A new space designed for collaboration and experimentation sets the stage for student-driven inquiry and authentic research experiences.

ACTIVE LEARNING IN THE LAB
Winged road warriors

Researchers track migration of monarch butterflies to determine whether roadside milkweed — often laden with salt — can fuel their journey.

Monarch butterflies are making their migration south. Several thousand monarchs reared on the St. Paul campus are en route to central Mexico. Extra eyes are watching their journey this year.

Emilie Snell-Rood, an associate professor in Ecology, Evolution and Behavior, raised and released the butterflies over the course of a few weeks as part of ongoing research exploring how road salt impacts the survival and migration of these beloved butterflies.

Since monarchs commonly eat roadside milkweed, the study will help researchers better understand whether this food source is a healthy one.

“Sodium in road salts is interesting,” says Snell-Rood. “Small amounts can be beneficial [to the insect] because it’s an important micronutrient, but large amounts can be toxic.”

A community of citizen scientists dedicated to tracking monarchs, known as Monarch Watch, creates an unprecedented opportunity to track survival and movement in the wild. As the monarchs migrate, citizen scientists will be looking for the tagged wings of the butterflies associated with the study. —CLAIRE WILSON

Read more about the project and how you can get involved at z.umn.edu/wingedroadwarriors.
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Growing enrollment and improving the student experience.

5 Big River Continuum
A new scientist-artist exchange links the first and last field stations on the Mississippi River.

6 Combating corrosion
A new enzyme-based approach could solve a pervasive problem.

7 The persistence of plague
New research looks at Soviet-era eradication efforts and implications for how to combat the disease.

10 Active learning in the lab
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CBS alumna Bernice Folz wants others to experience the gift of great education.

25 Itasca alumni weekend
CBS alums across generations converged at the station for a weekend in June.
A MESSAGE FROM THE DEAN

Bigger and better
Enrollment in the College is growing, and improvements to the student experience keep pace.

This fall more than 600 incoming undergraduates made their way to campus, many of them recognizable by their maroon and gold tie-dye Nature of Life shirts. This rite of passage hasn’t changed much over the years, but the student experience has in some important ways. Here are just a few examples.

In 2006, the College introduced the Foundations of Biology courses. The introductory biology courses for CBS students are premised on active learning. That means no lectures, lots of teamwork and a strong emphasis on empowering students to apply what they learn. The Foundations courses have since become a model for institutions all over the world. Science even awarded Foundations its Prize for Inquiry-Based Instruction in 2013.

We know active learning works, and research in our Department of Biology Teaching and Learning points out some nuanced ways this approach supports more equitable outcomes in STEM courses.

The courses are a signature part of the CBS experience for our students, but there was a disconnect when students moved from classroom to lab. The outdated spaces where they conducted research in Foundations courses meant that the principles of collaboration and creativity emphasized in the courses did not cross over to the lab bench. This fall, that all changed.

As you will see in the feature story for this edition of BIO, the new Active Learning Lab in the Biological Sciences Center provides students with a flexible space that has everything they need to design and carry out a wide array of experiments. There’s nothing else like it on campus.

The student experience continues to evolve in other ways, as well. We’ve made significant investments in career services and advising, expanded our offerings in the form of a new major in Cellular and Organismal Physiology and a new minor in Computational Biology, and made it a priority to expand scholarship support for our students.

In the last decade, the size of the incoming class has nearly doubled. Scholarships — especially four-year scholarships that provide consistent support — hadn’t kept up. When I became dean just over four years ago, one of my first priorities was to increase the number of four-year scholarships available to our students. We embedded that goal in the Campaign for the College of Biological Sciences, and I am happy to announce that as of this fall, we have created and awarded 114 four-year scholarships!

Even as we celebrate our accomplishments, we continue to work hard to ensure that our students have the best experience possible. We do this through our commitment to evidence-based teaching, the day-to-day efforts of our very dedicated faculty and staff, and a continued focus on training students to do science.

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Valery Forbes, Dean
College of Biological Sciences
PETRI DISH IS BACK!

Curiosity-driven conversations about how biology affects our lives and shapes our future

BE PART OF THE EXPERIMENT!
@ URBAN GROWLER BREWING CO.
6:30 p.m. Doors open
7:00 p.m. Panel discussion
CBS alums attend free!
Promo code: CBS
DETAILS: z.umn.edu/fall2019petridish

OCTOBER 9
Life as we don’t know it

The ability to create cells from scratch promises to answer fundamental questions about life and provide new pathways to treating cancer, tackling antibiotic resistance, cleaning up toxic sites and more. It could also give clues about the many forms life could take on other planets. Join us for a lively, unscripted discussion about the opportunities and challenges associated with synthetic biology.

Panelists include:

KATE ADAMALA, Assistant Professor, Genetics, Cell Biology and Development
ALAN LOVE, Professor, History of Science, Technology and Medicine
JEFF GRALNICK, Professor, Plant and Microbial Biology

NOVEMBER 13
Putting a price on biodiversity loss

Can better measurement of biodiversity along with better science linking biodiversity conservation to our own quality of life be used to slow or halt the rate of biodiversity loss? We’ll explore the new opportunities that scientific advances are generating along with the political and economic challenges involved in addressing biodiversity loss.

Panelists include:

JEANNINE CAVENDER-BARES, Professor, Ecology, Evolution and Behavior
STEPHEN POLASKY, Regents Professor, Applied Economics
PATRICK HAMILTON, Director, Global Initiatives, Science Museum of Minnesota
NEW & NOTEWORTHY

College welcomes largest incoming class to date

This September, 624 new College of Biological Sciences students made their way to campus. They were part of the largest incoming in the College’s history, nearly double the number of incoming students a decade ago.

“Demand for our programs remains strong, and the College’s reputation as a leader in biology education continues to grow as well,” says CBS Dean Valery Forbes. “We continue to focus on making the student experience the very best it can be, including with the opening of our new Active Learning Lab this fall.”

The incoming class includes 79 University Honors students, 12 student athletes and 16 international students from Asia, Africa and Europe. More than a quarter of the incoming class are students of color.

Researchers recognized

College of Biological Sciences faculty members Dan Voytas and Marlene Zuk were elected to the National Academy of Sciences earlier this year, one of the highest honors in the country for scientists in the United States. Eight of the 44 University of Minnesota faculty elected as NAS members since 1930 are affiliated with the College.

“The election of Professors Voytas and Zuk to the National Academy of Sciences is a well-deserved recognition of the impact each has had on their respective disciplines,” said Valery Forbes, dean of the College. “Their work — from cutting-edge gene editing of plants to substantially improve crops to advancing understanding of key evolutionary processes while providing profound insights into human behavior — is a testament to the incredible research happening in our College and at the University.”

Zuk is a professor in the Department of Ecology, Evolution and Behavior. Voytas is a professor in the Department of Genetics, Cell Biology and Development.

Research ties renewed with Norwegian universities

For more than a decade, researchers at the University of Minnesota — many of them College of Biological Sciences faculty — have built connections and collaborated with peers across the Atlantic through the Norwegian Centennial Chair Program.

Established in 2006, this multi-institution agreement brings together researchers from the University of Oslo and Norwegian University of Life Sciences with faculty at the University of Minnesota to collaborate on bioenergy, genomics and food safety research. All three institutions recently renewed the partnership, which will provide support for the program for an additional four years.

“The Norwegian Centennial Chair is an incredible opportunity that not only helps our faculty exchange ideas and research with colleagues around the world, but also opens doors for our undergraduate and graduate students to further their research efforts,” says College of Biological Sciences Dean Valery Forbes. “I look forward to seeing what the next four years of this program bring us in these key areas of scientific research.”

Among the current research efforts supported by the Norwegian Centennial Chair Program, CBS-affiliated faculty members Tim Griffin, Lincoln Potter and Daniel Bond are currently collaborating with Norwegian colleagues on projects focusing on topics ranging from antimicrobial resistance to cardiovascular disease. Future projects will continue building on key areas including robotics, sustainable energy and global health.

BIG BIO TURNS 25!

The field-shaping long-term biodiversity experiment at Cedar Creek Ecosystem Science Reserve celebrated a major milestone. The experiment continues to generate data and inspire new experiments. Learn more at about it at z.umn.edu/bigbio.
A trip down the Mississippi River is a study in extremes. At its northern point, it is ensconced in the protected old-growth forest of a state park. Its southern shores are dotted with oil refineries and industrial infrastructure. The water itself becomes progressively more polluted with runoff from agricultural and urban areas.

“I have made several recent trips to the outlet of the Mississippi River near New Orleans, starting my travels at Itasca in the boreal forest and ending in Louisiana bottomland on the same river,” says Jonathan Schilling, director of Itasca Biological Station and Laboratories.

“At Itasca, the river is hardly more than a stream with a footbridge you can walk across. At the other end near where it flows into the Gulf of Mexico, it’s wide and muddy with a heavily trafficked eight-lane bridge connecting one shore to the other,” says Schilling. “For all its contrasts, it remains shared water. There is a connection at a level deeper than words — it’s a cool thing — and it is worth exploring.”

The collaboration took shape over the course of the last year with a hand from the Weisman Art Museum at the University of Minnesota Twin Cities; Tulane University’s Bywater Institute, which runs A Studio in the Woods; and local and Native American community members and arts organizations near Itasca, including rural arts advocate Rebecca Dallinger.

“This exchange is about exploring the impact of human activities upstream through a creative dialogue between scientists doing place-based research and artists rooted in these very specific environments,” says Schilling.

The program, dubbed Big River Continuum, launched this September with a simple set-up: A New Orleans–based artist — Monique Verdin, member of Houma Nation — is spending a few weeks at Itasca learning about the place, the people and the science happening at and around the station. This winter, an artist from northern Minnesota — Karen Goulet, who is a member of White Earth Band of Ojibwe — will make the trek downstream to A Studio in the Woods. With Dallinger in a curatorial role, both artists are helping pilot the exchange with the goal to dial in something sustainable, fruitful and art-forward.

“This is not about adopting an artist’s medium to deliver a scientist’s message,” says Schilling. “We are untethering this dynamic to set it free as a collaborative. The Studio [in the Woods] has pushed this envelope already. There are some bold thinkers in our midst, and we think we can widen the conversation together.

“Ultimately, we hope that this partnership will contribute to a broader conversation about our relationship to the river — how we understand it and how we assign value to it,” says Schilling. “Art and science are two ways to build shared understanding of what is, as well as what could be. This is the essence of conservation.”

—STEPHANIE XENOS
COMBATING CORROSION

Disrupting bacteria’s communication pathways may thwart costly infrastructure decay happening just under the surface in harbors around the world.

Hundreds gather at the cusp of the Duluth-Superior harbor each day to watch as the iconic lift bridge rises and massive barges pass under on their way to the port. These enormous vessels captivate onlookers, but the real drama happens below the surface.

The barge and harbor infrastructure are under attack. Bacteria, algae and other organisms vie for space and frequently settle on steel structures. Steel makes an appealing home for these bacteria and other organisms, and their growth alters the steel’s surface. In severe cases the process, known as biocorrosion, can turn stately docks to sheets resembling Swiss cheese. The drama takes place in every harbor worldwide, and a $60 billion coating industry has developed to thwart it.

A coating that dominates the market is effective, but contains copper oxide. Heavy metals leach from the coating to keep bacteria from aggregating, but this also negatively impacts aquatic life in harbors. Despite these known impacts and harsh regulation on copper-containing coatings, no environmentally friendly and scalable alternative exists.

Mikael Elias, a member of the College’s faculty, reached out to Randall Hicks, a professor at the University of Minnesota-Duluth, after reading an article about ongoing research in the harbor. Hicks studies microbial communities in the in the Twin Ports and has worked for nearly a decade to address biocorrosion rates there. Elias saw a potential application for an enzyme — a molecule that drives chemical reactions — his lab recently modified. These enzymes prevent bacteria from communicating and grouping together. This creative approach could potentially stop bacteria in the harbor from grouping up on steel structures without negatively impacting aquatic life.

“Now [the enzymes] are so stable that we can use them in application fields that were not possible before,” says Elias. “Where the typical enzyme is too unstable to use outside of a test tube, our enzymes are so stable we can dilute them into paint.”

Hicks included coatings with the bio-engineered enzymes from Elias in his trials. He found that they outperformed others in the lineup to inhibit biocorrosion. Researchers continue to study how the enzymes thwart biocorrosion, including how enzymes impact surface-colonizing bacteria.

The potential to join a worldwide market with an environmentally-sustainable alternative is not lost on the researchers. The team recently patented the engineered enzyme and continues to work with industrial partners.

Hicks says, “The new coating offers another arrow in the quiver to battle biocorrosion.” —CLAIRE WILSON
Mention the Black Death and visions of overcrowded, 14th-century European cities teeming with rats come to mind. Despite the association of plague with crowded cities, the disease didn’t originate there. It first appeared in Central Asia’s rural areas. The bacterium that causes the disease is regularly found in flea and rodent populations in the region.

A new study by Ecology, Evolution and Behavior professors Susan Jones and Marlene Zuk details secret plague eradication efforts in the Soviet Union. The researchers explore why these measures failed and what that means for controlling the disease now.

A document from the World Health Organization in the mid-20th century claimed no sources of plague existed in the USSR following this campaign. Jones, a veterinarian and science historian, encountered this document a few years ago and knew this couldn’t be the case. With strong collaborations in place, she learned a bit of Russian and requested access to archives in St. Petersburg and elsewhere.

The bacterium that causes plague infects fleas that then bite their animal hosts, typically wild rodents. When conditions are right, infected fleas can bite domesticated rodents, pets, livestock and humans. Depending on the type of plague and treatment, infected humans die 35–95 percent of the time.

Beginning in the 1920s and lasting several decades, the USSR attempted to eradicate the disease. Pledges to “sanitize” landscapes and “liquidate” all wild rodents and fleas over thousands of square miles led to extensive scorched-earth campaigns. This included spraying DDT from airplanes, mobilizing tens of thousands of people to manually place poisons into rodents’ burrows and burning the landscape.

In the 1970s, the USSR turned away from complete eradication, instead opting to monitor and control flea densities. Complete eradication is not a plausible option to battle animal-to-human diseases like plague. Instead, monitoring disease buildup in nature and controlling its spread is the best option for preventing spillover to humans.

Ongoing research aims to increase understanding of the complex ecologies of the disease, including the bacterium, fleas and burrowing rodents. Zuk hopes to study how the social behavior of burrowing disease-harboring rodents will better inform on-the-ground surveillance efforts.

“The plague story is central to the globalization of our disease ecology histories,” says Jones, and provides powerful insights into how scientific discoveries and political influences can become intertwined. —CLAIRE WILSON
Research takes off at Itasca

Itasca Biological Station and Laboratories awards Seed-to-Root grants in an effort to expand research at the field station.

“Establishing a Forest Global Earth Observatory plot at the boreal-temperate ecotone”

PETER KENNEDY
Plant and Microbial Biology

Scientists know climate change holds the potential for lasting impacts on the distribution of ecosystems around the world. Here in Minnesota, however, how quickly the composition of forest ecosystems are changing from one type to another is not yet clear. Examining around 35,000 trees, Peter Kennedy hopes to find out.

“Despite excellent experimental work on the physiological responses of young trees, there has been little actual field-based quantification of the rate of change in tree composition occurring at the boreal-temperate forest ecotone,” he says.

“We are establishing this 16-hectare long-term forest inventory plot near the University of Minnesota Itasca Biological Station and Laboratories to better understand this tree composition change within a global context.”

Kennedy and his collaborators plans to identify and map the trees across the plot and use the data collaboratively with fellow researchers around the globe through an international network of similar research plots.

“Warming by worming: Significant control of soil temperature by invasive earthworms and vegetation”

KYUNGSOO YOO
Soil, Water and Climate

When gardeners put their shovels in the ground to turn over the first bits of soil in their backyard, they are likely to encounter an earthworm or two. While now commonplace, European earthworms greatly changed the makeup of soils in North America after native earthworms mostly died off during the Ice Age. With large populations across the state and country, Kyungsoo Yoo wants to know what impacts they have on soil temperature as they move through leaf litter and soil.

“We are hypothesizing that invasive earthworms substantially affect heat exchanges between the atmosphere and the soils,” says Yoo. “The expansion of earthworm populations resulted in removing or thinning organic litter layer that insulates the underlying mineral soils from the hot summer or cold winter temperatures. We thus expect to see that forest soils infested with invasive earthworms experience more extreme temperatures. Worming may significantly modify global warming.”

“Think globally, sequence locally: Enhancing research and teaching at Itasca Biological Station by establishing on-site long read sequencing capacity”

TRINITY HAMILTON
Plant and Microbial Biology

Trinity Hamilton launched a project using DNA sequencing technology to evaluate the microbes and fungi from tributaries into Lake Itasca. As lakes play a key role in carbon cycling, she plans to use a “MinION” DNA sequencing device to evaluate the varied sources of water to the lake, and what variations she may see in the microbes and fungi that may impact carbon and nitrogen levels.

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Some things old, some things new

The new College of Biological Sciences Conservatory will bring even more rare plants of the world to the people of Minnesota.

If you want to see plants from far-flung places, the College of Biological Sciences Conservatory is the place to go. The new Conservatory will open to the public in 2020 with some old favorites alongside some new additions such as the *Xanthostemon gugerlii* (pictured) from New Caledonia. “We’re focusing on plants from unique floristic regions with distinctive flora,” says Curator Lisa Philander. “Visitors to the new space will be able to see plants from Socotra and other spots around the Southern Hemisphere that they can’t see anywhere else.”

Learn more about the new Conservatory at cbs.umn.edu/conservatory.
CBS STUDENTS COLLABORATE IN THE NEW FOUNDATIONS OF BIOLOGY COMMONS JUST OUTSIDE THE ACTIVE LEARNING LAB.
This fall, the College opened the doors to a first-of-its-kind lab that gives students the space and support to participate fully in the scientific process.

BY STEPHANIE XENOS » PHOTOS BY JACKSON EDDY/A FRAME FORWARD
The Active Learning Lab will serve hundreds of students each semester, giving them access to the equipment they need to carry out all kinds of experiments. The lab represents a leap forward in providing all College of Biological Sciences students with an authentic research experience driven by their own curiosity.

“When students are immersed in the scientific process and participating in every aspect of it, we describe that as an ‘authentic’ research experience,” says Forbes. “We think this is important because students learn better by doing science rather than following a prescribed set of predefined steps as is typical in laboratory courses. Gaining authentic research experience is a hallmark of the CBS undergraduate experience and something that is hugely beneficial to our students.”

Learn more about this one-of-a-kind research space at: z.umn.edu/activelearninglab
STUDENTS CAN CARRY OUT A WIDE VARIETY OF EXPERIMENTS IN THE NEW LAB. THEY HAVE ACCESS TO ALL THE EQUIPMENT THEY NEED TO TEST THEIR HYPOTHESES.

“It’s a truly unique space designed to fuel collaboration and creativity. It provides students with everything they need to design and execute their own experiments.”

—VALERY FORBES
The recipients of the College’s 2019 Alumni Achievement Award and Emerging Leader Award made their mark in different ways, but both embody the very best of CBS.

**And the winners are ...**

The recipients of the College’s 2019 Alumni Achievement Award and Emerging Leader Award made their mark in different ways, but both embody the very best of CBS.

**STEVEN JACOBSEN**
Ph.D. Plant Physiology, ’93
Professor, Molecular Cell and Developmental Biology, Biological Chemistry
University of California, Los Angeles

Jacobsen is a world-renowned researcher in epigenetics at the University of California, Los Angeles. He is a member of the National Academy of Sciences and a Howard Hughes Medical Institute Investigator. He studies the epigenetic modification of the plant *Arabidopsis thaliana*.

**Professional aspirations:** “I hope that by the end of my career, gene silencing pathways in plants are understood at a deep level. I also hope that my former postdocs and students continue on in fruitful science careers, are happy and impart their love of science to future generations of students.”

**Point of pride:** “My record in training postdocs and placing them in academic positions.”

**Best memory from your time in CBS?** “The thrill of joining [CBS Professor] Neil Olszewski’s lab and feeling like I had the chance to really learn how to do basic research.”

**SARAH WEATHERMAN**
B.S. Microbiology, ’15
Graduate Student – MHA/MBA Candidate
University of Minnesota Twin Cities

Sarah Weatherman served as a post-baccalaureate fellow at the National Institute of Allergy and Infectious Diseases, where she helped develop a vaccine for the Nipah virus. She is currently pursuing her Master of Healthcare Administration and MBA degrees at the University of Minnesota Twin Cities and volunteers for the Phillips Neighborhood Clinic in South Minneapolis.

**Professional aspirations:** “My goal is to have a career that I can look back on and feel that I got up every morning and contributed to the world around me. I am personally passionate that healthcare is a right, not a privilege, and I hope I can continue to advance that idea through working with healthcare systems.”

**Point of pride:** “My winding journey to get to where I am today! ... There is no one right path, and I'm proud my path has been unique and successful.”

**Best memory from your time in CBS?** “Upper-level microbiology labs and courses. I met some of my best friends in those courses. I’m even going to be maid of honor at my Microbial Physiology and Diversity Lab partner’s wedding!”
SHIP SHAPE

CBS alum and former faculty member Bob Sterner keeps the Large Lakes Observatory on a steady course.

Standing on the deck of the Blue Heron, Bob Sterner (Ph.D. Ecology, Evolution and Behavior, ’86) looks at home. His knowledge of the boat is detailed and intimate. He knows each machine and instrument from many days spent on board. Sterner has sailed out of the Twin Ports on the 86-foot fishing-trawler-turned-research-vessel on dozens of research trips starting in the mid-1990s at the beginning of his tenure as a College of Biological Sciences faculty member.

As director of the Large Lakes Observatory (LLO) for the past five years, he’s spent more of his time on shore, but he remains deeply engaged in the organization’s research mission. “This is the only institution with a mission to study all of the large lakes of earth,” says Sterner. “Researchers associated with LLO have worked in lakes all over the world but Lake Superior is special, of course. It holds about 10 percent of the freshwater on earth, and it’s right at our doorstep.”

Even when he’s at his desk instead of on board, Sterner keeps track of the Blue Heron’s movements online using the Oceanographic Research Marine Tracker to the delight of the vessel’s crew. “I often check out where the vessel is on the lake,” he says. “It’s great!”

Lately, Sterner’s attention has turned to a mystery close to home: large blue-green algae blooms on Lake Superior’s southern shore. The blooms, which made headlines two years ago, are a new phenomenon as far as researchers can tell.

“You usually see them in more nutrient-rich lakes and Superior is anything but. There are these occasional thick blue-green algae blooms now, and people understandably want to know why.” Sterner notes that the lake is warming, which may be a catalyst. The verdict is still out, but Sterner and his students set sail this past summer to collect samples in search of answers. All in a day’s work at LLO.

— Stephanie Xenos
Bernice Folz (Ph.D. Biology, ’73) achieved a great deal over her decades-long career in technology and higher education. She received numerous accolades for her innovative approach to graduate education and her acumen as an administrator and educator. She earned a Ph.D. in science at a time when not many women did so. “Today we still need more women in science like Jane Goodall, Sally Ride and Rosalind Franklin to name a few,” says Folz. “Their achievements changed the world.”

Folz made her mark by developing a highly ranked graduate program in software at the University of St. Thomas (UST). For this and other accomplishments, she was the first woman admitted to the Minnesota Science and Technology Hall of Fame. She received the Outstanding Alumna Achievement Award from the University of Minnesota and was honored with the Distinguished Service Award from the UST. The list of honors goes on.

Folz, however, measures success by those she’s helped along the way. “Life is not about me, it is about what I can do for others,” she says. Folz has achieved her goal and then some. Thousands of students benefited from her efforts over the years, and that number will continue to climb. Folz established a fellowship to support College of Biological Science graduate students for years to come. She cites the outstanding experience she had as a CBS graduate student as one reason she chose to create the fellowship.

“We must also work toward making sure that anyone who is interested in science has a chance to contribute to the scientific world,” she says.

Folz took an unconventional path to a Ph.D. in biology, studying mathematics and business before embarking on a doctoral degree. “I was fortunate to have outstanding scholars as teachers in CBS,” she says, citing her advisor, Douglas Pratt, a longtime botany professor and beloved mentor. “I am forever thankful that Dr. Pratt took me on as one of his grad advisees in the Ph.D. program in CBS even though my undergrad and masters were in business and math,” says Folz. “He was a model for me when I became director of graduate programs in software at the University of St. Thomas.”

After spending her early career in the late 1950s and ’60s programming and designing business systems for UNIVAC Folz joined the UST faculty in 1978. Her love of learning translated to...
a graduate program in the emerging area of software engineering.

The program was one of the first with a curriculum that aligned theory and practice. “What was learned in the classroom was carried back to use in the workplace,” says Folz, who worked with industry to develop courses in tune with the rapidly evolving field.

“My background in science taught me to do what researchers do best and that is to seek new ways to help society,” says Folz. “IBM’s secret was to build a company around an idea, not a technology. That is what I did in developing the Graduate Program in Software Engineering — build a program providing lifelong learning to adult software engineers, no matter what the application, no matter what the platform, no matter what decade, and no matter who the users are.”

Though she retired from UST, Folz continues to teach and learn, and she’s keen to ensure that others have the opportunities she has had to advance.

“Albert Einstein once said, ‘only a life lived for others is a life worthwhile,’” says Folz. “My education enabled me to live a wonderful life — a life well lived and enjoyed. It’s a gift I worked hard for and the rewards have been great. I want to help other students experience the same through their education.” —STEPHANIE XENOS

“IN THE COMMUNITY

“I think of outreach as a responsibility to bring our publicly funded research into the community and to maybe reshape folks’ ideas about what being a scientist means. Market Science is an effective way to do that.”

—JOHN BENNING
CBS graduate student and Market Science volunteer

THERE'S STILL TIME TO MAKE IT TO THE MARKET!

Market Science volunteers continue to regale market-goers with science facts and fun at farmers markets around the Twin Cities through the end of October. Check the schedule of upcoming dates and locations at cbs.umn.edu/market-science.

COMING UP AT CEDAR CREEK

Cedar Creek hosts talks, nature walks, workshops, family programs, citizen science opportunities and more! Check out the full lineup of public programming throughout the year at cedarcreek.umn.edu/upcomingevents.
Field notes

Our field stations are a place for formative research experiences for students and a space for engagement with the public.

With the fairgrounds emptied of carnival rides and corn dog stands for another year, students back in class and fall activities in full swing, summer already seems like a distant memory. Even so, one particular event from this past summer remains vivid for me.

In June, the College hosted a gathering for alumni at Itasca Biological Station and Laboratories. I had the good fortune to be there to enjoy the brilliant scenery and experience the camaraderie of alums across generations reconnecting with the place and each other.

We celebrated the release of a cookbook compiled by the Itasca kitchen staff, sat under the giant white pine just outside the dining hall to listen to a brass band play polkas perched in the tree’s branches, learned about the fascinating world of fungi from station director Jonathan Schilling and spent time on the water and in the woods.

Itasca is a special place with special meaning for many CBS grads. Some of the College’s most steadfast supporters make Itasca a priority in their giving plans, and it’s easy to understand why. Whether through directed research, field biology courses, the Nature of Life program for incoming students or a combination of all of the above, bonds formed while at the station are a hallmark of the CBS experience. Lifelong friendships — and a few marriages — trace their roots back to the station.

Getting out in the field is a formative experience for our students, and both of our field stations — Itasca and Cedar Creek — serve a dual role of educating and inspiring curiosity about the living world.

“Visitors to our field stations encounter science in context in a way no museum or classroom can equal.”

If you are interested in learning more about how you can support this work, please get in touch. There are exciting opportunities to build capacity at Cedar Creek through support for the proposed Minnesota Ecology Walk and Root Tunnel and at Itasca through support for public engagement.

REEDE WEBSTER
Chief Advancement Officer
FY19 Fundraising Facts & Figures

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, 114 students have received four-year awards. Thank you to our generous donors!

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

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.

Distribution of funds

606 DONORS

Every gift matters!

$5.37M TOTAL FUNDS RAISED

DONORS

STUDENT SUPPORT

RESEARCH

PROGRAM SUPPORT

FACULTY AND STAFF SUPPORT

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CBS Snapshot: The Great Itasca Get-Together

This summer, alumni and their families made their way to Itasca to relive the memories.

The College hosted an alumni weekend in June bringing together alums and their families across generations with an affinity for the field station. They enjoyed nature talks, a launch party for the Itasca Come and Get It Cookbook, bonfires, gorgeous sunsets and even a polka performance in the towering white pine just outside the dining hall!
Monarch butterflies are heading to Mexico. Help send researchers, too!

This summer, CBS faculty member Emilie Snell-Rood and members of her lab reared, tagged and released several thousand monarch butterflies exposed to varying levels of sodium. The researchers look to better understand the impact of road salt on monarch migration. A few lab members hope to travel to the monarchs’ overwintering grounds in Mexico to spot butterflies, but they need your help to get there!

Support graduate students in the Snell-Rood lab. Make a contribution to the Monarchs to Mexico crowdfunding campaign at z.umn.edu/monarchstudy.