MTSU Science Building

MIDDLE TENNESSEE STATE UNIVERSITY

Our New Catalyst

MTSU's new $147-million science building takes teaching and research efforts to the next level

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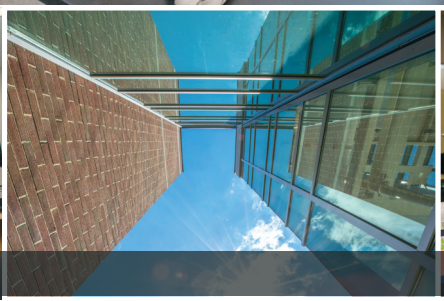


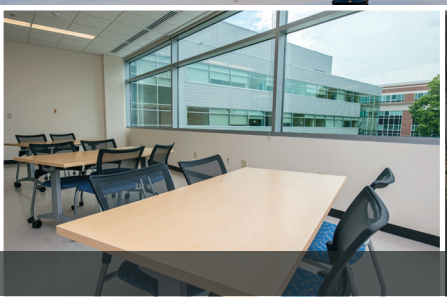
From the Ground Up

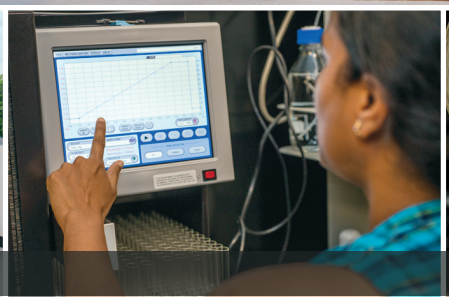
The new Science Building changes the game for research and learning.

The brand-new, state-of-the-art, $147-million Science Building opened to students in fall 2014.

With more than 250,000 square feet for teaching, faculty and student laboratory research, and collaborative learning, the new building is the biggest improvement ever for science education and research at MTSU and for the more than 13,000 students who enroll annually in biology, chemistry, and other science courses.

The following pages offer a look inside the new building and some perspectives from the past.





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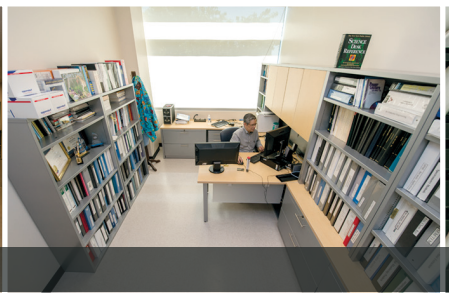
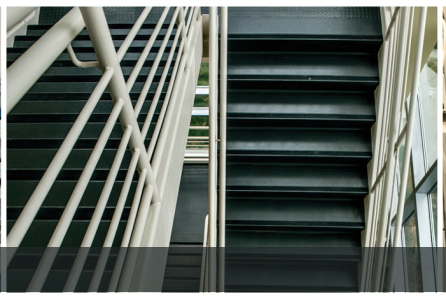
Functional by Design

The new Science Building at MTSU brings student-centered learning environments to the forefront of the educational experience in chemistry and biology. The design focuses on the creation of intellectual neighborhoods or communities of scholars that operate based on shared scientific pursuits rather than the traditional administrative model of departments.

Science has moved from a primarily discipline-specific approach to an increasingly collaborative, interdisciplinary, team-based philosophy, and the building is organized to best accommodate the way faculty and students work in groups for courses and research. Neighborhood wet-bench spaces offer a variety of shared instrumentation and support convenient for teaching and research; communal write-up areas and group discussion rooms are adjacent to faculty offices; and a variety of informal learning spaces promote relaxed collaboration.

An open, adventurous environment that encourages inquiry, collaboration, and discovery, the building's open circulation path brings in daylight and views of the courtyard, adjacent informal learning spaces, and glass-walled laboratories.

New types of experimental learning spaces combine low and high technologies such as advanced imaging and communication systems with sinks and movable tables for flexible curricular approaches, active, and participatory learning.


Thomas, Miller and Partners LLC, in jont venture with Hastings Architecture Associates LLC, served as lead designers of the facility. Turner Construction Company led construction.

Additional project team members included I. C. Thomasson Associates (mechanical plumbing electrical engineer); Structural Design Group (structural engineer); Einhorn Yaffee Prescott (laboratory); Littlejohn Engineering Associates (civil engineer); Hodgson Douglas LLC (landscape architect); Fire Protection Associates (codes); Terracon Consultants (hazardous materials, geotech); Palmer Engineering (surveyor): The Sextant Group Inc. (audio/visual, acoustical); Bliss Fasman Lighting Design (lighting); Architectural Energy Corporation (daylighting engineer); Allied Glass Experts (curtainwall); Rowan Williams Davies & Erwin Inc. (exhaust, noise, vibration and smoke evac.); Atlas Safety and Security Design Inc. (security); International Commissioning Engineers (commissioning).

Turner

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TMP
JOINT VENTURE

HASTINGS
ARCHITECTURE ASSOCIATES, LLC

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especially in the science, technology

Today is a great day for Middle Tennessee State University and for the entire state of Tennessee as we officially open this new and much-needed science building.

Attracting and growing jobs in Tennessee is directly tied to education, and by 2025, at least 55 percent of Tennesseans will need a certificate or degree beyond high school to find a job. Today we are at 33 percent, so our Drive to 55 initiative aims to remove barriers to a post-secondary education because, if we are not prepared to fill those jobs, they will go somewhere else.

We need more college graduates, especially in the science, technology, engineering, and math (STEM) areas. Graduates with STEM degrees are important to our state's ability to thrive and compete in today's global economy. And with more space to train these students—provided by this building—we will take big strides toward our goal of increasing the number of STEM graduates.

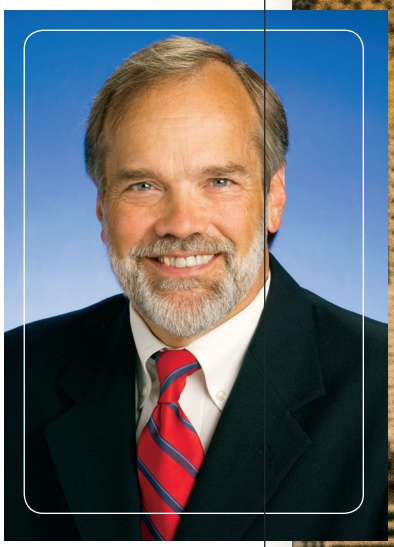
Middle Tennessee State University was founded more than a century ago as a normal school for teacher training. It has grown into a major comprehensive university—the No. 1 producer of graduates in the Tennessee Board of Regents system. It also boasts more than 100 graduate programs, several new Ph.D. programs, and an ambitious research agenda.

This new building represents a major investment by the state in this great university's second century of service and MTSU's ability to prepare and propel our workforce and economy.

Today, we are all True Blue!

Bill Haslam
Governor
State of Tennessee

It gives me great pleasure to represent the Tennessee Board of Regents at this Grand Opening ceremony for Middle Tennessee State University's Science Building.



This $147-million project represents one of the most significant investments ever made by the state of Tennessee toward the enhancement of science and technology education. TBR and its institutions understand well our responsibility to produce more graduates for the state's workforce, and this facility will help us enhance our system's already strong performance in this regard.

It is projected that this new facility will help MTSU increase the number of degree-holders in biology, chemistry, and other related fields by as much as 25 percent. Those graduates will help our state fill emerging and existing high-technology jobs and produce more science and math teachers for our K–12 schools.

This Science Building has been sorely needed for years and even held the distinction as the number-one capital project request of both TBR and the Tennessee Higher Education Commission. I congratulate Gov. Bill Haslam and the Tennessee General Assembly for moving this project forward for the betterment of higher education and the economy of the entire state.

My best wishes to MTSU as it begins to fully use this building to blaze new trails in science and technology for the benefit of the state and its citizens.

John Morgan
Chancellor
Tennessee Board of Regents

significant investments ever mad

Flip through the magazine to see the building grow.

Science graduates to fill high-tech

We take great pleasure in welcoming you to Middle Tennessee State University for the Grand Opening of our new Science Building.

This project was the number-one priority of the University even before my arrival as president 13 years ago. As the top producer of graduates for the Tennessee Board of Regents system and the Greater Nashville workforce, this $147-million Science Building is critical to our continuing efforts to provide more science graduates to fill high-technology jobs, prepare more teachers for math and science in K–12 schools, and enhance the economy of our region and state.

We appreciate the efforts of the executive and legislative branches of Tennessee's government that led to the inclusion of funding in the 2012 budget for the construction of the Science Building. Specifically, our thanks go to Gov. Bill Haslam, Lt. Gov. Ron Ramsey, House Speaker Beth Harwell, former House Speaker Jimmy Naifeh, and the entire Tennessee General Assembly, particularly our Rutherford County delegation at the time of approval: Sen. Bill Ketron, Sen. Jim Tracy, Rep. Joe Carr, Rep. Pat Marsh, Rep. Mike Sparks, and Rep. Rick Womick. Our thanks also to current House Rep. Dawn White.

We also thank former Murfreesboro Mayor Tommy Bragg, current Murfreesboro Mayor Shane McFarland and Mayor Ernest Burgess of Rutherford County for their strong support of this effort.

We also acknowledge the tireless work of friends, supporters, students, faculty, and staff in supporting this vital investment in the future of our University. And we also want to thank everyone involved in the planning, design, and construction of this project, including Turner Construction, for finishing under budget and ahead of schedule.

This state-of-the-art learning environment and research facility will inspire learning and thinking that will not only bolster our economy but improve the quality of our lives through innovation and imagination.

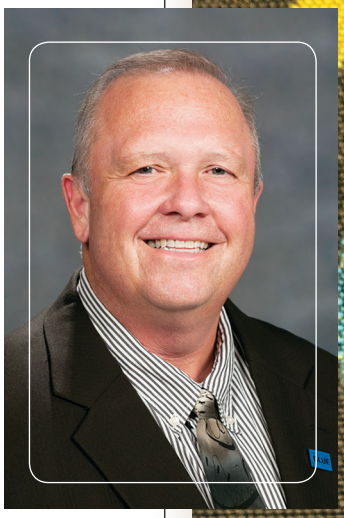
We will make history with today's formal opening of this long-awaited facility. But even greater accomplishments are ahead, as students and faculty use this incredible resource to build a better future for Tennessee—and the world.

True Blue!

Sidney A. McPhee
President
Middle Tennessee State University

MIDDLE TENNESSEE STATE UNIVERSITY

A building does not make a program or a college. What makes a program or a college is outstanding faculty, staff, and curriculum. Our college is committed to offering students a high-quality education; opportunities in innovative programs such as study abroad, internships, and undergraduate research; and invitations to engage in service on campus and in the community, regardless of what building we are housed within. That said, I am incredibly excited about this new building. It is a state-of-the-art science building and an outstanding learning environment for our students, where high-quality teaching and research are already happening.



Research is critical to the mission of the University and to the economic and social development of society. Research is intertwined with teaching, and it may be the best kind of teaching—students personally mentored in research projects. These opportunities create learning environments that foster creativity, produce strong analytical and leadership skills, and offer the student valuable hands-on experiences and essential skills for the future, ultimately creating productive and influential members of society. That's all happening inside this building today.

MTSU is a thriving, innovative research community. Now it includes excellent facilities to support faculty and students. In this new building, research in areas such as botanical medicine, among many other specialties, is making MTSU an emerging leader in research and graduate education in Tennessee.

As proud as I am of the ever-higher levels of research being conducted, I am equally proud of the outstanding teaching happening in our college, which benefits the more than 13,000 students who enroll annually in biology, chemistry, and other science courses. Our instructional emphasis includes a mammoth effort in recent years to redesign how we structure and deliver General Education courses in the college. With much effort and painstaking faculty review, these courses have been overhauled to increase attendance, engagement, and eventual success. Such efforts are perfectly aligned with President McPhee's Quest for Student Success, the Tennessee General Assembly's Complete College Act, and Gov. Bill Haslam's Drive to 55.

From this thorough rethinking of course design to the opening of this new building to the many other efforts and initiatives underway in the College of Basic and Applied Sciences at MTSU, we really mean it when we say, "We are True Blue!"

Robert Fischer

Bud Fischer
Dean
College of Basic and Applied Sciences

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A LONG and *Winding* Road

There are many people who deserve thanks and credit for MTSU's new Science Building.

The MTSU Science Building project was first placed on the TBR Capital Outlay Priority List in 1998. For several years, the project sat atop that list. MTSU's Master Plans identified the significant need for additional science space as far back as 1991.

Much of the credit for at long last securing state dollars to build the facility belongs to Rutherford County's legislative delegation. Sen. Jim Tracy chairs the STEM legislative caucus tasked with improving science, math, engineering, and technology education statewide. Sen. Bill Ketron is a member of the Senate Finance Committee. Together with local representatives Mike Sparks, Rick Womick, Pat Marsh, and Joe Carr, the group's synergy was key to the final push required to get funding approved. So was the effort of local mayors Ernest Burgess and Tommy Bragg, the strong push by TBR, and ongoing support from the local delegation, including current District 37 representative, Dawn White.

Ketron says that essential to the effort was gaining the support of people in positions of influence like House Speaker Beth Harwell and Lt. Gov. Ron Ramsey (both of whom are on the Building Commission), the state's three constitutional officers, and other key legislators including former House speaker Jimmy Naifeh, House finance committee chair Charles Sargent, House education committee chairs Richard Montgomery (past) and Harry Brooks (current), Senate finance committee chair Randy McNally, and Senate education chair Dolores Gresham.

"By the time we brought all those members down to campus and let them see the sorry state of disrepair on these buildings, things just came together," Ketron says.

Getting them to campus was the handiwork of President Sidney A. McPhee and State Rep. Carr, who hatched a plan to invite lawmakers to attend a men's basketball game in 2010 and to see the aging science facilities.

The trip was a turning point.

"I made the comment while in one of the labs that I thought I had burned one of the tables in the room with some acid one day while I was enrolled there in the early '70s," Ketron says. "It was quite a revealing conversation for the people in attendance."

The former dean of the College of Basic and Applied Sciences, Dr. Tom Cheatham, says that without Dr. McPhee's persistent, determined will to make the new Science Building a reality, it wouldn't have happened.

"He did a marvelous job of orchestrating all this and knowing which buttons to push and which not to push," Cheatham says. "And John Hood [former lawmaker and head of MTSU's Office for Government and Consumer Affairs], of course, is always giving him good advice in that respect."

Sen. Tracy also credits the leadership and determination of Governor Bill Haslam for sealing the deal.

"The governor understood how important it was to middle Tennessee and Tennessee as a whole," Tracy says. "Coming from a business background, he understood how important it was in the whole scheme of things to raise the level of science education."

"This has been a long-awaited, long-overdue project," said Rep. Joe Carr (R-Lascassas). "This is the culmination of a perfect storm—a governor committed to higher education, a General Assembly ready to see this facility come online, and a University striving to ensure this project came to fruition. It represents a great step forward in STEM education that the University and the Tennessee Board of Regents are expecting for the benefit of the entire state."

At right: Gov. Bill Haslam, in his State of the State address to a joint session of the Tennessee General Assembly in 2012, announced he would include funding for MTSU's Science Building in his budget proposal.

Sen. Bill Ketron ('76)
(R-Murfreesboro, District 13)

Rep. Mike Sparks
(R-Smyrna, District 49)

Above: President Sidney A. McPhee and State Rep. Joe Carr applaud the governor's announcement from the floor of the House chambers.

Lt. Gov. Ron Ramsey
(R-Blountville, District 2)

House Speaker Beth Harwell
(R-Nashville, District 56)

Rep. Joe Carr ('81)
(R-Lascassas, District 48)

Rep. Pat Marsh
(R-Shelbyville, District 62)

Sen. Jim Tracy
(R-Shelbyville, District 16)

Rep. Rick Womick
(R-Rockvale, District 34)

Rep. Dawn White ('98, '99, '02)
(R-Murfreesboro, District 37)

much of the credit for at long last securing state dolla

Our New Catalyst

With a new $147-million Science Building now open for business, MTSU prepares to take its science and research efforts to the next level.

Anyone familiar with the programs and infrastructure at MTSU knows that the new $147-million Science Building is as desperately needed as it is long overdue. And yet, when viewed in the greater context of other changes happening on campus, in Tennessee, and beyond—from an evolving University mission to the shifting of funding formulas, to the explosion of scientific frontiers—the timing couldn't be better.

This project had been the number-one priority of the University even before President Sidney A. McPhee's arrival 13 years ago. MTSU absolutely requires this building to continue its effort to provide Tennessee with qualified graduates for the workforce. About 80 percent of MTSU students will take classes in the new Science Building.

And this building is already helping produce more science graduates to fill high-technology jobs, prepare more teachers for math and science in K–12 schools, and enhance the economy of our region and state. It immediately makes MTSU more competitive for research projects, science scholarship, and entrepreneurial efforts.

MTSU's enrollment has almost quadrupled in the last 45 years but with no increased space for science education until now. Wiser-Patten Science Hall and Davis Science Building were built in 1932 and 1967, respectively, and have a combined total of nearly 117,000 gross square feet. The new building has more than 250,000 gross square feet for teaching, faculty and student laboratory research, and collaborative learning.

Rest assured, those two older buildings, which hold memories for generations of graduates now working in science fields and those who simply took science courses as undergraduates in them, will be put to good use. They are scheduled for significant renovations to bring them back to usefulness. They are to be emptied in January 2015 and ready for reopening by May 2016. About $20 million will be spent to get the job done.

A primary benefactor will be the Physics and Astronomy Department, which will take over the second and third floors and part of the first floor of Wiser-Patten. The Davis Building will house the Geosciences Department, which recently moved from Liberal Arts to Basic and Applied Sciences. Geosciences' departure from Kirksey Old Main will open space in MTSU's oldest and most beloved building for expansion of the Computer Science Department.

The Davis Building will also house centers that need additional space: the Center for Cedar Glade Studies and the Center for Environmental Education. Eleven new and a total of 18 advisors for the College of Basic and Applied Sciences will also be in Davis, and other spaces in the building will be used for research labs or future growth. These are just a few of the planned moves.

The new building strengthens MTSU's ability to pursue a **solid, focused research** agenda, and it significantly raises our profile as a **research institution.**

Wiser-Patten Science Hall and Davis Science Building are scheduled for significant renovations.

Consistent with our rich tradition of teacher training, the new Science Building is tailor-made for the science of education, designed to make learning and teaching more productive and compelling experiences. It follows ideas put forward by the nation's foremost science and technology experts with regard to what works best for effective science and science education teaching. It includes discovery-based group-learning environments and spaces for informal discussion and collaborative interaction, all vital for establishing and promoting an ultramodern science education and research community.

Speaking of research, space in the new building will meet MTSU's needs for many decades. Certain upgrades will be particularly transformative. In chemistry, for instance, modern fume hoods now allow experiments that were long prohibited in our older buildings. As a result, the new building strengthens MTSU's ability to pursue a solid, focused research agenda, and it significantly raises the University's profile as a research institution.

MTSU grants about 700 degrees in biology, chemistry, and related fields each year. Now that the new Science Building is in operation, that number is expected to increase significantly.

Science courses generate about 60,000 credit hours annually, and more than 13,000 students, majors and nonmajors, enroll in biology, chemistry, and physical science courses.

Courses now offered in the new building serve academic programs beyond general education, biology, and chemistry. Nearly all of MTSU's students will benefit from our much-improved science facilities.

MTSU's new Science Building will be the portal through which we enter a new realm of science and research activity and compete for its rewards.

Has it been a long time coming? Definitely. But now the science and research fetters have been broken, and it's time to get to work.

There's a lot of science to be done!

Flip through the magazine to see the building grow.

BUILDING BLOCKS

The new Science Building rests on a foundation of giving. Here is a look at several significant donations that supplemented state funding and helped build the new facility.

A generous bequest from Dr. Liz Rhea for the new Science Building will honor her and her late husband, Creighton.

"Dr. Rhea understands how long we have needed this science building and the impact it will have on our student body and our ability to compete as a university for research dollars," said President Sidney A. McPhee.

Rhea, an alumnus and Murfreesboro resident, is a longtime giver to the University. The open atrium area inside the new building will bear the Rhea name.

Rhea vividly remembers studying in the older science building when she was a student in the 1950s.

"I was in that Wiser Building day and night," she said. "I think now we can attract the brightest and best students—some of the best minds in the country. It'll make it a joy to go over to the new building and learn."

Born Liz Hay in Eagleville, Rhea attended Eagleville High and later Middle Tennessee State College, graduating in 1955. She then attended the University of Tennessee Memphis Medical School, obtaining a degree with a specialty in radiology.

A grade-school principal started her on her career path.

"He told me, 'Elizabeth, you're so smart. Why don't you go to medical school? And I said, 'What?' And he said, 'Just hitch your wagon to a star.' So I always said, when I grew up, I was going to go to medical school. I don't know what the people of Eagleville thought of a little girl saying that."

Rhea met her future husband, Dr. Creighton Rhea, when he taught her radiology class. Married in 1961, they moved the next year to Murfreesboro, where Creighton went to work at Murfreesboro Medical Clinic.

The couple moved away from the area in 1970 to work for the Veterans Administration Hospital. Luckily for Murfreesboro and MTSU, they retired and returned in 1992 to be closer to Liz's mother, who passed away in 2003. Creighton died in 2004.

Rhea's life back in Murfreesboro can be characterized in one word: volunteering. The consummate fundraiser, Rhea has campaigned for numerous good causes for many years, raising money that has changed lives and improved the quality of life in Rutherford County.

Rhea remains a tireless, enthusiastic supporter of MTSU and Murfreesboro.

"My blood runs blue," Rhea said. "I was a cheerleader in college here. And I'm always cheering on this University. Go MTSU!"

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A generous bequest from Dr. Liz Rhea for the new Science Building will honor her and her late husband, Creighton. The open atrium inside the new building will bear the Rhea name.

Flip through the magazine to see the building grow.

BUILDING BLOCKS

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Alee Clark

Gale Jefferson Clark

A Fitting Legacy

A state-of-the-art analytical chemistry laboratory in the new Science Building has been named in honor of Dr. Gale Jefferson Clark, whose passions were teaching and conducting research and who was instrumental in planning the new building.

"My husband loved teaching, and he loved using chemistry to benefit people," Alee Clark says. "He loved the analysis and detection of harmful pollutants."

Dr. Clark died in 2008. A gift from his estate will help fund the lab, which he helped plan.

Alee Clark previously made a gift of the couple's first house in Murfreesboro. The proceeds fund a graduate chemistry scholarship.

"It's a small house, but it's full of memories," she says.

Her husband joined MTSU in 1969, the year they married and he received his Ph.D. from Vanderbilt. Dr. Clark retired in 2006 after serving four department chairs, three deans, and six University presidents.

Alee chose to include funding for the lab in her estate as a way to help recruit the best students.

"That's the mission of the University, the quality of the education the students receive," she says. "Over the years, my husband saw MTSU grow in many ways—physically, academically, and professionally. I wanted to support that moving forward into the future."

She hopes the next generation will share her husband's passion. She recalls finding him at his desk in his home office at 3:00 a.m. and the hours he would spend meeting with technicians and calibrating new lab instruments when they were delivered to the University.

"MTSU was his heart, and he loved it," Alee says.

Dr. Clark brought that kind of drive and joy to every aspect of life, whether he was in the classroom, at the controls of a light airplane on a cross-country adventure, going camping, playing a musical instrument, or singing in the choir.

Time was precious to Clark, who underwent treatment for cancer while he was a college student. The doctors gave him little hope of surviving, but he wasn't discouraged.

"He didn't miss any school," says Alee. "He had great perseverance."

The radiation treatments that saved his life exacted a price: forty-seven years later, in 2008, his lungs were so weakened he could not survive treatment for a heart condition.

Dr. Clark never saw the new Science Building, but Alee is sure he would be pleased. The lab named in his honor is on the third floor.

Seeds for Growth

The late Doug Kanitz was a professor in Engineering Technology. A member of the Tennessee Solar Energy Association, he was presenting training seminars and certification courses on forward-thinking topics such as solar-powered vehicles as far back as 1999.

His widow, Bev, made one of the earliest verbal commitments to the science building, making a pledge years before the state approved funding to build.

Several years ago, Bev left her longtime home in Murfreesboro to be near her adult children, Kraig Kanitz and Karen Schneider, in Cincinnati. But she watched from afar with anticipation as the building has been built.

The University plans to name the new greenhouse in honor of Doug and Beverly. Previous gifts from the family established the Douglas R. and Beverly A. Kanitz Scholarship in Engineering Technology.

Solid Foundation

Funding for the new Science Building got a significant boost in October 2013 with a $1.5 million grant from the Christy-Houston Foundation.

Bob Mifflin, president of the nonprofit foundation, said at the time that the award reflects the organization's mission "to enhance the quality of life in Rutherford County with an emphasis on healthcare."

"It's the most important building, I think, that has ever been built on that campus," Mifflin told MTSU News and Media Relations. "The Science Building is going to be involved with nursing students, with pre-med students, physical and occupational therapy students, and others. All of that is very much health-related."

The Christy-Houston Foundation was established in 1986 after the sale of Rutherford Hospital. With its Science Building grant, the foundation has contributed more than $8 million to the University over the years for projects such as the Cason-Kennedy Nursing Building, the Tennessee Center for the Study and Treatment of Dyslexia, Student Health Services, Project Help, and nursing-related scholarships.

"The Christy-Houston Foundation thinks there is no organization or business more important to Rutherford County than MTSU," Mifflin says.

The Perfect Match

Gayle Duke ('65) helped Neil Armstrong reach the moon. Now her love for MTSU will help generations of students who will study in the new Science Building reach for the stars.

Duke and her husband, Dwayne, are including the University in their estate. It will endow scholarship funding in CBAS for students who, like Gayle, are the first in their families to go to college.

Duke understands the value of a degree in the sciences. After graduating with a degree in mathematics and the experience of taking the first computer science class ever offered by the University, Gayle joined IBM in Huntsville, Ala., where NASA was taking the first steps toward the moon.


Gayle and Dwayne Duke

"President Kennedy had decided we were going to the moon. It was exciting—such a special time," Gayle says.

She recalls working on an Apollo flight control computer with 16 kilobytes of memory to help guide the moon capsule on its round-trip journey of more than 475,000 miles. (Today's smartphones have up to 32 gigabytes of capacity.)

During her career, she worked on Skylab (the first U.S. space station), Spacelab, and the space shuttles.

Other major commitments to the Science Building have come from **George** (deceased) and **Charlotte Gardner**, **Clara Todd**, **Dr. Dan** and **Margaret Scott**, **City of Murfreesboro**, **Rutherford County**, and the **Rutherford County Industrial Development Board**.


Flip through the magazine to see the building grow.

The Right Recipe

A baker's dozen look at standout research efforts at MTSU

MTSU is transitioning from a primarily undergraduate institution to a doctoral research university with significant research activity. The following is a representative list of researchers whose important work will now either be housed in the new Science Building or benefit from the additional space and flexibility.

Traditional Approach

MTSU's collaboration with a Chinese botanical garden bodes well for the health of a nascent Tennessee industry

MTSU already has some very promising new centers of research. One example is the Tennessee Center for Botanical Medicine Research (TCBMR), headed by Dr. Elliot Altman, who also directs the Ph.D. program in Molecular Biosciences, and China native and MTSU research assistant professor Iris Gao. TCBMR has an exclusive partnership with the foremost botanical garden in China to do analyses of thousands of traditional Chinese plant extracts to screen them for anticarcinogenic, antiviral, or antibacterial properties that could lead to the development of advanced pharmaceuticals. An analysis of 52 plant extracts recently provided by the garden identified 29 with promising results, including 12 with anticarcinogenic activity, eight with promising anti-inflammatory activity, and one that may be useful in the treatment of diabetes. This set of 52 extracts is in addition to almost 40 results identified last year that show promise in the treatment of cancer, viral infections, and other ailments.

Ginseng, a popular over-the-counter supplement used to boost the immune system, was one of the first herbs from traditional Chinese medicine to be widely used. Those suffering from colds or flu and those whose immune systems are suppressed, such as cancer patients, are primary users of ginseng. In November 2013, state and University officials announced the MTSU Ginseng Initiative to grow and harvest the plant at the 438-acre School of Agribusiness and Agriscience Experiential Learning and Research Laboratory. "This is a great opportunity," said alumnus and state senator Bill Ketron (R-Murfreesboro) at the time of the launch. "It is up to us to take it to the next level. We can make this a statewide cash crop." MTSU and the Chinese botanical garden recently extended their pact through 2021, securing MTSU's worldwide rights (excluding China) to patent and market products developed through the partnership. The partners agreed to a 50–50 split of any profits from the collaboration.

A Fine Grasp

Dr. Daniel Erenso, associate professor, Physics and Astronomy, uses an experimental technique that enables him to "grasp" individual red blood cells (RBCs) with a laser beam to study morphology and elasticity by measuring their responses to linear and rotational deformations. What's the upside? Abnormalities in RBC shape or flexibility, which are caused by genetic mutation, can result in sickle cell (SC) diseases. The prevalence of these diseases in the United States is approximately one in 5,000. The average life expectancy of individuals with SC diseases is 42 years for males and 48 years for females.

The Spill Doctor

One MTSU professor uses spiders to find truth in the ashes of Tennessee's worst environmental disaster

In early 2009, Dr. Ryan Otter (Biology) stood awestruck on the banks of the Emory River in Roane County. What two months earlier had been a serene fishing alcove now looked like a lunar landscape or a present-day Pompeii. Under his boots, where there should have been vegetation, there was gray sludge. And the water in the alcove was simply gone, displaced by wet fly ash, a thick chemical stew that had spilled into the river when an earthen retention pond ruptured at the TVA Kingston Fossil Plant.

The scope of the spill was unlike anything Otter, an environmental toxicologist, had ever seen. It was also unlike anything the United States had ever seen. The slurry blanketed everything in its path, pushing homes off foundations, choking two tributaries of the Tennessee River, and burying a 300-acre ecosystem. For the people who lost their homes, the event was a life-changing disaster. But for the area's quieter (and far more numerous) residents—the water and land animals—the prognosis wasn't so clear. Despite the ubiquity of fossil fuel plants worldwide, Otter says, there had been very little research on fly ash, a byproduct of coal combustion that contains trace amounts of many potentially dangerous elements including arsenic, lead, and mercury.

Weeks after the spill, Otter joined a coordinated effort of several agencies to answer a slightly different version of his gut-level question: Is this an environmental catastrophe? He found the answer in an unexpected place, and that answer surprised everyone.

continued on next page

H_2O and Go!

MTSU's "Davy Crockett of science" travels from ocean to ocean on only sun and water

Though the sun is 93 million miles away, its light—solar energy—travels to earth in a mere eight minutes. Most of the earth's surface is the source of another continuously renewed cycle of energy—H_2O.

Sun and water. Both are essential to life. And both are relatively free and abundant. Dr. Cliff Ricketts, a longtime School of Agribusiness and Agriscience faculty member and an alternative fuels researcher, has a dream that one day people will drive their vehicles using only the natural energies of sun and water. He's worked for 25 years to figure out how to make that dream a reality.

"My whole passion is sun and water," says Ricketts, a farmer who fashions himself a modern-day Davy Crockett of science, or "frontiersman with energy."

In March 2013, Ricketts and a team of current and former students made news nationwide when they successfully drove a modified Toyota Prius from the Atlantic at Tybee Island, Georgia, to a Pacific beach near Los Angeles—a five-day, 2,600-mile driving expedition—powered exclusively by hydrogen made from sun and water. Two hydrogen storage tanks attached underneath the car (along with tanks added to the backseat and hauled by a trailer) equipped Ricketts and team with the fuel necessary to complete the coast-to-coast trip.

"Putting a man on the moon has more 'wow' factor," Ricketts said at the end of the long and successful journey. "But as far as helping people for hundreds or maybe thousands of years to come, I think this is planting seeds that will help [hu]mankind."

Planting Seeds

Cedar glades, where limestone bedrock occurs near or at the surface and makes it impossible for trees to grow, are endangered ecosystems. Globally unique, they are found primarily in middle Tennessee. But because of the rapid growth of Metro Nashville, an estimated 50 percent of cedar glades have been destroyed by development. Plant communities of highly specialized species, many of which are found nowhere else in the world, have been destroyed along the way. Drs. Jeffrey Walck and Siti Hidayati—a husband-wife team of plant ecologists—are focused on restoration ecology—attempting to restore glades that have been disturbed or destroyed. Hidayati recently went to her native Indonesia to conduct research of a different kind as part of a Fulbright U.S. Scholar Program faculty award. Hidayati, fellow professor Agus Susatya, and two students traveled to Sumatra to observe rafflesia, a parasitic flowering plant that is rare and threatened.

Flip through the magazine to see the building grow.

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When analyses of toxin levels in fish proved inconclusive, he knew he needed a different animal—something whose diet was more closely connected with the fly ash. Then he remembered his Ph.D. work with researchers from the Environmental Protection Agency, who used a commonly found spider to measure contamination at polluted sites. The spiders are ideal indicators, Otter says, because they have high fat levels that store toxins.

The spiders, known as long-jawed orb weavers, are easy to find on any riverbank in the country. Shy and harmless, they hide in trees near the water during the day, and at night they spin webs to catch mosquitoes, black flies, and other bugs that live in and feed on sediment. With the help of two students, Otter spent two days on the river, shaking tree branches and bagging several hundred spiders, which he sent to a lab for chemical analysis.

Otter says he tries to conduct research with no expectations about the outcome. But when the lab results came in, he was as shocked as anyone. The spiders tested negative for every toxin but selenium—levels of which, while concerning, weren't "off the charts," he says. Further field and controlled studies supported his initial findings. Apparently, the other toxins had bound with carbon in the fly ash and settled, uneaten, on the river bottom.

While media images of the Kingston site were terrifying, the spiders told a more accurate story. Because they bridge the ecosystems of river and land, says Otter, spiders reveal more than most animals can.

"All fish can tell you is the impact on fish . . . and how contamination moves through water systems in one way," he says. "But how is that contamination impacting things on the land? Fish can't really help with that."

Long-jawed orb weavers aren't the only creatures that eat aquatic bugs, he says. So do birds and bats, which then become part of the terrestrial food chain. "So these spiders are really cool indicators," Otter says. "They can tell a story about what's going on in the water and how much is leaving the water to come onto the land."

Thanks in great part to Ryan Otter, there's no longer a dearth of research on the environmental effects of fly ash. And while his work on the Kingston spill site is complete, he's just beginning research with long-jawed orb weavers, which he considers invaluable but overlooked subjects in the study of food-chain dynamics. "They can tell a huge story that typically has not been told," he says.

As Good as Gold

Dr. Charles Chusuei's technology could transform patient care in emergency rooms and health centers worldwide

As with most scientific research, discoveries with big applications often boil down to thinking small. Really small. Yet it also involves the detection of something one can find a bottle of in almost every home—hydrogen peroxide. It turns out that bubbling stalwart of home-based healthcare is also a natural byproduct of the biochemistry of all living organisms. The ability to monitor hydrogen peroxide on a molecular level has a host of practical applications in fields as diverse as healthcare (early cancer detection) and food service (spoilage detection).

As a result, researchers have developed a variety of nanotech-based sensors. For the most part, those technologies have used sensors dependent on carbon nanotubes (CNT) coated with oxides derived from precious metals—gold, palladium, ruthenium, etc. As the word "precious" suggests, it's not cheap to use such metals.

Dr. Chusuei found that the expensive way to do things was hardly the only way. In an effort to establish a cheaper biosensing material, Chusuei turned to zinc. An earth-rich element, zinc is much more abundant and, therefore, cheaper than the precious set. But in order to establish it as a viable substitute, Chusuei and his team first needed to control the shape of the ZnO compound itself. (The more complete the coverage by the ZnO of the CNT, the better the sensor.)

"It was a lot like the fairy tale 'Goldilocks and the Three Bears,'" Chusuei says. In the end, working the ZnO into its ideal shape required many things being "just right." It required, among other things, finding just the right temperature (90 degrees Celsius) and pH (7.365) of the solution in which the suspended nanoparticles were formed as well as establishing just the right amount of time for sonication (the application of sound energy to agitate the solution).

With the bulk of the research completed—and with the right balance struck—it's actually a rather simple procedure to replicate, but as Chusuei's patent application shows, it wasn't an obvious one. The real-world potential of the research has Chusuei and his students excited. The cheaper the materials, the more widespread the possible application of the technology.

Cancer is not the only affliction potentially addressed by the research of Chusuei and his students, nor is hydrogen peroxide the only substance detectable. Another vein of inquiry includes the detection of lactic acid, a marker for anaerobic respiration (the presence of which can indicate that a patient is not breathing well or getting enough oxygen). Such sensors could detect signs of physical distress that show up well "before changes in heart rate or blood pressure would be registered," Chusuei points out.

Better by Design

Sustainable design and construction strategies implemented on this project include the following:

Vegetated open space has been preserved and designed to complement the surrounding campus. Along with fewer parking spaces and pervious concrete pavement, this measure aligns with MTSU's rainwater management plan.

Several mature trees were preserved, and native drought-tolerant species were added during construction. This not only reduces the need for extended irrigation but also provides shade for outdoor activities.

High-efficiency plumbing fixtures were installed, resulting in a projected reduction in potable water use of more than 33 percent below basic code requirements.

During construction, almost 93 percent of on-site generated waste was diverted from the landfill. Continuing this trend during occupancy, recycling containers have been placed throughout the Science Building in line with MTSU's campus-wide initiative.

More than 20 percent of the materials used in the construction of the facility contain recycled content. More than 25 percent of materials and products were extracted, harvested, recovered, or manufactured within 500 miles of MTSU.

Indoor air quality was managed during construction according to a project-specific management plan. Materials such as paints, sealants, flooring, and composite wood products used indoors were selected to reduce or eliminate the release of noxious fumes after installation.

The building maximizes outdoor views and natural daylight. The building's orientation provides less solar exposure on the east and west than on the north and south, which helps manage unwanted solar heat gain.

Flip through the magazine to see the building grow.

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Patterns of Mimicry

Dr. Andy Brower works to unveil the evolutionary history of butterflies

At an age when most kids were sitting on the family room floor watching Captain Kangaroo, Andy Brower was running across the green hills of Trinidad, watching his parents collect butterflies. Both were renowned entomologists: his mother, Jane, conducted groundbreaking research on butterfly mimicry, the protective adaptation by which one species develops the markings of another; his father, Lincoln, built on her research and also received acclaim for his study of the unique migratory pattern of the monarch butterfly. The scientific term "Browerian mimicry" was named for them. ("My parents were high school sweethearts," Brower says. "Nerdy, bug-collecting sweethearts.")

By age seven, Andy had tagged along on several research trips to Trinidad and, shepherded by graduate assistants, amassed his own "little-kid butterfly collection" of brightly colored tropical species.

Now, Dr. Brower is a renowned entomologist in his own right. A graduate of Yale and Cornell, he conducted postdoctoral research at the Museum of Natural History and the Smithsonian Institution, and he has published more than 60 peer-reviewed articles and become an internationally recognized expert on butterfly evolution. In 2006, he left Oregon State University to join the biology faculty at MTSU.

One of Brower's advantages over his parents is technology they didn't have that allows him to study butterflies at the chromosomal level. Over the past 20 years, he has been piecing together an evolutionary history of a group of South American butterflies, studying their DNA to figure out how certain mimetic patterns developed over time in that continent's diverse geography. Did those patterns stay essentially the same, he wondered, or did they change—and what role did genetics play in the process? He hypothesized that the butterflies evolved their wing patterns independently and "mimicked" one another many times in different areas. When he began the research, he says, "The access we had to the genome was pretty limited. It's much broader nowadays, but subsequent research has largely borne out what I said."

Brower has secured more than $1 million in external funding for his research. But he and other researchers are playing beat the clock because thousands of species of plants and animals are threatened with extinction each year. "There are too many people, the climate is changing, and it's an ecological catastrophe for most other living things in the world right now," he says. "And as countries like China and Brazil become more economically advanced, it speeds up the destruction of natural resources—they get whittled down to little national parks and places like that." The next few decades will be the most critical in history for understanding and preserving biodiversity, Brower says, and that requires coordinated, systematic research.

To promote that collaborative mission, Brower has added his expertise to the Tree of Life Project, a Web-based "family tree" charting genetic interconnections among all living things. Scientists and nature enthusiasts around the world have contributed to 10,000 Web pages, each devoted to a different group of plant or animal, from tyrannosaurs to fungi. (Thanks to Brower, it includes more than 40 varieties of *Heliconius* butterfly alone.) It's an ambitious undertaking, a blueprint of the evolution of life on earth.

Unlike applied science, whose goal is problem solving (often through the development of marketable technology), basic science has no agenda beyond furthering understanding of the natural world.

Certainly applied science is built upon that understanding: as Nobel prize–winning astrophysicist George Smoot once noted, "If we only did applied research, we would still be making better spears." But as academia pushes the more lucrative applied side, Brower says he feels fortunate to do what he does for a living. "My work is like art, in a sense, and my artistic medium is that I generate stories about the evolutionary history of butterflies." When he tells those stories well, he doesn't just help people understand biodiversity—he gets them excited about it. Then, perhaps, they'll be motivated to preserve it.

Vanishing Giants

Dr. Brian Miller investigates the disappearance of one of the region's strangest looking animals

Devil Dog. Ground Puppy. Snot Otter. Tweeg. Hellbender. These are just a few of the nicknames associated with *Cryptobranchus alleganiensis alleganiensis* (the Eastern Hellbender) and *Cryptobranchus alleganiensis bishopi* (the Ozark Hellbender), two subspecies of North American giant salamander, one of the largest amphibians in the world and the specialty of Dr. Brian Miller, professor of biology.

After receiving his master's in biology from the University of Missouri and a Ph.D. in zoology from Washington State University in 1989, Miller came to MTSU to work specifically with hellbenders. "The habitat looked promising for hellbenders," he says as he recounts how he had no trouble finding the creatures in 1991 in the Duck, Little Duck, Collins, Buffalo, and Calfkiller Rivers. Now, after researching almost every foot of water from the Duck River to the Normandy Reservoir, Miller hasn't been able to find the creatures. "Almost all of the individual hellbenders we collected, marked, and released were older, larger, and sexually mature," Miller says. "We think that in areas where we cannot find young individuals, it is because they aren't reproducing well." The die-off has happened quickly, and alterations in the water quality and stream habitat may account for the changing population. "Pollution, agricultural run-off, or disease may all account for the decreasing populations," Miller says, "and we're just trying to get a better feel about what might be happening."

According to Miller, hellbenders used to be easy to find, and in the past, people harvested the creatures for pets or for science class dissections. "I had snakes, lizards, and salamanders as pets," Miller admits. "But it's a different time now. Since I began my work at MTSU, my views on owning wildlife as pets have changed." He says if a previously easy-to-find group of animals is disappearing, it should be a cautionary tale. "These are the largest salamanders we have that live in the clear, clean water of streams," Miller says. "If they're dying out, there is some kind of environmental problem that we need to investigate."

"Just as we try to protect our cultural heritage—Stones River Battlefield, Oaklands Mansion—I think it is also important to preserve our natural heritage. Future generations deserve the opportunity to visit local streams and see a diversity of wildlife and not just those species tolerant of more polluted or disturbed waters."

Connecting the Dots

MTSU's new chemistry chair sees big things in small particles

New chemistry chair Dr. Greg Van Patten was awarded $120,000 from the National Science Foundation to prepare and study new kinds of semiconductor quantum dots. A researcher of these small particles since 2005, Van Patten is among many in the scientific world who believe these quantum dots may be key factors in treating cancer or curbing the energy crisis, among other things. According to an article on Patten in a publication produced by Ohio University, quantum dots "have the capability to play a role in biomedical-imaging and hyperthermia treatment of cancerous cells." Van Patten is specifically interested in implications for solar energy conversion—from lighting to digital display to energy to biomedicine to quantum computers.

Flip through the magazine to see the building grow.

Remembering the Past

The new Science Building occupies ground where memories were made

MTSU's new Science Building was built on the former site of four dormitories that hold cherished memories for many alumni.

Wood Hall was a women's residence built in 1964 and named for prominent alumnus Randall C. Wood ('41), founder of Dot Records and creator of Gallatin-based Randy's Record Shop, which grew to become the world's largest mail-order record business. Wood gave a generous gift of $40,000 in 1961 that led to the drafting of a charter by alumnus and Rutherford and Cannon County chancellor Whitney Stegall ('37) for the Middle Tennessee State College Loan, Scholarship, and Development Foundation, the University's first fundraising unit and a precursor of the Development and Foundation Office now housed in Wood-Stegall Center.

Felder Hall was a women's residence also built in 1964 and named for Evelyn Felder, a house mother during the '40s. The fall 1965 *Mid-Stater* reported that Felder, who came to campus in 1946 as director of residence halls, "endeared herself to hundreds of young Raiders and Raiderettes, as she was unexcelled in playing the mother-away-from-home."

Gore Hall and Clement Hall were men's residences built in 1965 and named for former U.S. senator and MTSU alum Albert Gore ('32) and former governor Frank Clement. Gore's election to the U.S. Senate in 1952 and Clement's election as governor the same year are considered major turning points in Tennessee political history, shifting power in the state away from longtime Memphis political boss E. H. Crump.

Memorial plaques have been placed at the site of the new Science Building to commemorate the dormitories and those whose names they once bore.

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Going Retro

A retrofit wheel-hub motor developed at MTSU could cut gas consumption in half

MTSU has partnered with two Turkish universities to pursue groundbreaking automotive research and development surrounding plug-in hybrid technology developed by Dr. Charles Perry. MTSU has signed a letter of intent with Meliksah University and Firat University for an academic and industrial partnership to further develop Perry's retrofit wheel-hub motor. "Turkey is like the Detroit of Europe," said Dr. Andrienne Friedli, director of the Center for Advancement of Research and Scholarship. "Many European automobile companies manufacture cars there, and because of the high price of gasoline, people in the region are already spending $1,000 to retrofit their cars to use cheaper fuels."

Perry has gotten international attention for his technology, which has the potential to cut a vehicle's fuel consumption by half or more by turning it into a hybrid powered by gasoline and electricity. Perry invented a novel method of converting a standard gasoline-powered vehicle into a plug-in hybrid that uses a combination of gas and electricity with minor alteration of the rear wheel hub. A wheel-hub motor is just that—a motor attached, or retrofitted, into the rear wheel structure of a vehicle. Perry's motor can be used on passenger cars, light trucks, and fleet vehicles to conserve fuel and reduce consumption as much as 50 percent. Perry said the competitive advantage of his new motor is that "We don't cut, weld, or modify; we just bolt on this motor to the rear wheels of the vehicle." The motors provide electric traction to the vehicle from energy stored in a battery, thus reducing the amount of fuel used by the engine. The battery can be charged at an electrical outlet and is also charged during braking, when the wheel-hub motors are in regenerative mode.

TEACHING SPOTLIGHT

Cementing a Reputation

The Concrete Industry Management Department keeps its grads in the mix

Successful students who graduate from MTSU's first-of-a-kind M.B.A. program with a specialization in Concrete Industry Management (CIM) will have the background for active careers in the global, high-growth, science-driven concrete industry.

The University's then-unique undergraduate CIM program began in 1996 as part of an effort to foster sustainability and a deeper institutional memory in an industry crucial to the global economy but in which skills have traditionally been passed from one generation of workers to another—even among those with advanced degrees—through on-the-job experience, not university classrooms.

The business "is still a good-old-boy industry on a local level, but the ready-mix truck is only part of the end product," says CIM chair Heather Brown. "The cement industry is an international powerhouse."

MTSU's CIM Department is a powerhouse as well, especially when it comes to research. The program works with companies on projects like determining if a Tennessee-mined kaolin clay is suitable for concrete once mined, burned, and crushed into metakaolin; investigating the long-term durability and bond strength of thin overlay systems for bridge decks and highway applications; comparing different curing methods and products for pervious concrete to determine if plastic sheeting can be eliminated; conducting testing on three manufactured fibers and one recycled fiber for use in pervious concrete to increase freeze/thaw and abrasion resistance; and validating strength and absorption benefits of a colloidal silicate densifier for interior polished floors. Importantly, much of the research produced by CIM is completed by undergraduate students and in intervals that match the speed of the ever-evolving concrete industry.

The program recently received new grants from the Tennessee Department of Transportation (TDOT) totaling more than $200,000 with Dr. Zhifu Yang and Dr. Marcus Knight as principal investigators. CIM plays an important role for TDOT in projects such as gauging the life expectancy of roads and bridges and selecting the correct concrete to use on transportation projects. CIM also investigates new materials to be used on certain projects.

"It's pretty unusual nationally to see students involved in state transportation projects like this," says College of Basic and Applied Sciences dean Bud Fischer. "It allows our students to do hands-on research activity, which is also important for the state."

Those Who Can, Teach

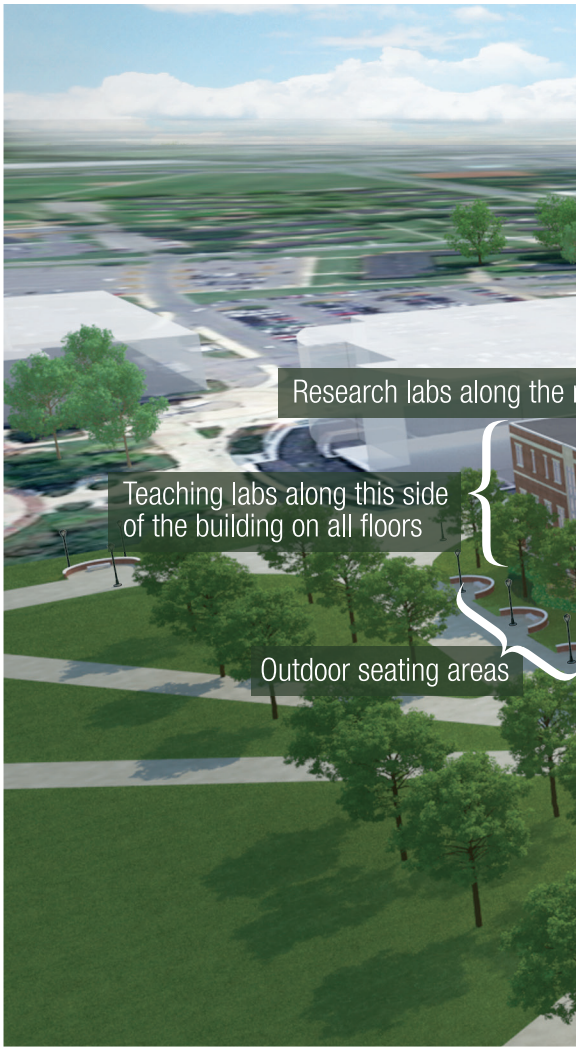
Bud Fischer, Dean of the College of Basic and Applied Sciences, believes that research is critical to MTSU's mission and is also critical to the economic and social development of society. Often overlooked, Fischer says, is that research is intertwined with teaching. In fact, it may be the best type of teaching, where a student is personally mentored on a research project. It is in these situations where MTSU creates learning environments that foster creativity, produce strong analytical and leadership skills, and provide students with valuable hands-on experiences and an essential skill set for the future—ultimately making alumni productive and influential members of society. All of this is happening on a daily basis in the new Science Building.

Concurrently, MTSU's instructional emphasis has recently included a mammoth undertaking to redesign how the University structures and delivers some General Education courses in which too many students were failing. With much effort and painstaking faculty review, these courses have been overhauled in an effort to increase attendance, engagement, and eventual success.

At the heart of course redesigns in the College of Basic and Applied Sciences is sound pedagogical practice that shifts the nature of the teaching/learning enterprise—making it more active and learner-centered, with the primary goal of changing passive note-takers into active learners in order to enhance their chances for success. Science has moved from a primarily discipline-specific approach to an increasingly collaborative, interdisciplinary team-based philosophy; and as such, this new building's design concept is organized to best accommodate the way faculty and students now work in groups, for both courses and research.

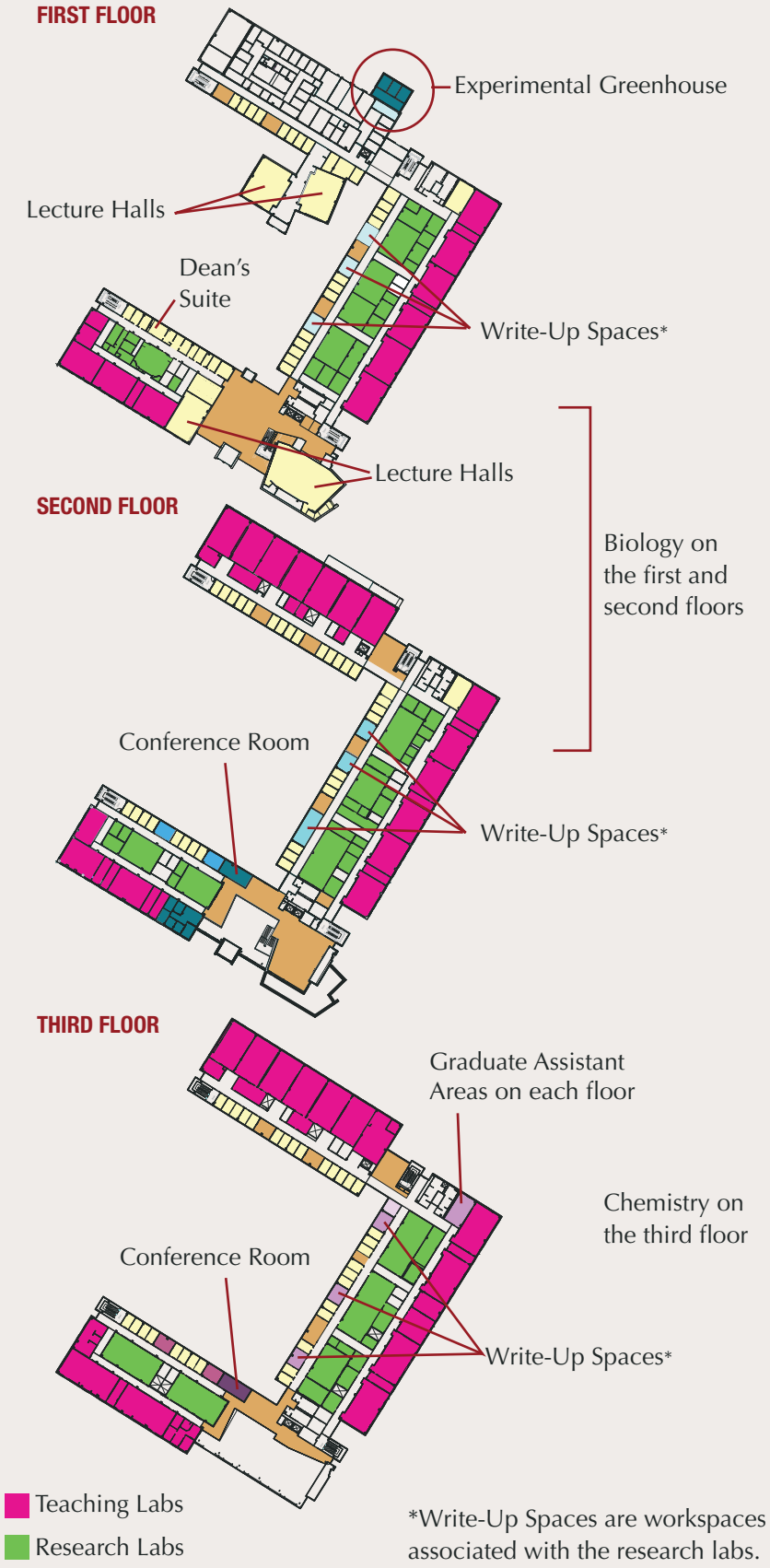
Flip through the magazine to see the building grow.

MTSU SCI



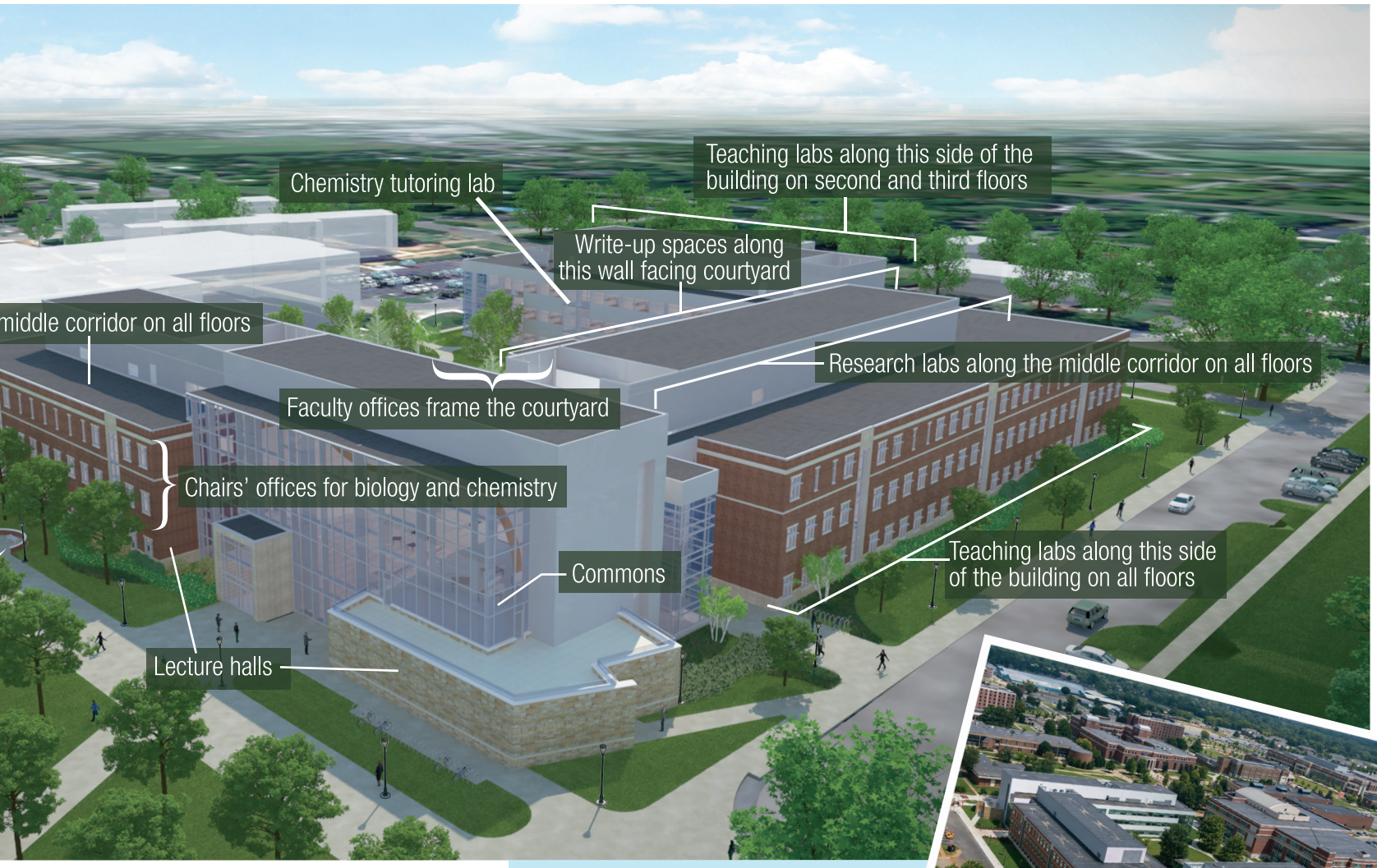
Scope of Instruction

The new building will house classes in biology and chemistry, aerospace, agribusiness/agriscience, engineering technology, nursing, physics and astronomy, elementary education, teacher licensure in science education, wellness and exercise science, human sciences, nutrition/food science/dietetics, geology, social work, and recording industry production technology.



*Write-Up Spaces are workspaces associated with the research labs.

ENCE BUILDING OVERVIEW



Building Stats

The building is organized around a series of intellectual neighborhoods with clusters of faculty offices, classrooms, instructional laboratories, research space, instrumentation and support rooms, and informal learning areas.

The building covers at least 250,000 square feet.

Over 3,000 students use the building each day.

49 laboratories
- 36 teaching labs
- 13 research labs

1,499 seats
- 912 in teaching labs
- 192 in research labs
- 395 in classrooms and lecture halls

Learning Spaces

Students learn not only during formal instruction time, but also when working on team-based projects. Different types and sizes of spaces are distributed throughout the building; the largest is the Commons. This team-based science work area is a 2,500-square-foot classroom without walls and designed for interdisciplinary interaction and collaborative study between students and faculty.

The materials in the atrium are designed to control sound and deliver effective acoustics for presentations. The atrium's natural lighting reduces heat gain, and natural light saves energy.

Ninety percent of spaces have a direct view to the outside.

Flip through the magazine to see the building grow.

RESEARCH FOR ANSWERS

The College of Basic and Applied Sciences is changing the boundaries of scientific endeavor, seeking solutions to some of the world's greatest challenges, and preparing tomorrow's STEM educators.

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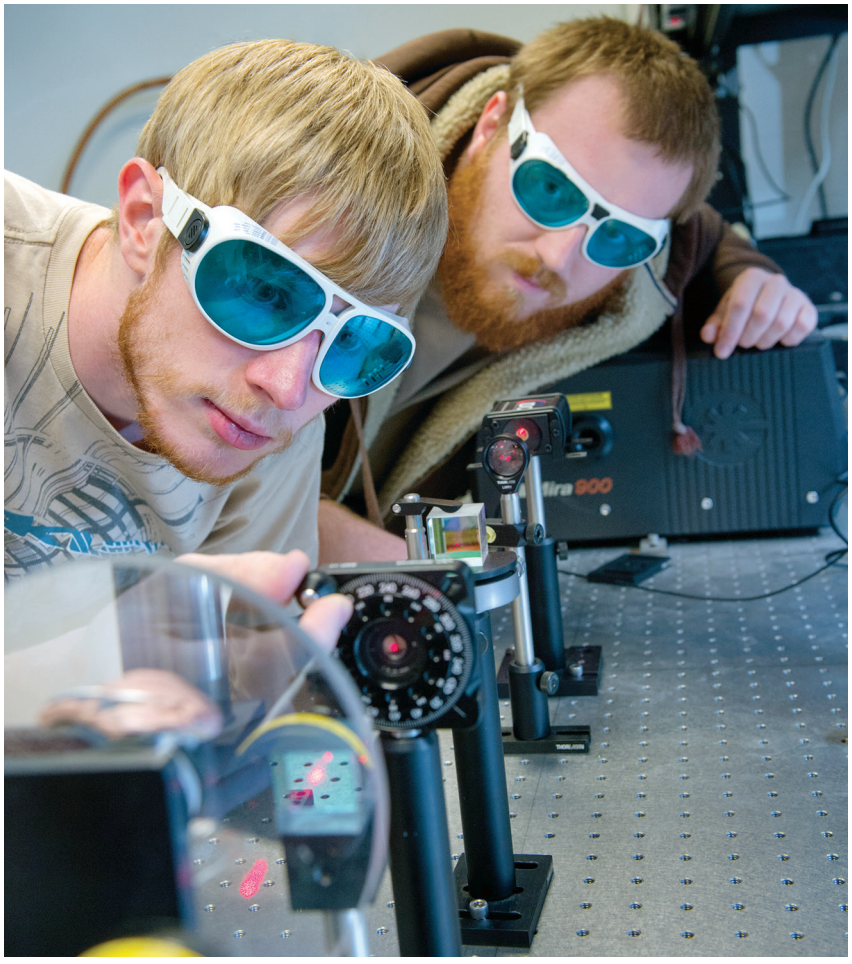

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Rave Reviews

First-day impressions

As first impressions go, the new Science Building left a memorable one Monday, Aug. 25, for students attending the opening day of 2014 fall semester classes.

Comments from students seeing the facility for the first time and faculty members who recently moved in included words such as "very spacious," "comfy," "bright with lots of windows," and "so many opportunities."

The facility is one of the most significant investments ever made by the state of Tennessee for the enhancement of science and technology education. It opened a full semester earlier than the original projection of January 2015.

Professor Cindi Smith-Walters, Biology, is in her 21st year at MTSU. She said the move into the new building "is like stepping out of shadows and into sunlight."

"There are so many more opportunities students will have with technology and the facility and being able to do research, and the student areas are unbelievable," Smith-Walters said.

Senior Kenneth Ball, a Science major and Secondary Education minor from Savannah, Tenn., called it "a wonderful step up from the old buildings."

After his first class in the new building, Ball found the classroom atmosphere exciting. "This is bright," he said, "and a step into the future."

School of Nursing student Moesha Martin, a freshman from Murfreesboro and a graduate of Siegel High School, waited for an early afternoon chemistry class in the spacious first-floor atrium.

"This building is nicely made and very organized," Martin said. "There's a calm, cool, collected feel in the lobby. You feel like you can chill. It's laid back, with lots of light."

Walking down a hallway and discovering one of the many informal learning areas throughout the building, Martin admired the mobile chairs and the outlets for charging laptops and phones.

"I really like this place," she said, adding that she expects to spend a lot of time in the building.


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