the

faculty in July 1996.

"I'm delighted to join with the mathematics department in honoring Weiying, who is not only a preeminent scholar in her field but also someone who has brought her considerable enthusiasm into the classroom and into her role as Clinic director for her department," says Lisa Sullivan, vice president and R. Michael Shanahan Dean of the Faculty. An endowed chair recognizes outstanding faculty while providing invaluable support for salary, research, teaching or service activities.

Gu specializes in differential geometry and topology, with applications to big data analysis,

computer-aided design and robotics. Her research on the geometry of a manifold (e.g., a sphere or a Grassmann manifold) and in computational geometry directly applies to big data-to-decision, fundamental problems in dynamics, control theory, robotics and computer graphics. She also researches applications to math-biology and applications to industrial mathematics.

The McAlister Professorship was established in 2018, during The Campaign for Harvey Mudd College, by longtime supporters Robert and Barbara McAlister to recognize and support the work of an outstanding faculty member within the Department of Mathematics. The appointment includes an annual discretionary fund to support travel, research or teaching.

During this academic year, Gu has published several papers with her students highlighting their research on applying advanced mathematics to big data analytics and developing new algorithms for machine learning and artificial intelligence. This

summer, she'll teach Nonlinear Data Analytics during HMC's expanded Summer Session and will conduct research with Matthew LeMay '21 and Ricky Shapley '20, the 2019 HMC Giovanni Borrelli Fellow.

"I plan to use my discretionary funds to conduct research and attend conferences with my students, including my senior thesis students, summer research students, Clinic students and PhD students from Claremont Graduate University," Gu says. "I also would like to use the discretionary funds to further develop data sciences-related courses for my students."

Gu is developing two new courses (Advanced Data Analysis with Applications in Solving Real World Problems and Nonlinear Data Analysis with Applications in AI) and has been updating the Mathematics of Big Data course she developed in 2016. "I have been trying my best to meet our students' need for data analysis, recording these needs and gradually turning them to new data science courses," she says.

More Honors & Appointments

Su is Phi Beta Kappa Visiting Scholar

When teaching and popularizing mathematics is your passion, you don't pass up the opportunity to travel the U.S. to do so.

Francis Su, Benediktsson-Karwa Professor of Mathematics, joined a cohort of America's leading thinkers who attended classroom discussions and seminars, met with students and faculty members and delivered public lectures as Phi Beta Kappa Academic Honor Society 2019–2020 Visiting Scholars.

With the purpose of fostering an exchange of ideas between visiting scholars and resident faculty and students, the program is an ideal fit for Su. "People often think math is for an elite few but it's not for them. I hope to help people see that doing math is intimately tied to being human. And because of that, math should be seen as something that everyone should pursue and is worth the effort to learn

well. I also want to remove barriers to people being able to pursue mathematics," Su says. A past president of the Mathematical Association of America, he has done much public writing and speaking on issues related to removing barriers for women and underrepresented groups to student mathematics. His book *Mathematics for Human Flourishing* will be published by Yale University Press later this year.

Orwin is ACE Fellow

The American Council on Education (ACE) announced that Elizabeth Orwin '95, James Howard Kindelberger Professor of Engineering and department chair, has been named an ACE Fellow for academic year 2019–2020. As a fellow, she'll spend one year participating in retreats, interactive learning opportunities, visits to higher education campuses and organizations, and placement at another higher education institution. Fellows also conduct projects of pressing concern

for their home institution and seek to implement their findings.

Established in 1965, the ACE Fellows Program is designed to strengthen institutions and leadership in American higher education by identifying and preparing faculty and staff for senior positions in college and university administration. Associate Professor of Mathematics Talitha Williams was an ACE Fellow for academic year 2015–2016.

Orwin is director of the Engman Fellowship Program in Bioengineering, which trains students in biomedical engineering research and device design. In addition to teaching courses in engineering design and engineering systems, Orwin has developed courses and programming in biomedical engineering. She has served as advisor for HMC's chapter of Society of Women Engineers and has drawn on her extensive background, as well as her experience as an engineering alumna, to mentor many women engineers. In

2017, she received the Orange County Engineering Council's Distinguished Educator Award and President's Award.

CS Professor Elected to CRA

July 1, Ran Libeskind-Hadas, R. Michael Shanahan Professor of Computer Science, will begin serving a two-year term as secretary on the executive committee for the Computing Research Association (CRA) board of directors. He previously served as co-chair from 2011–2017 on the CRA Education Committee, which focuses on promoting undergraduate research, providing resources to faculty to prepare talented students for research and encouraging undergraduate students to pursue graduate education and research careers in computing fields. The CRA includes more than 200 North American organizations active in computing research.

Retirement Reflections

Four longtime faculty members, all named Honorary Alumni by the Alumni Association Board of Governors, are venturing into retirement after many productive and impactful years. Here's a look at some of their interests, memories and plans.



Hal Barron
professor of
history emeritus
(1979)

Barron is an expert on U.S.

social history, specializing in rural life. He has written or spoken about the history of agrarian society, the portrayal of rural life in American culture, citrus culture in California, the history of crossword puzzles, issues of immigration and ethnicity, and the experiences of Japanese Americans and Jewish Americans. He also teaches citizenship classes to immigrants who want to become eligible for naturalization.

Classroom memories: "I thoroughly enjoyed developing a new course about Los Angeles history as an HSA 10 section. In I Love L.A., I focused on the rich mixture of different races and ethnicities that has characterized that history from its beginnings and shaped its social, cultural, and political development. It was particularly gratifying to me, and a testimony to HMC's ability to change and grow, that the last time I taught this course, it had a majority-minority student enrollment. That would have been unthinkable when I first started teaching here."

Retirement plans: "[Wife] Kathy and I are expanding our cultural horizons and regularly go to lectures, seminars and museum exhibits, especially about Los Angeles history. We have

the L.A. Phil and the L.A. Opera, and I am now a student at Pasadena City College, where I am taking the course History of Opera. There is bicycling (bright-colored spandex and all), cooking, exploring new restaurants (much more difficult without Jonathan Gold as our guide), political work to resist the current administration and numerous opportunities for Jewish life and learning."

Fun fact: "I actually won some money as a contestant on Jeopardy!"



Mike Erlinger
professor of
computer science
(1981)

Erlinger researches

computer networking and has worked extensively in the areas of network security and management, including: intrusion detection systems, intrusion alert formats, secure protocols, and integration of security systems into network management systems. He also researches K-12 computer science education and is passionate about increasing computer science awareness in youth.

Observations:

- Five years in, computer science became a department
- 11 years in, computer science became a major
- 30 years in, computer science became the national leader in percentage of women majors
- 38 years in, computer science is arguably the largest major at HMC

What I learned from students: "Persistence and patience."



Patti Sparks
professor of
physics (1989)

Sparks' work involves the design,

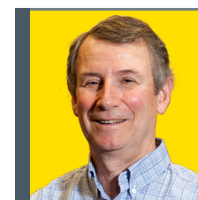
making and study of magnetic device structures, including a new class of devices based upon the property of giant magnetoresistance, increasingly important in sensor and data storage technology. She is well-known for being a staunch supporter and mentor of students.

What I learned from students: "There was an E&M rule regarding change/reflection I always needed to refresh in my mind before teaching it. And I admitted this to the class. There was a student who in class looked at me with a blank face when it came time to teach this rule, and he said "low to high, add a pi." I will remember the look on his face forever. And from this day forward this phrase has stuck in my mind and has been passed down to from class to class via the student network."

Classroom memories: "I love physics and food and teaching the science behind what is happening when cooking. One of the things we have the students do is to take their cooked masterpieces and share them with the CS 5 students, who usually have office hours at the time the class is offered. One day a student commented on how nice it was to give people warm cookies, a special add-on to their college education. This put a smile on my face."

Retirement plans: "I have been quilting for 17 years. I recently had my second pattern published. I like working with geometric designs and making the fabric sing. I told my daughters, when I retire I would live closest to the

cutest grandchild. I have one, so this would mean I should be moving to Maryland. But one can change their mind, right?"



John Townsend
professor of
physics (1975)

Townsend's primary research

interests have been in particle physics, although he has also done some work in nuclear arms control, an area that might be called public interest science. He was chair of the College's first major revision of the Core Curriculum, served four five-year terms (21 years) as physics department chair and introduced the off-campus major. He is the author of two textbooks: *Quantum Physics: A Fundamental Approach to Modern Physics* and *A Modern Approach to Quantum Mechanics*.

What I learned from students: "One of the things I learned was how challenging physics is as a discipline (which I well knew when I chose it as my major as an undergraduate) and the joy I had when I succeeded in getting students interested in and motivated to understand the subject."

Impact: "My books may turn out to be my most significant professional accomplishments since, in both cases, I am advocating for a sea change in the way quantum mechanics and quantum physics (what used to be called modern physics) are taught for undergraduates."

Fun fact: "I worked closely with the astronaut Sally Ride, right after she retired from NASA."

• Building STEAM

A strategic partnership builds confidence and competence among local youth

Written by Elaine Regus

TWICE A YEAR, SOME 20 HIGH SCHOOL GIRLS FROM the surrounding communities spend eight days on the Harvey Mudd College campus learning computer coding and using what they learn to develop projects, like a gene-editing comb design or original music.

The effort is a partnership between the College and STEAM:CODERS, a Pasadena-based non-profit dedicated to educating and inspiring youngsters from underrepresented and underserved families through science, technology, engineering, art and mathematics (STEAM).

The eight-week Saturday sessions in fall and summer are taught by HMC students and funded by various grants and endowments through the Office of Community Engagement to ensure that the program remains free for participants.

Raymond Ealy, executive director, founded STEAM:CODERS in 2014 to introduce students to the STEAM disciplines and give them access to technology. Since then, more than 8,000 students in kindergarten through 12th grade have participated in the program that offers a combination of hands-on activities, field trips and classroom instruction designed to spur imagination and innovation.

The partnership between STEAM:CODERS and HMC began when Colleen Lewis, McGregor-Girard Associate Professor of Computer Science, joined the nonprofit's board. Initially, HMC students traveled to Pasadena to teach the classes. Then, based on conversations with Gabriela Gamiz, director of community engagement, Lewis approached Ealy about offering the classes at Harvey Mudd. Since then, HMC has hosted the program on campus twice a year to serve students from the surrounding communities.

"The thing that has been really magical about it is each time I've been able to hire students to both run and teach in the program," Lewis says. "It's been fantastic, and it's been really exciting to me to just get out of the way and let students take ownership over this."



At first, the HMC program was open to anyone and attracted primarily young men. The few young women who did enroll seemed reluctant to speak up, voice their ideas and openly share their opinions. Gamiz says they noticed the limited participation of young women and wanted to address this and take action." So, Gamiz and Lewis decided to limit it to young women only. A turning point came after Gamiz discussed her concerns with HMC sophomore Mary Celestin, who shared her experiences from Girl Scouts where she developed a program for elementary school girls to get involved in STEAM as part of her Gold Award project. Gamiz invited Celestin to teach one of the sessions.

Celestin loved the flexibility of being able to develop her own curriculum. She was impressed by the impact STEAM:CODERS has had on thousands of kids in the Pasadena and Los Angeles areas and wanted to be part of that.

"I really wanted to focus on introducing girls to the power of computer science not only as a career, but also as something that is a tool for any type of

“ I really wanted to focus on introducing girls to the power of computer science not only as a career, but also as something that is a tool for any type of career or hobby that they're interested in. ”

—MARY CELESTIN '21

career or hobby that they're interested in," says Celestin, who incorporated hands-on and teamwork activities into each session.

Each lesson focused on prominent women in the field that they were studying.

"The big thing for them was to see people who looked like them in STEAM and seeing women—women of color—doing really amazing things in all the different fields," says Celestin, whose father is from Haiti and whose mother is Cape Verdean.

Enthusiasm from the students was evident on the last day when they presented their final projects to classmates and parents.

"They were super excited to present to their parents and to express their newfound interest in computer science not only as a career but something they could use all the time, every day and show to their friends as something that is cool and exciting," Celestin says.

Feedback from parents has been positive as well.

"They talk about how empowering it has been to their young daughters to know they can have a voice and can express themselves, develop ideas and see them from start to finish and the level of confidence they have gained as a result," Gamiz says.

Gamiz works with community partners in Claremont, Pomona, Ontario, Montclair and Upland to recruit students for the STEAM:CODERS program. She also sends out email blasts, uses social media and taps a list of area teachers with whom she has worked in the past.

"It takes a lot of different people to come together to make something like this happen and to recognize the value of having something just for women," Gamiz says. "So, I'm super thankful for these kinds of partners that listen to one another and take action to implement programs that best serve young scholars."

Ealy said Harvey Mudd is one of the first campus locations for STEAM:CODERS and has become a model for other partnerships. The collaboration with HMC has been a win-win for everyone involved. Not only does the arrangement provide instruction for the students, it exposes their families to the college experience. "We want the students and parents to dream big," says Ealy.

"Most of the parents who bring their kids to campus for a STEAM:CODERS class never attended college, so they get to see what college is like and see how much their children enjoy participating in the program. Now, they have a mission to help their kids fulfill their dreams by preparing them for college and getting them more information on how to do that," Ealy says. ■

“ I’m super thankful for these kinds of partners that listen to one another and take action to implement programs that best serve young scholars. ”

—GABRIELA GAMIZ, DIRECTOR OF COMMUNITY ENGAGEMENT



STEAM:Coders Executive Director Raymond Ealy with Colleen Lewis, Mary Celestin '21 and Yeabtsega Birhane '20.

Student Success by the Numbers

555 Team 555 (Mek Jenrungrot '19, Santi Santichaivekin '21 and Jordan Haack '19) was the College's highest scoring team at fifth place (for the second year in a row), and Team TBD (Evan Johnson '20, Matthew Calligaro '20, Owen Gillespie '20) placed eighth at the 2018 Southern California Regional of the International Collegiate Programming Contest (ICPC), considered the world's largest and most prestigious programming competition. The third team, List Incomprehension (Cole Kurashige '20, Princewill Okoroafor '20, Kye Shi '21), placed 30th out of the 98 teams competing. Teams were tasked with writing software systems that solved issues like using artificial intelligence for typo checking or dividing up the customer base between two bicycle courier services.

3 For the third consecutive year, a team of Harvey Mudd students won top honors at the regional Association for Supply Chain Management student case competition. Bohan Gao '19, Charles Dawson '19, Ryan Haughton '19 and Lydia Sylla '19 will head to Las Vegas in September to compete in the final round, to be held during the annual ASCM conference. The students were tasked with solving a case about a toy manufacturer that wants to expand its manufacturing capacity with low investment.

6 Harvey Mudd College improved upon last year's team placement and maintained its position as the top-scoring undergraduate institution in the William Lowell Putnam Mathematical Competition, the preeminent undergraduate mathematics competition. In team competition, veteran Putnam competitors Adam Busis '19, Shyan Akmal '19 and Xuming (Evan) Liang '20 placed an impressive sixth out of 568 institutions. In the individual category, Busis ranked 87th in the nation, and received an honorable mention; Liang and Mengyi Shan '21, scored in the top 200.

214 The record number of undergraduates who attended the 2019 American Astronomical Society meeting in Seattle. Among them was Luis Martinez '19, a physics major who received the Chambliss Astronomy Achievement Student Award for his exemplary undergraduate research in astrophysics with Jorge Moreno, an assistant professor of physics and astronomy at Pomona College. "What Lights up a Galaxy Bridge" focuses on simulating galaxy merges to gain a better understanding of star formation in galaxy bridges.



▲ Lydia Sylla '19, Charles Dawson '19, Erick Vera '19 (CSU Long Beach) and Ryan Haughton '19

10 The number of weeks Charles Dawson '19, Ryan Haughton '19 and Lydia Sylla '19 spent on a project to help modernize manufacturing operations at Laguna Clay Company, a Los Angeles ceramic supply business. They helped the owners reduce clutter, streamline material handling, redesign assembly processes and improve efficiency. For their efforts, the team was recognized by the Manufacturers' Council of the Inland Empire with the 2019 Innovation by Students award.

A Novel Experience

Written by Hannah Slocumb '19

Every other fall semester, professors Jeff Groves and Jim Eckert teach a course in literature by Charles Dickens and Thomas Hardy. This includes reading a number of books, including *A Christmas Carol*, *Bleak House*, *Far From the Madding Crowd*, and *Tess of the d'Urbervilles*. Hannah Slocumb describes this incredible experiential learning experience.

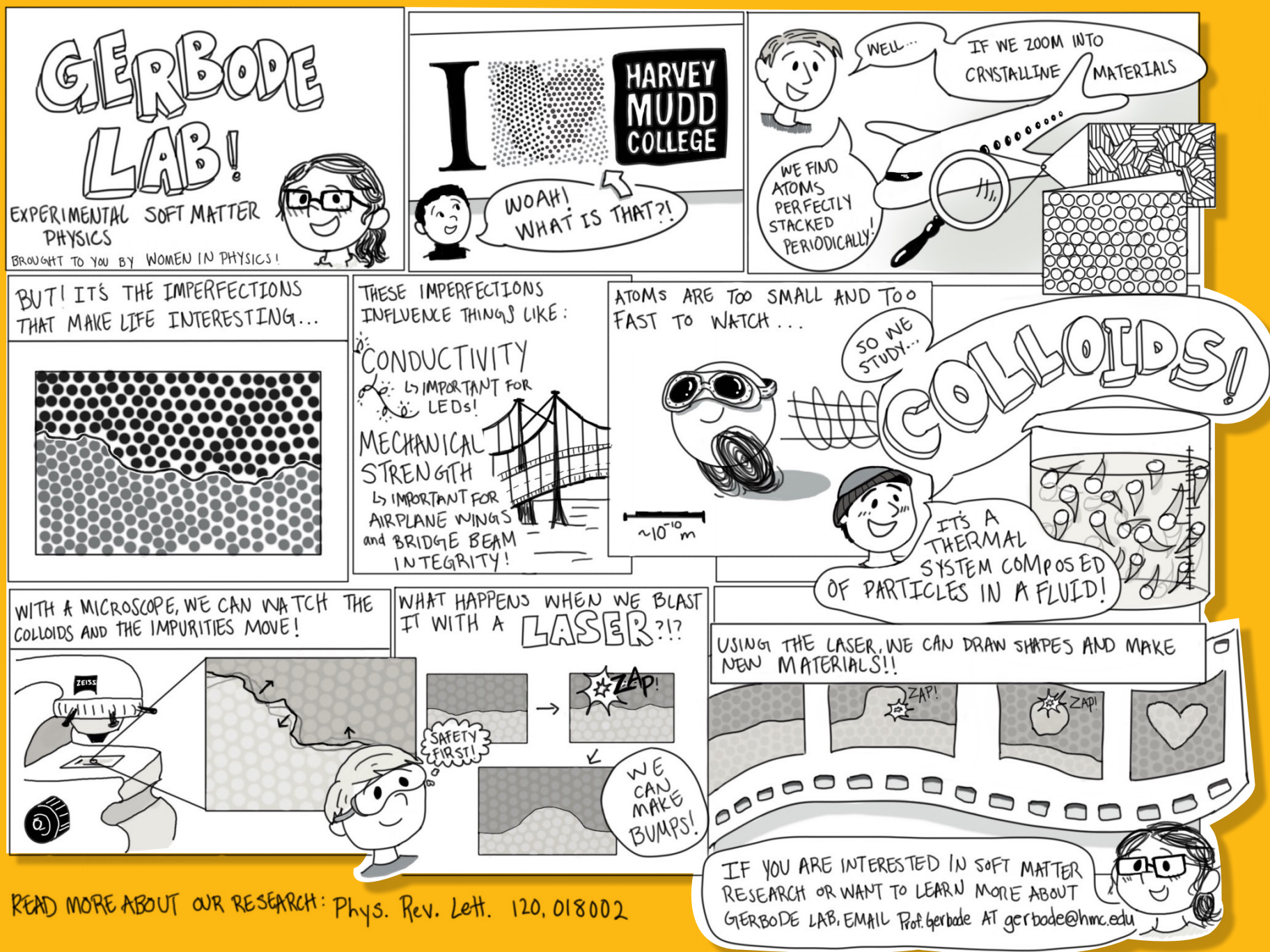
During the semester, we learned about aspects of Victorian era history such as art and architecture, advances in printing, and modes of transportation. Following the semester, the class headed over to England to spend two weeks exploring London, where many of Dickens' novels took place, and Dorset, which

Hardy rechristened as 'Wessex' in his books. In London, we learned more about Victorian-era and Dickens' history up close, with visits to St. Pancras Station, St. Paul's Cathedral, and a number of other historic sites.

After a week exploring London, we headed over to Dorset to get a glimpse into life in the countryside. There, we were able to see several places featured in Hardy's books and in his actual life, such as Tess's Cottage, Hardy's childhood home, Max Gate and more. We also were able to visit some of the tourist sites, like Salisbury Cathedral and Stonehenge. By the end, I felt like I was able to understand Dickens' and Hardy's novels much more deeply by seeing first-hand the sorts of places explored in their books.



2018-2019 Dickens and Hardy class



READ MORE ABOUT OUR RESEARCH: [Phys. Rev. Lett. 120, 018002](https://doi.org/10.1126/science.120.018002)

▲ Women in Physics co-presidents Maya Martinez '20 and Mae Lee '20 wanted to improve access to the research opportunities in the HMC Department of Physics. Lee suggested comics. "I know from experience how difficult it is to approach a professor when you know nothing about their field because it's not touched upon in Core," says Lee, who created a comic about Nicholas Breznay's solid state physics

lab. Martinez brainstormed with physics professor Sharon Gerbode to develop a concept that would illustrate what goes on in the Gerbode Lab. "It was especially fun taking what I've learned thus far and Prof. Gerbode's ideas of what to include and finding ways to illustrate it in a clear and captivating manner," says Martinez, a lab member for four semesters. Her illustration includes herself and other Gerbode Lab

members Maya Martirosyan '17, Jeremy Wang '17, Alejandro Baptista '17, Caitlin Cash '18, Kemper Ludlow '18, Nina Brown '19, Eli Weissler '19, Jatin Abacousnac '19, Rachel Barclay '20, Prakarsh Pandey '20 and Henry Limm '20. The officer board of Women in Physics aims to make a comic for each lab in the physics department. View more comics on the Admission blog, bit.ly/ComicPhys19.

• Cube Community

Adam Walker '22 brings a fun, collaborative cube puzzle competition to Harvey Mudd.

By Sarah Barnes

IT'S A GLOOMY, RAINY DAY IN FEBRUARY. HIXON Courtyard is empty, wet and quiet, except for the sound of rain falling into the koi pond. In colorful contrast, beyond large glass doors on the west end of the courtyard, Galileo Hall is alive with activity. Inside, more than 100 people are participating in a World Cube Association (WCA) competition, organized by Adam Walker '22 and the Harvey Mudd College Office of Community Engagement.

Sitting in Galileo's sea of blue chairs, milling around in the aisles and waiting their turns to compete are children and parents, teens, college students and a handful of adult participants. Almost everyone in the auditorium is in some stage of solving a Rubik's Cube or similar cube puzzle; a few are focused on Pyraminx puzzles (like the cubes but in pyramid shapes). Large screens in front of the auditorium display the day's schedule, showing the order of competitors for each round of each event (3x3x3 Cube, 4x4x4 Cube, 5x5x5 Cube, 3x3x3 One-Handed, and Pyraminx). The atmosphere is friendly, with the colorful squares of so many cubes looking like a cheerful sprinkling of confetti throughout the room.

Amid the frenetic scene, Walker sits still except for his hands, which are moving quickly and nimbly to solve a 3x3x3 cube. The stone-faced fifth grader to his left, a competition judge, watches patiently until the puzzle is solved. It doesn't take long: 8.77 seconds after picking it up, Walker returns his cube, solved, to the table in front of him. A digital clock displays the time, Walker's best of the day, in red LED.

The judge records Walker's time on a slip of paper which they both initial, then Walker takes his cube and his time to a long table at the front of the room, where more judges record his results on their computers and advance his name to the next round. After that, he's off, switching back into the busy role of event organizer.

A native of Las Vegas, Walker has been cubing since he was 10 years old, when boredom at a party led him and some of his friends to attempt solving



Adam Walker '22 can solve this 3x3x3 cube puzzle in under 10 seconds.

a cube for the first time. Frustration sent them to YouTube for video tutorials on how to solve the puzzle. That night, after his friends had lost interest and moved on to something else, Walker remained in front of the computer watching the tutorials. "After about three hours of videos," he says, "I was able to solve it in about three-and-a-half minutes."

With constant practice and more videos, Walker eventually got his time down to about nine seconds. That's when, at age 12, he entered his first competition, and he hasn't stopped cubing since.

For anyone who's never been to a WCA competition, the first experience is illuminating. The WCA holds events in more than 100 countries, where regional organizations are responsible for organizing local competitions. With more than 125,000 registered competitors worldwide, WCA events can draw large crowds. Competitors range from elementary school students to retired adults, with the majority being in their early to late teens. Not unlike a track meet or other organized sporting event, the crowd at a WCA competition is made

up of competitors and their families. But unlike other events, a WCA competition is run, governed and executed by the competitors, who take turns judging and competing. This format inspires a friendly, fun atmosphere in which even a novice cuber feels comfortable. For Walker, it's that feeling of community and fellowship that matters most and keeps him involved.

"To me, competing is more about community—meeting other cubers," he says, than it is about winning or losing. "You can be put in the same group as someone like Max Park [a speed cube world record holder who attended the Harvey Mudd competition]. The WCA doesn't have any division based on skill or age, etc."

Walker describes his 12-year-old self as "that nerd who solves cubes and doesn't really fit in." When that nerd entered his first cube competition, he found a place where he did fit in. "It was a fun escape in middle school," he says. "I started going to competitions and meeting all kinds of people that way. I still have a lot of those friends today."

Several of those friends came to Harvey Mudd to help Walker execute the WCA event on campus. His parents also made the three-hour drive from Las Vegas to support their son, something they've grown used to doing as his participation in the cube community deepened over the years. It's a trajectory familiar to many parents whose children discover a passion for something. They find they've become passionate about it as well and commit to spending their weekends driving to nearby and far-flung competitions. One parent at the Harvey Mudd event described herself as her son's "cuber Uber."

"When I first started competing, I think my parents thought it was cool but maybe didn't see much practicality in it," Walker says. "But they've been really supportive."

Though Walker isn't really concerned about his hobby being practical ("I just think it's fun," he says), since coming to Harvey Mudd, he's begun to see that his hours of cube puzzle practice are paying off in ways beyond fast competition times. "Once, in a chemistry class, I was trying to think of crystal structures, trying to think of where the holes are between the atoms, and using some of the different cube shapes, I was more easily able to visualize it," he says.

Like his first cube competitions in middle school, Harvey Mudd is a place where Walker feels like he belongs. "My motivation for cubing continues to be the community," he says. "I really want to organize more competitions at Mudd. All of my friends were

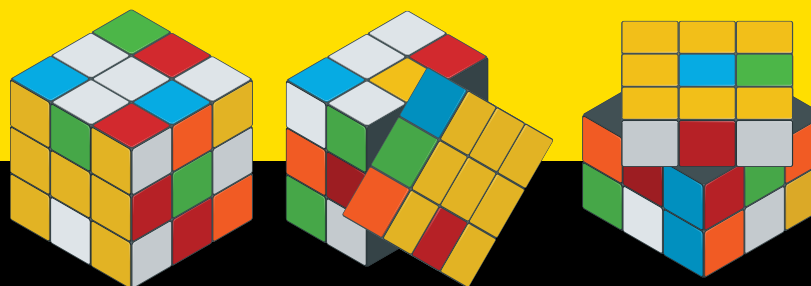
saying what a great venue it is. This is one of the reasons why I chose Mudd. I can do stuff like this and no one's looking at me funny. People think it's cool and are supportive."

Indeed, cubing events do seem like a natural fit for the Harvey Mudd community. "Maybe a quarter of the students know how to solve cube puzzles," says Walker. Walker was able to recruit Delaney Cohn '22, Eric Brandon Chavez '22, Jason Chen '22, Kyra Clark '22, Ryan Martinez '22, Shanni Lam '22, Sidney Cozier '20 and Jacky Lee '20 to the competition, and he hopes to expand the number of Mudd cubers. "For how many people at Mudd solve, it would have been nice to see a few more people compete," he says, reiterating that the competitions are friendly and focused on community more than winning or losing. "There were at least 30 people at the event who had never competed before," he says. "There's two reasons to compete: One is to meet other people in the cubing community and the other is to challenge yourself and set individual goals. For most of us it's not

about winning the competition. It's about individual accomplishment and community."

Walker worked with the Harvey Mudd Office of Community Engagement and its director, Gabriela Gamiz, to organize the WCA event. Gamiz says she's eager to keep the momentum going around building a cubing community at Harvey Mudd and hopes to support Walker in this endeavor. "I definitely want to organize more competitions at Mudd," Walker says. "Maybe start a cube club." For now, time is a constraint—as a WCA delegate, Walker attends competitions every two to three weeks, making time for cubing around his school work and his other favorite activity: writing code.

One of the WCA's stated goals is for people from all over the world to have fun together in a friendly collaborative atmosphere where people help each other. That seems to be what happened at the Harvey Mudd event. At the end of the competition, Walker was exhausted and content. "It was a great event," he says. "Knowing that so many people are having a good time is really cool." ■



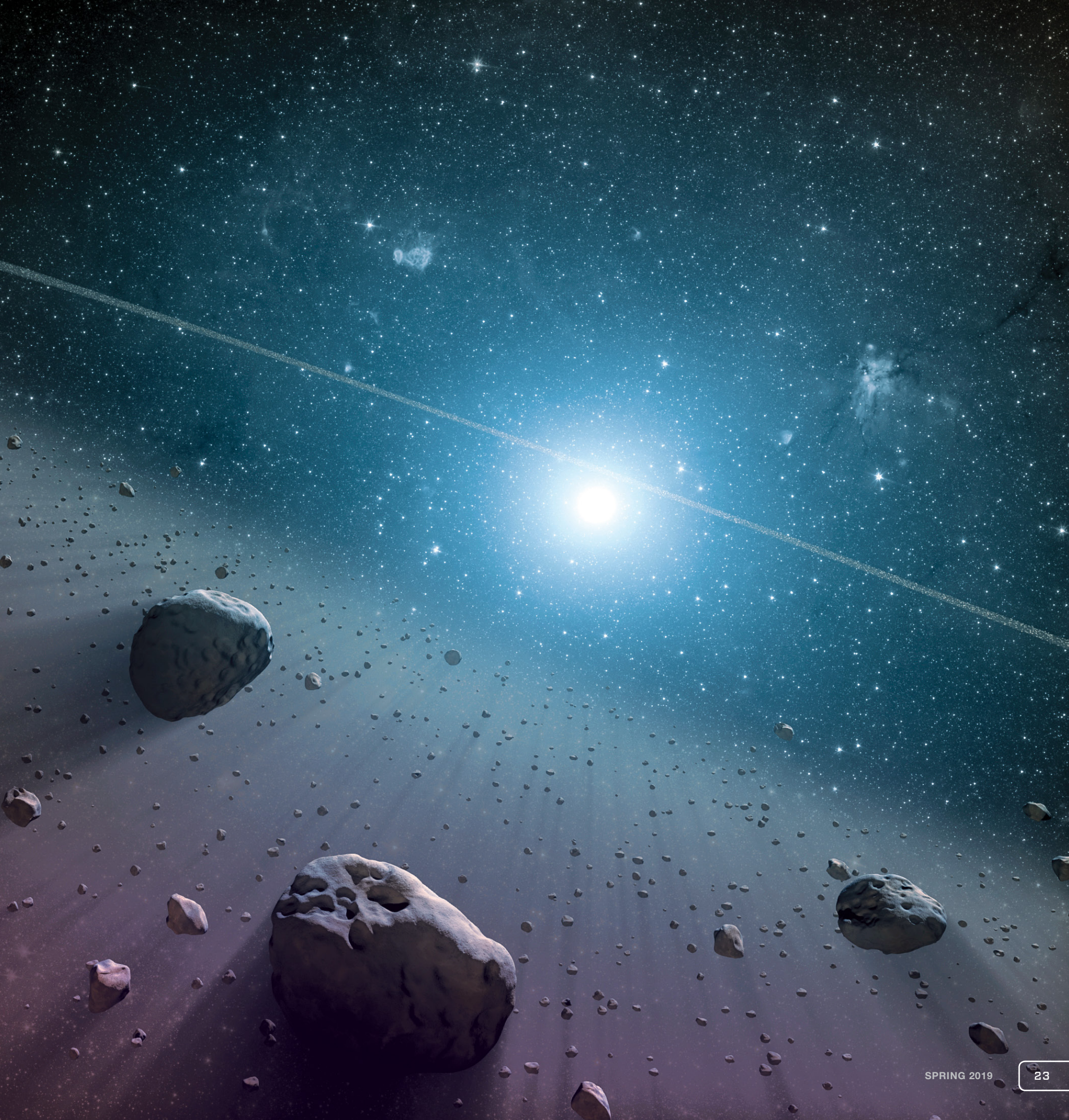
Walker's tips for the cube newb

1. Watch several hours of YouTube tutorials. Then watch more.
2. Once you're down the cube puzzle rabbit hole, you'll learn that there are many methods (or algorithms) that can be used for solving. Walker's favorite is the CFOP method (Cross, First two layers, Orientation of last layer, Permutation of last layer) aka the Fridrich Method), which is popular with speed cubers.
3. Keep a variety of cubes handy at all times. Walker and his dorm mates have a large collection in their living room, and he usually has one in his backpack. He also built a cube simulator on his laptop, so he can practice even when he doesn't have a cube in hand.
4. Find your cube community on Facebook or by attending a World Cube Association event (worldcubeassociation.org). You'll learn a lot and make new friends.

BEYOND THE HORIZON

An algorithm developed for an Engineering Clinic project is being used to detect and track Kuiper Belt objects, improving our understanding of how the solar system was formed.

Written by Daniel F. Le Ray



FOUR BILLION MILES FROM EARTH, a massive region of planetesimal bodies called the Kuiper Belt circumscribes our solar system. Home to dwarf planets like Pluto, the belt also boasts thousands of small, planet-like objects which may date back to the beginnings of our own planetary system.

On Jan. 1, 2019, NASA's New Horizons space probe completed a flyby of one of these objects—(486958) 2014 MU69, informally known as either MU69 or Ultima Thule. More than three years earlier, New Horizons had become the first spacecraft to investigate Pluto. Back home on Earth, six Harvey Mudd alumni who had made a small contribution to this historic moment in space exploration looked on.

New Frontiers

Nearly a decade before New Horizons reached Ultima Thule, Steven Berry '11 Austin Lee '10, Cullen McMahon '11, Claire Robinson '11, Chris Sauro '10 and Florian Scheulen '10 were recruited for a Clinic Program project with the Southwest Research Institute (SwRI), a science, engineering and technology nonprofit that helped engineer the New Horizons spacecraft alongside the Johns Hopkins University Applied Physics Laboratory.

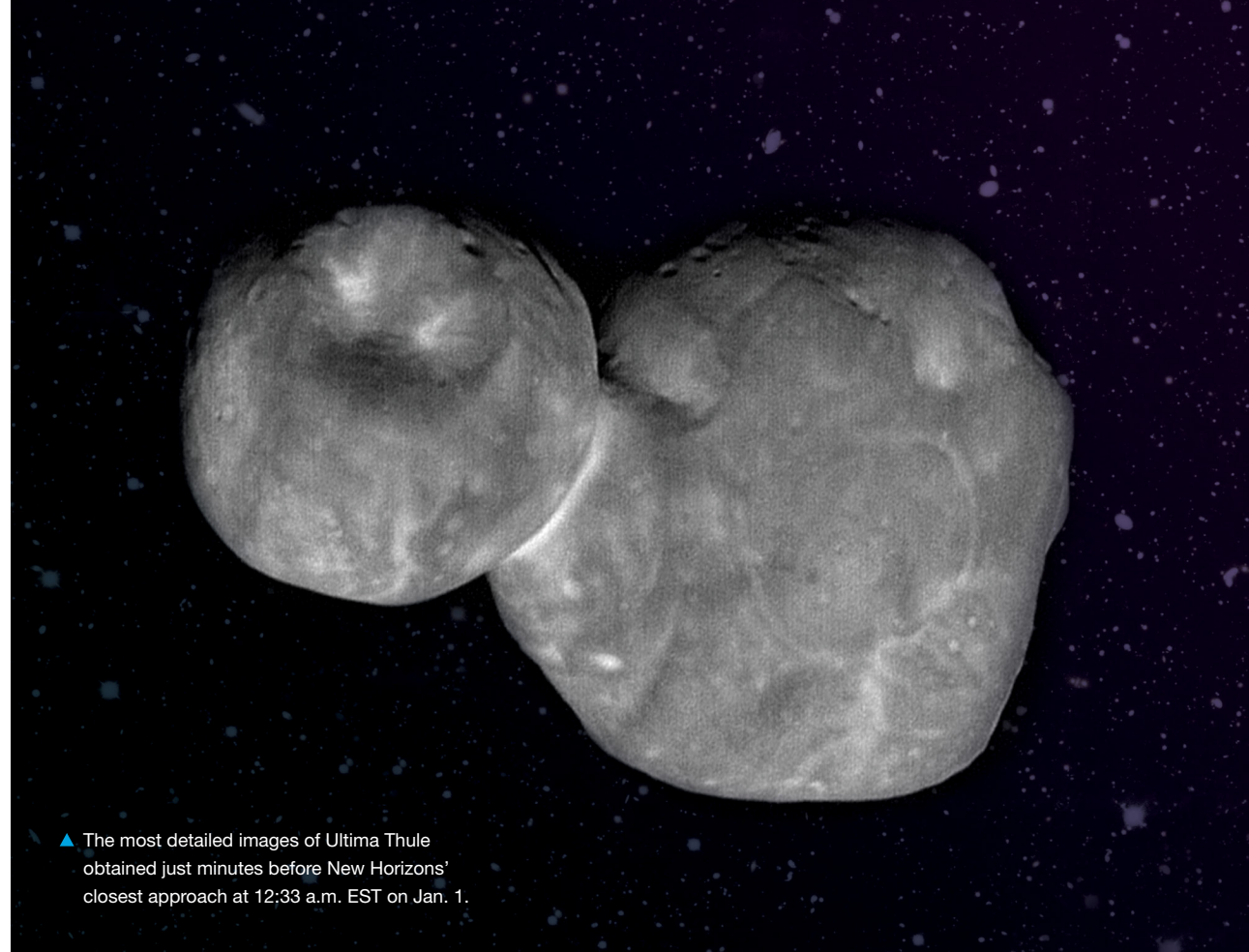
In 2009, the students were charged by SwRI staff scientist and clinic liaison Marc Buie with improving an optimal image subtraction (OIS) algorithm. This algorithm would be used to detect and track Kuiper Belt objects, with the goal of selecting one for New Horizons to study in the future.

"Those folks—they were really, really clever, crafty students. They dug in and tackled the project and did everything that I asked them to do and more. It was fantastic," says Buie, for whom space exploration has always been a calling.

"At an age when most kids would say they wanted to be a doctor or a fireman or something like that, I would actually say I want to be a nuclear physicist, not really knowing what that meant," he recalls. "I got really turned on to the space program, watching the astronauts go to the moon, and that set me on a course for where I've ended up today."

As for his planet of choice: "I distinctly remember Pluto picking me," he adds.

In fall 1982, Buie was about to embark on his doctoral dissertation in planetary sciences at the University of Arizona. After reading a paper his adviser had written about methane on Pluto, he



▲ The most detailed images of Ultima Thule obtained just minutes before New Horizons' closest approach at 12:33 a.m. EST on Jan. 1.

became hooked on all things Plutonian. Buie's dissertation went on to prove that methane was on the planet's surface rather than in its atmosphere—a big change in how scientists viewed Pluto at the time.

Even then, a mission to the edge of the solar system beckoned.

"I remember thinking: We've not gone to Pluto with a spacecraft, but this is something that could happen in my lifetime, during my career, and I want to be a part of that," Buie says.

From then on, he and other Pluto enthusiasts devoted their energies to lobbying for a funded mission. Finally, in 2006, New Horizons launched from Cape Canaveral. Its destination: Pluto and beyond.

In the Stars

Pluto looms large in Buie's life. But for the six Mudders, it was new territory.

According to Lee, who has since gone on to work for Apple as a silicon engineer, "our biggest challenge at first was just getting up to speed; we had a lot to learn."

After setting up the project, Buie travelled to campus to meet with Lee and his classmates.

"Marc was fantastic," says McMahon, now CEO

of Bay Area simulation infrastructure company Simr. "He brought a clear focus to the work he wanted out of us and demonstrated with his hustle and engagement what he expected of us on the project."

His expectations were high: the group was asked to speed up the OIS algorithm by a factor of at least a thousand. Originally written in C, the algorithm had been converted to IDL (interactive data language, a programming language commonly used by planetary scientists) by someone who was not well-versed in IDL. As a result, it was glacially slow.

"While it worked, it took hours to do one image subtraction, and only on a small test image at that," Buie remembers. "I knew that there was a useful tool here, but I needed help in just turning the crank and turning it into a tool that I could actually use."

The New Horizons team planned to use OIS to search images from ground- and space-based telescopes for a Kuiper Belt object that would become the spacecraft's post-Pluto target.

How? Imagine using a powerful telescope to take multiple images of the star-filled Milky Way. Using OIS, you can "overlay" those images on top of one another and "subtract" all the stationary objects. This is how you find "objects marching across the field. That's how you discover planets. That's how Pluto was discovered," explains Buie.

After an in-person IDL bootcamp, Buie set the undergraduates to work. There was a lot of experimentation at first, according to Lee.

“I remember spending a few late nights immersed in low-level optimizations, either trying to wrap my head around how to rewrite nested loops in IDL’s paradigm, where array arithmetic is preferred, or porting the most critical routines to C.”

McMahon, who had already been doing research into image processing, found that “getting the pipeline of data processing moving was difficult. But it was really cool to see once it started.”

The team eventually got the OIS running like clockwork. Then, they set about creating a brand-new tool to solve another issue with telescopic imaging.

Just as a wide-angle camera lens can distort a photograph, “the same thing happens on a much smaller scale with a telescope,” Buie explains. “In order to line up the images and do optimal image subtraction, we needed a tool that allowed us to map and resample an image from one coordinate system to another.”

The resulting tool, christened Dewarp, was a resounding success.

“You could take some crazy distorted image, describe how it’s warped and then straighten it up and make a nice rectilinear version,” Buie says. “This was a tricky programming effort in and of itself—you actually had to know IDL really, really well for this to run fast and get the job done.”

Going Interstellar

It will take nearly two years for all the data from the Ultima Thule flyby to reach Earth. For the Pluto encounter, those data were home in 15 months. What are New Horizons’ most interesting discoveries so far?

Surprisingly, Pluto and its moon Charon have large, canyon-like features. These are most likely the result of subsurface oceans freezing and thawing, making the planet’s crust expand.

“None of us really expected to see that, because we expected [any oceans] to have frozen out a long time ago.”

Another finding that may rewrite the textbooks is what appears to be a volcano located on an ice-covered basin called Sputnik Planitia, a relatively young feature on Pluto’s surface.

“A volcano is not necessarily a crazy thing to think about being on a planetary body,” Buie explains. However, this one appears to be active,

suggesting that “the heat and the energy that was captured at the time of [Pluto’s] formation took a lot longer to dissipate than we were originally expecting. It is mind-blowing that something that small and cold could still be active today.”

Almost 10 years after the clinic project, Buie still uses OIS and Dewarp almost every day. While the OIS application was part of the process of finding and selecting Ultima Thule, both were “central to the work that I did to help make the mission a success. Having these things in my toolkit just made it all possible.”

And what about the alumni?

“It gave me a lot of respect for the scale of the work that leads to modern discoveries,” says Lee, who has been eagerly watching the most recent updates on Ultima Thule.

“The follow-up data are astonishing,” he says. “If this is what we have to discover in what was previously a mere pixel on our best telescopes, what other surprises are out there?”

McMahon saw the flyby news on New Year’s Day.

“I thought it was incredible that our work finally had an impact almost a decade later,” he says. “I’m extremely proud that we were able help, though the lion’s share definitely belongs to Marc.”

Buie, who himself worked in a research lab as an undergraduate, understands the significance of student involvement in new discoveries.

“I know just how valuable and how important it is to be involved with research and researchers and to get your hands dirty with this kind of stuff,” he says.

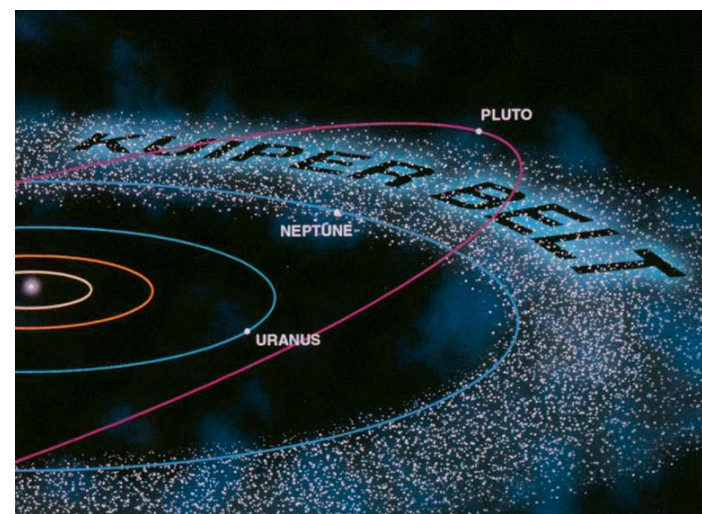
New Horizons has now left Ultima Thule to travel through the remainder of the Kuiper Belt and beyond, making it only the fifth space probe to leave our solar system. The plutonium running the craft should last at least another 20 years, allowing us a glimpse into the workings of interstellar space.

The Clinic group’s work has already proven invaluable to New Horizons’ exploration of the farthest reaches of our planetary system.

“What I see looking at these images is going to rewrite the book on our understanding of how the solar system was formed,” Buie says. “It’s that important. It’s that powerful. And it’s great that we got to involve this Clinic team from Harvey Mudd—it takes so many people to make these kinds of fundamental discoveries.” ■

“What I see looking at these images is going to rewrite the book on our understanding of how the solar system was formed. It’s that important. It’s that powerful. And it’s great that we got to involve this Clinic team from Harvey Mudd.”

—MARC BUIE, SOUTHWEST RESEARCH INSTITUTE STAFF SCIENTIST AND HMC CLINIC LIAISON



NASA

▲ The Kuiper Belt is one of the largest structures in our solar system—others being the Oort Cloud, the heliosphere and the magnetosphere of Jupiter. Its overall shape is like a puffed-up disk or donut. Its inner edge begins at the orbit of Neptune, at about 30 AU from the Sun. (1 AU, or astronomical unit, is the distance from Earth to the Sun.)



LAUNCHING A SOLUTION

How do you test new software features while protecting users from bugs? Two Mudders found a way.

Written by Ashley Festa



GRADUATING AS VALEDICTORIAN OF HER high school class at age 16, earning two bachelor's degrees by the time she was 20, and holding a patent at 23, LaunchDarkly CEO and co-founder Edith Harbaugh '99 is accustomed to being ahead of the curve. Co-founder and CTO John Kodumal '00 bypassed his senior year of high school to study at Clarkson University in Potsdam, New York, and also holds a patent.

Harbaugh and Kodumal, who met at Harvey Mudd in 1998, each had several jobs with technology startups (Kodumal as a PhD at Berkeley; Harbaugh in engineering, products and marketing) before deciding LaunchDarkly could fill a gap in the marketplace. They founded the continuous-delivery, feature flag management platform in 2014, allowing companies to efficiently roll out new software features while minimizing the risks involved. Over 500 customers, including QVC, AMC, GoPro and Meetup, use the platform.

Software developers can control the rollout of new code using feature flags, which are decision points in the code, similar to a fork in the road. Instead of launching a new feature to all users simultaneously, LaunchDarkly's platform allows developers to send just a portion of users—for example, 3 percent of users, or only those in a particular city—down the new pathway, while leaving everyone else on the original path. That way, if there's a bug in the code, it doesn't wreak havoc for all users. Developers can also evaluate whether users enjoy the feature. If they love it, developers can roll out the feature more broadly, but if they hate it or if there's a bug, developers can quickly turn off the new code and revert to the original code. Feature flags can also divert users for other reasons, such as to comply with a law particular to one state.

Some companies have engineers in-house to manage such responsibilities, but other companies cannot afford, or just don't want, a team dedicated to this work. Without the capability of feature flags, though, the new code is binary—either on or off—so there's no way for the company to mitigate any user frustration.

"That's one thing I like best about LaunchDarkly—we really help developers," Harbaugh says. "Instead of suffering from a bug for hours or days, you can just turn it off without going into the office. So our customers' lives are better. We're breaking silos between product and engineering."

“ Instead of suffering from a bug for hours or days, you can just turn it off without going into the office. So our customers' lives are better. We're breaking silos between product and engineering. ”

—EDITH HARBAUGH '99

Such trailblazing work has caught the eye of peers in the industry. Harbaugh was honored as one of the 2018 Top Women Entrepreneurs in Cloud Innovation by CloudNOW, a nonprofit focused on the professional development of women in cloud computing.

"Edith is part of a new wave of leaders, entrepreneurs and technologists," says Jocelyn DeGance Graham, founder of CloudNOW. "We applaud her technical accomplishments in creating a platform that reduces risk from software development, as well as her contributions to diversity and inclusion as she blazes trails supporting the next generation of tech leaders."

Kodumal is continually iterating to find the best way to scale to demand. He recognized that GoLang, a programming language that he didn't previously know, would work best for LaunchDarkly, so he learned the language as he built the company. Kodumal explains that the language is best because it optimizes reading rather than writing code, allowing all collaborators to understand what is written. Because LaunchDarkly manages tens of thousands of requests every second (over 200 billion feature flags daily), it's critical employees understand immediately what's happening and address any issues that arise.

Beyond their mutual admiration, the CEO and CTO say they complement each other's strengths: Harbaugh looking at things from the product management side and Kodumal from the engineering side. While Kodumal admits he pushes for perfection and Harbaugh says she'd rather get things out the door, they don't find their differences problematic.

"We work well together because we've known each other 20-plus years, and we have a deep foundation of trust," Harbaugh says.

Kodumal agrees. "I have absolute faith she has my best interests and the best interests of the company at heart. That's enormously valuable as a cofounder."

Propelled by Mudd

Harbaugh believes the CEO should be a company's No. 1 salesperson, adept at identifying customers that would benefit from LaunchDarkly's services. She credits working at Harvey Mudd's alumni phonathon with honing that ability.

"The phonathon trained me to be a salesperson," she says. "Every night, we got call sheets of who to call, and I wanted to get the most donations. I sorted my sheets into the best candidates to donate, usually 20 to 30 years out of school. It also helped me learn to deal with rejection and build rapport."

Harbaugh and Kodumal have also fostered a strong rapport with their employees by building a positive company culture. "Work is not life" remains one of their core values. Having time for family and personal activities, Harbaugh says, gives their nearly 100 employees a healthier mindset. The cofounders also give employees a \$2,500 yearly education stipend.

"We're not just creating a software product; we're creating a company," says Harbaugh, who manages her own health by running marathons and ultramarathons. She has more than 30 marathons under her belt as well as three 100-mile races. (Her best finish was 29 hours.) She decided to give up the longest races in favor of spending more time on the company, but she occasionally runs 50K races for fun. Kodumal loves rock climbing.

As more of people's daily interactions are software-driven—in the bank, at the grocery store, in their car—Harbaugh believes LaunchDarkly will remain a tool sought after by developers.

"People are moving to the cloud and need new tools like LaunchDarkly," Harbaugh says. "They are demanding better software, and developers must work hard to get it right. LaunchDarkly will help them get there." ■

Hacking Misconduct

A trustee and computer science students use technology to connect victims and help rid workplaces of bad behavior.

Written by S.C. Stuart



IN OCTOBER 2017, HARVEY MUDD COLLEGE PRESIDENT Maria Klawe and Trustee Laurie Girand were at the Computer History Museum in Mountain View, California, participating in an Alliance of Southern California Innovation working group. Together with more than 40 top technology executives, they sat down to tackle the issue of diversity and inclusion within tech companies, large and small.

As revealed in recent high-profile cases, known predators at the top of organizations are often protected by their boards of directors, who authorize payments to victims and silence them with non-disclosure agreements. The result: An entire corporate culture develops against promoting talented women to the top, let alone retaining them in the ranks.

Girand, who started her career at Apple Computer and has consulted for many technology companies, including Adobe, Netscape and Sun Microsystems, is an experienced consumer advocate and philanthropist. During the working group, others proposed proactive ideas for advancing diversity and inclusion, but few emphasized dealing with systemic elements of sexual misconduct that impede progress. She thought technology could address intentional perpetrators, so she set out to create a solution. The site, I'm With Them (ImWithThem.org), launched Jan. 23, 2019.

Girand applied her earlier consumer advocacy experience. In 1996, when her young daughter was poisoned by contaminated, unpasteurized apple juice, Girand marshalled her forces with STOP Foodborne Illness and got the FDA to change its regulations. During this time, Girand learned that many victims are willing to come forward if it will prevent others from being

victimized but are often isolated from one another and prevented from organizing. It gave her an idea of how to tackle sexual harassment with I'm With Them.

Girand recruited Diana Arreola and Monica Acosta, two Scripps College students registered in Harvey Mudd College computer science classes as part of their off-campus major program. Alongside her husband, Scott McGregor, former CEO of Broadcom Corp., they then set up I'm With Them as a nonprofit. Together, they built a web app to privately connect victims of work-related sexual misconduct by a common perpetrator.

With a B.S. in electrical engineering and computer science from Princeton and an MBA from Stanford, Girand is fascinated by networks and systems.

"Studies show that approximately 90 percent of workplace sexual misconduct is never reported," Girand points out. "We know that perpetrators intentionally isolate their victims, and systems then treat their complaints separately, like Whack-a-Mole."

Criminal behavior is also often pattern-based, and this lends itself to data collection. To populate the database, I'm With Them has victims describe what's happened to them, not as testimony, but as facts (data points). They characterize their experiences on the site by checking boxes and clicking on/off buttons. Data patterns of perpetrators and experiences can then be matched to others, linking victims of the same predator together. The site does not advocate for the victim—they get to make decisions about what to do next for themselves.

"I'm With Them is unique among solutions today," says Girand. "It privately introduces victims to one another, given that they have a perpetrator of sexual



misconduct in common. It is organization-independent; no organization has to first commit to it. It does not share any other information, and is not intended to ever be a reporting mechanism. It is intended to overcome barriers to reporting, by increasing confidence that their experiences will be heard and supported.”

To build the site, Girand reached out to Colleen Lewis, McGregor-Girand Associate Professor of Computer Science, asking her to recommend some bright students.

“Professor Lewis had personally worked with Diana and Monica on research the previous summer and highly recommended them. I cannot advise students enough: Get to know your professors because they are a valuable resource,” Girand says.

Acosta jumped at the opportunity—she was looking for a chance to use her technology skills in a socially meaningful enterprise. As part of her computer science studies at Harvey Mudd, she’d taken the Intro CS series (Introduction to CS, Principles of CS, and Data Structure and Program Development) Software Development, Algorithms, Programming Languages, Computer Systems, and Computability and Logic.

“I’m now also currently enrolled in Data Science Ethics,” says Acosta. “But because of my courses at HMC, I already had the skills necessary to meet Laurie Girand’s requirements. Diana and I built out the I’m With Them site using Ruby on Rails and PostgreSQL. My hope is that our work will help cultivate a safer workplace environment for people of any gender or racial background.”

Some of the early press coverage raised concerns about how the site asks survivors to sign up with a high level of personal disclosure required. Girand is happy to unpack the process and explained exactly how it works:

“As a nonprofit created for social good, we are intentional about the data we request,” she says. “To protect our users, we need to ensure that people who enter data are who they say they are. To do that, at registration, we gather just enough to verify identity with a secure third party. The rest of the data entered is not personally identifying. It’s all about detailing the perpetrator and characterizing the incident concerned.”

Once the system finds matching profiles of perpetrators, with permission of the victims, it introduces the victims to one other. Only names and email addresses, and the fact their accounts match, are shared. Nothing else. Then it’s up to them. The

site does not share other data, nor does it handle communications between victims.

“The very purpose of the site is to introduce victims to one another so they can mutually share their experiences. This means we advise that anyone uncomfortable with sharing should not use the site,” said Girand.

I’m With Them has an explicit (and easy-to-digest) privacy policy to maintain the privacy and anonymity of its users, except between the victims who intend to meet, within legal means.

“ By enabling victims of serial misconduct to find each other and prove a pattern of behavior, we believe justice can prevail. I’m With Them has the potential to end unethical and toxic work environments so everyone can thrive. ”

—LAURIE GIRAND, HMC TRUSTEE AND CO-FOUNDER OF I’M WITH THEM

“We are so committed to our users’ privacy, that we state that if there were a change of control, we will delete all data from the system. We know of no other nonprofit or for-profit that says that,” Girand says.

A STEM advocate, McGregor has taken an active role in I’m With Them, serving as secretary and treasurer of the nonprofit. Retiring from Broadcom Corp. in 2016, after over a decade as CEO, McGregor is 100 percent behind his wife’s initiative toward change.

“The culture of a company and tone at the top makes a huge difference in the frequency of such behavior and how it is dealt with,” says McGregor. “In my leadership roles, I’ve endeavored to create a culture that enables and encourages women. I strongly support Laurie’s leadership of I’m With Them as a new tool to empower victims of sexual harassment and to discourage serial offenders.”

“Our society is making great progress on diversity and inclusion. Yet progress will be held back by those who abuse their power,” Girand says. “By enabling victims of serial misconduct to find each other and prove a pattern of behavior, we believe justice can prevail. I’m With Them has the potential to end unethical and toxic work environments so everyone can thrive.” ■



Family Weekend

Family Weekend continues to grow. In February, over 500 parents and family members of Harvey Mudd students visited campus, met faculty and staff, checked in with their students and made some pretty incredible boats. Find more images online at hmc.edu/flickr and the video at bit.ly/HMC-FW19.

Save the Date

Family Weekend 2020
Feb. 7–8



#HMCAumniWknd

Alumni Weekend 2019



Alumni Weekend images
bit.ly/AWpics2019



Alumni Weekend video
bit.ly/AWvideo2019



ALUMNI, ARE YOU LINKEDIN?

The LinkedIn group for the Harvey Mudd College Alumni Association is growing. Join the more than 2,700 alumni who are helping each other expand professional and personal networks. If you're already a group member, stay up to date by getting a digest of your alumni network activity. Learn more and find a link to the group at alumni.hmc.edu/networking.

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Nadine Malcolm (mathematics) is managing machine learning software projects and “brushing up on my long-forgotten statistics knowledge.”

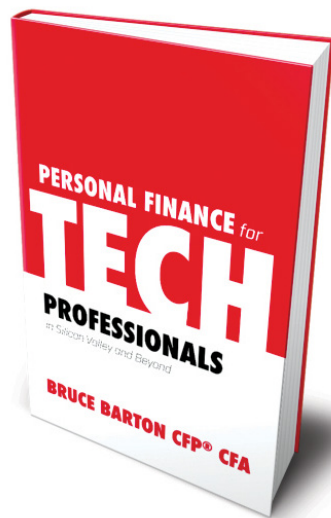
1976

Khai Le (engineering) opened his Raleigh, North Carolina, home to fellow alumni, parents and friends on Feb. 3. They enjoyed a reception and discussion with Lisa Sullivan, vice president and R. Michael Shanahan Dean of the Faculty and professor of economic history.

1981

Ann McDermott (chemistry) and her research group published “Identifying coupled clusters of allosteric participants through chemical shift perturbations” in the *Proceedings of the National Academy of Sciences* (Feb. 5, 2019). Ann uses nuclear magnetic resonance spectroscopy to study protein structure, function and dynamics at Columbia University. She is a 2011 HMC Outstanding Alumna and a member of the National Academy of Sciences and the American Academy of Arts and Sciences.

1986



▲ Northern California Alumni joined **Bruce Barton** (engineering) at an event Feb. 12 in Mountain View to launch his book *Personal Finance for Tech Professionals*.

1987



Rob Gould (mathematics) visited campus in February to give a talk on “Teaching and Learning Data Science: Who and How and Why” and spoke with students about considering a career

in data science education. He said, “We ignore the role of data in our lives at our own peril, and yet, armed with some basic skills, the analysis of data can provide opportunities to citizens of all ages. Learning to become data literate is as important as learning to write, read and think quantitatively. At the moment, we know very little about how to prepare future data scientists, much less how to prepare everyone else to live in a data-driven culture. We desperately need people who can think scientifically and creatively about learning and teaching data science.”

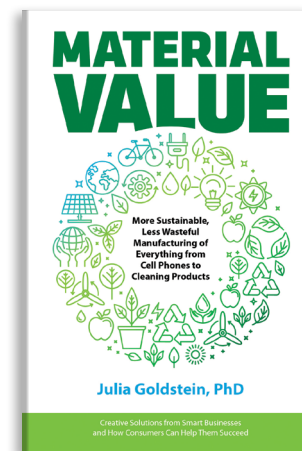
Since earning a PhD in mathematics (specializing in statistics) at UC San Diego in 1994, Rob has been at UCLA, which founded its Department of Statistics in 1998. He has helped develop and manage the department’s undergraduate education program and has been actively involved in statistics education ever since. He is founder of the American Statistical Association DataFest competition (2011), co-author of an introductory statistics textbook published by Pearson Higher Ed, and has been active in many leadership roles in the ASA statistics education section and the International Association of Statistics Education. In 2012, he was elected Fellow of the American Statistical Association.

John Otsuki (mathematics), appeared in a Jan. 15, 2019, segment on WHSV-TV3 (Harrisonburg, Virginia), “Valley business owner looking to hire government workers part-time during shutdown.” Instead of focusing on the politics of the federal government shutdown, Otsuki, co-owner of Creative Cause Solutions and Blue Stone Fabrics, sought to help the federal workers caught in the crossfire by hiring them for part-time work. He said, “It’s not their choice to be in the situation they’re in. I think that politics should be dealt with in Washington and we can help the local families the best we can.” View the segment at bit.ly/Otsuki19.

1988

Steve Roth (physics) has retired after 30 years with Hewlett Packard.

Julia Goldstein P18 (engineering) is excited to announce her book, *Material Value: More Sustainable, Less Wasteful Manufacturing of Everything From Cell Phones to Cleaning Products*. She says her writing and editing business is doing well. For anyone who’s curious



about what degrees in engineering and materials science have to do with a career as a writer, a list of recent projects makes it clear. Julia has written white papers, articles and various website content covering 3-D printing, semiconductor fabrication, medical imaging, storm water management and more.

1992

Rich McHugh (physics) moved from Alabama to Davis, California, and works as a laryngologist at Kaiser Permanente. Kids are doing well, he says, and adds that he’s glad to be back in California closer to family.



Nkarta Therapeutics, a privately held cell therapy company developing engineered natural killer immune cells to fight cancer, announced that **Matthew Plunkett P21** (chemistry) has joined as senior vice president and chief financial officer. Matthew joins Nkarta with a long and distinguished career in the industry, encompassing extensive executive management experience and tenure as a life science investment banker. He was most recently chief financial and business officer of Medeor Therapeutics, a development stage cell therapy company.

ALUMNI PROFILE

Passport to STEM

An alumna describes her journey to becoming an international STEM advocate

Written by Lia King

DURING FALL 2018, ANNISA DEA '17 SPOKE ABOUT her personal journey during an International Women in STEM panel hosted by HMC and Keck Graduate Institute.

“I was motivated to talk in this panel because I always felt blindsided by new challenges I faced as a non-citizen in the U.S. throughout my time as an undergrad,” says Dea, who is from Indonesia. “I thought the shock would end after orientation and frosh year, but between taxes, visas, fellowships and employment authorizations, I was always surprised by some extra hurdle I would have to tackle as an international student.”

Dea majored in biology and chemistry at HMC and graduated with distinction. She did her senior thesis with Jae Hur, assistant professor of biology, studying aging in fruit flies (*Drosophila*). “This was when I first realized what a powerful tool model organisms—such as fruit flies, mice, yeast, etc.—served in figuring out the mechanisms of our everyday biological actions, whether it be aging or sensing.”

Now a genetics research assistant in the laboratory of Elizabeth Hong at Caltech, she investigates the mechanisms behind neural wiring of the *Drosophila* olfactory circuit. Understanding the logic of how sensory inputs are combined by higher-order olfactory neurons is at the heart of understanding how a biological system extracts meaningful information from external cues to guide behavior. Dea is responsible for all aspects of this project, from designing and executing experiments, to analyzing data and drafting figures for potential future publications.

Her inspiration to pursue a career in the STEM fields came from her mother, an electrical engineer, who was often the only woman in her work environment. Similarly, Dea was the only girl in her high school physics class. “I remember already feeling pressure to prove myself in this male-dominated space,” she says. “It’s really a shame



because there’s so much in diversity that all STEM fields can benefit from.”

The principal investigator in the Caltech lab where Dea works is a woman, as are many of Dea’s lab colleagues. This is an anomaly. “I have noticed that female scientists tend to get talked over a little more than the men do. But if you’re brainstorming, there’s no wrong or right answer! I’ve often felt the need to be completely certain of what I want to say before I say it and the need to prove myself a little harder than a man would, to be more sure of my rationale.”

Dea says she sees the gender gap in STEM fields slowly diminishing as more female faculty are hired. However, she acknowledged, “We still have a lot of work to do. Making STEM education more accessible and welcoming for women is key, like encouraging and, more importantly, supporting young girls’ involvement in currently male-dominated STEM after-school activities. We should work to maintain this support from the elementary school level all the way to the faculty level.”

Steady encouragement is important, Dea believes. She cites a 2018 study by Microsoft that included more than 6,000 girls and women between the ages of 10 and 30 from across the U.S. The study report highlighted ways to better support girls and young women in STEM, including increasing the number of STEM mentors and role models—

including parents—to help build young girls’ confidence that they can succeed in STEM.

As Dea furthers her career in research, she hopes to continue paving the way for more female involvement in STEM and breaking away from outdated stereotypes. Next year, she begins her PhD in molecular and cellular biology. She will utilize tools in genetics, biochemistry and computational biology to investigate various molecular mechanisms in model organisms. “I hope to become a professor in a small liberal arts college (like Harvey Mudd!) where I can focus on teaching and research mentorship,” she says.

Dea has had some difficulty finding funding opportunities because she’s not eligible for certain grants that require U.S. citizenship, but she’s working through this and other challenges with a strong support system.

“Evelyn Real [HMC program manager for international students and scholars] has been my lifesaver in navigating all my logistical battles as an international student, both during and after Mudd,” says Dea, who developed a close network of international student-friends while at Mudd. “Currently, we’re trying to figure out the visa transitions from working to going back to school!

“I know they’ll always have my back no matter what new roadblock we face.” ■

1995



Vicky GOLF (engineering) was featured in the Jan. 19 PCMag.com article “Future Coders Get a Peek Behind the Curtain at Warner Bros. Studios.” During an all-day event organized by

STEAM:CODERS, a nonprofit that works with schools and communities at or below the poverty line (see page 16), middle school girls got a studio tour and participated in tech workshops on machine learning, robotics, game engines, data science and more. “Warner Bros. has the largest content library in the world,” said Vicky, a board member of the nonprofit and CTO at Warner Bros. “And through this lens, we can inspire these girls into getting excited about a very wide mix of possible futures in technology.”

Denis Moskowitz (computer science) invented an unofficial astronomical symbol for the minor planet Sedna that was added to the Unicode standard in 2018 as code point 2BF2. Denis proposed the symbol shortly after Sedna was named, and it has become popular among some astrologers. His actual job (as a software engineer with Akamai in Boston) is going well, too.

1996



▲ Last December, **Raymond Montemayor** (engineering) won two Lucasfilm’s Star Wars Fan Awards: Best Stop Motion and Spirit of Fandom. Both were for his five-minute film *Star Wars: The Toys Awaken*, produced through his freelance digital media company PixelPlex LLC, which he started in

2012. In 2003, he co-founded MaxLinear, Inc in Carlsbad, California, (NYSE: MXL) after receiving an M.S. in electrical engineering from UCLA and working for five years as an RF integrated circuit designer for Silicon Wave Inc. in San Diego. He lives in Encinitas, California, with his wife, Ronnah, and his daughters, Maliya (9) and Nora (7), both of whom star in his fan film.

1997

Sonia Minassian (mathematics) works as a biostatistician at InClin Inc. helping design and analyze data from clinical trials in a variety of indications. She and Seth Hanson live in San Diego, and they have two boys Maceo (10) and Wes (7).

2001



▲ As part of a new AABOG initiative to increase interaction between alumni and students, **Brooke Basinger** (engineering), head of hardware operations at Verily Life Sciences (formerly Google Life Sciences), had brunch in March with students interested in biomedical engineering. They were joined by engineering professor and department chair **Liz Orwin '95** and Sarah Park, director of career services (see page 10). Participants had a lively discussion about careers in biomedical engineering.

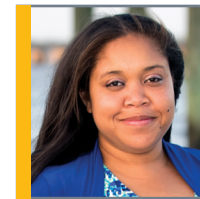
Angie Luengen (mathematics) says, “Two years ago, I left the math classroom and started working for Equal Opportunity Schools, an educational nonprofit helping high schools across the country close opportunity gaps for low-income students and students of color. I love my work and my colleagues (which include a CGU alum!).”

2004 | Reunion Year

Mark Nelson (computer science) began a new job as a computer science professor at American University in Washington, DC. He was previously a research fellow at Falmouth University, in Cornwall, UK. His research focus is artificial intelligence and games.

2006

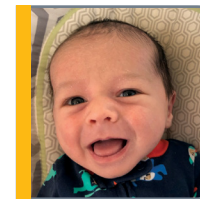
The U.S. Postal Service is using Ford E-450-based all-electric step vans in a pilot program in the Central Valley. The Motiv-powered vans were purchased through a partnership by CALSTART and the San Joaquin Clean Transportation Center and funded through a grant from the California Air Resources Board. Motiv Power Systems, a provider of all-electric medium duty fleet chassis, was founded by **Jim Castelaz** (engineering).



Donya Frank-Gilchrist (engineering) is now a coastal scientist at CE Hydro in Louisiana. The woman-owned business provides technical services for large water resource projects spanning

from the summit to the sea.

2009 | Reunion Year



Steven Pankratz (chemistry) and his wife, Leah, welcomed a son Nov. 27, 2018. He says, “Orion Melquiades Bambajon Pankratz has the right number of toes, fingers and eyeballs, and weighed 6

pounds, 11 ounces. We’re all happy to be back to work at the Orme School in Arizona.”

2011

Last fall, **Sarah Loeb** (mathematics) began work as a mathematics professor at Hampden-Sydney College. She and her fiancé moved to Farmville, Virginia, and are planning to wed this summer.

2012

According to **William Koven** (engineering), “Chip Design is Pretty Cool.” That was the title of a talk he delivered April 3 at Galois, a research and development lab that collaborates with commercial, defense and intelligence organizations to tackle computer science challenges. William discussed the basic principles of chip design, including information about how chips are manufactured, and gave an overview of the complexity of chip design by focusing on addition. A research engineer at Galois, William previously was co-founder and CEO of Reduced Energy Microsystems (REM), a company focused on low-power, high-performance edge computing. Prior to co-founding REM, he worked at AMD and at Intel in both product groups and Intel Labs. He has been involved in many production chip tapeouts as well as research chip development. He has also developed several novel asynchronous circuit architectures and is heavily involved in the asynchronous design community.

2013

Grant Ukropina (engineering), spoke April 27 at the Greater Los Angeles Area Council of Boy Scouts of America Women of Eagle Scout Brunch about “Why Becoming an Eagle Scout Helped Me in College, Obtaining My MBA and in the Business World.” Grant earned his MBA from the University of Southern California in 2017 and worked for four years as an engineer at McMaster Carr in Santa Fe Springs. He now works as a systems engineer at Happiest Baby in Culver City, which manufactures and distributes bassinets and other products worldwide that help new babies sleep through the night. His brothers, Nick and Conrad, are also Eagle Scouts.

2014

Miranda Parker (engineering) hosted another happy hour in Atlanta in January at Monday Night Brewing for fellow HMC alumni in the area.

2016

Maddie Weinstein (mathematics) finished the second year of her math PhD program at UC Berkeley. “I am studying algebraic geometry with Bernd Sturmfels. Inspired by Harvey Mudd’s Office of Institutional Diversity, I’ve started an organization at UC Berkeley called Gender Equity in Mathematical Studies with fellow graduate student Madeline Brandt.”

2018

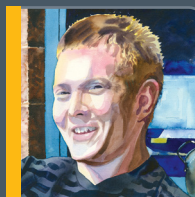
Jason Casar (chemistry) a former researcher in the lab of Lelia Hawkins, is a co-author on a published manuscript about aerosol measurement techniques. Jason, who spent a summer working at Aerodyne Research in Boston to improve an air pollution simulator, is in the materials science and engineering doctoral program at Stanford University.

Your News Matters



Have you changed jobs? Retired? Celebrated a milestone? We want your news! We compile information from a variety of public sources: campus event notices, newspaper and magazine articles, press releases and Google alerts. Please submit updates to alumni@hmc.edu.

In Memoriam



Jonathan Chance Crompton '13 (chemistry) died in February 2019. His parents, David and Karen, shared, “We are heart-broken by the death of our oldest son, Chance. Last

month he took his life after a long struggle with depression, alcohol and PTSD as a result of being drugged and sexually assaulted. There is nothing he wouldn’t do to support or help a friend, but could not ask for—or accept—that same help and support from the many friends and family who loved him, cared for him.”

While at HMC, Chance was a Case Dorm mentor, president of PRISM and an avid researcher, spending two summers at ARUP Laboratories, a medical laboratory based in Salt Lake City, Utah, where he did research in their Special Chemistry Division. He spent his sophomore spring in the Maloney Lab researching natural product synthesis and three semesters in the Karukstis Lab as part of an REU researching

liquid crystals. He also was part of an REU doing research on nanoparticles in the Schaak Lab at Penn State. He graduated with high distinction and became a graduate student at Caltech in the Lewis Lab. He was awarded a master’s in chemistry from Caltech and planned to pursue a PhD.

At HMC Alumni Weekend, family members, classmates and friends gathered to remember Chance in the chemistry department where the student lounge (Jacobs 2331) is named in his honor. Family members have established the Chance Crompton '13 Memorial Scholarship to provide financial aid to qualifying Harvey Mudd College students with demonstrated financial need. Those who would like to honor Chance’s life with a gift to this scholarship fund may do so online (<http://www.hmc.edu/give>, specifying the Chance Crompton '13 Memorial Scholarship in the field marked “Other”) or by contacting Jessica Berger in the Office of College Advancement at jberger@hmc.edu or 909.607.0877.

Painting by Maria Klawe

**HARVEY
MUDD**

is on a mission



The Campaign for Harvey Mudd College Report

With the conclusion of On a Mission: The Campaign for Harvey Mudd College in December 2018, the College celebrated its first campaign in 20 years and the largest in its history. Planning for the campaign began during the 2007–2008 academic year, with a “quiet phase” beginning in 2011 followed by the public launch in 2014.

This past spring, we held events both in Claremont and across the country to thank the many trustees, alumni, parents, faculty, staff, students and friends who collectively helped us raise more than \$175 million toward the people, places and programs that make Harvey Mudd so magical. Having raised more than \$25 million above our original \$150 million goal, we thank you for your support during this amazing campaign, and we look forward to sharing with you in this report some of the key accomplishments we’ve achieved together.



More than
\$50 million for
endowment

More than
\$175 million
raised

Q-and-A with the Campaign Chair

Wayne Drinkward '73 (engineering) joined the HMC Board of Trustees in 2005 and chaired the Physical Plant and Campus Planning Committees for three years. In fall 2012, he assumed the board chair position, succeeding Malcolm Lewis '67. Chairman of Hoffman Construction Company, the Pacific Northwest's largest locally owned construction company, Drinkward has been instrumental in much of the recent construction on campus, including the dorm named after him and his wife, Julie; the R. Michael Shanahan Center for Teaching and Learning, which he helped plan and construct, as well as the upcoming Scott A. McGregor Computer Science Center, which he has generously supported. Here, he shares his thoughts on the campaign and its impact on his alma mater.

Why is this campaign so important?

The Campaign for Harvey Mudd College demonstrates our commitment to deliver on the six themes of the College's 2006 strategic vision: innovation, leadership and impact; experiential and interdisciplinary learning; excellence and diversity at all levels; nurturing and developing the whole person; global engagement and informed contributions to society; and improvement of infrastructure and resources. We've also been able to share this vision and strengthen our connections with alumni, faculty, staff, parents, trustees, donors and friends, who want to help ensure that a steady stream of passionate problem solvers can address the world's most pressing issues. Our \$150 million goal was larger than any previous campaign, and we overcame the challenges of fundraising in the midst of a recession. Our success signifies that the HMC community can work together to fulfill the College's important mission.

What do you consider to be the most beneficial outcome(s) of the campaign?

With our strategic vision as a guide, we've transformed the campus with the Shanahan Center, Galileo auditoria, renovated Clinic teaching spaces, chemistry teaching labs, a new dorm and will soon have a new academic building. Most importantly, lives have been impacted by this campaign as you'll read on the following pages. The campaign has energized all members of the HMC community, so much so that one of our faculty members recently said, "I feel like anything can happen here, and it's wonderful."

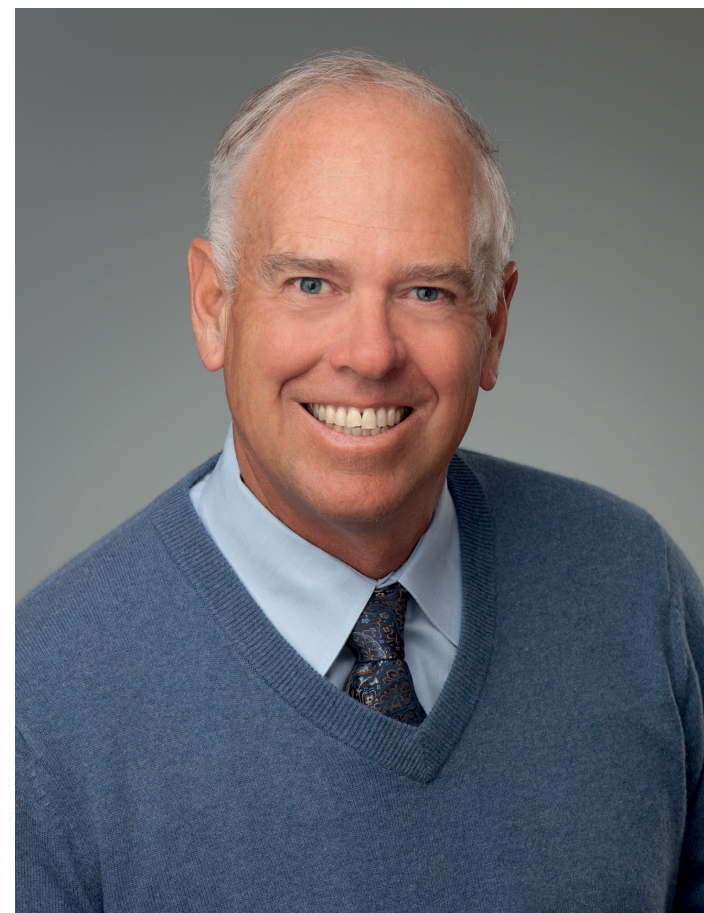
What can community members do to enhance HMC philanthropy?

A strong financial foundation is crucial to the ongoing success of the College. Achieving and sustaining excellence and innovation in education and research requires an outstanding faculty, modern facilities, technical staff, equipment and

information technology infrastructure. As an alumnus supporter and board chair, my goal is to keep Harvey Mudd moving forward. Those wishing to help us maintain the momentum created by The Campaign for Harvey Mudd College can get involved by continuing to spread the word about HMC (plan and/or attend an event and bring a friend; sharing the College magazine in print or online), introducing people who want to support an innovative STEM education to College advancement staff (development@hmc.edu), considering a planned gift (hmc.planmygift.org), volunteering, and, of course, continuing to give to the Annual Mudd Fund and to areas of particular interest to you and your family (hmc.edu/give).

Now that The Campaign for Harvey Mudd College has concluded successfully, how do we transition to what comes next?

Thanks to the planning, dedication and hard work of many constituents committed to a common goal—in this case, ensuring that Harvey Mudd remains one of the top liberal arts colleges in the nation—we celebrate the incredible success of the campaign and begin to reap numerous benefits, many of which are touched on in this report. Even though the campaign goal was exceeded, there are still several areas where funding is being sought, including naming opportunities in the McGregor Computer Science Center, an upcoming renovation for Physics, summer research and diversity efforts. We've improved the percentages of women, students of color and international students on campus, and the College has begun to greatly enhance both programming and conversations around a broad set of important issues as we foster a more inclusive campus community. By working together, we can ensure the College maintains the outstanding level of innovative academic excellence for which it is known.



Wayne Drinkward '73

CHAIR, HARVEY MUDD COLLEGE
BOARD OF TRUSTEES

Endowed Professorships

Endowed faculty positions allow the College to continue attracting and retaining a faculty passionate about and capable of teaching and mentoring students at the highest level while ensuring that the faculty-student ratio remains low. An endowed chair recognizes outstanding faculty while providing invaluable support for salary, research, teaching or service activities.

11 ENDOWED PROFESSORSHIPS

Art Benjamin (mathematics), Smallwood Family Chair*. An expert in algorithms, combinatorics, game theory and operations research, he is recognized nationally for his ability to perform rapid mental calculations.

Zachary Dodds (computer science), Leonhard-Johnson-Rae Chair*. He researches computer vision-based robotics and specializes in computer science education and curriculum design.

Ken Fandell (art), The Michael G. and C. Jane Wilson Chair in Arts and the Humanities*. Fandell's work includes drawing, sculpture, sound, video, text, collage, installation and photography.

Weiqing Gu (mathematics), Robert and Barbara McAlister Endowed Professorship in Mathematics. She is the director of the HMC Mathematics Clinic and specializes in differential geometry and topology, with applications to Big Data analysis, computer-aided design and robotics.

Kerry Karukstis (chemistry), Ray and Mary Ingwersen Professorship in Chemistry. Using spectroscopic and light scattering techniques, she explores dynamic assemblies of molecules into organized structures through non-covalent interactions.

Colleen Lewis (computer science), McGregor-Girand Chair*. She specializes in computer science education and curriculum development.

Ran Libeskind-Hadas (computer science), R. Michael Shanahan Endowed Professorship. His research addresses algorithmic issues in computational biology and, in particular, the problem of reconciling pairs of evolutionary trees such as gene trees and species trees and pairs of species trees (e.g., parasites and hosts).

Paul Steinberg (political science, environmental policy), Malcolm Lewis Chair in Sustainability and Society*. His research and teaching focus on global environmental politics, with a special interest in biodiversity conservation and environmental policy in developing countries.

Francis Su (mathematics), Benediktsson-Karwa Chair in Mathematics. He studies the application of combinatorics, geometry and topology to problems in the social sciences and is a strong proponent of removing barriers for women and underrepresented groups to student mathematics.

Hal Van Ryswyk (chemistry), John Stauffer Chair in Chemistry*. His research centers on dye-sensitized solar cells utilizing porphyrin dyes on nanostructured zinc oxide. He seeks to create low-cost photovoltaics that can be produced easily for large-area applications.

Werner Zorman (leadership), Annenberg Chair in Leadership (Deshong Endowment for Leadership)*. A former Nokia executive, he is a leadership development expert and entrepreneur. He teaches classes on leadership, communication and team building skills, conducts research on leadership education and facilitates leadership development among students, faculty and staff.

Curriculum Support

Teaching students to think across disciplines, across boundaries, even across cultures requires a broad and rich curriculum. Campaign funding enabled faculty to develop new and expanded coursework that engages students in community outreach as part of their course offerings. An annual gift, the Community Engagement Faculty Fellowship (Holen CE Faculty Fellows), has provided support to faculty members since 2016. Courses funded by the fellowship include:

Activism, Vocation, and Justice (new course), 2016, Erika Dyson. Goal: Teach students about community rights movements built on religious foundations and their historical, theological and philosophical roots by examining writings about justice. Examine movements that draw on religious ideas and practices to address contemporary issues at the intersections of race, gender, sexuality, economics, ability, politics and class.

Bicycle Revolution 2.0: Bringing the Revolution Home (course redesign), 2014, Paul Steinberg. Goal: Examine politics and policy of increasing bicycle transit access in nearby cities. Students serve as facilitators and catalysts helping connect bicycle constituencies, spread information, convene decision makers and stakeholders. Partners are key activists, experts and officials leading efforts to expand bicycling access; local leading advocacy organizations and city and county agencies.

Service-learning Approach for E4 (course redesign), 2017, Gordon Krauss. Goal: Broaden the number of partners for community engagement and service-learning projects by incorporating community organizations into a service-learning approach in Introductory Engineering Design (E4). Working with the Office of Community Engagement, community partners are served through a human-centered design project and/or through the major design project in E4.

Computing for Sustainable Urban Mobility (new course), 2018, Julie Medero. Goal: Provide opportunities, via a summer research program, for rising sophomores to work with community partners on data analysis and visualization projects that focus on sustainability and active transportation.

\$3.4 million

FOR FACULTY INNOVATION AND CURRICULAR DEVELOPMENT

*Donors to these endowed professorships took advantage of the generosity of Michael and Mary Shanahan, who established a matching gift program that allowed donors to double the effect of their personal gifts. Find all endowed faculty chairs and professorships here bit.ly/EndowProfHMC.

Experiential Learning

How student research/work was impacted by campaign

While experiential learning comes in many forms at Harvey Mudd, it finds its locus in the research opportunities our students undertake with faculty during summer. Opportunities occur across all departments and involve nearly 200 students working directly with faculty on current, relevant research. However, because grant funding for faculty/student research fluctuates, being able to offer opportunities for all interested and capable students has been challenging. That's why a top fundraising priority for The Campaign for Harvey Mudd College was to increase permanent funding for the Summer Research Program.

\$14.4 million

TO SUPPORT FACULTY-STUDENT EXPERIENTIAL LEARNING

Recent Summer Research Projects

FACULTY	STUDENTS	FIELD	PROJECT
Lori Bassman	Simone Griffith '19, Julianne Lin '20, Emily Hwang '20	Engineering	Computational Search for Novel High Entropy Metal Alloys
Katherine Breeden	Mara Downing '20, Cameron Krinsky '20	Computer Science	Eye Tracking Feature Films
Lisette de Pillis, Jeho Park	Michelle Li POM, Gianna Wu POM	Mathematics	Exploring Cell Differentiation Trajectories through Data Reduction
Gerald Van Hecke '61	Daphne Guo '19	Chemistry	Organic Acids for Thermal Energy Storage
Paul Steinberg	Henry Sojico '21, Sebastian Coll (Macalester College), Natalia Duran (PZ)	HSA/Math	Promoting Transportation Justice for Claremont's "Invisible Cyclists"
Matina Donaldson-Matasci	Michelle Lilly '20, Joanna Chang POM	Biology	Individual and Group Decision Making in Turtle Ant Transportation Networks
Kash Gokli	Ryan Haughton '19, Lydia Sylla '19, Charles Dawson '19	Engineering	Plant Layout Redesign for Optimal Material Flow and Reduced Forklift Usage at Mission Rubber Company
Lelia Hawkins	Jacob Donenfeld '21, Jared Brauner (UC Berkeley)	Chemistry/Engineering	Intelligent air quality sampling via mobile sensor networks
Theresa Lynn	Lorenzo Calvano '21, Nick Koskelo '20, Kye Wayne Shi '21	Physics	Demonstration of One-Way Steering for a Bell State Ensemble
Catherine McFadden	Katie Erickson '19, Justin Jiang '23	Biology	Octocorallia Species Identification and Distribution in the Gulf of Mexico
Brian Shuve	Andres Cook '21, Anna Barth '21	Physics	Analysis of Four-Lepton Decays in the CMS Open Dataset
Sharon Gerbode	Maya Martinez '20, Jatin Abacousnac '19, Rachel Barcklay '20	Physics	Characterizing Circular Grain Boundaries

“ Leaders in academia and industry have to ask good questions and work with colleagues to find ways to answer them. They test their ideas against reality, refine them and present clear results to their peers. Summer research offers Mudd students an exceptional chance to hone those skills early and showcase them for employers and grad schools. ”

—MICHAEL SCHUBMEHL '02

He and his wife, Stephanie, created the Tom Donnelly Summer Experiential Learning Fund



Coursework and the Community

Community engagement coursework spans the curricular and extracurricular sides of the campus. With help from the College's Office of Community Engagement, students and faculty study the challenging problems facing our communities and offer creative solutions to help. Funds created during the campaign provided some excellent learning opportunities as well as community support.

The New Millennium Experiential Learning Fund has supported four students pursuing summer work opportunities at otherwise unpaid internships with agencies or service projects and programs.

Wenbo Cao '18 interned at Kogakuin University in Tokyo, Japan, and Katherine Smith '20 interned at University of Michigan under the American Society for Pharmacology and Experiential Therapeutics.

Cassidy Le '20 interned at the Museum of Mathematics in New York City.

Emily Beese '17 interned with Resource Global, a Chicago nonprofit whose mission is to mentor and equip young leaders to help them connect their values and work to achieve social justice.

Anya Kwan '17 interned at Drexel Food Lab in Philadelphia.

The following students received funds from the **Ben Huppe '14 Memorial Internship for a Sustainable World** for their work on wide-ranging projects.

David Olumese '19 interned with Monday Motorbikes, a Los Angeles-based company that creates all-electric motorbikes.



▲ Moira Dillon '18 spent six weeks in Puerto Rico with biologists and epidemiologists from the Centers for Disease Control and Prevention to study the Zika virus epidemic. "It was inspiring yet also very challenging to be a part of the response to this virus and to witness firsthand the impact it is having around the world."

Fernando Salud '18 worked for Local Roots in Vernon, California. The company uses custom lighting, temperature and humidity to grow produce inside recycled shipping containers.

Emma Klein '17 worked with Chirag, a rural development organization based in the Kumaun region of Uttarakhand in India.



▲ **The 2016 Nathaniel Davis Prize for Public Policy and International Relations** recipient Shailee Samar '18 was an intern at the White House.

Community Engagement Programs

STEAM:CODERS | HMC students work with this nonprofit organization dedicated to inspiring underrepresented and underserved students and families through the fundamentals of science, technology, engineering, art and math (STEAM). (See page 16)

Homework Hotline | Launched in 2010 with the help of the Homework Hotline at Rose-Hulman Institute of Technology, Homework Hotline provides free, over-the-phone tutoring to students in grades 4 through 12 in the greater Los Angeles region, Inland Empire and beyond. Tutors are Harvey Mudd students selected for their technical expertise and their superior communication skills.

SWE WEST Conference | One of the largest community events of the year is the annual Women Engineers and Scientists of Tomorrow (WEST) Conference, coordinated by the HMC chapter of the Society of Women Engineers. The one-day event, attended each year by around 300 young women, includes discussions with female Mudd students and workshops aimed at attracting young women to STEM fields.

Science Bus | The student-run club hosts a Science Day each spring for students from local elementary schools. Science Bus program volunteers provide practical and positive interactions with science throughout the school year to encourage more young people to pursue higher education and careers in the STEM disciplines.

\$2.7 million

TO SUPPORT COMMUNITY ENGAGEMENT EFFORTS

“The education at Mudd was instrumental in my career success, so my parents and I set up the Erlinger Community Engagement Fund in honor of my Uncle Tad (Beckman) and Dr. Mike (Erlinger), who were colleagues. My Mom, an educator, wanted to support community education and assist those who wanted to succeed in academics. This was synergistic with a community program Dr. Mike had already established, so we were thrilled to participate in the program that helps so many students in Claremont and the surrounding area!”

—MICHELLE KIMURA '91

Michelle, Carol and Mike Kimura P91 established the Erlinger Community Engagement Fund to honor Michael Erlinger, Csilla and Walt Foley Professor of Computer Science, a co-leader of MyCS (a National Science Foundation-funded project that provides curricula to middle-years computer science teachers in California and Hawaii).

Scholarships

Harvey Mudd College's policy is to provide 100% of every student's demonstrated financial need. Approximately 73% of HMC students receive some level of financial aid.



Rex Asabor '22
President's Scholar

"The uniquely collaborative environment that I saw on campus while visiting for the FAST program proved to me that Harvey Mudd would be conducive to intensive learning and academic exploration. The presidential scholarship also made Harvey Mudd the most affordable option for me. The food was also really good." Asabor looks forward to joining the software engineering industry and working at a technology company.



Lorelei Bivins '21
President's Scholar

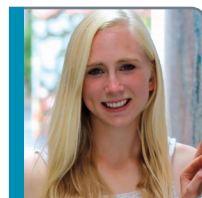
"I chose to attend Harvey Mudd first and foremost for the academics. The professors here are leaders in their respective fields and can offer us guidance in a more personal capacity than at a larger university. Another reason I decided to come to Mudd is the emphasis on liberal arts and understanding the impact of our work on society. I love the humanities as much as I love STEM, and there is no other college in the country that can blend the two as well as Mudd does. At HMC, I have had the opportunity to make connections with amazing people and feel part of a close-knit family. I know Mudd will prepare me for whatever path I choose in life, and I am ever-grateful for the opportunity to attend this institution."



Casey Gardner '19
The Rose Hills Foundation Science and Engineering Scholarship; Nancia L. and Vincent K. Jones, Jr. Endowed Scholarship

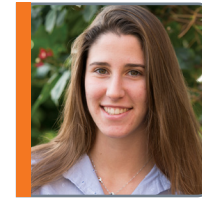
"My experiences on campus have made me realize how much Harvey Mudd has given me," says Gardner, who spent two summers participating in engineering research, under Professor Zee

Durón '81, studying the dynamics and seismic responses of large concrete dams. "I've realized the benefits of being a general engineer and of the rigors of the Core Curriculum; every week, some aspect of our research required us to apply the knowledge we had learned in class, and we had the skills and confidence to adapt those techniques to situations we had never seen before." After graduation, Gardner is pursuing a master's degree from UC San Diego in structural engineering (specialization in health monitoring and non-destructive evaluation).



Anna Goetter '19
Donald C. and Elene R. Hawthorne Endowed Scholarship

One of Goetter's favorite experiences was doing algorithms homework with her friend on their bus ride to a women's prison. Every other Tuesday, she and her friend traveled to the California Institute of Women (CIW) for a writing workshop as a part of a class at Scripps College. Their algorithms homework was also due on Tuesdays, so they would spend the 45-minute ride discussing the problems. "Although I was sometimes stressed to be spending so much time off campus, I always looked forward to the bus ride and workshop at CIW as a relaxing and rewarding experience," she says. Upon graduation, Goetter hopes to go into industry for a year or two and then go to graduate school for math.



Lucila Grinspan '21
President's Scholar

"I walked on to the CMS volleyball team and earned myself a starting spot on the team. I am so thankful to have the presidential scholarship and be able to receive an amazing education from Mudd while also having the opportunity to play a Division 3 sport competitively."



Marisol Guzman '19
Mary Horsley Endowed Scholarship

Guzman enjoys giving back to the community. She volunteers on campus with the Food Recovery program and every week, picks up leftover food from the cafeteria and drives it to a homeless shelter in Pomona. Last summer, she worked at the Bay Area Discovery Museum Discovery Camps where she taught children about nature and other STEM-related subjects. A memorable experience for Guzman was studying abroad in Spain, where she learned how to dance salsa, bachata and flamenco. Her academic research experience has included working with AT&T on a project that was focused on detecting HDR TV artifacts, such as wrong color space pixels, color banding on image and noise and color saturation. She is eager to start her career as an engineer and move back to the Bay Area.



Yongchan Hong '21
The Yuen Sang and Yu Yuen Kit So International Endowed Scholarship Fund

Mentored by Assistant Professor of Biology Jae Hur, Hong researched mitohormesis, the process in which a small amount of stress can increase efficiency of mitochondria, and proved that an appropriate amount of heat stress can actually lead to improvement of mitochondrial activity.

\$3.4 million

FOR PRESIDENT'S SCHOLARS PROGRAM

The President's Scholars Program is a renewable, four year, full-tuition scholarship program that identifies and encourages outstanding young men and women who have the potential to be future leaders in engineering, science, mathematics and technology and who are from backgrounds that are traditionally underrepresented at Harvey Mudd College or are the first in their families to attend college.

With Associate Professor of Biology Eliot Bush, he is using Python to develop a tool to find a family relationship between genomes. Hong also loves the rigorous academic atmosphere of HMC. “Even though it is tough, I love how students cooperate and learn about time management and how to be efficient,” he says. Hong plans to start a business after graduate school. He’s working on a startup called MemoryLane, an interactive photo organizing application that can view the photo and its location in chronological order via automated album.



Lillian Johnson '22
Class of 1966 Endowed
Scholarship

At age 13, Johnson first heard about Harvey Mudd College while listening to NPR in the car. President Klawe was being interviewed, and Johnson’s ears perked up when she heard about a computer class just for girls. “I was taking an engineering elective at my middle school and was the only girl, and that computer class sounded perfect! Four years later, when I was looking into colleges, Harvey Mudd was on my list. I was impressed by the true collaboration that happens on campus—the relationships that develop between the students and professors—and I felt right at home with the everyone I met. It was an easy decision to come back and become part of this thoughtful community,” she says.



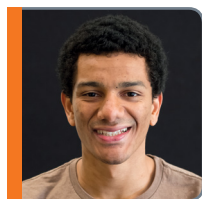
Luis Martinez '19
President’s Scholar

“Being a President’s Scholar has given me the opportunity to interact with brilliant people in a welcoming environment that promotes growth and community.” Marinez is deciding between graduate school and industry after graduation.



Obosa Obazuaye '14
President’s Scholar

“I enjoyed HMC’s sense of community, and the fact that even though everyone is different, the students are all united, friendly and intelligent.” A computer science alumnus, Obazuaye is currently a software engineer at ViaSat Inc. He appreciates the liberal arts side of HMC, which allowed him to explore interests in music, including taking violin lessons and electronic music courses, and foreign languages, including Japanese and Chinese.



Miles President '20
President’s Scholar

“A moment that may very well shape the future of my career was last spring in my computer systems class when we did a lab on the buffer overflow vulnerability. I really enjoyed this lab (as well as the entire class itself), so I enrolled in a computer security elective for this semester. I find cybersecurity thoroughly intriguing and am considering it as a possible subfield of study in the future. I am so thankful to have received the president’s scholarship because, otherwise, I would not have been able to attend this amazing college. The tight-knit community, the availability of the professors and the material itself have made for an incredible experience so far.” President plans to work in industry and get a master’s degree part time (then maybe a PhD).



Camille Simon '21
President’s Scholar

“I’ve had the honor of being one of the dorm presidents for Drinkward Dorm. Being a President’s Scholar gives me another community of people to not only recognize around campus, but also a group of people I can always talk to and count on. The President’s Scholars and Drinkward Dorm communities are just two of

the many I am so happy to be a part of at Mudd, because the people truly do shape your experience here. These communities continue to reinforce that Mudd was always where I was meant to be.”



Ellie Smith '22
President’s Scholar

“One of the most important factors in my decision to attend HMC was the community of support and collaboration. This community really fosters a place where not only is it commonplace for people to work together to solve hard problems and ask for help when needed, but also the community encourages it. The classes here are extremely interesting and engaging. Each class presents a relevant problem and teaches us ways we could go about solving or researching it more.” Smith says she’d like to become a pediatric dentist.

75 ENDOWED
SCHOLARSHIPS
CREATED AND
SUPPORTED DURING
CAMPAIGN

\$3.3
million ANNUALLY
TO BENEFIT
STUDENTS

CAMPAIGN DONORS GAVE
\$9.5 MILLION TO CREATE
AND SUPPORT **45** ANNUAL
SCHOLARSHIPS

Campaign Timeline

HARVEY MUDD is on a mission

Quiet phase of The Campaign for Harvey Mudd College begins; \$150 million goal

- HMC visibility in national press increases; prominent appearances by President Klawe at White House and Annenberg Retreat at Sunnyslans

CAMPAIGN TOTAL:
\$33,146,705
JULY 1

2011

- Mellon Foundation **\$600,000** grant supports Summer Institute students' academic and co-curricular activities as well as summer research
- Opening of Sprague Learning Center Studio, made possible by **\$750,000** grant from Fletcher Jones Foundation, Arthur Vining Davis Foundations, and HMC CIS



Founding Class 50th reunion

- Reaccreditation affirmed by Western Association of Schools and Colleges



Bernard M. Gordon Prize for Innovation in Engineering and Technology Education goes to Clive Dym, Mack Gilkeson and J. Richard Phillips for Engineering Clinic; They donate **\$250,000** toward engineering programs



Malcolm Lewis '67, the College's first alumnus trustee and board chair, dies in October; Wayne Drinkward '73 selected to replace Lewis as chair of the board. Drinkward is also chair of The Campaign for Harvey Mudd College, along with vice chair Barbara Patocka P00.

CAMPAIGN TOTAL:
\$44,828,473
JUNE 30

2012

- College's media mentions double; social media presence triples
- Chemistry faculty and John Stauffer Charitable Trust support chemistry summer research.



Henry Luce Foundation **\$200,000** grant for CS, engineering and physics scholarships

- Ahmanson Foundation grant supports teaching and learning building

- HHMI grant to HMC for experiential and interdisciplinary opportunities



New R. Michael Shanahan Center for Teaching and Learning opens in fall; certified LEED Gold by the U.S. Green Building Council.

NSF \$367,461 grant funds undergrad computer science summer research

- Clinic Program celebrates 50th anniversary

CAMPAIGN TOTAL:
\$86,387,615
JUNE 30

2013

- Campus improvements: Parsons first floor (new art studio and classroom); Galileo basement (new optics lab)
- HMC Concert Series inaugurated in Wayne '73 and Julie Drinkward Recital Hall

[relationships matter]

- Focus groups and discussions shape new College branding message: "Relationships matter" and theme for the campaign, "On a Mission"
- College establishes and staffs Office of Community Engagement with **\$150,000** from Ralph M. Parsons Foundation
- Board of trustees votes unanimously to increase College's student body size to as many as **900 students** over the next decade; agrees to add faculty, student support and facilities support in advance of growth

Campaign public phase begins



College welcomes most diverse entering class in College history, Class of 2019

- Kash Gokli joins the Department of Engineering as a professor of manufacturing practice



- For first time in its history, College graduates more female engineering majors than male in Class of 2014

2014

- Hotchkiss Dean of Student Fund created to support the Division of Student Affairs
- Shanahan Center receives 2013 Claremont Excellence in Design Award for Sustainable Development



- Campus improvements: updated Parsons engineering and Clinic spaces; renovation of Department of Humanities, Social Sciences, and the Arts spaces; new and expanded areas in Hoch-Shanahan Dining Hall to accommodate increased demand.



- College establishes and staffs Hixon Center for Sustainable Environmental Design



Wayne '73 and Julie Drinkward Residence Hall opens for fall



New Millennium Experiential Learning Fund and Holen Community Engagement Fund established

Electrical charging station installed with funds from Thomas Bleakney '69



Hearst Foundation grant supports underwater robotics lab

CAMPAIGN TOTAL:
\$119,516,376
DEC. 31

2015

CELEBRATING
60 YEARS 1955-2015

College celebrates 60th anniversary

For first time in its history, College graduates more female physics majors than male in Class of 2016



Faculty approve new joint major in mathematics and physics

Drinkward Residence Hall earns LEED Silver

CAMPAIGN TOTAL:
\$140,837,871
DEC. 31

2016



Computer science major celebrates 25 years



Lisa Sullivan becomes first woman appointed dean of the faculty

Kapor Center for Social Impact funds study about equitable access to computing careers



"Optical blasting" discovery by HMC physics researchers

CAMPAIGN TOTAL:
\$151,042,516
DEC. 31

2017

HMC receives Sustainability Tracking, Assessment and Rating System Bronze rating for sustainability performance

Donors contributing at the leadership level (\$1,000 or more) **increases 88%** since 2011; accounts for over 90% of all AMF dollars received



Campus improvements: new AV system in Platt Living Room (Shibby Theater); lab remodel, Galileo 101; lab remodel (special research equipment), Jacobs; Engineering space upgrades, Parsons; renovations to Riggs Room, LAC

CAMPAIGN TOTAL:
\$175,177,135
DEC. 31

2018



College hosts 230 elementary and middle-school students at FIRST Lego League Challenge event, first time the regional qualifying competition is held on a college campus



Fletcher Jones Foundation grant supports Department of Chemistry instrumentation



Homework Hotline receives its **20,000th** call

Hixon Center for Sustainable Environmental Design holds first conference



HMC INQ startup program connects alumni/experts to HMC students and alumni entrepreneurs

College named to 2015 President's Higher Education Community Service Honor Roll/Education category

Core curriculum review begins

Board of trustees extends President Klawe's term through June 2021



Campus improvements: Galileo auditoria modernization; Kingston and Parsons roof replacement; chemistry lab renovations; new staff apartment added to Atwood dorm; South (Marks) dorm kitchen upgrade (donor-funded); Parsons second floor and basement Engineering lab remodel; Math Clinic area renovation; new Math Fluids Exploratorium, Sprague third floor

Presidential Leadership Program **\$250,000** grant from Andrew W. Mellon Foundation provides opportunities to review Core Curriculum and to increase racial and gender diversity among faculty

College's first health and wellness dean hired



Highest-ever percentage of women physics and computer science majors graduates in Class of 2018

The Campaign for Harvey Mudd College By the Numbers

NUMBER OF NEW DONORS (2011–2018)

3,115 

TOTAL GIFTS AND PLEDGES (AS OF 12/31/18)

\$157,668,123

GIFTS

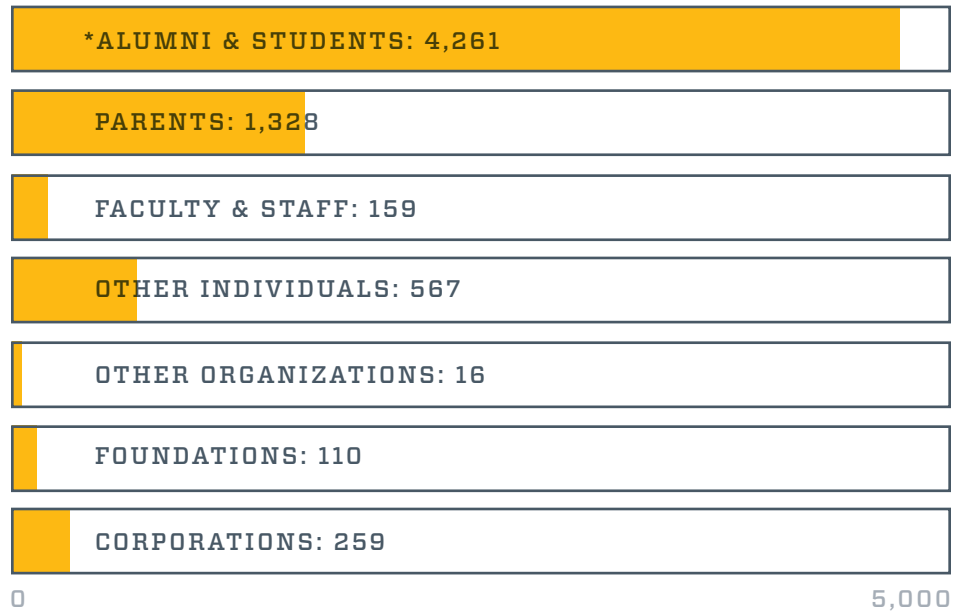
\$17,509,013

OUTSTANDING PLEDGES &
STATEMENTS OF INTENT

\$175,177,135

TOTAL

CAMPAIGN DONORS (BY CONSTITUENCY)

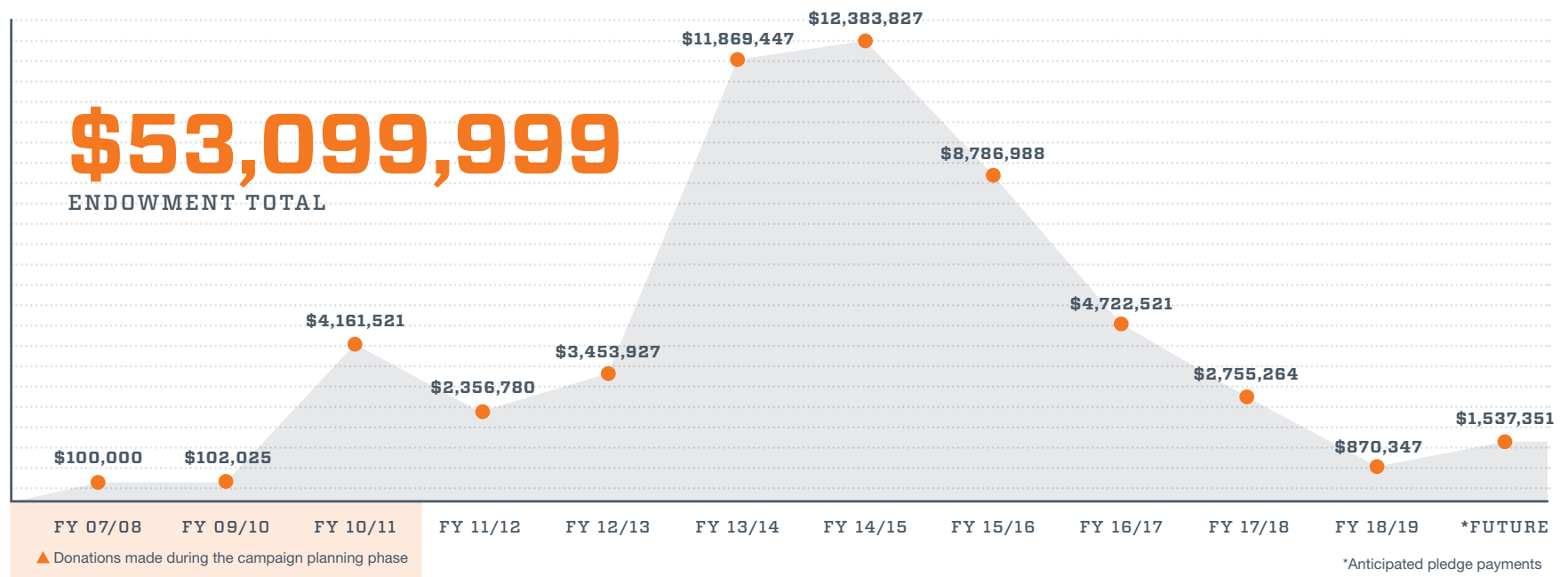


6,700

TOTAL

*GAVE WHILE A
STUDENT: 1,303

GROWTH OF ENDOWMENT DURING CAMPAIGN (2011–2019)





Construction Begins on New Academic Building

This summer, the College will begin construction on the Scott A. McGregor Computer Science Center (MCSC). The campus's first outward-facing building, the MCSC will serve as a bridge connecting Harvey Mudd to the other Claremont colleges and the community.

The Los Angeles architecture firm Steinberg Hart has designed the first floor of this new gateway to Harvey Mudd to include a multidisciplinary, collaborative Makerspace, where faculty and students from HMC and across The Claremont Colleges can gather to create, invent, tinker, explore, build and discover using a variety of tools and materials.

The second and third floors of the three-story, 36,000-square-foot academic building provide a much-needed new home for the rapidly growing Computer Science Department, which will further expand its highly collaborative, cross-departmental work with faculty and students from

The Claremont Colleges as well as with industry and educational institutions across the country. The larger space dedicated for computing allows the creation of a more contiguous CS space, bringing together previously fragmented elements such as student project space, Clinic Program work areas and computer labs. The new building will also allow renovation and expansion of teaching and research spaces in other departments, including physics.

In June, DPR Construction begins work on the new McGregor Center that is anticipated to last up to 18 months. Completion is estimated for early 2021. If you'd like more information on the building, including naming opportunities, contact: Matt Leroux, AVP for development and constituent programs, 909.607.0902 or m1eroux@hmc.edu.

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Art of Cyprus

By the time the artifacts in this collection were unearthed from Cypriot copper mines and pulled from ancient Mediterranean shipwrecks, they were already hundreds to thousands of years old. In the early 1900s, Harvey S. Mudd brought them to the United States, where they spent the last 100 years. Now, the College will donate the collection to the University of Cyprus, returning the artifacts to their place of origin, where their histories will be studied by current and future generations. More on page 8.