THE MAGAZINE OF HARVEY MUDD COLLEGE

mudd

SUMMER 2024

Heading Up Injury Research

CONGRATS CLASS OF 2024

April Rasmussen P'24 and Clay Rasmussen

Brian McNair, Niles Babin, Claudia Nanez, Bella Jariel, Sathvika Anand, Fontane Rosa, Aidan Stone-Grijalva, Andres Sanchez

President Harriet Nembhard and Cole Nagata

Joshua Garcia-Kimble and family

Aech Loar

Itzel Hernandez, Zeneve Jacotin, Amber Hughes

Allison Marten, Felix Murphy, Caitlyn Ossa

Commencement speaker Grant Sanderson

Download free images from HMC Flickr, bit.ly/gradimages2024
Video of ceremony: bit.ly/3yieoxP

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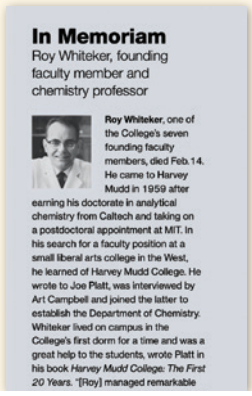
Letter to the Editor

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

Regarding the spring 2024 *Mudd Magazine* In Memoriam, page 9: Professor Whiteker's analytical chemistry class, with its emphasis on accuracy and precision, is the reason I eventually became an analytical chemist. Back in the day, another important meme from his class was that chemists use balances, and butchers use scales. It would take another decade or two for electronic "balances" based on force transducers, to catch up with his beloved chain-o-matic balance.

Sincerely,
Arleigh Hartkopf '64



In Memoriam
Roy Whiteker, founding faculty member and chemistry professor

Roy Whiteker, one of the College's seven founding faculty members, died Feb. 14. He came to Harvey Mudd in 1959 after earning his doctorate in analytical chemistry from Caltech and taking on a postdoctoral appointment at MIT. In his search for a faculty position at a small liberal arts college in the West, he learned of Harvey Mudd College. He wrote to Joe Platt, was interviewed by Art Campbell and joined the latter to establish the Department of Chemistry. Whiteker lived on campus in the College's first dorm for a time and was a great help to the students, wrote Platt in his book *Harvey Mudd College: The First 20 Years*. "[Roy] managed remarkable

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PRESIDENT'S PERSPECTIVE

Lessons from Singapore

The Harvey Mudd College community began a comprehensive strategic planning process in November 2023. As a result of collaborative Strengths, Opportunities, Aspirations and Results (SOAR) sessions, and strong working group and steering committee efforts, we arrived—in one semester—at a draft of "Propelling Innovation: HMC Strategic Plan 2035." Review and refinement continue, with the goal of completion and approval by the board of trustees in fall.

On a visit to Singapore in June, I had the opportunity to ponder aspects of the strategic plan with an international education point of view. The highlights in this regard were visits to the United World College of South East Asia (UWCSEA) and the National University of Singapore (NUS) as well as meaningful interactions with Harvey Mudd alumni, students, parents and friends.

Fostering Global Citizens: UWCSEA

United World Colleges (UWC) is an international network of 18 schools on four continents where students from more than 100 countries can pursue the International Baccalaureate Diploma, a prestigious alternative to the high school diploma. Since 2019, Harvey Mudd has annually admitted two or three UWC graduates. During my tours of the SEA campuses, I was struck by their commitment to fostering global citizenship and their peace-building curriculum.

Like Harvey Mudd, UWCSEA is focused on developing academically proficient students who are compassionate, socially responsible individuals. Their emphasis on service learning, sustainability and inclusivity aligns closely with our College's values.

In meetings with UWCSEA leaders, we discussed potential collaborative initiatives that could enhance our mutual focus on entrepreneurship, sustainability and diversity. By sharing resources and best practices, we can enrich our educational programs and help broaden our students' global perspectives.

NUS Innovations

The visit to NUS was equally inspiring. NUS is renowned for its cutting-edge research and innovative educational approaches, and it is globally recognized for its engineering and technology programs. I toured the NUS School of Design and Environment 4—one of the first new-build, net-zero energy buildings at an academic institution. The building has a WELL certification, which attests to spaces designed and constructed with evidence-based health and wellness interventions. Their Campus as A Living Lab at NUS (CALL@NUS) program transforms the campus into a testing ground for sustainability projects.

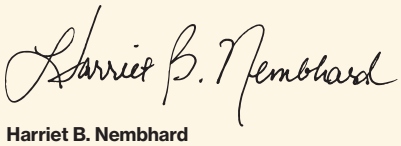
These efforts align well with our strategic plan aspirations of constructing a new academic "living building" with state-of-the-art facilities to support experimental scholarship, modern science and engineering design, and with ongoing initiatives in sustainability and environmental stewardship.

Engaging Our Community

In addition to visiting these esteemed institutions, I had the privilege of meeting with several Harvey Mudd alumni, students and parents who are based in or near Singapore. These interactions reinforce the importance of maintaining strong ties with our global family. Their perspectives and advice help us understand the needs and aspirations of our students as well as provide insights into how our College plays a role in positively impacting the SEA educational, technological and economic ecosystems.

Building Partnerships

As we continue to develop the College's strategic plan, I am confident that the insights and connections gained from this trip will help us achieve our goals. Global partnerships are important for developing students who are academically accomplished and socially responsible, globally engaged citizens.



Harriet B. Nembhard
President
Harvey Mudd College

Travel Partners

In addition to meeting with Harvey Mudd constituents in Singapore, I enjoyed being part of Claremont McKenna College's annual Worldmeet group (here atop Marina Bay Sands Hotel). Now in its third year—I also attended year two in Iceland—this event brings together faculty, alumni, parents and students to enjoy tours, discuss the global political and business landscape, and learn from ambassadors from the host country.

COLLEGE NEWS

Status of Strategic Planning

SINCE PRESIDENT HARRIET NEMBHARD'S ARRIVAL IN FALL 2023, the College community has been discussing how to propel the innovations and accomplishments made during the prior strategic plan into the next decade. Conversations are grounded in our shared mission as well as in our aspirational vision for what Harvey Mudd could be like in 2035 if our ambitious goals are achieved.

In community meetings throughout the academic year, participants helped determine strengths, opportunities, aspirations and desired results (SOAR analysis). This information was reviewed by the Strategic Planning Steering Committee, which developed a draft strategic plan. This draft plan was shared with the community in spring 2024 and with the board of trustees. It will be finalized and approved by the board this fall, then the final plan will be shared with all stakeholders in the community, and implementation will begin.

High-impact Partnerships

One of the priorities in the draft plan calls for fostering "high-impact partnerships." This includes expanding Clinic partnerships with nonprofit organizations and other entities to align Clinic more fully with its educational and mission-focused goals and to strengthen ties to companies and graduate programs in high-impact areas.

The Strategic Planning Task Force on Clinic and Corporate Partnerships is leading the charge to assess the Clinic Program and the College's corporate partnerships to better understand the programs' strengths as well as identify areas of improvement, ensuring alignment with the needs of students and with HMC's emerging strategic plan.

As part of its engagement with students, faculty, staff, trustees, alumni and community members, the task force released a survey this summer to understand a variety of viewpoints on the issues at hand. A summary will be shared on the task force site once available. Watch for updates on the site hmc.edu/strategic-planning/, in e-newsletters and across the College's social media channels. Direct comments and questions to taskforce_ccp-l@g.hmc.edu. ■

Community Prizes

Alongside numerous student awards presented this spring were accolades for outstanding faculty and staff

2024 HMC Leadership Award: Outstanding Staff Member

For positive contributions to the campus, for leadership and for making a difference in students' lives.

Nabel Villafaña, associate registrar; at HMC since 2014

Nominators noted Villafaña's tireless work ethic, kind demeanor, guiding sense of fairness and justice and her desire to be helpful in service of the College's mission. "She is always willing to assist others in complex or simple tasks and does so in a kind way that feels helpful and informative," a nominator wrote. "Nabel is often regarded as one of the most consistently reliable staff members on campus. She has a great depth of knowledge about how things work at HMC."

2024 HMC Leadership Award: Outstanding Faculty Member

Lucas Bang, assistant professor of computer science; at HMC since 2018

Bang was recognized by nominators as one who goes "above and beyond their job role to serve as a mentor for students and/or student organizations and embody Mudd values, such as collaboration and care for the campus community." Another added, "In his research lab, he creates a cohesive environment by bringing people together, making sure everyone feels appreciated and that they are contributing meaningfully to the work."

Henry T. Mudd Prize

For extraordinary service. Awardees receive $6,000, $3,000 of which is designated for use within the College at the discretion of the recipient.

Zach Dodds, Leonhard-Johnson-Rae Professor of Computer Science; at HMC since 1999

In addition to researching robotic hand/eye coordination and computer vision-based robotics, Dodds specializes in computer science education and curriculum design. He co-developed the College's ground-breaking CS5 course, serving as principal investigator and co-PI on a number of projects funded by the National Science Foundation, as well as improving curricular design in computer science nationally. He was lauded for his focus on student success in and out of the classroom and for his dedication to the intellectual development, emotional well-being and all-around success of students. His efforts to improve K–12 computer science education include co-founding the MyCS Middle-years Computer Science program, which provides computer science curriculum to students in school districts that serve populations underrepresented in CS.

Wendy Menefee-Libey, senior director of learning programs; at HMC 2000–2024

Menefee-Libey joined the staff as director of learning programs, later becoming senior director. As director of the Writing Center and Academic Excellence Program, she created a warm, welcoming space where students from all disciplines can develop the critical and analytical tools to become clear and forceful communicators. She helped create and maintain Writ 1, the College's interdisciplinary writing course. She was recognized for "working tirelessly to ensure student success, confidence and joy in learning." Menefee-Libey, who designated a portion of her Mudd Prize to HMC's learning programs, retired in spring 2024.

Mary G. Binder Prize

For outstanding support staff ($1,000 award). Established by Sam Tanenbaum, engineering professor emeritus, and his wife, Carol, in honor of Carol's mother.

Diana Limon, registrar coordinator; at HMC since 2017

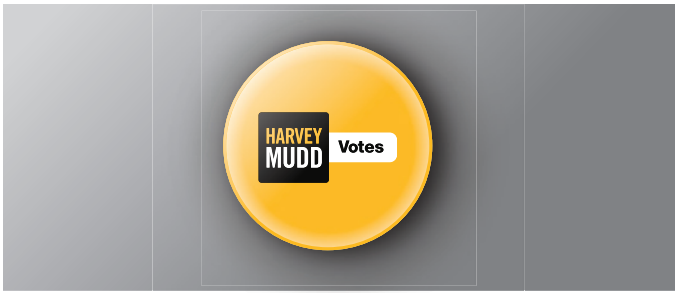
Limon began working in the Department of Facilities and Maintenance, then became registrar coordinator in 2022 shortly after being named an Outstanding Staff Member. Nominators noted that Limon "always goes above and beyond her duties, with a cheery disposition and willingness to help." ■

Civic Preparedness, Civil Discourse

Higher education is being called upon to help address the disillusionment and frustration that many young people feel about the U.S. political system. Through College Presidents for Civic Preparedness, participating U.S. college presidents—including President Harriet Nembhard—pledge to prepare the next generation of well-informed, productively engaged and committed citizens; defend free expression, civil discourse and critical inquiry as essential civic norms; and increase thoughtful engagement and better understanding by students for the effective functioning of our democracy.

"The better the College can increase its capacity to prepare students to be active and engaged citizens advocating for science, the more impact it will have in ensuring that scientific evidence informs decision-making and research applications in the service of humanity," says Nembhard.

Civic learning and engagement programming at Harvey Mudd is managed through the Office of Civic and Community Engagement, directed by Gabriela Gamiz. During activities for the 2024–2025 academic year, Gamiz says that students will explore what polarization is, how it contributes to their civic identity and how it consciously or unconsciously affects how they exercise the power of their voices and their right to vote. "We'll provide tools that can help students have more curious conversations and perspectives."



A sample of fall semester civic learning and engagement efforts

Book club. *I Never Thought of it That Way: How to Have Fearlessly Curious Conversations in Dangerously Divided Times*, by Monica Guzman

Living Room Conversations. In-person events for HMC students before and after general election

Bridging the Divide Speaker Series. Topics include What is polarization? (history, present and future outlook)

Participation in the College Bowl via Unify America. Two college students with diverse views/backgrounds discuss hot-button issues, find common ground and discover how to have a respectful conversation without conflict.

MotiVote. A resource that can help students register to vote and make a plan to vote

Engineering professor Whitney Fowler (second from left) with her student researchers

RESEARCH

By Molecular Design

Fluorescent nanofibers might offer a solution to global water challenges

Written by Sarah Barnes

AS ENGINEERS, WHITNEY FOWLER AND her students use their knowledge of mathematics, science and technology to solve problems and invent new things. Working at the intersection of engineering, chemistry, materials science and biology, Fowler, Natchayaporn Sindhurattavej '26, Shreya Jampana '26, Mai Phuong Pham '25, Leonardo Romero '25, Anna Grace Rogers '25 and Griffin Stevens '25 are engineering molecular systems to address challenges presented by the global water crisis.

"There currently are a lot of ways to cheaply purify water in places all around the world; they just might not be implemented," says Fowler. "But there aren't many technologies that allow communities and non-governmental organizations to see for themselves how pure their water is. There is a huge data gap here, and that's because the technologies don't exist. I wanted to tackle this need in my research group."

Fowler and her students molecularly engineered self-assembling nanofibers that have fascinating properties. Using the amino acids as building blocks, they programmed peptide amphiphiles (PAs) to spontaneously self-assemble in water into nanofiber structures. "When they self-assemble, they become intrinsically fluorescent, which was an exciting discovery I made last year," says Fowler. "In this most recent work, we hypothesized that we could molecularly design the amino acid sequence to enhance the fluorescence by limiting the molecular motion of the PAs in the nanofiber structures. We thought that instead of the molecules losing energy when they are wiggling around, that energy could be emitted as fluorescent light. And our hypothesis was true! We chose an amino acid sequence that limited motion, and the nanofibers were 10 times more fluorescent."

The group's research was published in *ACS Biomacromolecules'* special issue *Peptide Materials*.

Fowler's group is now incorporating this molecular sequence with an additional binding motif into the PA, which allows the team to design protein-inspired fluorescent sensors to detect contaminants in water. When the amino acid sequence binds to the target in water, the fluorescence signal will change and indicate that a contaminant is present.

"This is exciting because proteins have the ability to bind to a lot of targets with very high specificity," Fowler says. "We can harness that biological ability and incorporate it into a synthetic material that we can optimize and repurpose for our application." ■

Faculty Updates

Research, Awards, Activities

Biology

Researchers in **Danae Schulz's** lab study how African trypanosomes adapt to living in different hosts: humans, hoofed animals and tsetse flies. Understanding how the parasite adapts to different hosts could lead to the design of effective strategies for treating the disease. The lab's focus is to understanding how gene regulatory proteins called bromodomain proteins interact with the DNA as parasites transition from the blood to the insect. In 2022, the Schulz lab was the first to report using CUT&RUN (cleavage under targets and release using nuclease), a chromatin profiling strategy used to analyze DNA-protein interactions, on African trypanosomes. The Schulz lab protocol "Adaptation of CUT&RUN for use in African trypanosomes" is now available in *PLOS ONE*, an open-access journal that publishes rigorously reported and peer-reviewed research for the benefit of the wider science community.

Chemistry

Bilin Zhuang says her goal in teaching is to make physical and computational chemistry fun and accessible for students from various backgrounds. A recent National Science Foundation CAREER grant will support her efforts via her project "Developing a Hybrid Adaptive Particle-Field Simulation Method for Solvation of Charged Macromolecules and a New Computational-Chemistry Course for Lower-Division Undergraduates." The grant supports Zhuang's research group to develop an improved method to perform all-atom simulations for large molecules in solutions. All-atom simulation is a convenient tool for studying interactions between molecules, but it is very costly for systems of large molecules in solution, which are ubiquitous in nature (DNA molecules in our bodies, for example). To enable these simulations, the Zhuang group will develop a simulation method that can drastically reduce the number of solvent molecules considered with molecular details while capturing the dynamics of the solution environment. This method will provide a convenient and accelerated tool for simulating large molecules in solution and will require fewer computational resources. "We hope this method will make molecular simulation more widely accessible for students in chemistry, with the fewer computational resources required" Zhuang says.

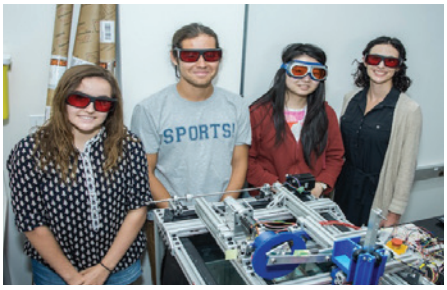
Computer Science

Jim Boerkoel, a faculty member since 2013, was promoted to full professor. Boerkoel, the Csilla and Walt Foley Professor and chair of the Department of Computer Science, specializes in human robot interaction, artificial intelligence and interaction design. He directs the Human Experience & Agent Teamwork Lab (HEATLab), which seeks to develop techniques that augment humans' own cognitive and physical abilities to create integrated human-agent teams that are more capable than their individual counterparts.

Julie Medero has developed a new elective that leverages CS skills in exploring creativity and making and expands the application of a CS degree to alternative and creative industries. "'Making' is a broad term," Medero says, "but, in the context of this course, it's hands-on creating of physical artifacts. That's something you wouldn't typically expect to do in a CS course, which is often thought of as taking place in a computer lab immersed in a world of bits and pixels." Students in the Making CS course apply their CS knowledge toward hands-on projects and spend most of their time in the makerspace using machinery like 3D printers, laser and waterjet cutters, embroidery machines, a digital jacquard loom, a printing press, soldering irons and tools in the wood and machine shops. Students set their own goals, break them down and choose their learning path based on their interests. "They learn to roll with uncertainty and learn that things aren't always as intimidating as they initially seem," she says.

Engineering

Josh Brake and his research group are developing a tool to use light channeled inside plant stems and roots to monitor plant health. He explains his work on the Oct. 19, 2023 episode of *The Academic Minute*, a daily podcast that features researchers from colleges and universities around the world. Listen at bit.ly/am-brake.



Leah Mendelson received a grant from the National Science Foundation for her project "ERI: Free surface and flexibility effects in partially-submerged bio-inspired propulsion." It aims to help researchers better understand the effects water's surface has on vehicles and robots that operate in underwater ecosystems. "The water's surface is a really interesting environment to operate in because there's a lot of fluid behavior that doesn't exist in other environments," Mendelson says. Her work in the field of bioinspired fluid mechanics focuses on using insights learned from swimming organisms to develop underwater vehicles and actuators that can maneuver efficiently and are less disruptive to surrounding aquatic environments.

Humanities, Social Sciences, and the Arts

Vivien Hamilton, who joined the HSA department in 2011, has been promoted to full professor. Hamilton teaches a wide range of courses in the history of science, technology and medicine, asking questions about the cultural authority of science, the multiple occurrences of seemingly revolutionary shifts in scientific theory and practice in history, and the impact of structures of race, class and gender on the production of scientific knowledge. Her research focuses on medical technologies, including x-rays, in the late 19th and early 20th centuries. Hamilton co-edited *Inevitably Toxic? Historical Perspectives on Contamination, Exposure, and Expertise*, a collection of essays that examines a diverse set of spaces contaminated by radiation and industrial waste. The work was chosen by the Association of College and Research Libraries for its 2019 list of Outstanding Academic Titles.

A paper by Assistant Professor of Economics **Dede Long**, "Working From Home, Commuting Time, and Intracity House-Price Gradients," has been accepted by the *Journal of Regional Sciences*, one of the top journals in the field of urban economics. The paper examines how remote work reduces commuting costs and flattens the house price gradient.

Paul Steinberg and **Karl Haushalter**, Seeley W. Mudd Professor of Chemistry and Biology and chair of the Department of Chemistry, co-authored "Collaboration Across Boundaries: A Practical Guide," published in the *Stanford Social Innovation Review*. Steinberg is the Malcolm Lewis Professor of Sustainability and Society.

Math

ZOE MESSENGER '26

The College hosted the 21st International Conference on Fibonacci Numbers and their Applications. Organized by **Art Benjamin** and held July 8–12, the event featured more than 50 talks on various aspects of the Fibonacci Numbers and related sequences and was attend by 70+ mathematicians from around the world. The conference also included free events aimed at the general public, including Fibonacci music from a Grammy-nominated musician and a Pomona piano prodigy, a Fibonacci game show and magic show, and a talk by Jennifer Quinn, professor of mathematics at University of Washington Tacoma.

The *Math Therapy* podcast hosted **Francis Su** for an engaging conversation about the ways mathematical discovery can unleash the wonder and curiosity innate within us all. On Episode 3 of Season 6, Su and host Vanessa Vakharia also discussed how humans can cultivate the virtues we'll need to keep AI in check. Listen at bit.ly/MT-Su.

Talithia Williams, professor of mathematics and the Mathematics Clinic director, recently received the 2024 Rice University Laureates Award, given by the alumni association of Rice University (where she received her master's and PhD in statistics). Williams makes mathematics and statistics accessible to millions through her work as a TV host, speaker and author of the book *Power in Numbers: The Rebel Women of Mathematics*. As a researcher, Williams has worked with the World Health Organization to develop a cataract model that improves predictions for cataract surgical rates in African countries. Williams is nationally known for her TED Talk, "Own Your Body's Data," in which she equips a mass audience to use statistics to take ownership of their health. She runs an annual conference (Sacred SISTAHS) to encourage young girls from minority communities to study STEM. Williams, who joined the Harvey Mudd faculty in 2008, received a teaching award in 2015 from the Mathematical Association of America and was promoted this year to full professor.

Physics

Sharon Gerbode was promoted to full professor. Gerbode and her students focus on two areas at the forefront of experimental soft matter physics: colloids—where microscopic solid particles suspended in a fluid self-assemble into thermodynamic phases; and adaptive biomaterials—where soft microstructured biological tissues actuate complex motions. In 2018, the Gerbode group discovered "optical blasting," which allows people to internally sculpt colloidal crystals and could lead to new ways of modifying material properties. More recently, Gerbode co-authored a paper, "Grain splitting is a mechanism for grain coarsening in colloidal polycrystals," that was published in *Physical Review E*. Gerbode, a 2016 Cottrell Scholar, joined the Harvey Mudd faculty in 2012.

Mark Ilton and four of his students celebrated the publication of their work in the *Journal of the Royal Society Interface*, which publishes articles of high-quality research at the intersection of the physical and life sciences. Lead author Lucien Tsai '24 along with Ilton and co-authors Paco Navarro '25, Ingrid Wu '23 and Taylor Levinson '25 performed summer research in Ilton's Physics of Soft Matter (PoSM) Lab that resulted in their paper, "Viscoelastic materials are most energy efficient when loaded and unloaded at equal rates." The research describes the results of the group's investigation of the mechanical energy efficiency of biological springs (i.e., tendons).

Dynamic Dozen

With the addition of 12 teachers/scholars—three of them alumni—the College has 116 faculty members charged with educating future scientists, engineers and mathematicians and inspiring them to become passionate problem solvers who understand the impact of their work on society.

Chemistry

Colm Healy
PhD, chemistry, Trinity College Dublin, Ireland; visiting assistant professor at HMC for the past two years
Research interests: Uses materials chemistry to tackle climate change, energy storage and conversion, renewable fuels. In Healy's Hybrid Materials Chemistry Lab (HMC@HMC), researchers examine organic-inorganic hybrid materials, which combine some of the properties of traditional organic plastics with traditional inorganic glasses.
Fun fact: Over a five-year period, Healy lived on four different continents.

Maduka Ogba
PhD, chemistry, Oregon State University; postdoctoral fellow at Pomona College; former faculty member, Chapman University
Research interests: Utilizes computational chemistry methods and high-performance computing to develop cost-effective and environmentally friendly catalytic reactions. Researchers in Ogba's group investigate using cheap, earth-abundant and environmentally sustainable salts to convert environmental pollutant molecules into useful drugs and materials.
Fun fact: Ogba is a cinephile and was an avid member of dance crews as an undergrad.

Computer Science

Jonathan Chang '17
PhD, computer science, Cornell University; data science fellow, Cornell Center for Social Sciences
Research interests: Studies ways to promote healthier interactions in online communities. From a technical perspective, develops new algorithms and computational models to characterize and detect behaviors that are harmful to online communities. Explores, from a technical perspective, how such technologies can best be leveraged to create tools and policies with a positive impact.
Fun fact: Chang spent all four years at Harvey Mudd in East Dorm. He's also a big fan of Hong Kong style cuisine.

Vidushi Ojha '17
PhD, computer science, University of Illinois at Urbana-Champaign; software engineer for two years after college
Research interests: Focuses on broadening participation in computing by examining the institutional policies and classroom practices that foster students' learning and well-being. Ojha's research affords students an opportunity to learn a variety of qualitative and quantitative skills while working on topics directly relevant to their own experiences.
Fun fact: Ojha loves boba, books and board games. Other Harvey Mudd alums in the family: brother, Class of 2019; husband, Class of 2018.

Tim Randolph
PhD, computer science, Columbia University
Research interests: At the intersection of computer science and mathematics and focused on using new mathematical tools on hard problems in exact and parameterized complexity. He has published peer-reviewed research on cryptography, mathematics, management science and computer science education. Promotes equity and inclusion in computer science.
Fun fact: Randolph enjoys trail running, reading, vegan baking and all forms of outdoor adventure.

Engineering

Marissa Lee '18
PhD, mechanical engineering, Stanford University; previously an HMC visiting assistant professor
Research interests: Lee has collaborated with clinicians nationwide to enhance patient mobility. She intends to bring biomechanics and data science experience—which she further developed with the Philadelphia Phillies, a Major League Baseball team—to establish a research group that studies human mobility and performance and will focus on quantifying and improving movement in natural environments and uncovering relationships among bone, injury and treatment outcomes.
Fun fact: Lee is halfway through her goal of watching a baseball game at every Major League Baseball stadium.

Adyasha Mohanty
PhD, aerospace engineering, Stanford University
Research interests: Designs algorithms for improving the localization of autonomous systems in challenging environments and under challenging dynamics using AI and physics-based models, sensor fusion and principles from Information Theory. Seeks to design autonomous systems that function safely in the most unpredictable scenarios while bridging the gap between theoretical principles and practical implementations.
Fun fact: Mohanty loves doing Zumba dance and considered becoming a Zumba instructor.

Hixon Center for Climate and the Environment/Biology

Jessica Guo
PhD, biology/biological sciences, Northern Arizona University
Research interests: Studies plant-environment interactions under extreme climate, focusing on drylands subject to potentially lethal combinations of heat and drought. Co-principal investigator of an NSF-funded Research Coordination Network that aims to build a robust database of plant water potential and spur synthetic research across disciplines, such as plant ecophysiology, remote sensing and ecosystem modeling.
Fun fact: Guo almost became a herpetologist (a scientist who studies amphibians and reptiles), but "plants are easier to find and require less paperwork," she says.

Humanities, Social Sciences, and the Arts

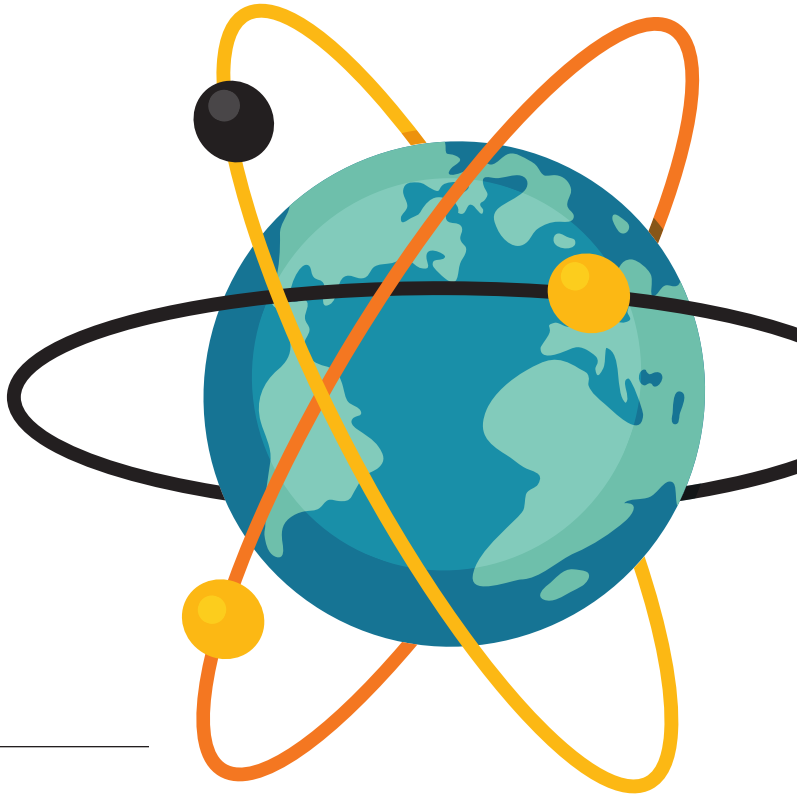
Jia Yi Gu
PhD, architecture, UCLA; taught at UCLA, USC, SCI-Arc, University of Toronto and Cal Poly San Luis Obispo; worked in Berlin, Barcelona and Anyang, China
Research interests: Works at the intersection of art and architecture. Research focuses on histories of knowledge production and display practices in art and architecture. Gu is director and curator of MAK Center for Art and Architecture and has served as director of Materials & Applications, a Los Angeles-based project space for experimental architecture. Co-founder of architecture studio Spinagu with Maxi Spina.
Fun fact: When traveling abroad, Gu organizes diasporic Asian food tours as a way of experiencing and better understanding the many cultures that constitute a locale, in particular the immigrant communities.

David Wilson
PhD, ethnomusicology, University of Chicago; DMA, vocal arts, USC; taught voice at NYU's Joint Music Program and at Stanford
Research interests: Investigates why music is a crucial tool to modern nationalism, why music is so attractive in contests over national legitimacy, and why the exact role of music is difficult to describe in nationalist contexts. Addressing music's capacity to educate individuals about the "correct" emotional relationship between everyday citizens and the nation-state in 20th- and 21st-century Taiwan and China. Author of Substack newsletter *Unmusable*, which explores music and media in Taiwan and China.
Fun fact: Wilson enjoys British mystery TV, Duolingo and binge-watching the *Great British Baking Show*.

Sarah Stefanos
PhD, sociology and environmental studies, University of Wisconsin, Madison
Research interests: Focuses on Ethiopia and Uganda and questions of globalization, race and ethnicity, indigenous peoples, inequality, migration, work and entrepreneurship, politics and political economy, environment and natural resources, and development. Co-founder of W2E Ltd, a waste-to-energy research company in Uganda that specializes in biogas systems and technological/business innovations at the intersection of energy and agriculture.
Fun fact: While in Ethiopia, broke an ankle falling into a meditation pool at a fancy hotel that was hosting a conference by the Breakthrough Institute.

Mathematics

Andrés Vindas Meléndez
PhD, mathematics, University of Kentucky; graduate certificate in Latin American, Caribbean and Latinx studies
Research interests: Algebraic, enumerative and geometric combinatorics, and mathematical and computational approaches and applications of data science and mathematics for social justice. Previously, an NSF Postdoctoral Fellow and lecturer at UC Berkeley; postdoctoral scholar at the Mathematical Sciences Research Institute (now Simons Laufer Mathematical Sciences Institute).
Fun fact: Meléndez adopted an Australian Cattle Dog mix puppy from a shelter.



MY MUDD LIFE

Readable, Comprehensible and Beautiful

HMC team's mathematical model and paper win top ICM honor

Written by Stephanie L. Graham

OF THE FIVE TEAMS THE COLLEGE FIELDED FOR THE 2024 International Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling (MCM/ICM), one team had an extraordinary result.

The team of Max Collins '25 (mathematics major), Paco Navarro '25 (math and physics) and Arjun Taneja '25 (computer science and math) earned the designation of Outstanding in the 26th annual Interdisciplinary Contest in Modeling, placing in the top 18 out of 10,000 participating ICM teams. Their solution was recognized with a Mathematical Association of America Award and with the International COMAP Scholarship Award, given to the Top 4 MCM/ICM teams. COMAP awardees received $9,000 for the team and $1,000 for the school.

The three friends developed a strong rapport by taking classes together and working on various projects. "Teaming up with them is what made the contest worth doing," says Taneja.

Before the contest, Collins, Navarro and Taneja received advice from Harvey Mudd mathematics professors Susan Martonosi and Jamie Haddock—co-coordinators of the MCM/ICM Seminar—and Heather Zinn-Brooks. Martonosi and Haddock gave all Harvey Mudd teams practical advice on how to approach the contest and how to manage time. Students work in teams of up to three students and have 96 consecutive hours to develop a mathematical model and write a formal paper describing their work. The team's papers are judged not only on their scientific and mathematical accuracy, but also on their clarity of exposition, insight and creativity. Collins, Navarro and Taneja spent most of their time bouncing ideas off each other and making their report "readable, comprehensible and beautiful."

Team members commented, "As we have learned from our time at Mudd, these are extremely important but often overlooked parts of math communication."

Their winning report was titled, "Dynamic Dams Model: A Multigranular, Human-Centered Approach for Modeling Water In The Great Lakes." One of three ICM problems—the others dealt with the sustainability of property insurance and reducing illegal wildlife trade—the challenge required teams to develop a dynamic model of the water levels in the Great Lakes. After determining the optimal water levels for the system, teams established algorithms that could be used by the two existing water-level control mechanisms to maintain optimal levels within the system.

Navarro really liked this problem because, being from Minnesota, he has a personal connection to the Great Lakes. Team members also selected the problem because the theme was operations research/network science-related. The three had taken an operations research course with Professor Martonosi in fall 2023 and really enjoyed it.

"We could see how the material we learned in class could be readily applied to this problem, so we concluded there was a good deal of potential in doing it," they said.

"This is quite an achievement, and we are so proud of these students," says Martonosi.

Ben Fusaro, creator of the contest in 1983, described the MCM/ICM: "Most problems that come up in business, government or industry are solved by teams, are likely to take many hours, and would not be restricted to using only pencil and paper. Moreover, the answer must be presented to an executive who wants a clear, understandable response."

A selection of the Outstanding summaries will be featured in *The UMAP Journal*, along with commentaries from the problem authors and judges. ■

2024 OUTSTANDING STUDENT ORGANIZATION

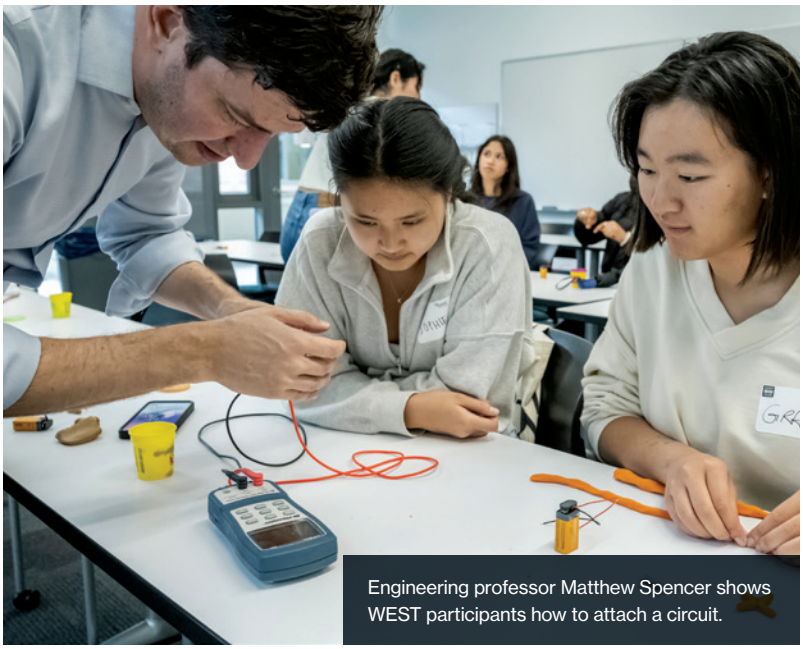
Society of Women Engineers

SWE was recognized as a student organization that makes a positive impact on campus or in the wider community and demonstrates integrity, leadership and teamwork.

SWE members were celebrated for their teamwork and support of the Mudd community. "This has much to do with hard work and enthusiastic collaboration of the team of officers," wrote a nominator.

One of their projects each year is producing the Women Engineers and Scientists of Tomorrow (WEST) Conference for high school girls. August McIntosh-Lombardo '25, SWE co-president, said, "We've been doing the WEST conference for a very, very long time, and we're very proud to keep it going. It's a good opportunity for local high school students, and we're also looking into how we can expand this and offer it to more people, because it really is something special."

Computer science professor Xanda Schofield '13 provides an introduction to computer science.


Engineering professor Matthew Spencer shows WEST participants how to attach a circuit.


WEST participants

HMC Outstanding Emerging Leader

Lucas Lemos '26 is founder of Cradling Love, a nonpolitical, non-religiously affiliated 5C service club with the mission of serving pregnant and parenting Claremont students emotionally and materially, especially by destigmatizing teen pregnancy. Lemos is known as someone who stands for justice, integrity and compassion. A nominator for the Outstanding Emerging Leader award wrote, "He has been a leader in organizing a healthy and vibrant community around him, continually investing in others ... Lucas demonstrates massive potential as a community leader and impactful member of the Mudd and The Claremont Colleges communities."

Capstone Roundup

From analyzing oceanic temperate forest trends to modeling gene enrichments in breast cancer, Harvey Mudd students shared their senior thesis research and course capstone projects at spring 2024 Presentation Days. Here we've selected a few projects that demonstrate Mudders' research achievements. Discover more projects at bit.ly/presentdays24.

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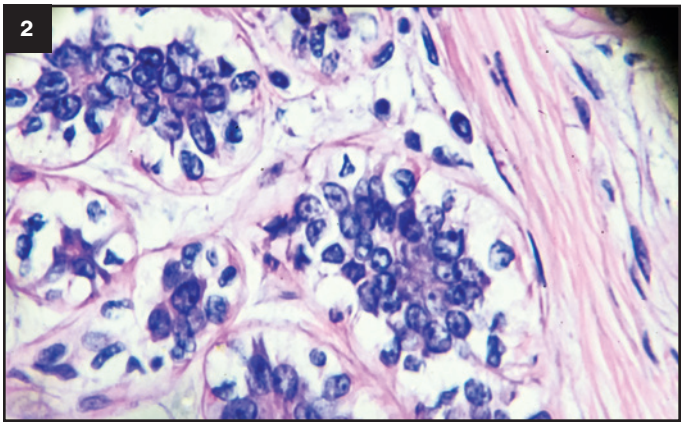

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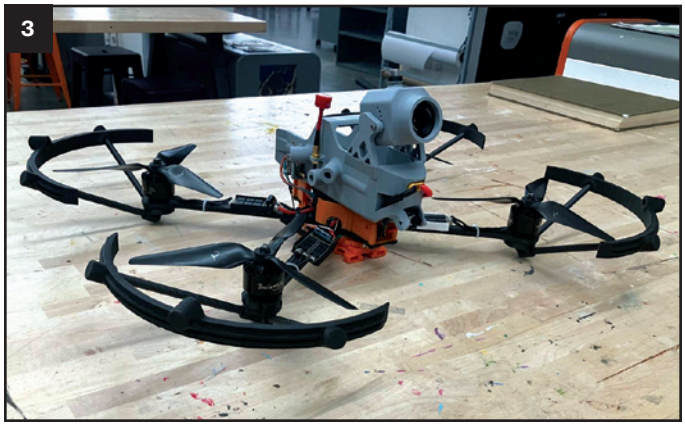

Chemistry

1. Forest Fires in Flux: Analyzing Trends and Influences on Oceanic Temperate Forests in a Changing Climate

Student: James Barrett
Advisor: Sarah Kavassalis, assistant professor of chemistry and climate

Climate change has significantly transformed fire regimes. Using satellite data and climate models, Barrett identifies fire incidence and severity trends in oceanic temperate forests—biomes once shielded from climate change due to their coastal location. Barrett's study considers climatic and human influences on forest fires. Data visualization, statistical analysis, and policy quantification clarify the relationship between climate extremes, human activity and fire. Understanding these interactions enhances predictions of future fire activity and air quality impacts, informing forest management policies to safeguard these crucial ecosystems.

Biology

2. Spatially Modeling Gene Enrichments from Cell Morphology in Breast Cancer

Student: Cevi Bainton
Advisors: Matina Donaldson-Matasci, associate professor of biology; Cathy McFadden, Vivian and D. Kenneth Baker Professor in the Life Sciences

Breast cancer is a highly damaging disease that is hard to predict. Cancer development can be better understood by considering the genetic heterogeneity of tumor cells, but the new techniques that make this possible are expensive and hard to scale. Bainton predicts genetic status in space within a tumor based on cell images from a spatial transcriptomics data set in breast cancer.

Shanahan Project

3. Smoke Mask Rescue Drone

Students: Dominick Quaye, Victor Shia

Students developed a custom drone technology that allows firefighters to deliver smoke inhalation masks to upper-floor apartment building residents during a fire. This is especially important for fires where a lower floor is consumed, as people in the floors above cannot be evacuated and smoke can rise through the building often suffocating them. The team customized the masks adding visual and auditory cues to users, made the battery quick-changeable for faster back-to-back mask deliveries, along with many other small upgrades.

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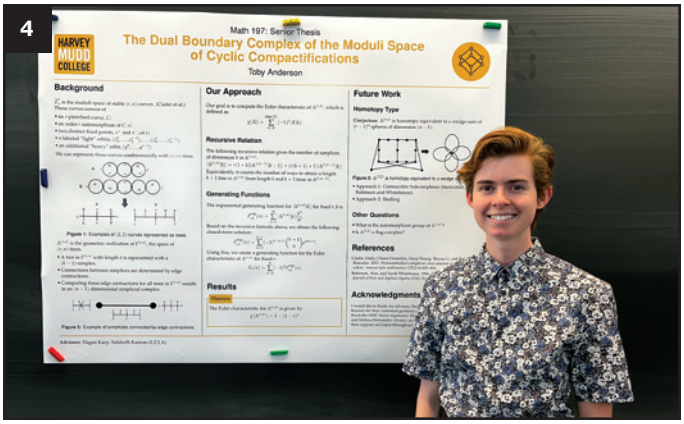

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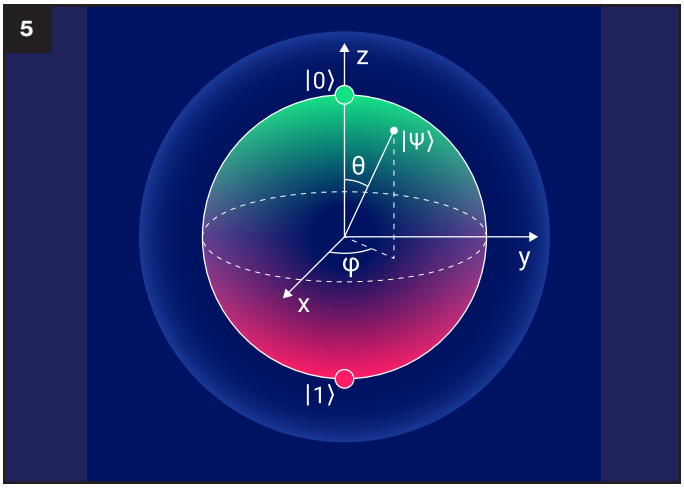

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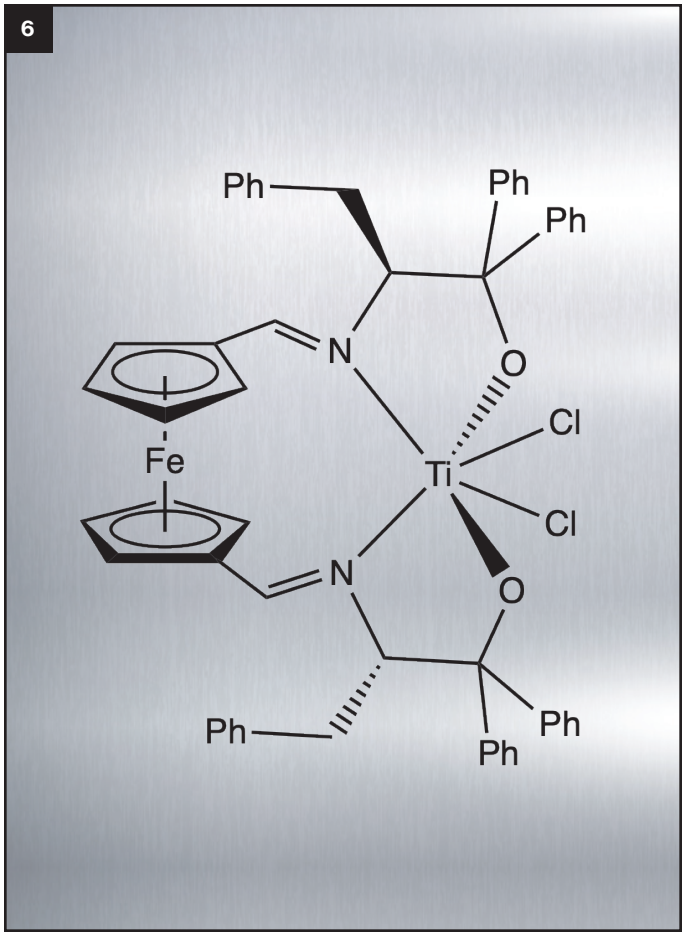


Mathematics

4. The Dual Boundary Complex of the Moduli Space of Cyclic Compactifications

Student: Toby Anderson
Advisors: Dagan Karp, professor of mathematics; Siddarth Kannan, UCLA

Moduli spaces provide a useful method for studying families of mathematical objects. Anderson studied certain moduli spaces of algebraic curves, which are generalizations of familiar lines and conics. He focused on the dual boundary complex of the moduli space of genus-zero cyclic curves. This complex is itself a moduli space of graphs and can be investigated with combinatorial methods. Remarkably, the combinatorics of this complex provides insight into the geometry and topology of the original moduli space. Anderson presented two topologically invariant properties of this space: its Euler characteristic and homotopy type.

Physics

5. Toward a Uniform Distribution of Two-Qubit Mixed States

Student: Freya Derdeyn
Advisor: Theresa Lynn, professor of physics

In quantum information, operations often work as expected only for some quantum states. But it cannot be accurately determined for what fraction of two-qubit quantum states a particular operation works because there is no known uniform distribution over mixed states. The Bloch sphere provides a uniform distribution for one-qubit states, but this representation is not extensible to higher dimensions. Many authors have explored representations of two-qubit quantum states, but they have limited their attention to only pure states or subsets of mixed states. Derdeyn used a parametrization of two-qubit mixed states to move toward a uniform distribution over all two-qubit quantum states.

Chemistry

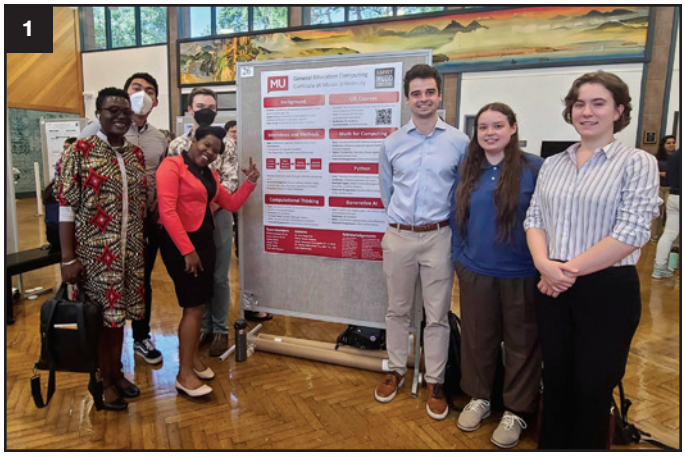
6. Synthesis of Chiral Titanium Complexes

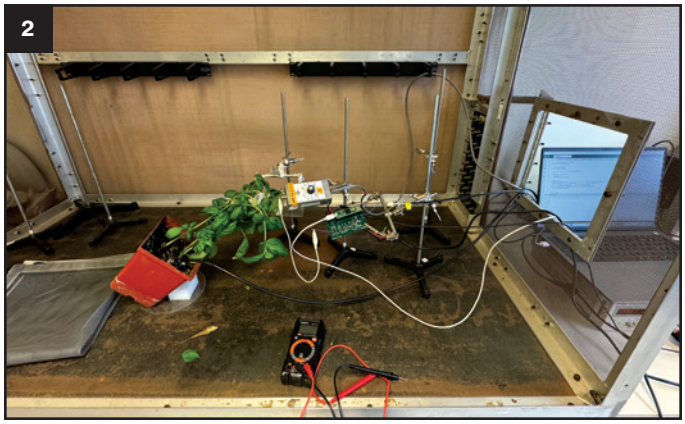
Student: Jocelyn Sabin
Advisor: Adam Johnson, professor of chemistry

The Johnson lab has been interested in studying titanium-based catalysis because it has the potential to replace catalysts that rely on more expensive, less abundant metals like ruthenium, rhodium and palladium. This year, researchers synthesized eight new titanium complexes using four different amino-acid-derived ligands with a ferrocene core. Due to the structure of the ligands, the products have interesting geometry and chirality.

Quantum Computing, Blood-feeding Insects and More

Harvey Mudd Clinic teams spent the academic year building working prototypes or helping advance industry standards in research and development. The Clinic Program provides opportunities for students to become well-versed in many areas, apply their learning in creative ways and understand the impact of their work on society. Teams tackle diverse projects, many made possible by community connections, including through parents and alumni.





Computer Science/Global Clinic

1. Computing Curricula at Musizi University

Musizi University liaisons: Takako Mino CMC ’11, CGU ’13, ’18, Elaine Alowo-Matovu, Jude Watimongo, Maria Assumpta Komugabe CGU ’24, Paul Bagyenda
Students: Andres Rivas, Emily Weiss, James Catron, Ford Ashmun, Abby Tiller
Advisor: Julie Medero, computer science department associate chair and associate professor

Musizi University is a liberal arts and sciences institution of higher education in Ntinda, Kampala, Uganda, that strives to prepare ethical, entrepreneurial and employable leaders who can engage with and shape the world’s emerging technologies. For Musizi’s undergraduate software engineering major, the Clinic team designed materials for six first-year courses: Computational Thinking, Math for Computing, Python, Generative AI, Uganda Studies, and Obuntu Bulamu Philosophy.

Engineering Clinic

2. Designing a Modernized Electropenetrograph

Auburn University/USDA liaisons: Dr. Kathryn Reif, Dr. Elaine Backus P19, Andy Dowell
Students: Simon Woodside, Rafael Burger, Tjaard Van Löben Sels, August McIntosh-Lombardo, Audrey Vo
Advisor: Josh Brake, assistant professor of engineering

The spread of arthropod-borne disease affects human health as well as agricultural and livestock resources. Researchers at Auburn University and USDA use a device called an electropenetrograph (EPG) to study insect feeding behaviors relevant to the spread of these diseases. However, existing EPG technology is not well-suited to the study of blood-feeding insects. To address this, the Clinic team designed an EPG with modernized features, including improved ease of use in field experimentation.

Computer Science/Mathematics Clinic

3. FizzyO: An Accessible Physical Therapy App for Children with Developmental Delays

ConcentricLife liaisons: Eric Ong ’02, Michael Austin POM ’97
Students: Mohamed Hamouda, Julia Hsing, Vani Sachdev, Joel Tan-Aristy, Amy Yuan
Advisor: Lynn Kirabo, Maria M. Klawe Assistant Professor of Climate and Computer Science

ConcentricLife, part of the Life Sciences group at Accenture Song, is a communications agency that creates purpose-built experiences in the health and wellness space. They seek to make physical therapy for kids with developmental delays more accessible, regardless of a family’s income or place of residence. The Clinic team worked with ConcentricLife to pioneer a solution through FizzyO, an innovative app that transforms physical therapy exercises into fun dances personalized to children’s mobility goals and accessibility needs.

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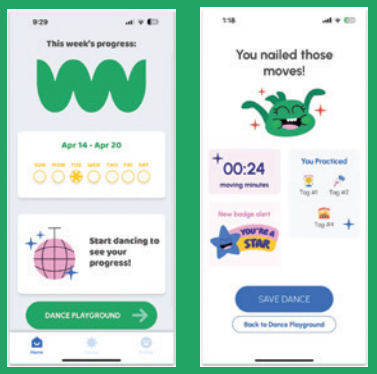

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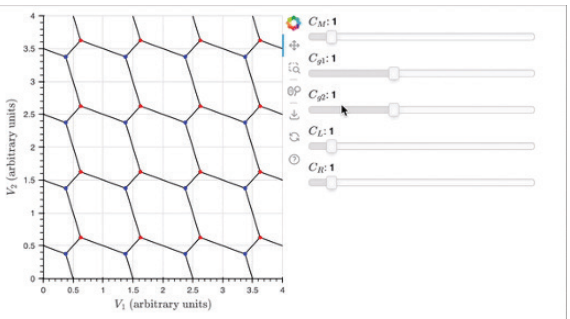

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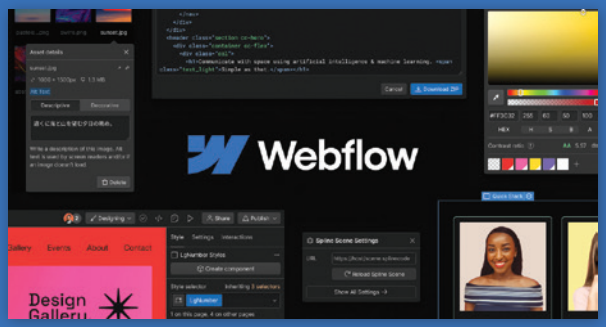

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Computer Science/Mathematics Clinic

4. Building Engaging Tutorials for Webflow: Simplifying the Learning Experience

Webflow liaisons: Allan Leinwand P'27, Kirat Chhina
Students: Eden Goldberg, Aryaman Jaiswal (CMC), Amy Liu, Htoomyat Naing
Advisor: Vera Khovanskaya, adjunct professor, mathematics (2023–2024)

The Clinic team developed a gamified onboarding app for Webflow aimed at enhancing user adoption and retention by simplifying the learning process and providing users a heightened a sense of progress. The app guides users through interactive tutorials, allowing them to complete tasks within a half-built website. This hands-on approach bridges the knowledge gap for beginners and enriches the learning experience for all users.

Computer Science/Physics Clinic

5. Training Scientists and Engineers in Exchange-Only Quantum Computing

HRL Laboratories liaisons: Thaddeus Ladd '98 and Paul Jerger '15
Students: Trishan Amruthur, Peter Luljak, Alec Roberson, YJ Tsai, Becca Verghese
Advisor: Jason Gallicchio, associate professor of physics

HRL Laboratories, a leading research organization specializing in exchange-only quantum computing (EOQC), was facing the problem of efficiently educating new hires on the principles of EOQC. Despite the publicly available information on quantum computing, there was very little documentation and training for HRL's unique research. Team members developed a browser-based tool that synthesizes HRL's research on EOQC and presented it in an interactive and digestible way for newly hired scientists and engineers.

Engineering/Climate Clinic

6. Investigating a Landfill Gas-to-Renewable Natural Gas Plant

LS Power liaisons: Kathy French '97, Jessica Haller
Students: Viviane Solomon, Nilay Pangrekar, Zoë Gomez-So, Tia Tounes, Kopchon Sittithammachoti
Advisor: Mark Gale, visiting assistant professor of engineering (2023–2024)

LS Power is a company focused on power generation, electric transmission and energy infrastructure. The team investigated a plant that captures and refines landfill gas into renewable natural gas. They improved plant efficiency via deliverables, such as a report on methane loss locations and volumes, a framework to model adsorption beds' lifetimes, landfill wellhead data analysis and a sensor installation plan to improve data collection.

"Something I learned at Harvey Mudd was how to solve problems," says Jacqueline Paver '77, an expert in injury research.

CRASH COURSE

Jacqueline Paver ’77 conducts scientific research on crashworthiness, biomechanical engineering and occupant safety

Written by Holly Leber Simmons
Photos by Jeffrey Liang

JACQUELINE PAVER ’77 IS HELPING WOMEN IN THE MILITARY MAKE HISTORY.

In 2022, Paver—a biomechanical engineer focused on injury mechanics and prevention—signed an independent contract with the United States Air Force to do manikin development and testing for military warfare aircraft to safely accommodate small and pregnant women.

“Military aircraft have been evolving over the last couple of years,” she says. “Occupant compartments must be redesigned, and new aircrew personal protective equipment must be developed. Female aircrew must be able to reach and operate controls and have seats, helmets and suits that fit them.” Helmets that are too heavy can cause neck injury, and poor positioning can lead to fatigue.

Examining ejection systems is one of Paver's recent projects. Ejection seats designed for males, she explains, have catapults that are extremely aggressive, which can lead to lumbar spine compression fractures. She's looking at a programmable catapult that would accommodate petite and pregnant females.

In January 2023, Major Lauren Olme of the 77th Weapons Squadron became one of the first pregnant air crew members to fly an ejection seat aircraft—a B1 Lancer supersonic bomber—thanks to a policy that authorizes pregnant aircrew to apply for a waiver "regardless of trimester, aircraft or flight profile," according to an April 11, 2022 Air Force Public Affairs news article. "Waivers are important, but programmable ejection seat catapults and modified restraints will reduce the likelihood and severity of fetal injury," Paver says. "My hypothesis is that we can redesign the ejection seat in the cockpit essentially using technologies that have been developed from automotive pregnant injury research."

Automotive injury research is Paver's bread and butter as a longtime independent consultant and as the president of the Center for Injury Research in Santa Barbara. The center's mission is to mitigate injury and prevent death through scientific research on crashworthiness, biomechanical engineering and occupant safety.

Paver's path to biomechanical engineering and injury research began 50 years ago at Harvey Mudd. She studied engineering almost by process of elimination after finding that neither chemistry nor physics nor mathematics suited her fancy.

Once ensconced in the engineering department, the classes that most piqued her interest were in failure mechanics; it was her introduction to injury mechanisms. "If you twist a bone, you get a spiral fracture. If you bend a bone, you get a transverse fracture. If you compress a bone, you get a different fracture pattern," she says. "My question was: Can you look at the fracture pattern, work backward and figure out how the forces are applied? And then can you look at how the forces were applied and relate it to the fracture patterns?"

Paver also credits her Engineering Clinic project for having a profound effect. "Something I learned at Harvey Mudd was how to solve problems," she says. "That's worth so much more than expertise in a particular field."

After graduation, Paver went on to graduate school at Duke University, one of the few schools offering a master's degree in biomedical engineering at the time. "My focus was head and spine injury and protection, simulation modeling and testing. I tested helmets. I tested spines. I tested cadaver responses to see how they failed. Then I made simulations of them and got into dummy development."

She earned her PhD in biomechanical engineering, spending summers at the Wright-Patterson Air Force Base in Ohio, where she worked on head and spinal injury simulations in the manikin lab. At the time, biomedical engineering was a

The Center for Injury Research, where Paver is president, contains an extensive physical and virtual library of journals, books, conference proceedings, papers, reports and videos of crash tests, and models of product liability defects.

“I got into failure and how the body breaks, understanding the body and how to protect it by creating anthropomorphic models.”

– JACQUELINE PAVER ’77

new field. “I got into failure and how the body breaks,” says Paver, “understanding the body and how to protect it by creating anthropomorphic models.”

She also began giving expert testimony in litigation cases, focusing on how a vehicle, or perhaps a helmet, had failed, which led to trying to understand and envision what alternate designs might be available. She also researched injuries from slips, trips and falls, including from heights, and from diving into shallow water. “You’d be surprised how many people don’t take responsibility for their actions, number one,” she says. “Number two, you’d be surprised how many people dive into shallow water or dive into water of unknown depth.”

In the 1980s, she met Donald Friedman, a pioneer of vehicle crashworthiness and occupant safety research and testing. The two kept in touch. In 2001, Friedman founded the Center for Injury Research and, several years later, she traveled to Santa Barbara for a seminar on litigation criteria for evidence. In 2010, Paver joined its board of directors. In 2016, a year after Friedman’s death, she became president.

Paver and the Center for Injury Research (CfIR) team examine airbag and restraint defect injuries (like seat-activated airbag deployment, seatbelts and latching). CfIR was also integral in upgrading Federal Motor Vehicle Safety Standard 216, a laboratory test procedure for roof crush resistance, taking it from a quasi-static rollover test—containing no occupants and no injury measures—to a dynamic rollover test, which uses dummies to measure injury potential. Such tests and standards are regulated by the National Highway Traffic Safety Administration, whom the CfIR also petitioned regarding defects in seat-activated airbag deployment.

“Say a mother was sitting in the passenger seat, reached into the back seat to adjust their child’s seat belt, lifting their buttocks from the seat,” Paver explains. “If they got in a crash, the driver airbag would deploy, but the passenger airbag would not.” CfIR also maintains a huge online and physical library related to crashworthiness and biomechanical engineering.

Though contracted as a sole proprietor, Paver is working hand-in-glove with her colleagues at the CfIR on the Air Force research, which will help create safe opportunities for all women—pregnant or not—to advance in their military careers. This is important to Paver.

While in recent years Harvey Mudd has earned renown for providing STEM opportunities for women, when Paver arrived on campus in 1973, female students weren’t abundant; she was one of about 50 women in the student body. “It’s incredible to see where Mudd is now compared to where it was when I started,” Paver says. “I think women were well-respected at Harvey Mudd when I was there, but we were an anomaly.” At the time, women were required to live at Scripps College. She took on the role of women’s proctor in her junior year, acting as a mentor for her fellow female students.

Her enthusiasm and passion to pay it forward hasn’t waned; Paver relishes any opportunity to share her unique area of expertise, developed over half a century, and mentor women who want to pursue a career in biomechanical engineering. ■

KORF DREAMS

A little goofy, a lot fun, korfball is a unique game that Carl Yerger '05 wants everyone to experience

Written by George Spencer
Photo by Alex Halloway

Carl Yerger '05, third from left, recently officiated youth and adult korfball games in Hungary and helped plan a national tournament in Cincinnati.

CARL YERGER '05 HAS A DREAM. HE WANTS KORFBALL, a European version of basketball, to become one of the nation's most popular sports. For the past eight years as president of the United States Korfball Federation (USKF), Yerger, a Davidson College math professor, has sung the praises of this obscure game to students, lobbied gym teachers and hustled to create korfball clubs around the nation.

Korf means basket in Dutch. In 1902, a Netherlands schoolteacher wanted girls and boys to play a team sport together. He modeled his new game after the rules of early women's basketball which limited contact and height advantages.

Today korfball is played by about a million people in 70 nations. True to its gender equality origins, the fast-paced game has four men and women on each side. Yellow plastic korfs sit atop eleven-and-half foot tall poles at either end of the basketball-sized court. Dribbling or running with the soccer-sized ball is forbidden. There's little physical contact.

"In korfball you do so many different things. You pass. You run. You shoot. Men and women work together as a team. It's perfect for gym class. It's such a unique game. It's not just about who's the biggest or the strongest," says Yerger, who was introduced to the game while getting his master's at Cambridge.

He had played varsity tennis while at Harvey Mudd and discovered a thriving korfball league at his new school. "It seemed a little goofy and a little fun and a way to meet people outside of the math department. I was athletic, so I thought let's give this korfball a try," he recalls.

Even though men and women compete against each other in mixed tennis doubles and ultimate Frisbee, the International Korfball Federation boasts that korf, as players often call it, is the world's best mixed-team sport.

To minimize any advantage males or tall people might have, players only guard members of their own sex. No one can take a shot when a defender is within arm's reach.

The 6-foot-1-inch, Yerger admits his height advantage helps but says it's not "exclusively important," because of the defended shot rule.

Constant and intense collaboration puts korfball in a superior gender-mixing league of its own, according to him. "Korfball is about working together. It has a very different vibe from other sports, because it's about togetherness," he says. "Men and women go to work together, and sports should be no different in that regard."

A recent *New York Times* article on korfball gave the game a much-needed publicity boost. The story said transgendered athletes might find a controversy-free home on korfball pitches. When asked about that, Yerger says, "The International Korfball Federation is working on guidelines. We want to get everyone to play korfball. We don't want to have division."

Yerger knows what it's like to be told he can't compete. He was at Georgia Tech in 2007 working on his PhD in the Algorithms, Combinatorics and Optimization program and hoped to play in the World Championships in Brno, Czech Republic, that October. But he and other U.S. players were unable to take part in qualifying tournaments due to time and expense constraints. "That's one of the systemic challenges U.S. korfball faces," he says.

Former USKF president Rebecca Shields praises Yerger. Besides being a "good rebounder and great team player," she thinks he can lead the game into a more popular future. "Carl brought us into the What's-our-vision, what-are-we-hoping-to-accomplish mode," she says.

Though life as president of the nation's korfball association is frustrating. For those wanting to start teams, the cost of equipment can be prohibitive—as much as $1,500 for a base, pole and basket which is patented and must be imported from Europe.

Introducing the game at the grass roots level in schools has been a priority—and a struggle. The USKF ran tournaments at Hamilton College and Hope College. Nothing lasting resulted even though Hope is in Holland, Michigan, which has a large population of Dutch immigrant descendants.

Yerger hoped to give the game deep roots in Birmingham, Alabama, schools in 2016. The World Games was going to be held there in 2022. He wanted to build a cadre of seasoned players who might form the nucleus of a national team.

To boost the odds of success, korfball leaders from the Netherlands, the world's powerhouse in the sport, flew over. The former Dutch national coach led seminars. A former player of the decade was one of four Dutch demonstrators. As many as 30 students attended for several days. Then disaster.

"One day there was football practice, and those kids didn't come. In the U.S., sports culture is so strong, students feel they need to be committed to only one thing," says Yerger. In the end, the U.S. was unable to even try out for the Birmingham games.

Today, several thousand school children play korfball in gym classes. If the U.S. tried to field a national team, there might only be about 50 Americans able to play at the international level, according to Yerger.

"Working to grow the game is a perpetual disappointment, but it's fun because we're all obsessed with korfball. You have to be ready to hear 'No' a lot and still want to keep at it. You have to be persistent," he says.

When not promoting the sport, Yerger leads the math club for Charlotte, North Carolina, students. He's also co-editor-in-chief of the AMC 10/12 exam. Run by the Mathematical Association of America, this test is taken annually by more than 200,000 teens around the world to use for college admissions.

Students in Yerger's math classes know all about korfball. He often sneaks korf-related questions into exams. One begins, "A survey of consumers in Davidson shows that 10% were dissatisfied with their child's korfball coach." Another presents a matched-pairs experiment comparing mean reaction times to korfball moves.

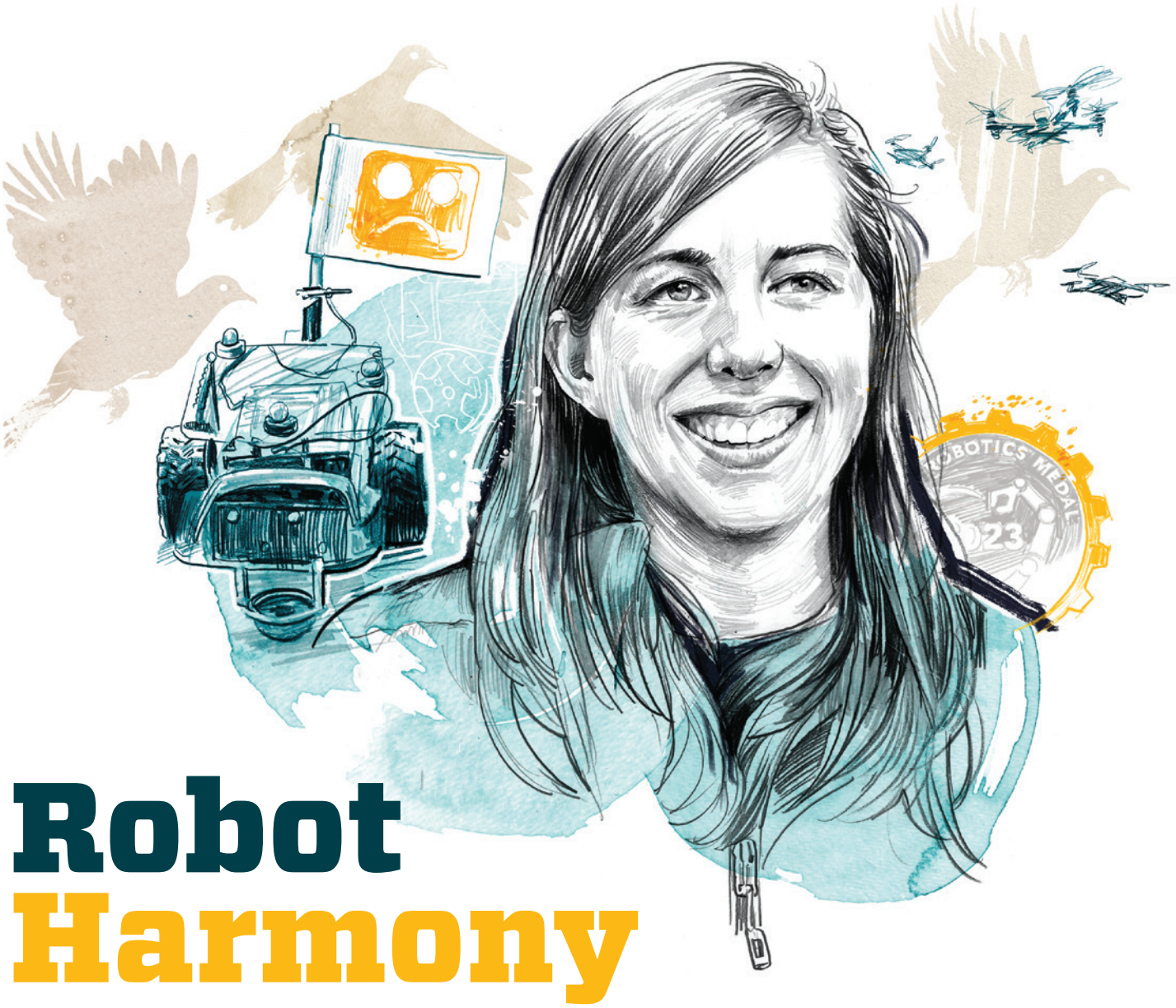
The growth potential of beach korfball excites Yerger. It requires fewer players and less equipment. Tournaments are shorter and mostly in the summer, and the sandy spinoff allows more playing offense and defense at the same time. This year, Yerger visited Hungary as part of the Budapest Semesters in Mathematics Director's Mathematician in Residence program) and was able to help officiate youth and adult games there. A national tournament is planned in Cincinnati in September.

When reminded that 50 years ago youth soccer was far from mainstream, Yerger thinks a similar explosion of interest could happen with korfball. "I'd be excited to see such an opportunity," he says. "All it might take is for a pocket or two of korfball to develop and for there to be a viral moment."

Above all else, one objective keeps Yerger going: "Beat the Dutch. Everyone wants to beat the Dutch. That's the goal." ■

Korfball Facts

- Invented in 1902 by a Dutch teacher
- Two teams of eight players, four male and four female
- The goal? Toss a ball into a netless basket (the korf) on an 11 ½-foot pole
- No dribbling or running with the ball
- No shooting if a defender is in arm's length
- Men defend men. Women defend women
- Played in 70 nations; most popular in the Netherlands, Belgium, Taiwan and China
- Seeking inclusion in the 2032 Olympics in Brisbane, Australia



Robot Harmony

Alyssa Pierson ’10 and her research team seek to understand and improve the algorithms that power multi-agent robot systems

Written by Becky Ham
Illustration by Julian Rentzsch

DURING HER JUNIOR AND SENIOR YEARS, ALYSSA PIERSON ’10 worked on a project with engineering professor Lori Bassman modeling the kinematics of pigeons in flight. Unlike most birds, pigeons can make a 90-degree turn in flight, and the researchers were trying to figure out exactly how the birds accomplish this feat.

Pierson, who now studies multi-robot systems, admits that “getting into robotics by way of pigeons is a rather unique way of getting into robotics. It’s not the typical path.”

But like those pigeons, Pierson has made her own in-flight twists and turns during her career. Her junior-year Engineering Clinic project found her working with Nike on a shoe design project. Her senior-year Clinic with the University of Iceland involved the design of a backyard heat waste reclamation system. After Mudd, she was a traveling project engineer, working for one company designing oxygen systems for astronauts and another company that developed concealed audio-video devices.

Today, she is an assistant professor of mechanical engineering at Boston University. "Seeing these many different jobs, these many different things I could work on, I realized that the thing I really liked was the kinematics and dynamics side of the pigeon project I had worked on, alongside some engineering," she says. "And the intersection of those two things happened to be robotics."

Pierson's research centers on multi-agent robot systems, looking at how trust, cooperation and competition operate within and between collaborative robot teams. In graduate school at Boston University, she says, "I became fascinated that you can take a relatively simple robot, that maybe doesn't have a lot of skills or capabilities, and through some clever design of other relatively simple robots, you can start to create much more complex behaviors of a system."

Self-driving vehicles—and how they interact with each other, with human drivers and with an ever-changing environment—are a classic example of a multi-agent system that Pierson studies. To understand and improve the algorithms that power these systems, she and her colleagues draw from research in social psychology and behavioral science as well as traditional engineering.

Psychology was Pierson's concentration at Mudd, "so it was always kind of a second technical interest," she says. "I've been excited to bring that into some inspiration for my current research in multi-robot teams."

She and her team are now looking at the future of automated delivery systems, where drones and sidewalk robots will bring everything from packages to medicines to takeout Thai to your doorstep. What will it be like for all these agents to traverse the streets and skies together?

"One thing we like about the delivery robot problem is that there's a lot of interesting game theory problems within the cooperation of these delivery robots," Pierson explains.

Competing companies won't want to share their algorithms for fast and easy delivery, but robot teams "will encounter each other out in the wild," she notes.

" There's a lot of interesting game theory problems within the cooperation of these delivery robots. "

"Ultimately, we want to come up with design policies that still work, that still get people the packages they want, but are robust to the idea that they are cooperating even though they're not trying to help each other."

Drones or other autonomous vehicles used for environmental and wildlife monitoring are another focus of Pierson's team, who are figuring out ways to get these drones to work cooperatively in remote regions that are difficult for humans to reach.

Her lab has a fleet of mini car-like robots that run on small, powerful computers called Jetson Nanos that the researchers can use to test out their theories. "We try to take every paper or concept that we write and instantiate it on a hardware platform," says Pierson.

Pierson also serves as chief scientist at Ava Robotics, a position that grew out of another mid-career swerve during the COVID-19 pandemic. A postdoc at MIT in 2020, Pierson found her carefully planned research projects abruptly put on hold as the university labs shut down. But through her connections with MIT's Computer Science and Artificial Intelligence Laboratory, she and a group of students worked with Ava to create a UV disinfection robot for the Greater Boston Food Bank.

At Ava Robotics, "I get to work on immediate, tangible robotics applications and see physical robots get delivered to customers," Pierson says. "It's really exciting and fulfilling."

Although she can't discuss many of her current projects at the company, she can talk about the telepresence robots that bring remote employees to the workplace and the security robots that patrol warehouses, among other applications. Like the disinfection robot, "it's the idea that we want robots to augment and aid what we can do in these office environments," Pierson says. "It's not a replacement of people."

In May 2023, Pierson received the inaugural MassRobotics Rising Star award, which recognizes talented women researchers advancing the field of robotics. "You do what you think is exciting and interesting, and I have very much followed the interesting ideas or research that I enjoy," she says, "so it's a tremendous honor to hear that this is worthwhile."

She is also excited that the award will make her "a visible role model within the community, to perhaps play a part in getting more women in engineering" and pay forward the mentoring that has supported her throughout her career.

Pierson's advice to younger researchers comes from something she learned at Mudd, she says. "Know that if you believe in yourself, the doubt of others doesn't matter. Remember that you can do a lot, and you can do more than you probably think you can.

"There's also a saying, 'stay in your lane,'" she adds. "And I would say you can always choose another lane." ■

MUDDERINGS

Award Season

The Alumni Association recognizes those who have had an impact on HMC and well beyond.


Karl Chan ’89, P’19


Stephen P. Schultz ’69


Kevin Esvelt ’04


Gerald Van Hecke ’61 with Claire Stevens


Edith Harbaugh ’99


Elizabeth HZ Thompson ’97


Jason Rhodes ’94

Outstanding Alumni Awards

Outstanding Alumni best exemplify the mission of Harvey Mudd and have made a sustained and effective commitment to improving society.

Karl Chan ’89, P’19
CEO, Laserfiche
Honored for his professional contributions at Laserfiche and his community engagement activities, including sponsorship of Clinic Program projects.

Kevin Esvelt ’04
Bioethics advocate; associate professor at MIT Media Lab; director of the Sculpting Evolution Group
Recognized for his expertise in gene-editing techniques and for his efforts to avoid dangerous, unintended consequences of this powerful technology. In 2013, he was the first to identify the potential for a powerful new method of genome engineering, CRISPR “gene drive” systems, to alter wild populations of organisms. His team openly shared research plans to accelerate discovery, calling out the need for safeguards and highlighting the importance of demonstrating reversibility in the laboratory.

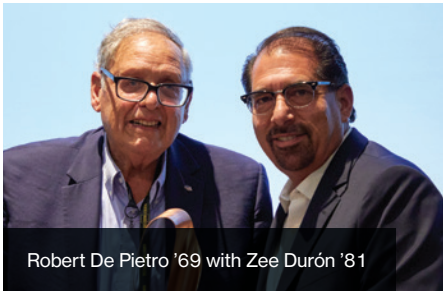
Edith Harbaugh ’99
Co-founder, LaunchDarkly
Recognized for outstanding contributions to the field of software and entrepreneurship and for mentoring entrepreneurs

Jason Rhodes ’94
Senior research scientist, NASA Jet Propulsion Laboratory; visiting senior scientist; Kavli Institute for Physics and Mathematics of the Universe, Japan; accomplished track and field Masters athlete
Recognized for significant contributions to space science, including to NASA’s Nancy Grace Roman Space Telescope, the European Space Agency’s Euclid mission and the Vera Rubin Observatory’s Legacy Survey of Space and Time, all designed to study “dark energy,” the hypothesized cause of the universe’s accelerated expansion.

Stephen P. Schultz ’69
U.S. utility industry expert; Former member, Advisory Committee on Reactor Safeguards, Nuclear Regulatory Commission; engineering consultant, International Atomic Energy Agency
Recognized for outstanding scientific and technical contributions in nuclear reactor design, risk assessment and reactor safeguards and for spearheading initiatives that led to significant advancements in reactor operational safety.

Ken Stevens ’61 (Awarded posthumously)
Founding Class member, member of first Claremont-Mudd Stags football team and CMS Alumni Association Hall of Fame member, ceramics expert, former University of Puget Sound art professor and art department chair
Recognized for significant contributions to society, especially in the arts, including the Ken Stevens ’61 Founding Class Concert Series at HMC. Stevens died in 2016.

Elizabeth HZ Thompson ’97
Executive vice president of research and development, Horizon Therapeutics
For outstanding contributions in the field of biopharmaceuticals and for advancing programs supporting young women in STEM. Her efforts have led to FDA approval of various pharmaceuticals which have significantly improved the lives of patients with certain rare, autoimmune and severe inflammatory diseases.


Robert De Pietro ’69 with Zee Durón ’81


Jerome Jackson ’76


Joanna Callahan, Kash Gokli, Peter Osgood


Marianne De Laet


Geoff Kuenning


Esther Hughes

Lifetime Recognition Awards

The Lifetime Recognition Award honors outstanding dedication to Harvey Mudd College.

Ziyad “Zee” Durón ’81, faculty member 1999–2024; former Jude & Eileen Laspa Professor of Engineering

Durón is an expert in the full-scale field testing of large structures, including seismic investigations and earthquake engineering. Durón introduced field experience into the experimental engineering course to give students a real-life example of what engineering in the professional field feels like. He developed several courses for the engineering curriculum, including a design, manufacturing and management program that was dedicated to fostering leadership and professional skills. Durón served as department chair for seven years and brought in significant financial resources for the engineering department, including helping to start the Frank and Frances De Pietro Fellowship Program in Civil Engineering, which has supported over 60 fellows.

Jerome Jackson ’76, a long-serving AABOG member, former trustee and Alumni Weekend volunteer

Jackson received the HMC Outstanding Alumni Award in 2006 and was a Nelson Speaker in 2004 and 2006. He has been in the medical device research and development field since 1978 and was recognized as a notable person by Medical Device & Diagnostic Industry Magazine in 2008. He developed radiofrequency heating and ablation systems for cardiology, gastroenterology, urology, gynecology and dermatology. Jackson has also developed numerous devices from minimally invasive disposable devices to permanent implants.

Honorary Alumni

Recipients are longstanding friends of HMC, its students and alumni, and have contributed significantly to the College’s betterment.

Joanna Callahan, staff member 2003–2023
Most recently, coordinator of alumni and parent relations (13 years). Recipient of Alumni Association’s Order of the Wart.

Marianne De Laet, faculty member since 2001
Professor of anthropology and science, technology, and society; former associate dean for academic affairs. Now director of the Meertens Institute, part of the Royal Netherlands Academy of Arts and Sciences.

Geoff Kuenning, faculty member 1999–2024
Professor of computer science, former Engineering Clinic director, mentor of faculty and students.

Kash Gokli, faculty member 2005–2024
Engineering professor, former Engineering Clinic director; director, Riggs Fellowship in Engineering Management. In 2021, inaugural director of entrepreneurship initiatives.

Esther Hughes, staff member 1998–2024
Administrative assistant, Engineering Clinic Program; administrative assistant, dean of the faculty office (18 years).

Peter Osgood, staff member 1998–2024
Admission director, advisor to three presidents and three vice presidents of admission and financial aid; mentor to fellow staff; advocate for student athletes in the admission process. Recipient of the 2016 Henry T. Mudd Prize.

Alumni Events

Board Game Night in Boulder hosted by Mary Moore-Simmons ’10

GOLD alums at Make-A-Box with the Makerspace at HMC

GOLD alums at Happy Hour in Seattle hosted by Cleo Stannard ’15, Teal Stannard ’18 and Arielle Isaacs ’21

Save the Date for Alumni Weekend 2025

Friday through Sunday, May 2–4

Reunion celebrations will be held for class years ending in 5 and 0, but all alumni are welcome to join in any part of the weekend. We look forward to seeing many of you on campus.

CLASS NOTES

1964

Karen SCR '64 and **Russ Merris** (engineering), along with their 14-year-old Labrador Retriever, Cassandra, moved this past June from their Hayward home of 47 years to Mount San Antonio Gardens in Claremont/Pomona.

1965

In 2023, **Scott Owen** (chemistry) received the Distinguished Educator Award from ACM SIGGRAPH and was also inducted into the ACM SIGGRAPH Academy. He's still a volunteer in ACM SIGGRAPH and serves as chair of the Governance Advisory Board and chair of the Outstanding Service Award Committee. He and longtime partner, Patrize, continue to travel, including to France (Nice and Paris), Cartagena, Columbia, and Italy (Rome-Naples-Brindisi).

1970

Jack Cuzick (math) received the 2023 William L. McGuire Memorial Lecture Award for his groundbreaking research discoveries and practice-changing contributions to the prevention and treatment of early-stage breast cancer. He is also the recipient of the 2024 Galen Medal in recognition of work transforming identification of women at high risk of breast cancer and pioneering modern prevention cervical screening strategies that have been adopted worldwide. Jack is the John Snow Professor of Epidemiology and Head of the Cancer Prevention Unit at the Centre for Prevention, Detection and Diagnosis at Queen Mary University of London. He is a 2010 HMC Outstanding Alumni Award recipient.

1972

Glenn Johnson (physics) is retired from his role as techincal director of National Systems BU at TASC Inc. and has turned his attention to his dissertation subject. He continues to publish physics research (relquantphys.org). Glenn lives on the outer banks in North Carolina, enjoying the beaches and pursuing fine wines.

1973

Rolf Holle (chemistry) writes: "When I went to HMC, I literally felt my brain expand. It was harder to get through than a top medical school. I just retired after a fulfilling career, including academics and then private practice. I was boarded in four subspecialties and benefited tremendously from my tough HMC education that taught me how to think. An example of the value of my HMC physics training comes to mind: As I walked in to the hospital at 7 a.m., I was stat paged to the ER to see a 6-year-old boy who had presented with seizures on the playground. He was intubated by the paramedics, but was minutes from dying because he was becoming very acidic despite normal O2 levels. Nothing worked. But applying my physics knowledge, I reasoned that he had an expiratory obstruction, and took the chance of pulling the airway tube out. I knew that I was risking his life in the process. As I did so, a large ballon fragment came out, and we were then able to ventilate him. He woke up soon after, and was soon discharged from the hospital. Thank you, thank you HMC."

1975

Phil Abrahamson (math) is happily retired after being laid off in August 2020. He writes, "I knew it was coming for more than a year and, during that time I spent about six hours thinking about a new job, ergo: 'retired.' My wife got us back into duplicate bridge in 2015, so I spend time playing with her and coaching newer players. And best of all, we now have two grandkids!"

1980

Richard Helling (engineering) joined the University of Michigan School of Environment and Sustainability for two semesters to supervise three teams of grad students working on master's projects related to the circular economy. "Very much like HMC's Clinic projects! The students have been great to work with."

Jeff Silverman (physics) is debating about retiring. "I talk with men who appear to be older than a certain age and ask them about what they do in retirement. One works in a children's museum. Another is a volunteer at a tourist railroad and drives a train on the weekends. Still another works at a shelter for homeless people. My son wants me to be a full-time grandfather, and there is some evidence that children who live in multigenerational households have better life outcomes. I have thought about doing some data science to objectively rate historical presidents."

1981

Jim Martin (engineering), a longtime Claremont resident, was named a City of Claremont 2024 Honored Citizen. A software engineer, he has been part of Claremont's Boy Scout Troop 407 since 1974, becoming its 40th Eagle Scout at age 17. He served as scoutmaster for 35 years, stepping down in 2022. He's now the chartered organization representative for Claremont United Church of Christ. Son, Zachary, a junior at Lewis and Clark College, is also an Eagle Scout. In a June 27 interview with the *Claremont Courier*, Jim talked about BSA officially welcoming all genders as of 2019. "That's been an important part of my involvement in scouting, to fight some of those exclusive policies that have existed for way too long in scouting."

1985

After graduation as an IPS major—"there was no biology department then, only Bill Purves and some friends"—**Larry Blyn** (biology) obtained his PhD in genetics from the University of Utah (where he studied gene regulation in pathogenic bacteria), followed by a postdoctoral fellowship at UC Irvine studying poliovirus. Larry now develops reagents designed to diagnose and test for pathogens involved in human infections. He is the site director and senior director of R&D for the Abbott Laboratories Carlsbad Center of Excellence in Carlsbad, California. His team is

responsible for reagent development and reagent production for many downstream products. He writes, "In my personal life, I have a wonderful wife and two children, including HMC biology graduate (**Becca '22**) and a budding journalist (Danielle) at Syracuse University."

Darwin Popenoe (chemistry) retired from Procter & Gamble in October 2023 and is concentrating on long-term personal projects, volunteer work and home-related chores. His volunteer work focuses on economic development in Tanzania (and southern Africa generally). The Nelson Mandela--African Institution of Science and Technology appointed him as adjunct staff in Jan 2023. He's helping build analytical-measurement lab capability and assisting with achieving ISO 17025 certification. Darwin says, "As my work is pro bono, I seek any partnerships that Mudd alumni (or current staff/faculty) may offer to strengthen capability of this recently created, strategic post-graduate university in analytical chemistry."

University of Rochester President Sarah Mangelsdorf has appointed School of Arts & Sciences Dean **Nicole S. Sampson** (chemistry) to the position of interim university provost. Nicole had served as the Robert L. and Mary L. Sproull Dean of the School of Arts & Sciences since August 2023. As the chief academic officer, she oversees five of the University's main academic units: the School of Arts & Sciences; Eastman School of Music; Hajim School of Engineering & Applied Sciences; Simon Business School; and Warner School of Education. Before joining the University, she was dean of the College of Arts and Sciences at Stony Brook University, where she served in numerous capacities over the course of three decades. Nicole also heads a research laboratory where she focuses on the molecular intricacies of mammalian fertilization, methods for precision synthesis of polymers, and finding new treatments for tuberculosis and cholera. Her work has been continuously funded by the National Institutes of Health since 1995.

1987

Chris Hickie (physics) has been a pediatrician in Arizona these last 20 years. He also works to promote vaccines in the face of increasing opposition from the pseudoscience-driven anti-vaccine movement.

Tom Jedrzejewicz (engineering) moved out of L.A. and up to Redding, in northern California, where he and his wife are enjoying the people, the slower pace, the views and stunning weather. He's doing IT work for a small manufacturing and distribution company.

Mark Sellers (engineering) retired from Sandia National Labs in 2020 as the associate labs director for Mission Assurance and has since been enjoying life with his wife, Ann, in the Outer Banks of North Carolina, where they recently completed construction of a new home. "We pinch ourselves every day with the sunsets and spectacular views of the Currituck Sound. Between pickleball, tennis, golf and visiting our five grandkids, I still carve out time to consult with Honeywell across several sites in the Nuclear Security Enterprise, traveling mostly to Las Vegas and Kansas City. This getting old thing is for the birds, but life is still good."

1989

Daryl Maeda (math) was appointed interim dean of the College of Arts and Sciences at University of Colorado Boulder in July. He will serve up to two years as interim dean with a focus on a commitment to transparency in budgetary and decision-making issues and the creation of a divisional resource allocation philosophy; renewed engagement with shared governance and college staff; and a continued focus on and elevation of student success programming. Daryl previously served as the inaugural associate dean for student success in the College of Arts and Sciences, and, most recently as dean and vice provost of undergraduate education. His work has focused on student success, particularly for underrepresented students from historically marginalized groups. He helped lead the Buff Undergraduate Success initiative, which has led to record retention and graduation rates for undergraduate students. A member of the CU Boulder faculty since 2005, Daryl is a professor of ethnic studies in the College of Arts and Sciences. He is an accomplished scholar and teacher whose latest book *Like Water: A Cultural History of Bruce Lee* explores the cultural, historical and geographical impact of Lee on the global stage. In 2023, Daryl won the 2023 Chang-Lin Tien Leadership in Education Award by the Asian Pacific Fund.

1991

Mark Wilkins (physics) has been living and working in Reykjavik, Iceland, with spouse, **Nancy Linford '94** (biology), and their two kids for about 10 years. He is a senior tools developer for CCP Games, working on art and content creation tools for the space MMO Eve Online and related products. In his spare time, he's working to improve his Icelandic.

1992

Tish (Poland) Berge (engineering) writes, "Feeling far from my engineering roots, I am in public service overseeing finance, administration, public outreach and governmental affairs for San Diego's regional water provider. Being in public service has been very rewarding and makes me feel connected to my community. As retirement gets closer, I am ramping up my hobbies of native plant gardening and volunteering as a pet therapy team with my rescue dog. **Tom Berge '85** and I celebrated 25 years of marriage and credit Mudd for bringing us together. We will be embarking on our next adventure of an empty nest after getting our two kids through college (UCLA civil engineering '22 and UCI mechanical engineering '23)."

ALUM PROFILE

AI Meets Human Cognition

Amani Maina-Kilaas '23 (computer science and mathematics) studies human and artificial intelligence in tandem to better understand cognitive neuroscience. A PhD student at MIT, he was recently awarded a Hertz Fellowship in applied science, engineering and mathematics by the Fannie and John Hertz Foundation.

The Award

The prestigious Hertz Fellowship is a doctoral award that includes five years of funding and entry into a network of over 1,300 worldwide fellows that includes many STEM trailblazers. Hertz Fellows are chosen for their promise in addressing current pressing challenges, including developing advanced therapeutics, enhancing spaceflight capabilities, designing safer AI systems and predicting the spread of infectious diseases.

How it started

Maina-Kilaas' research interests began at Harvey Mudd, where he studied intention perception and theoretical machine learning with computer science professor George Montañez as part of the AMISTAD (Artificial Machine Intelligence = Search Targets Awaiting Discovery) lab. For his exemplary academic performance, ingenuity and unique aptitude for research, Maina-Kilaas received the Computing Research Association's 2022 Outstanding Undergraduate Researcher Award and was named an Astronaut Scholar (2022–2023) by the Astronaut Scholarship Foundation.

Current focus

With additional support from a Dean of Science Fellowship, Maina-Kilaas focuses on computational psycholinguistics in MIT's Department of Brain and Cognitive Sciences, where he is advised by Roger Levy. Their work furthers the understanding of the cognitive underpinning of language processing and acquisition and helps researchers design models and algorithms that will allow machines to process human language.

Why this research area?

"I'm fascinated by how AI can be used to study how the mind works and, conversely, to develop more cognitively realistic models using what we currently know about the mind."

Hertz Legacy

Other Harvey Mudd alumni who have been named Hertz Fellows include Charlie Westbrook '67, Sherman Chan '76, Dana Hobson '85, Joseph Thywissen '94, Aaron Archer '98, Kevin Watkins '98, Thaddeus Ladd '98, Joel Miller '00, Nate Stern '03, Kevin Esvelt '04, Adam Pivonka '05, Gregory Minton '08, Peter Scherpelz '08 and Anna Soper '22.

1994

Scott Hampton (engineering) writes, "Managed to arrange the sale of some brands for a client in 2023 and a factory for another and slowly rebooting the medical device consulting after catching my breath. Highlight of 2023 was adopting an abused little puppy in the spring and helping him discover the joy of dog life in a safe home. I'm happy to say that parents are still healthy, kids are still employed, and life is, as they say, not so bad."

1995

Eric Nolan Martin (physics) ran his first half marathon in October 2022 and has run several more since then.

1996

Rachele Bouchand (Cawaring) (biology) lives in the Seattle area with her husband and daughter. She says, "Even though I loved my time at Mudd, I've spent my career in wealth management and am at a multifamily office called Pathstone."

In summer 2022, **Neil Laughlin** (biology) completed a longstanding life goal—descending from conversations with Cathy McFadden while at Mudd—by completing a scuba open-water certification in the Monterey Bay. "With my teenage son as my diving partner, I both literally opened up a new part of the world to explore, and also opened my eyes to ways to combine the experience with research in biology. I am hoping this experience is something my son considers as he looks at college himself! I've stayed connected to the Mudder community by leading the Alumni Association Networking Committee and enjoy making networking connections with current students and recent graduates in the role. While I'm not directly in the field of biology these days, what I learned at Mudd is central to my professional success."

1997

IGM Biosciences Inc., a clinical-stage biotechnology company focused on creating and developing engineered IgM antibodies, appointed **Elizabeth H.Z. Thompson** (chemistry) to its board of directors. Elizabeth is an accomplished drug development professional who has been involved in the development of important marketed medicines, most recently as the executive VP of research and development at Horizon Therapeutics, where she oversees all research and development activities across the company's preclinical, clinical and marketed products. She is also a member of the board of California Life Sciences, an influential life sciences membership organization. Elizabeth previously served as a Group Scientific Director in pharmaceutical development at AbbVie, acting as clinical lead and supporting global submissions and approvals for SKYRIZI®. She previously held positions across the clinical development, business development and medical communications fields as search and evaluation lead at Raptor Pharmaceuticals, head of scientific communications and publications at InterMune and development clinical director and licensing director at Amgen.

1998

John Hartono (biology) is in private practice as a nephrologist in Dallas.

Post Harvey Mudd, **Philip Hilmes** (engineering) went to USC for grad school in electrical engineering. He worked at DIRECTV, then started his own company, Audyssey Laboratories, developing and licensing audio enhancement technology to consumer electronics companies and also making some CE products. In 2012, Philip left to join Amazon, where he helped to develop and deliver Alexa and the first Echo device. He is now the director of audio technology at Amazon, managing development for all audio in Amazon's products and services.

2004

Valerie Lake (biology) is a compliance supervisor at Takeda pharmaceuticals. She began there working in the cell culture portion of the manufacture process, then worked as an investigator and as a manufacturing scientist before taking on a leadership role. At a manufacture plant that produces biologics as injectable medicines for rare diseases, Valerie supervises a group of investigators, who perform root cause analysis for any issues that occur in the manufacture process. She lives in a "cozy condo" in Thousand Oaks, California, with two cats.

After graduating Mudd with a mathematical biology degree, **Ben Nahir** (math) received his PhD in neuroscience from the University of Florida in 2009. A few months later, he got married, bought a house and moved back to Oregon for a postdoc at OHSU. He left academia in 2014, got an MBA from Portland State University and is now a venture capitalist with Elevate Capital, a mission driven venture fund investing in nontraditional founders. "Our son (6) can pretty much beat me down the hill on a snowboard, no problem."

2005

Kyle Grice (chemistry) is a full professor at DePaul University in the Department of Chemistry and Biochemistry. For the fifth time, he ran a two-week summer study abroad program to Cadiz, Spain, in collaboration with a DePaul biology professor. He writes, "I studied abroad while at Mudd (via a Pitzer program), and it was a life-changing experience. I wanted to give that opportunity to my own students here at DePaul."

2008

Meredith Rawls (physics) and **Mike Bigelow '06** (engineering) welcomed their second child, Julian, in November 2022. She joins big sister Skyler, age 6, who was born shortly after the family landed in Seattle. Meredith is a research scientist at the University of Washington for Vera C. Rubin Observatory, where she develops software and validates precursor data to prepare for a 10-year imaging survey

that will revolutionize astronomy. She also works in the emergent field of space environmentalism, striving to mitigate the rapidly increasing impacts of bright commercial satellites on the night sky. Mike is a sustainability program manager at Seattle Children's. The family enjoys exploring Seattle by e-bike.

2009

Jonathan Litz (chemistry) is a data scientist manager at Microsoft, working with teams across the company to build products customers love by leveraging online controlled experiments.

2010

Mark Cyffka co-founded AirMyne to build next-generation direct air capture technology that removes CO_2 from the air. Cyffka described AirMyne's technology and team on the organization's YouTube channel: https://bit.ly/hmc-cyffka.

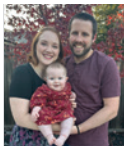
In 2021, **Daniel Garcia** (biology) completed an industry post-doc at Ionis Pharmaceuticals in Carlsbad, California, where he worked on applying antisense oligonucleotide technology as a therapy for mitochondrial diseases. He then moved on to Arcturus Therapeutics in San Diego where he's a scientist II in translational biology. He writes, "Sticking with my interest in nucleus acid therapeutics, I'm working on applying lipid nano particle delivery of mRNA therapy for rare metabolic diseases. My second daughter was also born in December 2021, so I've had my hands full raising two beautiful girls."

Michael McNeece (engineering) is a project manager for Stantec, managing major engineering projects, including dam expansions and transmission line extensions.

2012

Craig Burkhart (math) completed a northbound thru hike of the 2,200 mile long Appalachian Trail in 2023 starting on Springer Mountain in Georgia on March 24 and finishing on Mount Katahdin in Maine on Sept. 13.

2013



Carl Walsh (computer science) and **Ellery Walsh** (engineering) welcomed their first child, Jenna Martin Walsh, in May 2022. They moved to Novato in the San Francisco Bay Area to be close to Ellery's family. Carl is working as a DevOps software engineer at Autodesk. Ellery was working as a design for manufacturing engineer at Apple and is now a full-time parent for Jenna. The three Walshes collectively care for their dog, Austin.

2014

After graduating from Mudd, **Tuan Nguyen** (engineering) earned a PhD in chemical engineering from UC Santa Barbara. He works as a senior process engineer at C3Nano, a small company specializing in silver nanowires for consumer electronics. "Working with nanotechnology has been a consistent thread in my career, and it all started with my undergraduate research experience in Professor Lape's lab! I'm also really into birdwatching now."

2018

Zayra Lobo (engineering) writes, "For the past two years, I've been working as an embedded software engineer at Cruise, a self-driving car startup in San Francisco. I write the firmware for the cameras on the new vehicle that our company is developing, which will have no steering wheel. In my free time, I play guitar, work on home improvement projects, and hang out with my fellow Bay Area Mudders!"

2019

Lydia Sylla (engineering) and **Charles Dawson** (engineering) got married in Cambridge, Massachusetts, in July 2023. They celebrated with family and friends, including HMC classmates **Brenden Brown**, **Sara McAllister**, **Maggie Gelber**, **Alex Quinn**, **Camille Goldman** and **Katie Gruenhagen**.

2020

Daniel Bashir (computer science) is playing his violin and co-running an AI publication called *The Gradient* that includes a podcast, which has featured Yoshua Bengio, among others (https://bit.ly/gradient-mm). Daniel says, "Remaining thankful for the variety of academic experiences I had at Mudd and the range of interests my wonderful professors encouraged."

2021

Max Chao-Haft (math) is a math PhD student at Northwestern.

In Memoriam

R. Thomas Weimer '71/72 (engineering),

2011 Distinguished Alumni Award winner, died at home on April 6, 2024. He was 74. Tom had a long and distinguished career in Washington, D.C., working on public policy that involved science, engineering and technology. He worked for Lockheed, then received a professional engineering degree from University of Washington. At Sandia National Labs in Albuquerque, he focused on the safeguarding of the transportation of nuclear materials. Later, in response to the takeovers of the U.S. embassies in Iran and Pakistan, he spent 18 months with the State Department, creating innovative solutions for crowd control during embassy attacks. Tom spent the rest of his career working in Washington, D.C., specializing in natural resources, energy and science and technology policy issues. He retired in 2010 to Lookout Mountain, Colorado.

REUNION CLASS PHOTOS

Alumni Weekend 2024

1964 Russ Merris, Robert Borton, Bruce Worster, Dan Nelson

1969 Front: Leslie Foster, Steve Schultz, Doug Streuber, Henry Brady, John Harrell, Connie Weeks, Howard Cohen, Tom Bleakney. Back: Ron Roth, John Barsky, Glenn Fisher, Walt Foley, Andy Kaye, Robert De Pietro, Jim Miller.

1974 Front: Rich Zucker, Roses Mrohs, Rick Levin, Rick Maurer, Brian Wong, Ed Yoshida. Row 2: Jim Bender, Denny Bollay, John Lavrakas, John Ogren, Ron Blanc, Carl Silsbee, Marty White. Row 3: Michael Dickinson, Martin Caniff, Mike Dermody, George Conner, Dave Farber, Terry Flower, Tedd Gibson, Debbie King. Row 4: Bill Oakes, Bruce DePriester, George Innis, Steve Hogan, Jim Klinkam. Back: Dennis Olson, Tony Noe, Bev Orth, Tim O'Donnell, Fred Pickel, Denis Drapeau, Steve Quist, Scott Olmsted, Brian Rohrback, Dewey Szemenyei, Peter Taborek, John Ziemer. Also: Ken Livak, Martin Rudat, Ross Larkin, Bill Linn, Bill Vasek.

1979 Scott Foerster

1984 Front: Karl Flueckiger, Carolyn Wetzel, Kenny Chen, Greg Roberts, Larry Tong. Row 2: Paul Breed, Mongo Phraner, Stephen Blankley, Lita Schulte, Nate Cook, Steve Caron, David Gardner, Eric Johnson. Back: Jay Foster, Kirk Jones, Jim Smith, Jim Cassi, Eric Fullerton.

1989 Front: Sandy Price, Angie Moore, Kimberly Lawler-Sagarin, Carl Webb, Tim Wendler, Karl Chan, Mar Johnson, Kwang Sung, Jason Adler. Back: Margaret Ghiron, John Kim, Jenny Ellsworth, Steve Molin, Scott Ellsworth, Kaia David, Kyle Roesler, Aid McCarthy, Howard Deshong, Jung Park, Roger Carlson, Mike Brightwell.

REUNION CLASS PHOTOS

Alumni Weekend 2024

1994 Front: Gavin Minami, Matthew Hyon, Phil Snyder, Ben Melhuish, Vivan Li, Jo Capaldo, Michael Hicks, Matt Summers. Back: John Simpson, Erik Browne, Milo Crisostomo, Mike Munson, Mark Huber, Mark Mathison, Daniel McClelland, Kirby Lewton, Dan Hyman, Josh Mann, Chris Douty, Mchelle Mann, Jason Goldberg, Scott Hampton, Bill Fischer.

1999 Front: Sarah Shapard, Carolyn Dharm, Newt Sherwin, Janet Davis, Adrian Urias, Jeff Lawson, Ben Teller. Row 2: Rabin Bhattacharya, Andrew Bernat, Jenn Bernat, Dan Anderson, Rene Gamero, David Chan, Nathan Jakubiak. Back: Itai Seggev, Jason Umhoefer, Frank Shaw, Steve Foley, Aaron Barber, Jeff Matlin, Christian Andreu-Von Euw.

2004 Front: Kevin Esvelt, Debbie Vitus, Andrew Yip, Lindsay Erickson, Brandt Erickson, Kevin Pang, Charlie Matlack, Steve Hickman, Diana Friedman, Melissa Federowica, Stephen MacVicar. Row 2: Allison Jacobs, Edward Heaney, Colin Jemmott, Andrew Cole, Brian Humphrey, Darci Snowden, Ian Ferrel, Melissa Banister, Erika Rice Scherpelz, Lai Lao, Heather Whalen, Adrian Mettler. Back: Les Fletcher, Uber Jacobs, Jason Komadina, Evan Porter, Tonya Porter, Josh Padgett, Jeff Scherpelz, Aaron Becker, Zoe Boekelheide, Aja Hammerly, Eric Harley, Sean Skelly, Zak Andree.

2009 Front: Janet Komatsu, Jordan Eboreime, Terrence Wong, Kyle Marsh, Liz Flannery, Catherine Bradshaw, Alicyn Henkhaus. Row 2: Chris Fox, J.J. Boyles, Kacy McKibben Donna Mayeda, Kerry Thomas, Rachel Cranfill, Patrick Foley, Claire O'Hanlon, Heather Justice, Vatche Attarian. Graham Orr. Back: Stephen Rosenthal, Harry Dudley, Sam Gordon, Adrian Sampson, Jonathan Litz, Andy Wong, Rebecca Burns, Oliver Johnson, Ben Fogelson, Christina Snyder, Lauryn Baranowski, Brett McLarnon, Hector Cuevas, Greg Farnum, Shannon McKenna, Ryan Quarfoth.

2014 Front: Robyn Randall, Danielle Nicholas, Ginah Han, Lisa Lam, Beverly Yeh, Julia Lee, Carling Sugarman, Katie Shepherd, Maya Hardiman, Miranda Parker, Natasha Parikh, Jason Wang, Angela Medina, Emily Ross, Meg O'Keefe. Row 2: Madeline Goldkamp, JC de Sugny, Sarah Lichtman, Rohaine Hsu, Jonathan Williams, Alberto Ruiz, Maya Ornstein, Lauren Nishizaki, Audrey Musselman-Brown, Sidra Hussain, Sejal Shah, Meghan Jimenez, Emma Bodell, Marissa Novak, Corinne Druhan, Jordan Zesch. Row 3: Stephen Pinto, Kevin Lau, Anastasia Patterson, Victoria Fuedo, Stephanie Fawaz, Jane Joffswell, Tessa Kohl, Lauren Shull, David Scott, Abby Gregory, Ben Corr, Sophie Stuart, Brett Mills, Alex Flake. Row 4: Andrew Turner, Jeb Brooks Luke Mastalli-Kelly, girl blocked sign, Becca Thomas, Lena Reed, Lauren Winkler, Cecily Hunt, David Lingenbrink, David Derry, Brian Frost, Douglas Hu, Tuan–Nguyen, Alex An, Lisa Gai. Back row: Jacob Bandes-Storch, Mark Mann, Jason Bluhm, Jake Low, Greg Kronmiller, Spike Harris, Christian Stevens, Ray Hurwitz, Patrick Meehan, Frank Liu, Anthony Chung, Obosa Obazuaye.

2019 Front: Marianna, Sbordone, Kitty Belling, Bella Puentes, Carrie Saada, Alexis Ravnik, Liya Zhu, Sonia Sehra, Althea Hansel-Harris, Parnika Sharma, Briana Liu. Row 2: Matthew Huerta, Marissa de Souza, Elizabeth Poss, Cordelia Stiff, Nina Brown, Angela Sun, Adam Schulze, Skipper Gonzalez, Christopher Ye, Sophia Harris, Jason Dwyer, Brittany Wang, Sidney Cozier. Back: Gavin Yancey, Brenner Ryan, Joseph Nunez, Ali Khan, Ben Iten, Brenden Brown, Izzy Jones, Finn Southerland, Trevor Fung, Ciente Jones, William Teav.

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The fast-paced game of korfball is played by about a million people in 70 nations. Haven't heard of it? Athlete and math professor Carl Yerger '05 wants to change that. **Read more on page 22**.