

BIO

A publication for alumni, donors and friends of the
COLLEGE OF BIOLOGICAL SCIENCES at the UNIVERSITY OF MINNESOTA

LEARN + LEAD



CBS students are driven to make a difference. They are having an impact on campus and beyond.



A CBS great

A new guild for incoming students celebrates an alum with a love of science and culture.

Alumna Pearl Bergad recently joined a list of luminaries as the namesake of a CBS guild. Alumni submitted nominations and a collegiate committee selected a finalist. Bergad graduated from the College with a master's degree in biology in the late 1960s and went on to a career as a researcher in the U of M Medical School. After retiring from the University, Bergad became executive director of Minneapolis' Chinese Heritage Foundation, directing programs and activities designed to promote and preserve Chinese culture, history and heritage.

CBS Guilds support undergraduate students in their transition to college, creating a community within a community by connecting them to people and resources that contribute to their success. The College assigns students to guilds made up of about 90 of their peers who they'll get to know and work with over the next two years. The College's eight guilds are named after esteemed faculty and alumni among them including Josephine Tilden, Eville Gorham, Raymond Lindeman and Margaret Davis.

Read more about Pearl Bergad at z.umn.edu/bergadguild.

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ABOUT THE COVER: CBS UNDERGRADUATES CHEN CHEN, HOSSAM HALAWEISH AND PRECIOUS KENNEDY IN FRONT OF THE MCB BUILDING ON THE EAST BANK CAMPUS. PHOTO BY JACKSON EDDY



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EDITOR Stephanie Xenos

DESIGNER Sarah Karnas

CONTRIBUTORS Kevin Coss, Lance Janssen, Mary Hoff, Claire Wilson

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On a mission

Our goal is to make sure every CBS student can participate in an authentic research experience before they graduate.

Those of us who completed our undergraduate degrees more than a few years ago will likely remember lab courses as a time to complete prescribed experiments with predictable outcomes. Much has changed for students in CBS. The move to student-driven inquiry influenced course design and teaching labs in profound ways. It changed the way we teach and affirmed the importance of learning biology by doing biology.

Making sure students can access an authentic research experience is part of this paradigm shift. It's baked into our mission and infuses everything we do. Students have many options, but something unique to this College is the unparalleled opportunity to participate in the process of discovery across the entire spectrum of biology.

CBS was among the early adopters of student-driven inquiry in biology classes. The journal

Science recognized our Foundations of Biology courses for innovation in course creation. Students in Foundations apply what they learn by designing and carrying out experiments that address real-world problems.

The missing piece: a lab space designed to facilitate student-driven experiments. Fast forward to 2019, and that space came to fruition. Now, students in our Foundations courses can design and carry out a wide variety of experiments in the Dr. Denneth Dvergsten Active Learning Lab.

Class-based research experiences are one avenue for students to gain research know-how. Directed research in faculty labs is another. With that in mind, we launched the Dean's Research Program this summer to provide students with a paid research experience. Twenty-four labs and 37 students participated in the pilot. We also created a new position—



PHOTO BY JACKSON EDDY/A FRAME FORWARD

“Students who participate in research are better prepared for graduate and professional school and the workforce.”

coordinator for undergraduate research — to support students looking to get involved in research.

Of course, spending time in a lab is important not only to build scientific skills, but also for the chances it provides students to collaborate, persist through repeated trial and error, dig into the thrill of following one's own curiosity, and, ultimately, create new knowledge.

Students who participate in research are better prepared for graduate and professional school and the workforce. Positions in industry are appealing for some of our students, and we are working to build ties to industry with internships and workforce development front and center.

We want our students to be ready to fill the ranks of biotechnology and biomedical companies in Minnesota and beyond, and internships are a springboard to those opportunities. If your company has an internship program that would be a good fit for CBS students, get in touch!

VALERY FORBES, Dean
College of Biological Sciences

A top-down view of a petri dish containing several bacterial colonies. There is a large, bright orange, circular colony in the center. To its upper right is a smaller, yellow, circular colony. Below the orange colony is a white, circular colony. At the bottom of the dish is a large, irregular, greenish-grey colony. Several other smaller white colonies are scattered around the dish. The background is dark blue with some light blue bokeh effects.

THE EXPERIMENT CONTINUES

Join us online for Petri Dish conversations this fall!

The Petri Dish explores how biology affects our lives and what it means for our future. No PowerPoints. Just lively, curiosity-driven conversations on timely topics with University of Minnesota experts. The events will be held virtually.

OCTOBER 27 | 6PM CT

Concrete and canopy: Urban nature in the spotlight

NOVEMBER 17 | 6PM CT

Back to the beginning: Investigating the origin of life

More details at [Z.UMN.EDU/FALL2021PETRIDISH](https://z.umn.edu/fall2021petridish)

NEW & NOTEWORTHY

Expanding access to paid research opportunities for undergraduates

The College launched the Dean's Research Program this summer to accelerate efforts to expand research opportunities, particularly for students who would otherwise need to work during the summer instead. The response from students and faculty was overwhelming, with more than 233 students applying to be part of the program. The College was able to provide support for 37 students in 24 labs. The College also recently created a new position — coordinator for undergraduate research — to expand the number of participating labs and support students looking to get involved in research.



NOVEMBER 9: Addressing biodiversity decline with remote sensing and local knowledge, with Prof. Jeannine Cavender-Bares

Make lunch matter

Cedar Creek Ecosystem Science Reserve has been connecting scientists with the community through its monthly Lunch With a Scientist series for several years. Join the conversation online each month!

Check out upcoming topics and at cedarcreek.umn.edu/lwas

NOV 4

Minnesota Made: Growing the bioeconomy

With the bioeconomy expected to represent \$4 billion in economic activity in the next decade, the opportunities to translate cutting-edge research into bio-based products that are more sustainable and durable than existing options are abundant. Hear from an expert panel with deep roots in biotechnology and industry about the future of the bioeconomy in Minnesota and beyond. **Learn more at z.umn.edu/mnbioeconomy**

A little art on the prairie



Research interns and graduate students coordinated an art show at Cedar Creek Ecosystem Science Reserve this summer. The art on display took many shapes and forms, from string instruments to portraits. For the vast majority of participants, it was the first time they shared their works with others. For Caitlin Barale Potter, Cedar Creek's education and community engagement coordinator and the person who supported the planning process, the event gave scientists a chance to shine outside of a research setting. "One of our core tenets at Cedar Creek is the fact that scientists are people with interests, skills and experience both in their scientific field and outside of it," she says. "The creative talents of our scientific community are quite impressive but not always shared broadly." Rose Paredes, one of the organizers of the event, dabbled with art in her free time but until this event had never shared her work with anyone. "The interconnectedness of art and science is often overlooked," says Paredes. "By helping organize this art show, I wanted to explore this interconnectedness myself and help peers do that as well."

Explore the exhibition in more detail at z.umn.edu/cedarcreekart



Celebrating students return to campus

For many CBS undergraduates, the beginning of fall semester marked their first time on campus in more than a year. Students embraced the return, gathering outside McNamara ahead of 2021 Convocation and receiving a warm welcome from Student Services staff outside the Molecular and Cellular Biology building on the University's East Bank campus where they shared their aspirations for the future.



A plant for all seasons

Although the CBS Conservatory & Botanical Collection is not yet open to the public, you can get a glimpse behind the glass with “In Bloom,” a monthly email highlighting one of the 2,000+ rare species housed in the conservatory.

PICTURED: These succulents, known as *Conophytums*, cover large swaths of land with their vibrant hues during spring in the Karoo desert. Many of the world’s succulents originate from this small area in Namibia and the Northern Cape province of South Africa. There are more than 110 species of these pebble plants found there.



Become a Friend of the Conservatory to receive the In Bloom email! Go to z.umn.edu/conservatoryfriend.

Lifestyles of the small and furry

The Squirrel Squad research team studies how those familiar rodents behave across urban and rural habitats.

If you walked around Como Park in St. Paul over the summer, you might have noticed some rather unusual yard signs featuring a squirrel eyeing onlookers with a note that research is underway. The signs are a sort of invitation to curious passersby.

Charlotte Devitz, a Ph.D. student in Associate Professor Emilie Snell-Rood's lab, leads the Squirrel Squad research team. To help facilitate conversations, she set up signs and created "honorary member" stickers.

"When people see traps and our equipment, they often stare and I found that having a sign up gave them 'permission' to approach us and ask questions," says Devitz. "It's a natural way to engage with the folks and tell them about what we are doing."

Devitz and her research team lay out traps and then run tests on the squirrels and chipmunks to test whether they're more likely to be bold or shy. By repeating these tests with animals in urban, suburban and rural environments, they can better understand drivers of behavioral changes.

Squirrels and chipmunks might initially seem out of place in the Snell-Rood lab, which has earned the

nickname "the butterfly lab" around campus, but key questions overlap across the systems. Researchers in the lab focus on how organisms adapt to radical changes in their environments.

Squirrels and chipmunks thrive in urban environments, despite the novel challenges. Anyone who has picnicked in an urban park can attest to that. For Devitz, that's part of why they are great species to use to tackle these questions.

"By studying the behavior of well-adapted species, we can better monitor and predict the impacts of urbanization on other species in the future," says Devitz.

This question of adaptation fits nicely into the new Minneapolis–St. Paul Metropolitan Area (MSP) Long-Term Ecological Research Program, which formally kicked off earlier this year. For Devitz, this new program was a huge draw to pursue her Ph.D. in CBS. —CLAIRE WILSON

Hear more from Devitz, who was recently featured on NPR Short Wave—a popular science podcast—at z.umn.edu/npr-short-wave-Devitz.



WEED TO WORTHWHILE

A new cover crop developed by University researchers is good for maintaining healthy soil and a farmer's bottom line.

Corn and soybeans may be Minnesota's mainstay crops, but they present a bit of an issue. Their growing seasons leave farm fields bare for long stretches of the year, leaving the soil to erode from the forces of wind, snow and water.

On paper, the solution is clear: Plant "cover crops" outside of the growing season that protect the soil's fertility and prevent nutrients from leaching into groundwater and running off into nearby lakes and waterways. In practice, however, the method is costly with little economic return.

That's starting to change, thanks to years of research led by CFANS Professor Don Wyse and CBS Professor David Marks. Their combination of basic and applied science resulted in the domestication of pennycress—a common weed that grows throughout most of North America—bringing growers across Minnesota an economically feasible cover crop option.

Planted in the fall after the harvest of summer annual crops, pennycress can absorb nutrients like nitrate and phosphorus to prevent them from washing off into waterways and degrading the water quality. The plant is hardy enough to survive Minnesota winters and protect the soil beneath it.

Perhaps the most appealing part, however, is that growers can harvest pennycress seeds. The seed oil can be sold for a number of potential uses, such as for biodegradable packaging materials, lubricants, biofuels and even an edible ingredient in foods like granola

bars. Meanwhile, the seed meal (what's left after extracting the oil) carries proteins, essential fatty acids and fiber that make it appealing for food and animal feed. The seed meal can also be used as an organic fertilizer.

Despite pennycress' potential, the plant was unfit for cover cropping in its wild form. Its seedpods shatter too easily, it takes too long to reach maturity, and certain acid compounds in it make it unfit for humans or animals to consume. The process of domesticating pennycress, or breeding out these negative attributes and selecting desirable ones, was what transitioned it into a valuable crop. It happened much more quickly, thanks to a serendipitous collaboration between Wyse and Marks.

"I was well primed when Don came to me with this proposition to look at this plant pennycress that could address an important problem," says Marks, a professor of plant and microbial biology. "My work on *Arabidopsis* provided me with just the right background to quickly move pennycress toward domestication."

Pilot studies are now in progress throughout central and southern Minnesota. These studies are testing out the environmental and economic benefits of domesticated pennycress and optimizing the methods used to plant and harvest it. —KEVIN COSS

A version of this story originally appeared in Inquiry, a publication of the UMN Office of the Vice President for Research.

"My work on *Arabidopsis* provided me with just the right background to quickly move pennycress toward domestication."

—DAVID MARKS

GOING WILD WITH AI

By harnessing technology, researchers shorten the lag time between snapping photos and making conservation decisions.

Trail cameras allow conservation biologists and reserve managers to learn how animals move across a landscape. This information is incredibly valuable when it comes to data-informed decision making.

Researchers with the University of Minnesota Lion Center use over 2,000 cameras across different grids in six African countries. These cameras capture over 1.5 million images annually. Even with thousands of volunteers working to identify images through Snapshot Safari, it can take eight to 15 months from when the photo is captured to final classification of the animals in the images.

Increasing the speed and precision of image identification is bound to have significant impacts on work on the ground. Understanding where wildlife are headed is helpful to anticipate potential conflicts between farmers and wildlife. For example, if researchers notice elephants are moving closer to orange groves, they can set up barriers before a conflict occurs.

Volunteers sort through many images that don't contain any animals. When they find images that do, they identify the animal, count how many are present and note whether an animal is eating or on alert for predators. Artificial intelligence (AI) is poised to drastically expedite this process.

"Conservation biology is a crisis discipline. We're toeing the line of species going extinct, and the faster managers can respond, the better. We hope to have results within weeks

instead of months," says Sarah Huebner, a Ph.D. candidate in the Packer Lab and research manager of Snapshot Safari.

Seeing this time delay as a major constraint, Craig Packer, director of the center, reached out to collaborators with expertise in AI at the University of Wyoming several years ago. With a large library of classified images, the lab was in a good position to develop, train and test algorithms.

Through this collaboration, the team developed and implemented a tool that identified species well. It was limited, though, as it struggled to count species and identify behaviors.

Huebner reached out to staff at Microsoft working in the AI and conservation space to discuss potential collaborations. In combination with the Lion Center and Zooniverse, Microsoft AI for Earth created an online library to share labeled camera trap images with folks eager to build specialized algorithms to analyze images. The Snapshot team is hard at work developing and testing new algorithms to improve AI recognition of counts, behaviors and demographics of wild animals.

Other AI developers are creating algorithms to detect human activity on camera traps. Managers of protected areas are interested in getting alerts when human activity is reported in areas they wouldn't expect humans to be. This would allow their team to quickly converge on the spot if poaching is suspected. —CLAIRE WILSON

"The faster [wildlife] managers can respond the better. We hope to have results within weeks instead of months."

—SARAH HUEBNER





“

Our students are exceptional on so many levels, but one thing that is obvious when you spend time with them is their drive to make a difference.”

LEARN + LEAD

From fundraising for hungry kids during the pandemic to building a portal for students to find research opportunities, CBS students support the collegiate and broader communities in a variety of ways.

We are living in an era defined by advances in knowledge and know-how in the biological sciences. Understanding how life works is a critical step toward making life work better. And that's just what many CBS students hope to do. For many students, studying biology is part of a broader engagement with the world around them.

"Our students are exceptional on so many levels, but one thing that is obvious when you spend time with them is their drive to make a difference," says CBS Dean Valery Forbes. "They are incredibly engaged in service and leadership. The world needs leaders and engaged community members who are trained to base decisions on evidence as well as

empathy. Our students are positioned to play that vital role."

In an effort to further these experiences for CBS students, the College has worked to support undergraduates advancing their skills and knowledge both inside the classroom and out. CBS Student Services office has multiple staff members focused on helping students find campus groups or volunteer opportunities, and the College provides support to groups like the CBS Student Board, which advocates for students on campus.

"Through engagement experiences students have an opportunity to further develop their skills to be effective leaders and change makers, and apply these skills within the community," says Aryn Lipnicki, the College's assistant director of student engagement. "By developing

these skills to complement their study of the life sciences, students are prepared to engage in scientific endeavors in ways that are collaborative with the community."

Along with engaging in hands-on research, spending countless hours studying in the library and furthering their knowledge through coursework, many of our undergraduates volunteer, do research in faculty labs, lead student organizations and nonprofits, and take part in student government. Here are just a few examples of students making an impact on campus and beyond. —LANCE JANSSEN

PHOTOS BY JACKSON EDDY/A FRAME FORWARD

MEET A FEW OF THE MANY ENGAGED SCHOLARS WHO ARE ALREADY MAKING A DIFFERENCE.



Precious Kennedy looks at science through a social lens.

A COMMUNITY CONNECTOR

Building community with peers has been a constant throughout Precious Kennedy's University experience. Getting to know classmates before even coming to campus through Nature of Life at Itasca, as well as her time in the President's Emerging Scholars (PES) program summer seminar, opened her eyes to the importance of getting to know people across campus and beyond.

"In PES, we got to explore campus, make friends and establish communities," she says. "I think from that starting point I just realized I enjoyed and wanted to be in spaces that explored and dealt with different types of people and feel like I'm part of a broader community."

The neuroscience major continued her focus on peer interaction and community-building throughout her time at the University, later serving as a peer mentor in the PES program,

taking part in the CBS Dean's Scholars program and serving as a community advisor on campus. While connecting with her classmates, she's also built relationships with people across the metro area, volunteering as a reading tutor through the Reading Partners program and serving as a medical scribe for North Memorial Emergency Services. Engaging in this work has offered Kennedy the chance to engage in conversations and service that combine her interest in biology with a passion to engage with social issues.

"Some would say, 'go study sociology if you want to engage in areas like human rights or racial justice,'" she says. "And I would say 'No, you can have both of these things together, and it's very critical that we actually have that leadership perspective and that consideration with social consciousness within science.'"



A CRITICAL THINKER

Chen Chen likes finding new ways to pursue solutions to problems.



When Chen's academic pursuits may be scientific in nature, but an eye toward creativity keeps this senior engaged on and off campus. Chen studies genetics, cell biology and development as well as human physiology, though he long thought he'd pursue a degree in piano performance before finding an interest and passion in the sciences later in high school and now at the University. Pursuing a more artistic and creative side to biology led him into research and work on a paper exploring cardiac regeneration and remodeling at the Lillehei Heart Institute.

"Similar to music, what I enjoy most in this research was the combination of creativity and critical thinking," he says. "You get to ask these sci-fi-like questions about regenerating the heart, like something you would see out of the movies, but also a scientific perspective trying to create something from nothing."

This drive to create and discover new knowledge led Chen to also get engaged with more researchers at the heart institute, work for a medical device consulting firm, as well as currently serve as a quantitative research analyst for a hedge fund in Minneapolis.

"I'm still doing research, it's just with different types of data," Chen says. "My primary role within the hedge fund is developing new investment strategies and quantitative models that will essentially forecast volatility and returns of different asset classes and take advantage of mispricing between different global equity markets. ... These roles showed me that you have to have an inherent ability to think critically, to really look at data and know how much you need to scrutinize it and to know whether the data is good or not."

Kashif Qureshi likes finding connections and solutions with peers and the world around us.

A NETWORK BUILDER



As stay-at-home orders and online courses left Kashif Qureshi experiencing a different academic reality in the early stages of the pandemic, he suddenly realized he had a resource he doesn't often have: time. While focusing on his coursework and staying connected with peers virtually, he also used this extra time to build a new digital tool called GopheResearch. The networking site helps undergraduates find research opportunities on campus and provides faculty members with a way to advertise open positions in their labs.

"I had been thinking about making something like this for a while," he says. "I tried building something out during the pandemic and shared it with leadership in CBS. They thought it was great and we now have a good audience that's using it day in and day out."

An aspiring neurosurgeon, the biochemistry and computer science major has furthered his desire to learn and explore as an undergraduate, conducting research in three faculty labs, as well as taking part in premedical groups and the badminton club. While valuing the science and research side of his studies during his time in CBS, he also sees how building out his social network is important for his career aspirations.

"I think it's really important because I think when you come to the University it's not just about academics," he says. "I really wanted to grow as a person. Getting involved in research or badminton club or Pre-Med Club gives you a lot of exposure that's going to be helpful in the future where you're going to learn how to communicate with people, which is the most important thing."

In a world facing global-scale challenges, Bill Keute sees opportunity. The CBS senior sees a chance to engage and lead using his science training as a platform for addressing big problems.

"I think science and scientists are not always seen as leaders in society," says Keute. "But I remember my freshman year coming in and (Professor) Brian Gibbens saying, 'The 21st century is the age of biology' and now, as we see with COVID, that's even more true."

Keute has taken that mindset of engaged leadership to heart throughout his time in CBS. He currently serves as the president of the CBS Student Board after serving as treasurer last year, is co-president of the University's Pre-Dental Club, was a peer mentor for the CBS Dean's

Scholars program and was a guild leader for the Nature of Life program. In addition to appreciating the relationships and knowledge he's gained from others serving in these positions, he also sees the direct impact he can make on those around him.

"I decided to run for [CBS Student Board] president after seeing that with the pandemic, there's maybe some places that we can refocus our efforts," he says. "I want to be able to support people. ... One of the things that motivates me is to represent my peers and bring their opinions to the table that I may or may not share. But to bring that to the table with faculty and leadership and see what can be changed is important to me."



AN ENGAGED ADVOCATE

Bill Keute builds connections and works on behalf of his CBS peers.

Abygail Andebrhan credits her career trajectory back to a high school guest lecturer. When the Genetics, Cell Biology and Development major heard from the head of the Sickle Cell Anemia Foundation about the health and societal impacts of individuals dealing with this disease, she was immediately intrigued and wanted to learn more.

"During her discussion, I learned about how there was a social justice aspect behind the disease in the United States," Andebrhan says. "It's affected by race, and people who have it tend to be African American. With that, they're treated differently, and as a Black woman in America, I've always been very passionate about combating injustices and inequality in our society."

The aspiring physician is set to graduate this spring despite this being only her second year on campus. She completed two years of courses through the Post-Secondary Education Options while still in high school. Despite her relatively short time on campus, Andebrhan dug into her interest in health and research as a CBS undergraduate, volunteering with the Sickle Cell Anemia Foundation of Minnesota and conducting research in a genetic engineering lab on campus.

"Learning about gene editing has been fascinating as I realized you can go in and potentially resolve the one mutation that causes sickle cell anemia," she says. "Seeing that you could potentially go in with CRISPR and fix that, I knew I wanted to know more about this."

In addition to her science experience, she plans to serve as a community assistant in the dorms this year as a way to engage further with the communities around her.

"I want to be able to surround myself with different people and grow my cultural awareness," Andebrhan says. "I want to fight for different people's rights, but I want to also understand people's different views and perspectives."



Abygail Andebrhan combines fascination with biology and a passion to combat social inequalities.

A SOCIAL SCIENTIST



A PURPOSEFUL PHOTOGRAPHER

Hossam Halaweish takes portraits as way to give back while he pursues a future in medicine.

Hossam Halaweish's daily schedule may look a bit overwhelming between classes and studying, research in a surgery lab on campus, and volunteering. But he also squeezes in time to pursue another passion: soccer. The senior, who is majoring in biology, plays on the University's club team and has served as captain for three years.

"I love playing soccer," he says. "It just gives me a chance to escape some of the tension and release some of that pent-up energy of my day. I really enjoy getting out there, and the guys I've built relationships with have been awesome."

As he juggles his coursework and studies, he also recently started a nonprofit. During the pandemic, Halaweish decided he wanted to

do something to help children in need, so he started an organization called Portraits for a Purpose. He takes people's photographs and uses the proceeds to contribute toward feeding hungry children. The University recently recognized him with the Donald R. Zander Alumni Award for Outstanding Student Leadership for his work raising more than \$7,500 for the cause during the pandemic. For Halaweish, it's personal.

"I remember visiting family in Egypt and seeing kids my own age trying to find food out in the street," he says. "I really want to be able to give back to those around me who need help and provide some help for them when they need it most."

Inspired *and* inspiring

University of Minnesota Outstanding Achievement Award recipient Zhanjiang (John) Liu is living a pay-it-forward life.

It's been a rewarding year for CBS alumnus Zhanjiang (John) Liu (M.S. '85, Ph.D. '89). Liu received the University of Minnesota's Outstanding Achievement Award and the College of Biological Sciences Alumni Achievement Award this spring. He was recognized for numerous achievements, including pioneering work in fish genomics and exceptional accomplishments as a scholar, mentor to scores of graduate students and top administrator at two universities.

“I started to learn in my career, you can't really plan your life. ... You just have to ask yourself, ‘Can I do this?’”

Currently interim vice chancellor and provost at Syracuse University, Liu says he learned a lot of things as a graduate student at the U in the 1980s. But perhaps the most important lesson of all was what he calls the “Minnesota Spirit”—helping others succeed.

“Minnesota had a culture of educators. Our professors were educators, not just teachers. They cared about our success. They cared deeply about our careers,” he says.

“[This] made me an OK scientist, but even more made me a better person, made me a more impactful person, caring about others rather than myself.”

Liu's exceptional career began on a farm in one of the poorest regions of China. His desire to help feed a hungry world took him first to Northwestern Agricultural University in Shaanxi Province, China, and then to the University of Minnesota. Here he earned a master's degree in plant pathology with

Professor Bill Bushnell. Then he accepted Professor Perry Hackett's invitation to complete his Ph.D. in cell and developmental biology working on transgenic fish.

“Perry told me, ‘DNA is DNA, RNA is RNA—you can learn from these fish and apply it to your plant biology,’” he says. But he ended up staying the course.

“I started to learn in my career, you can't really plan your life,” he



says. “You can plan to stand up when you fall and be prepared to do the unprepared. You just have to ask yourself, ‘Can I do this?’”

After a postdoc in the University's Medical School and a stint with a Twin Cities biotech startup, Liu returned to academia in 1994 as a member of the faculty of Auburn University in Alabama, where he became an international leader in fish genomics. In 2013, Liu was appointed associate provost and associate vice president for research at Auburn University, and in 2017 moved on to leadership roles at Syracuse University.

Along the way, he has mentored more than 60 graduate students—many of whom have gone on to faculty positions of their own—and racked up more than 18,000 scientific citations. In addition to his work in the United States, he has served in numerous positions in China, including affiliate professorships at five institutions and honorary dean and director positions at several others. He is a fellow of the World Aquaculture Society and American Association for the Advancement of Science.

“My professors inspired me to feel that you can do anything you wanted to do,” Liu says. And his goal is to pass that on.

“That's the fundamental difference I'm trying to make as a provost,” he says. “[I want my faculty members] to give confidence to every student, including first-generation students, including disadvantaged students, so they feel there's a future for them. Our job is to inspire and empower students. Let them feel they can be anything they want to be. That's fundamentally what Minnesota gave to me.” —MARY HOFF

ALUMNI RECOGNITION

The College of Biological Sciences recognizes a handful of highly accomplished graduates each year in three categories. Recipients are selected from nominations submitted by alumni, faculty and staff. This year, the College named two recipients in each category from an incredibly strong pool of nominations.

Alumni Achievement Award

ZHANJIANG (JOHN) LIU

M.S. Plant Pathology '85, Ph.D. Genetics and Cell Biology '89

John Liu received both the College's Alumni Achievement Award and the University's Outstanding Achievement Award this spring. See the profile of Dr. Liu to the left for more about his many achievements as a scientist and administrator.

DARBY NELSON

B.A. Zoology '64, M.S. Zoology '66, Ph.D. Zoology '70

After completing his bachelor's, master's and doctoral degrees at the College of Biological Sciences, Darby Nelson went on to a distinguished teaching and public service career. Nelson taught environmental and biological science courses at Anoka-Ramsey Community College for 35 years and served three terms in the Minnesota House in the 1980s. He published *For Love of Lakes* in 2011 and *For Love of a River: The Minnesota* in 2019. "Dr. Nelson has been a titan in teaching and in advocacy for the conservation and the environment in Minnesota and has become a revered author of two significant books," says his nominator. "Any one of these sets of

activities would make him deserving of the Alumni Achievement Award, but the combination of all three buttresses my own pride in being a fellow alum of this scientist."

Emerging Leader Award

MINDI DEPAOLA

B.S. Biology '15

Mindi DePaola serves as a program specialist for the University Corporation for Atmospheric Research and National Center for Atmospheric Research. She currently advises senior leadership on best practices relating to COVID-19. DePaola previously served in positions with the United Nations and International Medical Corps, and holds a master's degree in public health from Johns Hopkins University. "This pandemic has been tough for all of us," DePaola says. "I am grateful that through all the stress and uncertainty, I could play my small part in protecting the health and safety of folks I work with."

SARAH KNUTIE

B.S. Ecology, Evolution and Behavior, '06

Sarah Knutie is an assistant professor of ecology and evolutionary biology at the University of Connecticut, where she studies

the impact of environmental change on diseases in wild animals. Dr. Knutie earned her Ph.D. in biology from the University of Utah in 2014 and recently developed a method of "self-fumigation" to manage a parasite problematic to the famous Darwin finches of the Galápagos. "I credit my success to the education and opportunities I received at the College of Biological Sciences," says Knutie, "and I am forever indebted to the mentors who helped shape who I am as a professor at the University of Connecticut."

CBS Service Award

JOSHUA LEONARD

B.S. Ecology, Evolution and Behavior '00

As the education director for the Belwin Outdoor Science program for St. Paul Public Schools, Joshua Leonard leads outdoor biology education for 10,000 students each year. In addition to moving educational offerings online for thousands of students during the pandemic, he has also worked to decrease barriers to nature for Black, Indigenous and people of color around the Twin Cities, helped launch the Minnesota Phenology Network, and was integral in the creation of the Como Woodland Outdoor Classroom. "Connecting more kids to nature, more often is of utmost importance for all of

us who want to live in a science literate democracy and live in a country where all kids can learn about and pursue their dreams," Leonard says.

GERI NELSON

B.A. Biology '68

A member of the inaugural CBS graduating class, Geri Nelson went on to teach for 25 years as a high school science educator after completing her degree in biology. In addition to inspiring generations of students to study the sciences, Nelson's work and service in science education and advocacy was recognized with the Hope Washburn Award by the League of Minnesota Voters, the RiverKeepers Award by the Clean Up the River Environment (CURE) organization, and the Distinguished Minnesotan Award by Bemidji State University. "Ms. Nelson has dedicated her life to service and volunteerism through her 25-year career as a high school science educator and through a lifetime of environmental and civic advocacy, engagement and volunteerism," says her nominator "I simply cannot imagine a better candidate for the CBS Alumni Service Award than Geri Nelson."

Gratitude

CBS supporters stepped up to ensure that the College thrives and continues to deliver on its mission for many years to come.

People give to the College of Biological Sciences for lots of reasons, but gratitude is foremost among them. Very often, supporters are grateful for the education and mentoring they or a loved one received as a CBS student. They give so that current and future students have access to the same great experience. The outpouring of support in recent years underscores this desire to “pay it forward.”

Longtime supporters Darby and Geri Nelson are an example of how the CBS community went above and beyond to make this campaign a success. Darby and Geri met at Itasca Biological Station and Laboratories as students, and Geri was a member of the College's first graduating class. Over the years, they've made supporting CBS students a priority. During the campaign they increased their endowment to ensure that students interested in field biology

have the chance to visit Itasca and learn at this unique living laboratory well into the future.

This is one of many gifts that made our Great Science at a Grand Scale campaign a resounding success. The campaign, which concluded this summer, focused on a number of priority areas, including support for our students and investments in critical infrastructure for research and learning. Thank you to all those who share this vision and gave so generously to this campaign. You can read about some of the highlights on the preceding pages of this issue of *B/O*. We set out to raise \$12 million, but decided to aim higher and nearly doubled that goal to \$21 million. In the end we raised \$29 million.

This vote of confidence in the work we do here at the College of Biological Sciences means a lot. Philanthropy is one way we signal

what matters to us, so the outpouring of support for this campaign underscores the importance of what happens in CBS classrooms and labs, as well as the ways that faculty and students share their science with the broader community.

Even as this chapter ends, a new one is beginning. Student support continues to remain a priority. During the campaign, we increased the number of four-year scholarships offered to incoming students from zero to 125. Now, we want to increase the amount of the scholarships as well.

In addition, we hope to raise funds to support a new program launched this summer designed to advance the College's goal of providing an authentic research experience to

every student. The Dean's Research Program funds research positions in faculty labs so that students don't need to choose between volunteering their time in a lab or making money in a non-research setting.

One of the great things about supporting students is that the return on that investment compounds over time. Our students go on to become healthcare professionals, scientists, educators, entrepreneurs and, perhaps most important, engaged members of the community. They give us hope for the future, and for that we are grateful.

REEDE WEBSTER
Chief Advancement Officer



“This vote of confidence in the work we do here at the College of Biological Sciences means a lot.”

Campaign for CBS

Facts & Figures

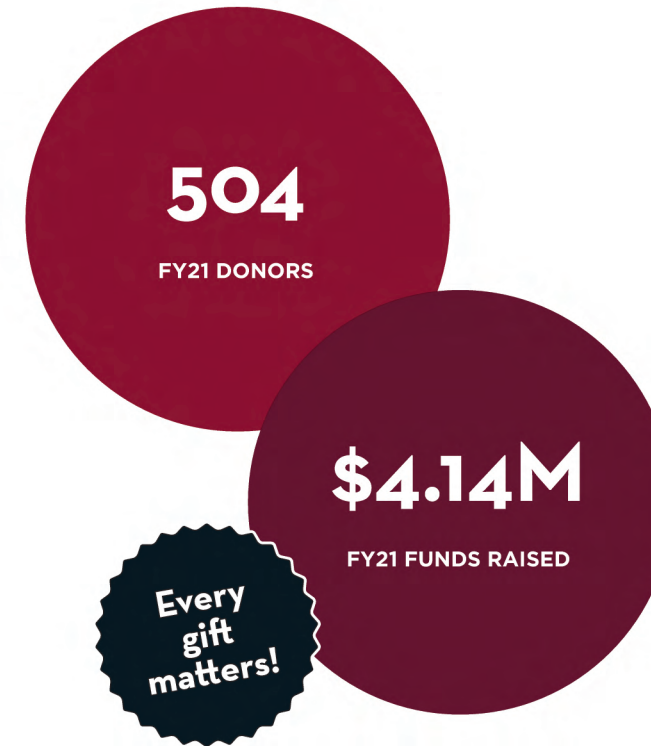
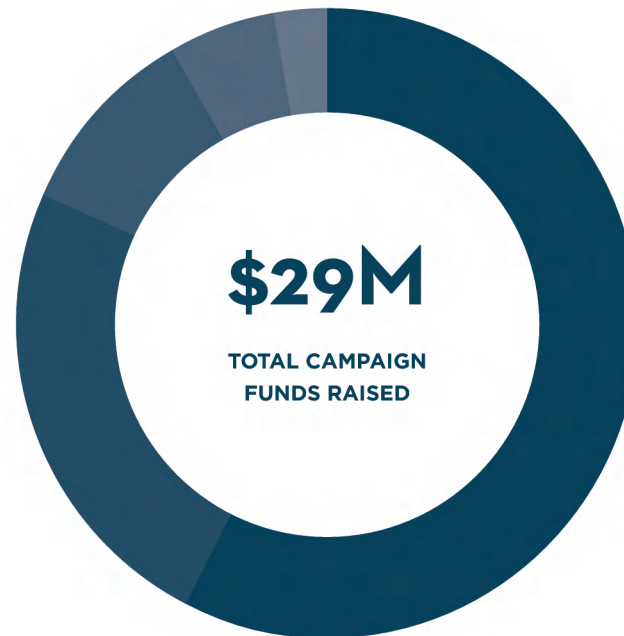
How to make a gift »

Send a check in the enclosed envelope or donate online at give.umn.edu (click on “Give Now”). Whether you write a check or give online, be sure to note that your gift is for College of Biological Sciences and indicate a specific purpose for the funds.

Questions?
Contact Reede Webster at webst033@umn.edu or 612-624-9460.

Scholarships sidenote

In 2015, the College had no four-year scholarships. The College made it a priority to create 100 four-year scholarships through its Great Science at a Grand Scale fundraising campaign. **As of this fall, 125 students have received four-year awards.** Thank you to our generous donors!



Distribution of funds

- STUDENT SUPPORT
- RESEARCH/FACULTY AND STAFF SUPPORT
- CAPITAL IMPROVEMENTS
- PROGRAM SUPPORT
- OUTREACH/COMMUNITY ENGAGEMENT

Upward *and* onward

By any measure, the College's Great Science at a Grand Scale campaign was a resounding success. The numbers tell the story of an outpouring of support from CBS alumni and friends.



Giving increased over 400 percent compared to 2015.



The College surpassed its original \$21 million campaign goal.



Nearly half of the 2,645 campaign donors were first-time givers.

The success of a fundraising campaign is about much more than the total dollars raised. It's about the concrete ways we can improve the student experience, advance critical research, share the wonder of discovery with the broader community and build a foundation to support this work well into the future. Here are a few highlights that underscore the impact donors to this campaign made in the lives of students and the broader community.



More support for students

Increasing student support in the form of scholarships and fellowships was a top priority of this campaign. CBS set out to raise \$5.5 million and increase the number of four-year scholarships from zero to 100. We exceeded both goals, raising \$17 million for student support and awarding 125 four-year scholarships averaging \$2,850 per year to incoming undergraduates. The goal going forward is to increase the number of scholarships and the award amounts. In addition, the College will raise funds for paid positions in faculty labs to ensure all students are able to participate in research.



An upgrade to the undergraduate research experience

In fall 2019, the College opened the doors to a first-of-its kind lab designed to support student-driven inquiry. The lab is named in honor of Denny Dvergsten, an award-winning science educator who fostered a love of science and discovery in his students. Creating opportunities for students to ask and answer their own research questions is key to nurturing a passion for science. The new Dr. Denneth Dvergsten Active Learning Lab serves hundreds of students, putting the space and tools for designing and executing experiments in their hands.



Increasing access to a world-famous site for ecological research

Cedar Creek Ecosystem Science Reserve is where modern ecosystem science got its start with Raymond Lindeman's discovery about how energy moves through aquatic ecosystems. In recent years, it's been a draw for school groups and community members. Construction is underway on the Richard and Judi Huempfer Minnesota Ecology Walk, which will guide visitors through a microcosm of Minnesota ecosystems and offer them an entry point for exploring biodiversity and other topics studied at the field station.

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The College gratefully acknowledges the following donors who generously provided support for scholarships and fellowships, research, and a variety of strategic initiatives. Every gift makes a difference.

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RESEARCH WITHIN REACH

Doing research in a faculty lab as an undergraduate prepares students to succeed in industry, graduate and professional school, and other endeavors. We want to make sure every College of Biological Sciences student has that opportunity. As a major research university, the U of M provides students an opportunity to learn science by doing science with world-class researchers. But not everyone can afford to spend time in the lab instead of at a job. That's why we're raising funds to support paid positions for undergraduates in faculty research labs.

Make research accessible to more students.

Contribute to the CBS Undergraduate Research and Internship Fund at z.umn.edu/CBSugradresearch